CODE MIXING AND CODE SWITCHING IN HINDI-ENGLISH

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May, 2013

Certificate

This is to certify that this dissertation entitled "**Code Mixing and Code Switching in Hindi-English Bilingual Children**" is a bonafide work in part fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student (Registration No. 11SLP011). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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Declaration

This dissertation entitled "**Code Mixing and Code Switching in Hindi-English Bilingual Children**" is the result of my own study under the guidance of Dr. Jayashree C. Shanbal, Lecturer in Language Pathology, Department of Speech-Language Pathology All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier in any other University for the award of any Diploma or Degree.

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To

Papa, Mummy and Tani

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CHAPTER 1: Introduction

It has been estimated that about half of the world's population is bilingual (Grosjean, 1982). According to the Census of India, 2001 (Ministry of Home Affairs, 2011) a total of 255,026,463 citizens can speak two languages. According to current linguistic, psychological, and neurolinguistic approaches, the term "bilingual" refers to all those people who use two or more languages or dialects in their everyday lives (Fabbro, 2001). Bilingualism is a complex phenomenon in which the children learn languages not only from their parents but also from their grandparents, babysitters, playmates, and also in the formal school setting. Grosjean (2010) has defined bilingual as, "Bilinguals are those who use two or more languages (or dialects) in their everyday lives". Grosjean (2010) emphasizes more on the regular use of languages rather than the fluency with which the language is spoken.

When individuals communicate in both the languages they may use the phenomena of code switching or code mixing. Code switching and code mixing are well-known traits in the speech pattern of the average bilingual in any human society the world over. Code mixing is defined, "as all cases where lexical items and grammatical features from two languages appear in one sentence" (Muysken, 2000). Code mixing refers to "the mixing of various linguistic units (morphemes, words, modifiers, phrases, clauses and sentences) primarily from two participating grammatical systems within a sentence" (Bhatia & Ritchie, 2004). More specifically, code mixing is intra-sentential and is constrained by grammatical principles. It may also be motivated by social psychological factors.

Inter-sentential alternations occur when the switch is made across sentence boundaries (Grosjean, 1982; Torres, 1989). Code switching is the alternative use by bilinguals of two or more languages in the same conversation and requires a greater deal of linguistic competence (Milroy & Mysken, 1995). Code switching refers to the alternation of two languages within a single discourse, sentence, or constituent (Poplack, 2000). Researchers classify bilinguals depending on age of acquisition as simultaneous and successive. De Houwer (1997), has described "simultaneous" bilinguals, as those who are exposed to La/L1 and Lb /L2 before two years of age, and the others are classified as "successive" bilinguals.

Literature discusses the phenomenon of code switching through different approaches. Various researchers often interpreted code switching in terms of socio-pragmatic approach (Riehl, 2005), grammatical approach (Auer, 1998; Myers-Scotton, 2002) and the recent psycholinguistic approaches (Clyne, 1996, 1991, 2003) to language alternations. Explanations to code switching and code-mixing have focused on specific conditions of language production in terms of the mental processes involved in code-switching in languages with different underlying structures of language systems. So when two bilingual individuals come into contact with each other, communication is carried out in either of the one language or both the languages by mixing and switching the codes of the two languages. This behavior of code switching and code mixing is seen in children too, who are exposed to two languages.

There are limited studies done in Indian languages to understand the effect of second language acquisition on code switching and code mixing. Harini and Chengappa (2007) studied the phenomenon of code switching and code mixing in Kannada-English bilingual children and the results revealed that code mixing and code switching are more

prevalent in successive than simultaneous Kannada-English bilingual children. Mahalakshmi and Prema (2011) studied the pattern of code switching in the Kannada-English bilingual children in the age group of 6-8 years and the results revealed that the children code switched or borrowed words from English language while naming nouns and some verbs. Mathew (2012) studied code switching pattern in Kannada-English bilingual children in the age range of 14-16 years and results indicated that most of the children exhibited intra-sentential form of switching and single-word switching. On similar lines there is a need to carry out in depth analysis about the nature of code mixing and code switching in Hindi-English bilinguals. This will facilitate in understanding the differences and similarities with existing research available in Kannada-English bilingual children, Spanish-English bilingual children, French-English, etc.

This study will also help us to understand the semantic, syntactic constraints of code switching and code mixing in bilingual children. It is possible to offer interesting indications about code-switching and code-mixing in young bilingual children as they are in the developmental phase of acquiring two different languages with different underlying language structures like that of Hindi (which is a alphasyllabic language) versus English (which is an alphabetic language). It will also be interesting to analyze the code-switching and code-mixing constraints i.e., to understand at which point the transition from one language to the other is possible based on different grammatical constraints of each of these languages. For e.g., in terms of the word order, Hindi follows the Subject-Object-Verb (SOV) and English follows the Subject-Verb-Object (SVO). Hence, it would be also interesting also to understand at what point in a sentence in Hindi an alternation is taking place from English. It would also be interesting to understand the developmental differences in terms of code switching and code-mixing in children from 6-8 years of age

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when children are actively introduced through formal education system begins for schooling in India.

Hence, the primary aim of the present study was to compare code mixing and code switching in Hindi-English (H-E) bilingual children. The other objectives of the study included the following,

Objectives of the study

- To compare the type, extent and level of code mixing and code switching in simultaneous and successive H-E bilingual children using SALT software (Miller & Chapman, 1981) and Perecman's levels of code mixing and code switching (Perecman's, 1984).

- To investigate the similarities and differences between code mixing and code switching seen in the simultaneous and successive bilingual children.

CHAPTER 2: Review of literature

The majority of the people of the world are bilingual and linguistic diversity is a norm rather than being an exception. As the world is developing, there is a tendency for English emerging as the universal language, with most of the people around the world adopting it as the second language in order to make communication possible. English is not only the medium of conveying messages at a private level but also a medium in conveying and sharing the knowledge in scientific and technical domains.

2.1   Definitions of Bilingualism

Bloomfield defined bilingualism as early as in 1933. He defined a bilingual as a "person who has native-like control of both the languages". Other extreme definitions of bilingualism or a person is said to be a bilingual, who knows some of the words in another language with or without the ability to speak those words. But the use of term "native-like" should be avoided, because it may set the criteria to a very high standard of proficiency. Haugen (1956) refers to bilingualism as "the ability to produce complete and meaningful utterances in the other language". This definition is arbitrary and unspecific because it says that a person is a bilingual if he/she knows one or two words of another language. So according to Jakobovits (1970) stated that while labeling a person as a "bilingual", the person's knowledge about both the languages should be taken into consideration.

According to current linguistic, psychological, and neurolinguistic approaches, the term "bilingual" refers to all those people who use two or more languages or dialects in their everyday lives (Fabbro, 2001). Bilingualism is a complex phenomenon in which the

children learn languages not only from their parents but also from their grandparents, babysitters, playmates, and also in the formal school setting. Grosjean (2010) has defined bilingual as, "Bilinguals are those who use two or more languages (or dialects) in their everyday lives". Grosjean emphasizes more on the regular use of languages rather than the fluency with which the language is spoken.

Bhatia and Ritchie (2006) stated that bilingualism is a complex phenomenon in which the children learn languages not only from their parents but also from their grandparents, babysitters, playmates, and also in the formal school setting. The children may use one language with their playmates and another with their parents. As a result, the child may become more fluent in certain areas in one language and other areas in another language. The children may often have difficulty in maintaining balance between both the languages.

Various authors have distinguished various types of bilingualism. The following section is concerned about the types of bilingualism as described by various authors.

2.2   Types of Bilingualism

The most common distinction is that between compound and coordinate bilingualism (Ervin & Osgood, 1954; Haugen, 1956; Weinreich, 1953). The distinction refers essentially to the semantic aspect of language.

A person is called as a compound bilingual, if he or she has learnt two languages in the same environment and acquires one concept for the languages with two verbal expressions. There is a fused neural representation of the two languages in the brain of compound bilinguals, but these representations work independently. For example, if a child is taught the concept of "food" in two languages at the same time, the child will

answer in the language the question was asked in a compound bilingual individual learns both the languages simultaneously, having one concept but has two different phonological realizations.

An individual is referred to as "coordinate bilingual", when the person learns or acquires the two languages in different contexts. For example, the child may be exposed to one language at home and another language at the day care center. A coordinate bilingual has two independent neural representations, with two independent systems. The words in each language have their different concepts and meanings. A compound bilingual develops one language system initially, followed by the development of the second language system and later on these two systems operate alongside. For example, a child is exposed to Hindi language at home and when he joins school, he asked to speak in English, this may lead to the child mixing up the two languages and phrasing like "the chair is choti" (Sharma, 2012). Weinreich (1953) differentiated one more type of bilingualism, which is referred as "sub-coordinate" bilingualism. This type of bilingualism occurs when the individual interprets the weaker language using the stronger language.

The concept of bilingualism and second language learning can be distinguished using the fact that, bilingualism is the acquisition of language, which is spontaneous and natural (raised by context), whereas second language learning is language learning which is derived out one's motivation. So, there are two types again, a spontaneous bilingualism and a conscious bilingualism. A spontaneous bilingual speaker has readily available access to both the languages in his environment through daily communication. The phonemes of both the languages are included in the daily communication and the bilingual has to extract the various rules from them. In conscious bilingual speaker, the

learning process is guided. The material used to learn the languages are well defined and they occur in various levels. The languages are learnt starting from the easiest concept to the most difficult concepts

Grosjean, 1982 has stated that the application of the terms native language, mother tongue, foreign language, and primary language should be avoided; instead the terms first language and second language should be used. The language which is acquired chronologically first, is referred to as the first language. Even though the language exposure is brief in the early stage of development and subsequently may be forgotten and not used later, it is still referred to as first language. Thus, it can happen that a second language- one that is acquired after a first language- becomes the individual's main and even only language in daily discourse. The terms first language and second language cannot be used for children who are exposed to both the languages at the same time; and the acquisition of the two languages in such cases is referred to as simultaneous bilingualism. When there is a clear distinction between the time of acquisition of first language and the second language, the pattern of acquisition is referred to as "successive bilingualism". Recent studies use the term La/L1 for first language and Lb/L2 for the second language.

McLaughlin (1978) set up an age criterion, which was adopted by many scholars, that acquisition of two languages before the age three years is referred as simultaneous acquisition whereas introduction of second language after the age of three years is termed as successive acquisition. In other words, the child who is acquainted to two languages before the age of three years is referred to as simultaneous bilingual. The child is acquainted to L2 after the age of three years is referred to successive bilingual. There are different criteria, which have been proposed to distinguish between "successive" and

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"simultaneous" bilingualism. Padilla and Lindholm (1984), refer to "simultaneous" bilinguals as those, who are exposed to both the languages since birth and the others are referred to as "successive" or "consecutive" bilinguals.

Miesel (1990) followed the terminology "Bilingual First Language Acquisition (BFLA)" instead of simultaneous bilingualism. According to this criteria, BFLA refers to those situations in which:

- A child is first exposed to Lb no later than a week after he or she is exposed to La, and

- A child's exposure to La and Lb is fairly regular i.e. both the languages are spoken to the child almost everyday.

De Houwer (1997), has described "simultaneous" bilinguals, as those who are exposed to La/L1 and Lb /L2 before two years of age, and the others are classified as "successive" bilinguals.

2.3   Code Mixing and Code Switching in bilinguals

When two bilinguals, who have the same language background, come into converse with each other, they often use change from one language to another while conversing. This linguistic behaviour of frequently changing the languages is widely known as 'language switching' or 'code switching' or 'code mixing', and this behaviour is exhibited by individuals in bilingual or multilingual contexts. The phenomenon of code switching may be associated with a certain mood of the speaker, circumstances of language production or the interlocutor. A bilingual may start speaking one language and finish the conversation using the other language, or the individual may have phrases from both the languages, which may succeed in a random order. The phenomenon of code

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mixing and code switching are well-known traits in the verbal output of an average bilingual individual.

Naseh, 1997, described code switching in the definition of bilingual people. He defined bilingual, who switches from one language to another according to the suitable environmental needs. In current literature, there has been some changes in the definitions of code mixing and code switching and their comparison. Muysken (2000) defined code switching as the prompt or swift succession of the various languages in a single speech event and he defined code mixing as the appearance of lexical items and grammatical units from both the languages in a single sentence. Annamalai (1989) stated that code switching occurs in full sentences with the use of other language, whereas code mixing does not include sentence level changes. Bentahila and Davies (1983) refer code mixing as the process of mixing of elements from both the languages in a single utterance, and code switching is referred to the product of the mixing, which produces a third code.

Code mixing is defined, "as all cases where lexical items and grammatical features from two languages appear in one sentence" (Muysken, 2000). Code mixing refers to "the mixing of various linguistic units (morphemes, words, modifiers, phrases, clauses and sentences) primarily from two participating grammatical systems within a sentence" (Bhatia & Ritchie, 2004). Code mixing is referred to as intrasentential mixing and code switching is referred to as more of inter-sentential mixing. Code mixing is obligated by the grammatical usage of the language and also be induced due to various social and psychological agents.

Grosjean (1982) and Torres (1989) stated that when the switch is made across the sentence boundaries then it is referred to as intersentential changes. Milroy and Muysken

(1995) stated that "the alternative use of both the languages by a bilingual individual in the same conversation is referred to code switching and it requires higher levels of language competency. According to Poplack (2000), the alteration of both the languages exhibited at the discourse level, sentence or constituent is referred to code switching.

Heredia and Altaribba (2001) have stated that when two languages are spoken in the same environment, the bilinguals use the phenomenon of code switching. The phenomenon of code switching is constrained by the grammatical and function usage and is controlled by the rules of the language. Li (1996) stated that when a word or phrase form one language is used as substitute in another language, then the phenomenon of code switching occurs.

The speed at which language is spoken, and the cognitive load that occurs while comprehending and in consolidation of the various linguistic factors, code switching seems to be an impossible phenomenon. The time taken for retrieving the appropriate word from the second language would require more time consumption as compared to conversing in one language only. There are various reasons given for explaining the phenomenon of code switching and code mixing. One of the most accepted explanations for bilinguals' code-switching phenomenon is compensation for the lack of language proficiency. In other words code switching occurs when the individual does not know either of the languages completely (Genesee, Nicoladis & Paradis, 1995; Lanvers, 2001, Thirumalai & Chengappa, 1986; Volterra & Taeschner, 1978). Grosjean (1982) found out that Spanish-English bilinguals code-switch because of their lack of formal knowledge.

Another possible reason for the phenomenon of code switching to occur is the failure to remember the appropriate word at the correct time. This is often referred to as

classic tip-of-the-tongue (TOT) phenomenon. In the TOT phenomenon, the person is not able to retrieve the information that is already known. This phenomenon is often associated with the word frequency effects. Grosjean (1982) pointed out that Spanish-English bilingual code-switched and used English words because English was more frequently used and it was faster to retrieve the English word. Thus, the language use and word frequency affect the phenomenon of code switching.

Various studies have shown that the phenomenon of code switching is constrained by the syntactical structure of the language. For example, Spanish and English differ in the position of adjective in the sentence, in English adjective precedes the noun ("I want a gren tomato") whereas in Spanish noun precedes the adjective ("quiero un tomate verde") (Lederberg & Morale, 1985). For example, in English language follows the Subject-Verb-Object pattern ("I want the pen"), whereas Hindi language follows the Subject-Object-Verb pattern (/mudʒe pæn tʃahIje/) (Sharma, 2012). Bilinguals use the phenomenon of code switching in order to be better understood by the listener. Some bilinguals consider that some words are used in order to convey the meaning better. For example the Spanish word "carino" implies both liking and affection, and there is no word in English language, which can be used to express these two meanings in the same word. Thus, when Spanish-English bilingual speakers come into contact with one another, they would code-mix in order to achieve a greater level of understanding by using this Spanish word "carino".

There are various methods used to study and analyze for the code-mixing and code-switching constraints. A few of these include the Matrix Language Frame (MLF) Model, Systematic Analysis of Language Transcripts (SALT) software (Chapman &

Miller, 1981), Perecman's Levels of code mixing and code switching are explained in the following sections.

Matrix Language Frame (MLF) Model

This model provides a consolidated set of constraints, as compared to the earlier models, which restricted to only one constraint, for example, the Government Constraint (di Sciullo et al., 1986), Functional Head Constraint (Belazi, Rubin, & Toribio, 1994). This model was put forth by Myers-Scotton (1993), Myers-Scotton (1995), Myers-Scotton and Jake (1995, 1997a), and Myers-Sctton and Jake (2000). The model has two central components:

- The difference between the Matrix Language (ML) and the Embedded Language (EL). According to this component, both the languages do not participate equally in the phenomenon of code switching and both the languages do not have the same constraints. The base language of the bilingual is referred to as the Matrix Language (ML) and the language whose constituents are inserted in the Matrix-Language Frame, is referred to Embedded language (EL). The morpho-syntax of ML plays a major role in setting the frame of the sentence. The ML provides the utterances with the system morphemes and also the sequence of the morphemes (System Morpheme Principle and Morpheme Order Principle). The content morphemes and the uncommon morpheme sets are contributed by the EL (EL Island Trigger Hypothesis and ML Blocking Hypothesis). Thus, according to this Model, there are three different types of basic elements: ML Islands, ML + EL constituents and EL Islands. The ML Islands and ML + EL constituents consists of ML system morphemes and the morpheme order of ML, and may be comprised of PPs, NPs, APs (Adverb and adjective) IPs and VPs.

- The difference between the content morphemes and the system morphemes. The basic difference between the content and the system morphemes is determined by the thematic role assignment and the quantification setup. The content morphemes include nouns and verbs, whereas system morphemes consists of adverbs, verb and noun inflection, determiners, negative operators and copulas and auxillary verbs.

Myers-Scotton and Jake (2000), proposed 4±M MLF model. In this revision, the system morphemes were further divided into two types: early and late, and this revision determined the way in which system morphemes can participate in the ML + EL constituents. The activation, form and appearance of early system morphemes are decided by the content morphemes. Plural morphemes and irregular past tense marker ("ran") are examples of early system morphemes, because are determined by the content morphemes. The determiners are also considered as early system morphemes because in this revised model, determiners were a part of the NP as the internal morpheme. The functional or positional relations outside the constraints of the content morphemes decide the presence of late system morphemes. The regular verb inflection for agreement is an example of late system morpheme, because it is determined by the factors, which are not included in the VP.

The arrangement of the content and system morphemes from the EL and ML are determined by the following set of rules:

- The System Morpheme Principle (SMP): According to this principle, in ML + EL constituents, all the syntactic and externally relevant system morphemes are derived from the ML (Myers-Scotton, 1995). The term "externally relevant"

means the late system morphemes. The early system morphemes are not included in this constraint.

- The Morpheme Order Principle (MOP): According to this principle, " the superficial morpheme order in the ML + EL constituents is derived from ML" (Myers-Scotton, 1995).

- The EL Island Trigger Hypothesis: When a whole EL constituent is mixed rather than one insertion from EL, then the late system morphemes from EL mat be present in the constituent. The NPs, IPs, VPs or Aps may constitute the EL Islands.

- The ML Blocking Hypothesis: According to this principle, there is a filter, which blocks the presence of EL content morphemes, which are not in agreement or is congruent with the relative ML morpheme. The term congruency means according to each of the languages, whether the morpheme is content or system. When there is a system morpheme counterpart for the EL content morpheme in the ML, then its presence is restricted.

The bilinguals often use the compromise strategies, when it becomes difficult to conform to the different principles or when there is absence of agreement to the principles. (Jake and Myers-Scotton, 1997a).

Systematic Analysis of Language Transcripts (SALT) software (Chapman & Miller, 1981)

The SALT software has been used to study the phenomenon of code switching and code mixing. Mahalakshmi and Prema (2011) have used the SALT software to study the phenomenon of code switching in Kannada-English bilingual children in the age range of 6-8 years. The children' utterances wee transcribed according to the protocols of

SALT software. The parameters, which were analyzed using the software, were: Mean Length of Utterance (MLU), Type Token Ratio (TTR), number of different words and number of Code Switches (CS). The results of this study have been discussed in the next section.

Levels of Analysis of Bilingual data

There are various levels at which the code mixing and code switching is discussed. They are the lexical level, the syntactic level, the phonological level, and the morphological level. The transfer at the lexical level is the most common form of code mixing and code switching. The lexical level transfers mainly consist of nouns. This type of transfer from one language to another is seen when the bilingual does not know the appropriate word or when the words from the both the languages sound similar.

When the bilingual speakers manipulate the syntax of the two languages in various ways, then syntactic level of analysis is carried out. When the two languages share a common syntactic structure, the bilingual speaker will use the common structure rather than an alternative structure, which may perform the same function but does not exist in both the languages (Boeschoten, 1998; Pfaff, 1979). The interaction of the syntax of the both the languages depends on the competency of the bilingual in both the languages.

The bilinguals' verbal output the phonological output from L2 is called as foreign accent and it relates to the transfers at the phonological level. The words which appear immediately after the code switched utterances are likely to have more phonological variations than the words occurring at different locations. The psycholinguistic data reveals that bilinguals often use the pronunciation of a word in one language with the

phonological characteristics from the other language accidently and these words are stored separately in the brain.   There are three chances or odds for the transfer of words from one language to another at the morphological level. In one case, there is no change in the morphological structure of the utterance according to the recipient language. In case two, the utterance may be integrated morphologically with the recipient language. In case three, the original form of the word is used without adopting inflections from any of the languages.

The research reveals that the bilingual speakers often show inconsistent adoption of transfer and the speakers may show all the above mentioned transferred in their utterances. The more integrated the word is according to the recipient language, the more it is indicative of language transfers.

2.4   Studies on code mixing and code switching in bilingual children

Paradis, Nicoladis and Genesee (2000) carried out a longitudinal study to find out whether children code mix utterances similarly as the adults. The analysis was carried out using the MLF Model for the utterances recorded at three intervals: at 2.6 years, 3 years and 3.6 years. The results revealed that the children followed the same pattern as the adults in almost all the principles except for the violations in the System Morpheme Principle, but the children showed increasing adherence to the principle with increasing age.

Current research is more concerned with on-line processing of spoken language and identifying some of the factors influencing the recognition of code-switched words. For instance, the English language allows both consonant-consonant (CC) and consonant-vowel (CV) clusters at the beginning of the word (e.g., "flight" vs. "bear"). Chinese, in

contrast, allows clusters but lack CC clusters. Li (1996) found that this difference in phonological structure affected Chinese bilinguals' processing of English code-switched words: They took longer to recognize English code-switched words containing CC initial clusters than those containing CV initial clusters. Other important factors reported to influence the recognition of code-switched words include context (e.g., semantic context), phonetics (e.g., whether the code-switched is pronounced according the phonetics of the first language or the second language), and homophonic overlap (e.g., whether there are words that are pronounced similarly) across the two languages. Discussing whether or not code switching is a time-consuming process, Li argue that when experimental studies utilize the appropriate methodology and take into consideration some of the factors mentioned above, the results revealed that the code-switched words are no different from recognizing monolingual words.

One of the shortcomings of all the previous studies in bilingualism is that they rely on the assumption that the bilingual's first language has a special status. Many models have depicted the first language has a bigger mental lexicon and containing more information than the second language lexicon. Given this argument is correct, one would expect the code switching would take place only when the bilingual is speaking the second language. That is, bilinguals would experience more first language interference as they communicate in their second language than second-language interference when they communicate in their first language. This would be attributed to the fact that the bilingual have limited knowledge of their second language. This may be the case for beginning bilinguals, but adult Spanish-English bilingual speakers reported more English interference when they communicated in Spanish, and little or no interference from Spanish when they communicated in English.

The mechanism underlying the language shift i.e., faster access of words in the second language than in the first language; has been explained by various authors. It is suggested that after a certain level of fluency and frequency of use is attained in second language, a language shift occurs and the second language behaves as if it were the bilingual's first language. In other words, the second language becomes more readily accessible than the first language, and the bilingual comes to rely on it more. That is, regardless of which language a bilingual learned first, perhaps the more dominant language determines which lexicon is accessed faster (Heredia, 1997).

For the Spanish-English bilingual speakers of United States, although there first language is Spanish, they obtain most of their formal education in English. Likewise, many of their everyday interactions involve English. As a result, the words and concepts of English become more readily accessible than the words and concepts of Spanish. An implication of this interpretation is that during the early stages of bilingualism, when bilinguals tend to rely more on their first language, their code switching mostly involves intrusions from their first language as they communicate in their second language. However, as the second language becomes dominant language, their code switching would tend to consist of intrusions from their second language as they communicate in their first language. In summary, language dominance plays an important role in how bilinguals access their languages.

Shin and Milroy's (2000) studied on CM and CS in Korean-English bilingual children in the age group of 6-8 years. The results of the study revealed that the Korean-English bilingual children in the age groups of 6-7 years and 7-8 years did not have any significant difference between the two groups and CM and CS is limited in these two age

groups and is constrained by either the preference of English language or competency in English language by the children and are mostly of CM type. According to the authors the results may be because of the reason that the data collection was done in school setup and the children mainly used the CS phenomenon as a contextualization strategy.

Arias and Lakshmann (2005) studied the representation of two languages in an sequential bilingual. A longitudinal study was carried to investigate the child's pattern of English language, Spanish language and Spanish-English mixed utterances. The mixed utterances were analyzed syntactically to study the extent of code switching phenomenon. The analysis included the classification of mixed utterances into three categories: mixing of content or functional word, syntactic mixing of utterances from language into the syntax of another, and utterances containing blends. The data was analyzed qualitatively as intersentential switching or intra-sentential switching. The intersentential utterances were then categorized according to the pattern followed: adult-like (grammatical) and non-adult-like (non-grammatical). The results reveal that the child could use the appropriate language according to the interlocutor, there was decrease in the number of mixed utterances and MLU for mixed utterances was the highest and the code switching of intra-sentential type occurred more frequently than intersentential and followed more non-adult-like pattern.

Harini and Chengappa (2008) studied the phenomenon of code switching and code mixing in Kannada-English bilingual children. The data was collected using a picture description task under three condition: monolingual Kannada, monolingual English and bilingual Kannada-English conditions. The analysis was carried out using the MLF Model, frequency of code mixing and code switching, and compered with the language proficiency using International Second Language Proficiency Rating (ISLPR)

rating scale. The results revealed that code mixing and code switching are more prevalent in successive than simultaneous Kannada-English bilingual children. ML Islands were more obvious in successive groups than in simultaneous groups. The numbers of EL Islands were exhibited more by the successive than the simultaneous group.

Mahalakshmi and Prema (2011) studied the pattern of code switching in the Kannada-English bilingual children in the age group of 6-8 years. The analysis was done using the SALT software. The results revealed that the children code switched or borrowed words from English language while naming nouns (vegetables, fruits, professions, vehicles) and some verbs. The children were selected from a low socio-economic status, and these children still exhibited the pattern of code switching in English even though they had limited exposure to the English language at home.

Mathew (2012) studied the code-switching pattern in Kannada-English bilingual children in the age range of 14-16 years and under two different conditions. The task was to describe the picture in Kannada language and English language separately. The author analyzed the data subjectively for instances of code mixing and code switching under various conditions two-language conditions- English and Kannada. The data was also analyzed for the location of code switching and (intra-sentential switching) code mixing. The results reveal that code switching was present in all the subjects (average 14.62%) and individual variations occurred in the range 28.12% to 7.69%. The differences were also seen for the male and female subjects. The female subjects had 20.81% used more code switched utterances than the male subjects, who showed 8.43%. The results also revealed that all the participants used the intra-sentential pattern of code switching and only single-word switching was observed.

Literature discusses the phenomenon of code switching through different approaches. Various researchers often interpreted code switching in terms of socio-pragmatic approach (Riehl, 2005). Hence, there was always an emphasis on understanding code switching based and when and why language alternations took place. It was felt that language alternations could serve as a conversational cue, expressing attitudes towards language, making linguistic identity, etc. (Auer, 1998; Tabouret-Keller, 1995). In yet other approaches, code switching was looked in terms of grammatical approach (Auer, 1998; Myers-Scotton, 2002). Here, research provided indications about the underlying structure of language systems when code-switching constraints were analyzed. In yet another direction, Clyne (1969, 1991, 2003) explained through psycholingusitically motivated code-switched language alternations. This was prompted greatly by the specific conditions of language production in terms of the mental processes involved in code switching in languages. In this regard, Auer (1999) opined that the term code switching should be used for socio-pragmatically conditioned code alternation whereas psycholinguistically conditioned type should be termed "code-mixing".

When two bilingual individuals come into contact with each other, communication is carried out in either of the one language or both the languages by mixing and switching the codes of the two languages. This behavior of code switching and code mixing is seen in children too, who are exposed to two languages. There are limited studies done in Indian languages to understand the effect of second language acquisition on code switching and code mixing. Harini and Chengappa (2008) studied the phenomenon of code switching and code mixing in Kannada-English bilingual children and the results revealed that code mixing and code switching are more prevalent in successive than simultaneous Kannada-English bilingual children. Mahalakshmi and

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Prema (2011) studied the pattern of code switching in the Kannada-English bilingual children in the age group of 6-8 years and the results revealed that the children code switched or borrowed words from English language while naming nouns and some verbs. Mathew (2012) studied code switching pattern in Kannada-English bilingual children in the age range of 14-16 years and results indicated that most of the children exhibited intra-sentential form of switching and single-word switching.

On similar lines there is a need to carry out in depth analysis about the nature of code mixing and code switching in Hindi-English bilinguals. This will facilitate in understanding the differences and similarities with existing research available in Kannada-English bilingual children, Spanish-English bilingual children, French-English, etc. This study will also help us to understand the semantic, syntactic constraints of code switching and code mixing in bilingual children. It is possible to offer interesting indications about code-switching and code-mixing in young bilingual children as they are in the developmental phase of acquiring two different languages with different underlying language structures like that of Hindi (which is a alphasyllabic language) versus English (which is an alphabetic language.

It will also be interesting to analyze the code-switching and code-mixing constraints i.e., to understand at which point the transition from one language to the other is possible based on different grammatical constraints of each of these languages. For e.g., in terms of the word order, Hindi follows the Subject-Object-Verb (SOV) and English follows the Subject-Verb-Object (SVO). Hence, it would be also interesting to understand at what point in a sentence in Hindi an alternation is taking place from English. It would also be interesting to understand the developmental differences in terms

of code-switching and code-mixing in children from 6-8 years of age when children are actively introduce through formal education system begins for schooling in India.

Hence, the primary aim of the present study was to compare code mixing and code switching in Hindi-English (H-E) bilingual children. The other objectives of the study included the following,

Objectives of the study

- To compare the type, extent and level of code mixing and code switching in simultaneous and successive H-E bilingual children using SALT software (Miller & Chapman, 1981) and Perecman's levels of code mixing and code switching (Perecman's, 1984).

- To investigate the similarities and differences between code mixing and code switching seen in the simultaneous and successive bilingual children.

CHAPTER 3: Method

The primary aim of the present study was to compare code mixing and code switching in Hindi-English (H-E) bilingual children. In order to study the code switching and code mixing in Hindi-English bilingual children a cross-sectional normative research design was employed.

Participants

Forty children in the age range of 6-8 years (further subdivided into two groups 6-7 years and 7-8 years) who are native speakers of Hindi language and who acquired English language, as their second language were considered for the study. Twenty children were considered in 6-7 years and 7-8 years age group of children. Each age group children had ten males and ten females.

The criteria for selection of the participants for the study were as follows:

- McLaughlin (1978) set up an age criterion, that acquisition of two languages before the age three years is referred as simultaneous acquisition whereas introduction of second language after the age of three years is termed as successive acquisition. For the present study, De Houwer's (1997) criteria for successive and simultaneous bilinguals were considered. According to De Houwer (1997), "simultaneous" bilinguals are those who are exposed to La/L1 and Lb /L2 before two years of age, and the others are classified as "successive" bilinguals.
- All the subjects were ruled out for any language or sensory impairment with the ICF CY checklist (WHO Work group, 2004) Version 1.C for 6-8 years.

- All the children were selected from the mid/high Socio Economic Status (using Socio Economic Status scale; Venketasan, 2011)

- The Language Use questionnaire (Shanbal & Prema, 2007) was administered to the parents to examine the language use in the children in two languages.

Test Material

The test material included picture stimuli, which include picture of a 'Park' (Appendix I), which was used as a stimulus to elicit verbal responses from the children in sentences. In the pilot phase, the picture suggested in Harini and Chengappa's (2008) study was considered. Since the picture was a black and white picture, the investigator designed the picture and colored it. Two children in the age range of 6-8 years were shown the stimulus picture. These children included in the pilot phase were not included in the final data. From the pilot study, it was found that responses could be elicited form the children and also found to show adequate vocabulary. Before finalizing the stimuli, the picture was also shown to three experienced Speech-Language Pathologists. The professionals rated the picture in terms of familiarity of stimuli within the pictures for vocabulary and appropriateness of the picture to be used for children within the age range of 6-8 years. Once the picture was found to be appropriate, the final testing was carried out.

Test Environment

The children were asked to sit comfortably in a quiet room. The children were given a copy of the stimulus for two minutes to practice. The language samples were recorded using the Sony Walkman NWZ-D135F model. The video samples were recorded using the Sony Xperia Mini Pro mobile phone.

Procedure

The study was carried out in two phases.

Phase I: It included collecting socio-demographic information, screening for language impairment, and selection of the participants on the basis of language exposure and language preference using the questionnaires developed and Shanbal and Prema (2007).

Phase II: A picture description task was used to elicit the children's verbal behaviour. The children were instructed to describe the pictures in his/her native language i.e., Hindi, but they could take help from the second language i.e., English, if they do not find any specific word in their native language.

Scoring, coding and analysis:

The children's utterances were audio recorded and the utterances were transcribed and marked according to the protocols of Systematic Analysis of Language Transcripts (SALT) software (Version 2012) (Miller & Chapman, 1981). The morphemic analysis was carried out first, followed by transcription using [CS] for code switched utterances.

The utterances were analyzed according to the Matrix Language Frame (MLF) Model (Myers-Scotton, 1993; Myers-Scotton & Jake, 1995) and also using the Systematic Analysis of Language Transcripts (SALT) software (Miller & Chapman, 1981).

The number of code mixing and code switching were calculated for each of the subjects. The total number of code mixing and code switching exhibited by the two groups was calculated.

The Systematic Analysis of Language Transcripts (SALT) software was used to find out the following parameters:

- Total utterance

- Total completed words

- Mean Length of Utterance (MLU) in words

- Number of different words

- Type Token Ratio (TTR)

- Number of bound morphemes

- Total number of code switches

- Total number of non-repeated code switches

Perecman's Levels of code mixing and code switching (Perecman, 1984) was used to classify the utterances into lexical-semantic (word and Phrase level), syntactic, morphological and phonological levels. Further, these levels of code mixing and code switching were compared between the two age groups. The data was analyzed for the frequency of CM with the language exposure and language use.

The MLF Model was used to analyze the sample based on the following parameters:

- Matrix Language Islands (ML Islands)

- Matrix Language Shifts (ML Shifts)

- Embedded Language Islands (EL Islands)

- Matrix Language + Embedded Language (ML + EL)

- Borrowed Forms (BF)

- Embedded Language Insertions (EL Insertions)

- Revisions

The data was analyzed statistically using the Statistical Package for the Social Sciences (SPSS) software package (Version 20.0) to delineate the similarities and differences existing between the two different age groups of bilingual children. The descriptive analysis was done to calculate mean, median and standard deviation values for frequency of CM and CS in successive and simultaneous H-E bilingual children, various parameters obtained through SALT software analysis such as TU, TWC, MLU-W, NDW, TTR, NBM, TCS, and TUCS, Perecman's level of CM and CS at word and phrase level, for frequency of CM with language exposure to Hindi and English language, and also for various parameters of MLF Model such as ML Islands, ML Shifts, EL Islands, ML + EL constituents, Borrowed forms, EL Insertions, and Revisions. The non-parametric Mann Whitney test was done to compare between age groups and gender for the frequency of CM and CS in successive and simultaneous H-E bilingual children, various parameters obtained through SALT software analysis such as TU, TWC, MLU-W, NDW, TTR, NBM, TCS, and TUCS, Perecman's level of CM and CS at word and phrase level, for frequency of CM with language exposure to Hindi and English language, and also for various parameters of MLF Model such as ML Islands, ML Shifts, EL Islands, ML + EL constituents, Borrowed forms, EL Insertions, and Revisions.

CHAPTER 4: Results

The aim of the present study was to investigate code mixing (CM) and code switching (CS) in Hindi-English (H-E) bilingual children.

The objectives of the present study included the following:

- To compare the type, extent and level of code mixing (CM) and code switching (CS) in successive and simultaneous H-E bilingual children using SALT software (Miller & Chapman, 1981) and Perecman's levels of code mixing and code switching (Perecman's, 1984).
- To investigate the similarities and differences between code mixing (CM) and code switching (CS) in the H-E bilingual children.

Forty H-E bilingual children in the age range of 6-8 years (further subdivided into two groups 6-7 years and 7-8 years) who are native speakers of Hindi language and who acquired English as their second language were considered for the study. Twenty H-E bilingual children were considered in both the 6-7 years and 7-8 years age group.

The data was analyzed for different parameters manually as well as using the SALT software, MLF model, Perecman's levels of CM and CS and qualitative analysis was carried out. The parameters analyzed included, frequency of CM and CS, Total number of utterances (TU), Total number of words completed (TCW), Mean Length of Utterance at words level (MLU-W), Number of different words (NDW), Type Token Ratio (TTR), Mean Length of Utterance at syllable level (MLU-S), Number of Bound morphemes (NBM), Total number of code switches (TCS) and Total number of Unrepeated Code Switches (TUCS) parameters using SALT (Version 2012) software;

and Matrix Language (ML) Islands, ML Shifts, Embedded Language (EL) Islands, ML + EL constituents, Borrowed Forms (BF), EL Insertions and Revisions parameters were analyzed using the MLF Model (Myers-Scotton and Jake, 2000); and Perecman's level of code mixing and code switching (Perecman, 1984).

Descriptive statistics was done to calculate the mean, median and standard deviation (SD) values. Non-parametric Mann-Whitney test was used to check for significant difference for various parameters between age groups.

The results of the present study are explained in the following sections.

4.1   Comparison of CM and CS in successive and simultaneous in H-E bilinguals

4.2   Frequency of Code mixing (CM) and code switching (CS) in H-E bilingual children

4.3   Comparison of performance of H-E bilingual children between age groups on Systematic Analysis of Language Transcripts (SALT).

4.4.   Comparison of performance of H-E bilingual children between age groups on Perecman's Level of Code mixing and Code Switching

4.5   Frequency of CM and CS and effect of Language use on Frequency of CM and CS

4.6   Comparison of performance of H-E bilingual children between age groups based on MLF Model

4.1   Comparison of CM and CS in successive and simultaneous in H-E bilinguals

McLaughlin (1978) set up an age criterion, that acquisition of two languages before the age three years is referred as simultaneous acquisition whereas introduction of second language after the age of three years is termed as successive acquisition. De

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Houwer's (1997) criteria for successive and simultaneous bilinguals was considered for the present study,. According to De Houwer (1997), "simultaneous" bilinguals, as those who are exposed to La/L1 and Lb /L2 before two years of age, and the others are classified as "successive" bilinguals.

Descriptive statistics revealed mean, median and SD values for H-E bilingual children. Table 4.1 shows the values of median and SD values for the frequency of CM in the successive and simultaneous H-E bilingual groups between age groups.

Table 4.1
Median and SD for the frequency of CM in the successive and simultaneous H-E bilingual groups between age groups

Age Group	Type of Bilingualism	N	Median	SD
6-7 years	Successive	10	7.00	2.83
	Simultaneous	10	9.50	1.89
	Total	20	9.00	2.60
7-8 years	Successive	10	10.00	3.38
	Simultaneous	10	6.00	2.00
	Total	20	8.00	3.69
Total	Successive	20	9.00	3.22
	Simultaneous	20	8.50	3.17
	Total	40	9.00	3.15

The analysis of results revealed that for frequency of CM, in the age group 6-7 years, the simultaneous H-E bilingual children (Median=9.50, SD=1.89) showed greater number of CM than the successive H-E bilingual children (Median=7.00, SD=2.83) (see Figure 4.1). The analysis of results revealed that in the 7-8 years age group the simultaneous H-E bilingual children (Median=6.00, SD=2.00) showed lesser number of CM than the successive H-E bilingual children (Median=9.50, SD=3.38) (see Figure 4.1).
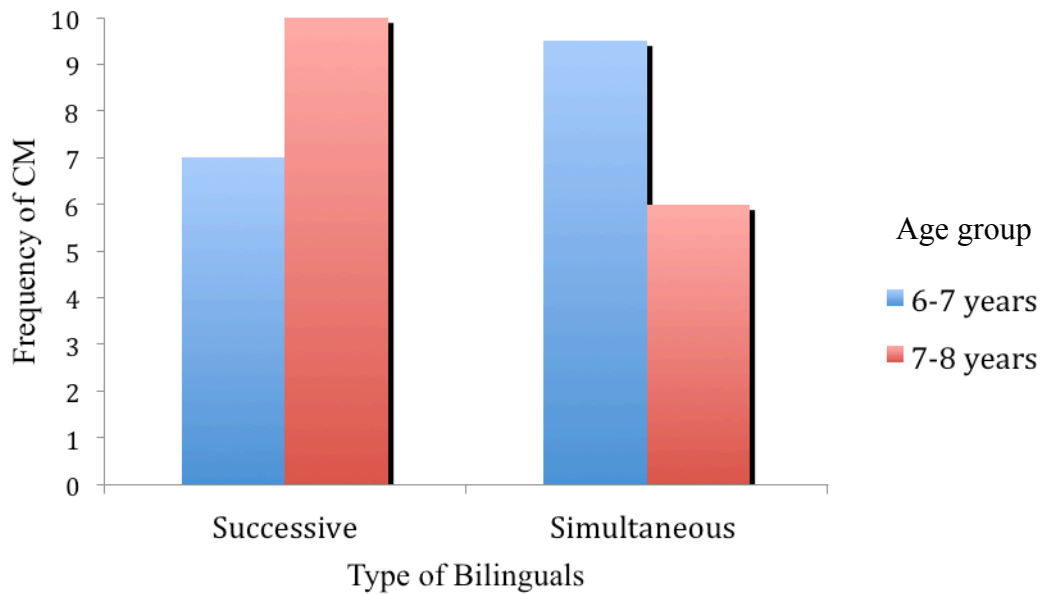
Figure 4.1 Frequency of CM for successive and simultaneous H-E bilingual children in the age group 6-7 years and 7-8 years

The analysis of results revealed that the simultaneous H-E bilingual children in the age group of 6-7 years (Median=9.50, SD=1.89) had greater number of CM than the simultaneous bilingual H-E bilingual children in the age group 7-8 years (Median=6.00, SD=2.00). The analysis of results also revealed that successive H-E bilingual children in the age group of 6-7 years (Median=7.00, SD=2.83) had greater number of CM than the successive H-E bilingual children in the age group of 7-8 years (Median=10.00, SD=3.38).

The analysis of results revealed that in the age group of 6-7 years the simultaneous H-E bilingual children had greater CM than successive H-E bilingual children. The results also revealed that in the age group of 7-8 years simultaneous H-E bilingual children exhibited lesser number of CM than the successive H-E bilingual children. Overall, the analysis of results revealed that the successive H-E bilingual children (Median=9.00, SD=3.22) showed greater CM than the simultaneous H-E

bilingual children (Median=8.5, SD=3.17). The non-parametric Mann-Whitney test was used to compare the successive and simultaneous bilingual groups. The analysis of results revealed that there was no significant difference between the successive and simultaneous H-E bilingual groups. The results revealed that there was no significant difference between the groups on the frequency of CM and CS between the age groups and there was no gender effect observed.

A qualitative analysis of the data for successive and simultaneous H-E bilingual children was done. The findings are reported for two children each in the successive and simultaneous bilingual groups within each age group, i.e., 6-7 and 7-8 years of age.

Sample A-6-7 years

The transcribed sample of a successive H-E bilingual child in the age group of 6-7 years has been qualitatively analyzed below. The transcribed sample A according to the protocols of SALT software is depicted below.

Transcription of Sample A

1 C Do bachcha/e cycle[CS] chala raha/e hai/e.
2 C Ladka aur ladka/i jhule pe baitha/e hai/e.
3 C Ladka aur ladka/i pani mein batak aur boat[CS] chala raha/e hai/e.
4 C Ladka aur ladka/i ladka aur ladka dekh raha/e hai/e.
5 C Do doggy/s[CS] bhag raha/e hai/e.
6 C Dada aur dada/i baitha/e hai/e.
7 C Ladka aur ladka/i khel raha/e hai/e.
8 C Ladka/i ice[CS] cream[CS] kha raha/i hai/i.
9 C Ek bachcha mummy[CS] ke saath ghum raha hai park[CS] mein.
10 C Ek ladka/i daud raha/i hai/i.
11 C Ek chidiya pedh pe baitha/i hai/i.
12 C Do ladka/i/e sand[CS] castle[CS] bana raha/i hai/e.
13 C Ladka/i pita ka saath ja raha/ihai/e.

Qualitative analysis of sample A revealed that the child is mainly exhibiting CM than CS behaviors. In other words, the child had more of intra-sentential switching pattern present than inter-sentential patterns. For example, the child in the sample A said /do dɔggIʒ bʰaːg rahe hɑĩ/ (In English it meant-two dogs were running) in the 5th utterance of the above sample. In this utterance the word 'doggies' was the word used in a code mixed utterance. The child should have used the word /kuʈʈe/ in Hindi language instead of 'doggies' which is a word in English. The CM was mainly used for the nouns such as sand castle, park, doggies, and boat. The child also used borrowed words such as mummy, ice cream, and cycle. The child exhibited CM, which followed the grammatical constraints of Hindi and English language.

Sample B-6-7 years

The transcribed sample of a simultaneous H-E bilingual child in the age group of 6-7 years has been qualitatively analyzed below. The transcribed sample A according to the protocols of SALT software is depicted below.

Transcription of Sample B

1 C Ek ladka/i bhag raha/i hai/i.
2 C Ek ladka/i ice[CS] cream[CS] kha raha/i hai/i.
3 C Bachcha/e slide[CS] pe khel raha/e hai/e.
4 C Phool/e chamak raha/e hai/e.
5 C Ladka/i bachche ko ghuma raha/i hai/i.
6 C Ek ladka/i apne dadaji ko kutta dikha raha/i hai/i.
7 C Ladka ladka/i ball[CS] se khel raha/e hai/e.
8 C Bachcha/e pani mein khel raha/e hai/e khilona/e se.
9 C Bachcha/e see[CS] saw[CS] pe khel raha/e hai/e.
10 C Bachcha/e sand[CS] castle[CS] bana raha/e hai/e.
11 C Bird[CS] udh raha/i hai/i.
12 C Ladka ghode pe ghum raha hai.
13 C Ladka ek scooter[CS] pe ghum raha hai.
14 C Ladka/i ek cycle[CS] pe cycle[CS] kar raha/i hai/i.

The qualitative analysis of the sample B revealed that the child had greater frequency of CM (intra-sentential) than CS pattern (inter-sentential). For example, the sample B showed "/batʃtʃe slaɪd pe kʰel rahe haĩ/ (In English it meant children are playing on the slide) in the 3ʳᵈ utterance of the above sample. In this utterance the word 'slide' was the word used in a code mixed utterance. The child should have used the word /pʰisalpatti/ in Hindi language instead of 'slide' which is a word in English. The CM was mainly used for the nouns such as slide, ball, sand castle, and bird; and once for verb such as cycle. The child also used borrowed words such as mummy, ice cream, and cycle. The child used borrowed forms such as cycle, scooter, seesaw, and ice cream.

When sample A and B are compared, the results revealed that the simultaneous H-E bilingual child (sample A) differed from the successive H-E bilingual child (sample B) for the use of verb in the code mixed utterances. For example, the child used the word "cycle" instead of using the word /tʃala:/ in Hindi language. The other code mixed utterances were from the same categories and few of them were borrowed words such as ice cream, seesaw etc.. Both the successive and simultaneous H-E bilingual children's sample mentioned above follow the intra-sentential (CM) form at the lexical-semantic level. For example, /ladka ladkI bɔ:l se kʰel rahe haĩ/, here the child is using the word "ball" in English language, where he should have been using /ge:nð/.

Sample C-7-8 years

The transcribed sample of a successive H-E bilingual child in the age group of 7-8 years has been qualitatively analyzed below. The transcribed sample A according to the protocols of SALT software is depicted below.

Transcription of Sample C

1 C Do ladka/e badminton[CS] khel/e raha/e hai/e.
2 C Ladka/i ice[CS] cream[CS] kha raha/i hai/i.
3 C Ladka ladka/i jhule khel raha/e hai/e.
4 C Ladka/i cycle[CS] chala raha/i hai/i.
5 C Bachcha/e khel raha/e hai/e.
6 C Bird/ [CS] is/s[CS] fly/ing[CS] in[CS] the[CS] sky[CS].
7 C Uncle[CS] is[CS] sit/ing[CS] on[CS] the[CS] table[CS].
8 C Bachcha/e ghar bana raha/e hai/e.
9 C Pani mein kamal ka ful hai.
10 C Ladka/i duck[CS] aur ship[CS] ke saath khel raha/i hai/i.
11 C Yahaan pe bahut saare ful/e hai/e.
12 C Ladka aur ladka/i ball[CS] khel raha/e hai/e.

The qualitative analysis of the sample C revealed that the H-E bilingual child exhibited both CM and CS patterns. In other words both intra-sentential and inter-sentential form of mixing and switching behaviors was noticed in the child's utterances. The example of CM is when the child spoke /ladka ɔ:r ladkI bɔ:l se kʰel rahe hɑĩ/ (In English it meant- boy and girl are playing with the ball)in the 12[th]uteerance of the above sample. In this utterance the child has used "ball" in English as a code mixed utterance. The child should have used the word /genð/ in Hindi language instead of 'ball' which is a word in English. The example of CS is when the child spoke the whole utterance in English language "uncle is sitting on the table" in the 7th utterance of the above sample. The code mixed words were mostly nouns such as duck, ship and ball and borrowed forms such as badminton, ice cream and cycle. The code mixed utterances followed the grammatical rules of both the languages. The code switched utterances included two sentences, which were spoken in English language. The code switched utterances followed all the grammatical constraints of the English language.

*Sample D-*7-8 years

The transcribed sample of a simultaneous H-E bilingual child in the age group of 7-8 years has been qualitatively analyzed below. The transcribed sample A according to the protocols of SALT software is depicted below.

Transcription of sample D

1 C Ladka/e horse [CS] pe savaari kar raha/e hai/e.
2 C Bachcha/e slide[CS] pe khel raha/e hai/e.
3 C Doggy[CS] kud raha hai.
4 C Ladka/i gir gaya/i hai/i
5 C Bachcha/e jhula/e par khel raha/e hai/e.
6 C Ek ladka upar chad raha hai
7 C Panchi ud raha hai.
8 C Pedh slide[CS] ke paas hai.
9 C Bachcha/e swim/ing[CS] kar raha/e hai/e.
10 C Bachcha/i icecream[CS] kha rahi hai.
11 C The[CS] child/s[CS] is/s[CS] play/ing[CS] in[CS] water[CS].
12 C The[CS] boy[CS] is[CS] climb/ing[CS] up[CS].

The qualitative analysis of the sample D revealed that the child exhibited both the CM (intra-sentential) and CS (inter-sentential) utterances. The child did CM in /ped slaɪd ke pa:s haI/ (In English it meant- tree is near the slide)in the 8th utterance of the above sample. The child used the word "slide" in English as a code mixed utterance. The child should have used the word /p^{h}isalpatti/ in Hindi language instead of "slide" in English language. The child did CS when he spoke the whole utterance in "the boy is climbing up" in the 12^{th}utterance of the above sample. The code mixed utterances was mainly for the nouns such as horse, slide, and doggy; verbs such as swimming; and borrowed forms such as ice cream. The code mixed utterances followed the grammatical constraints of both the languages. The code switched utterances consisted of two utterances were spoken in completely in English and it also followed the grammatical constraints of English language.

The comparison of both the samples C (successive H-E bilingual child) and D (simultaneous H-E bilingual child) revealed that both the children used code mixed and code switched utterances in their verbal output. The CM and CS was according to the grammatical constrains of both the languages. The only difference noticed in the two samples C and D was that of use of code mixed utterance for the verb (swimming).

The comparison between the successive and simultaneous H-E bilingual children revealed that the simultaneous H-E bilingual children used the code mixed utterances for verbs, nouns and borrowed forms; whereas the successive H-E bilingual children used the code mixed utterances only for nouns and borrowed forms. The comparison of all the four samples revealed that irrespective of the type of bilingualism the children of age 7-8 years revealed the use of code switched utterances, which were not observed in the 6-7 years aged bilingual children.

All the above samples, did not exhibit tag-switching instances and all the individuals had code mixed utterances at word level, i.e. the children code mixed free morphemes as well as bound morphemes but never violated the grammatical constraints of either of the languages. The H-E bilingual children in the age group of 7-8 years exhibited phrase level code switching instances as noted in "the boy is climbing up" in the 12th utterance.

The H-E bilingual children in the age group of 6-7 years code mixed only from Hindi to English language, whereas H-E bilingual children in the age group of 7-8 years code switched from Hindi to English language as well as from English to Hindi language. Statistical procedures such as descriptive statistics and non-parametric Mann Whitney test results revealed that there was no significant difference between successive and

simultaneous H-E bilingual children for CM and CS. Hence, the data for the two groups i.e., simultaneous and successive H-E bilingual children were combined and further statistical analyses were carried out to explain the performance of the H-E bilingual children on various parameters between age groups 6-7 years and 7-8 years.

4.2 Frequency of Code mixing (CM) and code switching (CS) in H-E bilingual children

The frequency of CM and CS was analyzed between the two age groups (6-7 and 7-8 years). Descriptive statistics was used to calculate the median and SD values for the two age groups 6-7 years and 7-8 years. Table 4.2 shows frequency of CM and CS between age groups 6-7 years and 7-8 years.

Table 4.2
Frequency of Code mixing and code switching between age groups

Age group	Parameter	N	Median	SD
6-7 years	CM	20	10.00	3.28
	CS	20	0.00	0.00
7-8 years	CM	20	6.00	4.09
	CS	20	0.00	5.13

The analysis of results revealed that the children in the age range of 6-7 years showed greater CM (Median=10.00, SD=3.28) than the CS (Median=0.00, SD=0.00). The results also revealed that H-E bilingual children in the 7-8 years group showed greater CM (Median=6.00, SD=4.09) than CS (Median=0.00, SD=5.13) (see Figure 4.2.). A comparison of data for CM and CS in the two age groups revealed that H-E bilingual children showed greater CM in the 6-7 years group than the 7-8 years group (see Figure 4.2). The analysis of statistical data revealed that the H-E bilingual children in the age

group 6-7 years (Median=0.00, SD=0.00) and 7-8 years (Median=0.00, SD=5.13) had no CS errors.
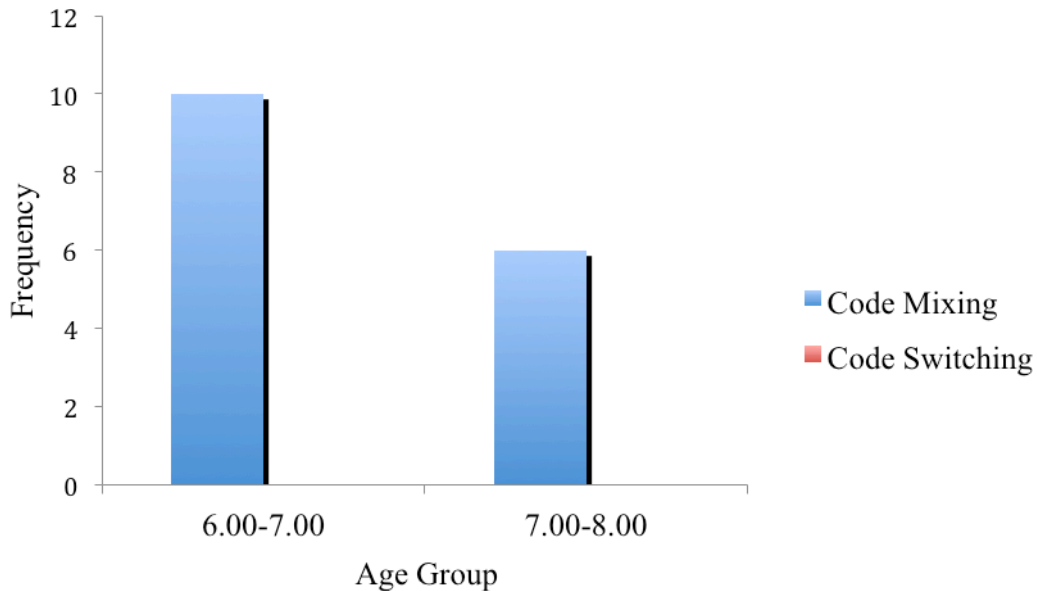

Figure 4.2. Frequency of Code mixing and code switching between age groups

Overall it was found that H-E bilingual children showed greater CM (Median=9.00, SD=3.80) than CS (Median=0.00, SD=3.67) (see Figure 4.2). Out of the forty H-E bilingual children, only four H-E bilingual children in the age group of 7-8 years showed the CS behaviors. Further, the two groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed that there are no significant difference between the two age groups for the frequency of CM ($|Z|=2.98$, $p>0.05$) and CS ($|Z|=0.54$, $P>0.05$). The non-parametric Mann-Whitney test was also used to observe for gender differences in terms of the frequency of CM and CS. The results revealed that there was no significant gender effect observed in both the age groups.

4.3 **Comparison of performance of H-E bilingual children between age groups on Systematic Analysis of Language Transcripts (SALT).**

The Systematic Analysis of Language Transcripts (SALT) software was used to find calculate the following parameters:

- Total utterance (TU)

- Total completed words (TWS)

- Mean Length of Utterance (MLU) in words

- Number of different words (NDW)

- Type Token Ratio (TTR)

- Number of bound morphemes (NBM)

- Total number of code switches (TCS)

- Total number of non-repeated code switches (TUCS)

The descriptive statistical analysis was done for all the subjects and the median and SD values were calculated. Table 4.3 shows the Median and SD values for the various parameters analyzed using SALT software between the age groups.

Table 4.3

Median and Standard Deviation values between Age groups (SALT Software analysis)

Age Group	Parameters	N	Median	SD
6-7 years	TU	20	15.00	3.30
	TCW	20	100.00	230.20
	MLU in words	20	6.91	1.53
	NDW	20	38.00	10.44
	TTR	20	0.38	0.04
	NBM	20	35.00	6.08
	TCS	20	11.00	3.21
	TUCS	20	9.50	3.02
7-8 years	TU	20	15.50	4.38
	TCW	20	92.50	36.93
	MLU in words	20	6.73	1.51
	NDW	20	41.00	13.61
	TTR	20	0.44	0.06
	NBM	20	32.50	7.11
	TCS	20	11.00	28.23
	TUCS	20	8.00	14.32

Note. TU- Total utterances, TCWS- Total Completed Words, MLU-W Mean Length of Utterance in words, NDW- Number of Different Words, TTR-Type token ratio, NBM- Number of Bound Morphemes, TCS- Total Code Switches, TUCS- Total Unrepeated Code Switches.

Total number of utterance (TU)

The analysis of results revealed that the H-E bilingual children in the age range of 7-8 years (Median=15.50, SD=4.38) showed greater total number of utterances than the H-E bilingual children in the age group of 6-7 years (Median=15.00, SD=3.30) (see Figure 4.3). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed that there was no significant difference between the two age groups ($|Z|=0.10$, $p>0.05$) for the total number of utterances.
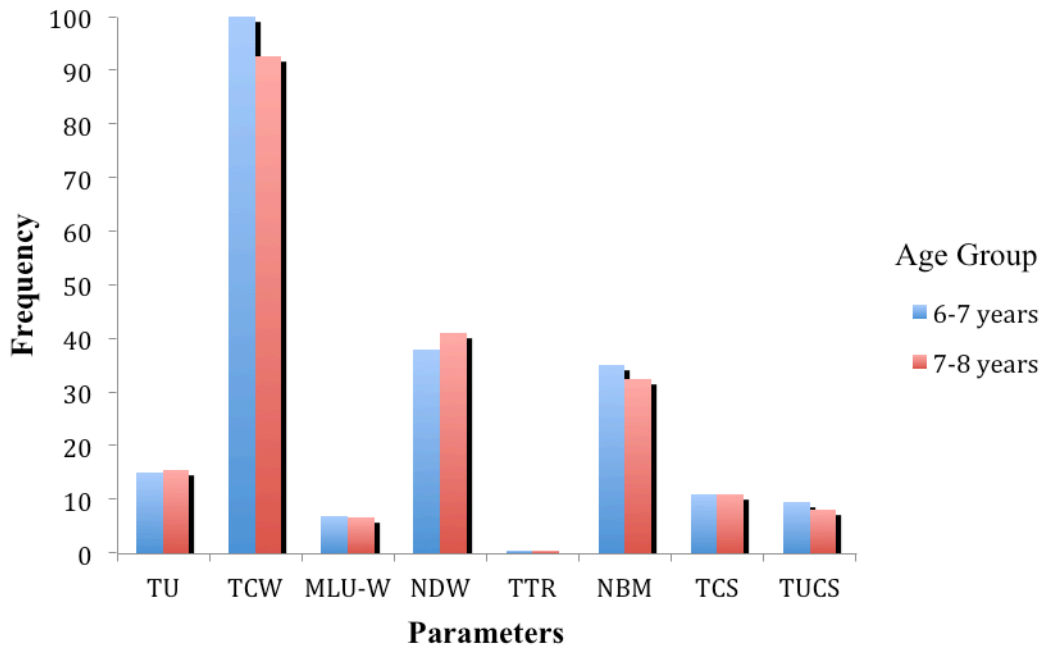
Figure 4.3 Frequency of parameters on SALT analysis between age groups.

Note. TU- Total utterances, TCWS- Total Completed Words, MLU-W Mean Length of Utterance in words, NDW- Number of Different Words, TTR-Type token ratio, NBM- Number of Bound Morphemes, TCS- Total Code Switches, TUCS- Total Unrepeated Code Switches.

Total number of completed words (TCW)

The analysis of results revealed that the H-E bilingual children in the age range of 6-7 years (Median=100.00, SD=230.20) showed greater total number of completed words than the H-E bilingual children in the age group of 7-8 years (Median=92.50, SD =36.93) (see Figure 4.3). Non-parametric Mann-Whitney test results revealed that there was no significant difference between the two age groups ($|Z|=0.71$, $p>0.05$) for the total number of completed words.

Mean Length of Utterance in words (MLU-W)

The analysis of results revealed that the H-E bilingual children in the age range of 6-7 years (Median=6.91, SD=1.53) showed greater MLU in words than the H-E bilingual

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children in the age group of 7-8 years (Median=6.73, SD =1.51) (see Figure 4.3). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups ($|Z|=0.28$, $p>0.05$) for the MLU in words.

Number of different words (NDW)

The analysis of results revealed that the H-E bilingual children in the age range of 7-8 years (Median=41.00, SD=12.37) showed greater total number of different words than the H-E bilingual children in the age group of 6-7 years (Median=38.00, SD=10.44) (see Figure 4.3). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups ($|Z|=1.73$, $p>0.05$) for the total number of different words.

Type Token Ratio (TTR)

The analysis of results revealed that the H-E bilingual children in the age range of 7-8 years (Median=0.44, SD=0.06) had greater TTR than the H-E bilingual children in the age group of 6-7 years (Median=0.38, SD=0.04) (see Figure 4.3). The comparison for all the forty subjects (i.e., both the age groups 6-7 years and 7-8 years) was done using the Mann-Whitney non-parametric test. The results revealed that there is a significant difference between both the age groups for TTR ($|Z|=3.30$, $p<0.05$). The comparison of the male and female subjects for all the forty subjects (i.e., both the age groups 6-7 years and 7-8 years) was done using the Mann-Whitney non-parametric test. The results revealed that there is a significant difference for the male and female subjects of both the age groups for TTR ($|Z|=2.670$, $p<0.05$).

Number of bound morphemes

The analysis of results revealed that the H-E bilingual children in the age range of 6-7 years (Median=35.00, SD=6.08) showed greater number of bound morphemes than the H-E bilingual children in the age group of 7-8 years (Median=32.50, SD=7.11) (see Figure 4.3). The two age groups were compared statistically using the non-parametric test Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups ($|Z|=1.42$, $p>0.05$) for the number of bound morphemes.

Total number of code switches (TCS)

The analysis of results revealed that the H-E bilingual children in both the age groups 6-7 years (Median=11.00, SD=3.21) and 7-8 years (Median=11.00, SD=28.23) had equal number of intra-sentential code switches which are nothing but code-mixing (CM) but variability in the values of standard deviation was higher in the H-E bilingual children in the age group of 7-8 years (see Figure 4.3). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups ($|Z|=0.19$, $p>0.05$) for the total number of code switches.

Total number of un-repeated code switches (TUCS)

The analysis of results revealed that the H-E bilingual children in the age range of 6-7 years (Median=9.50, SD=3.02) showed greater number of un-repeated code switches than the H-E bilingual children in the age group of 7-8 years (Median=8.00, SD=14.32) (see Figure 4.3). The two age groups were compared statistically using the non-parametric test Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups ($|Z|=0.08$, $p>0.05$) for the total number of un-repeated code switches.

4.4. Comparison of performance of H-E bilingual children between age groups on Perecman's Level of Code mixing and Code Switching

The Perecman's level of code mixing and code switching was studied across the two age groups for both the genders. The descriptive statistics was carried out to calculate the median and SD values for the different levels: lexical-semantic (Word and Phrase level), syntactic, morphological and phonological levels for the two age groups: 6-7 years and 7-8 years. The subjects did not exhibit any syntactic, morphological and phonological levels of code mixing and code switching; so the statistical analysis was carried out for the Lexical-semantic levels: at word and phrase levels.

Table 4.4 shows the values of the median and SD values for the Perecman's Level of code mixing and code switching (lexical-semantic levels) between the age groups (see Figure 4.4).

Table 4.4
Median and Standard Deviation values for the Perecman's Level of CM and CS (lexical-semantic levels) between the age groups.

Age Group	Parameter	N	Median	SD
6-7 years	Word level	20	9.50	3.13
	Phrase level	20	0.00	0.57
7-8 years	Word level	20	7.00	3.76
	Phrase level	20	0.00	5.11

The analysis of results revealed that the H-E bilingual children in the age group of 6-7 years (Median=9.50, SD=3.13) showed greater lexical-semantic level of CM and CS at word level than the children in the 7-8 years of H-E bilingual children (Median=7.00, SD=3.76) (see Figure 4.4). The non-parametric Mann-Whitney test was done to compare the Perecman's level of CM and CS for Lexical-semantic level (word level) for the two age groups 6-7 years and 7-8 years. The results revealed no significant difference

between the two age groups (|Z|=1.52, p>0.05) for the Perecman's level of CM and CS for Lexical-semantic level (word level).
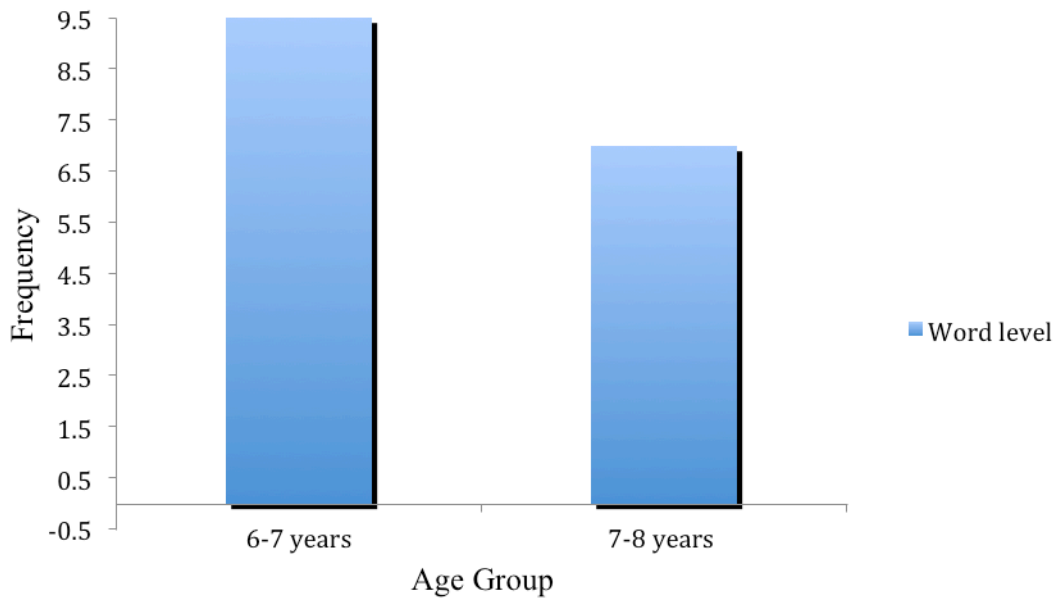

Figure 4.4 Frequency of Perecman's Level of CM and CS (lexical-semantic levels) between the age groups

The analysis of results reveal that the H-E bilingual children in the age range of 7-8 years (Mean =1.75, SD=5.11) had greater lexical-semantic levels of CM and CS at phrase level than the H-E bilingual children in the age range of 6-7 years (Mean =0.30, SD=3.57) (see Figure 4.4). The non-parametric Mann-Whitney test was done to compare the Perecman's level of CM and CS for Lexical-semantic level (phrase level) for the two age groups 6-7 years and 7-8 years. The results revealed no significant difference between the two age groups (|Z|=0.95, p>0.05) for the Perecman's level of CM and CS for Lexical-semantic level (phrase level).

4.5   Frequency of CM and CS and effect of Language use on Frequency of CM and CS

The Language Use questionnaire (Shanbal & Prema, 2007) was used to find out the use and exposure of each child in both the languages Hindi and English. The ratings were combined to get a total score for each of the languages. The descriptive analysis was carried out to for each of the languages with the frequency of code mixing. Table 4.5 shows the comparison of language exposure and language use with the frequency of CM.

Table 4.5
Comparison of Language Exposure and Language Use with frequency of CM

	N	Use of Hindi	Use of English	Frequency of CM (Median)
	1	1	5	135.00
	6	2	4	13.50
	25	3	3	11.00
	8	4	2	6.00
Total	40	-	-	11.00

Note. Exposure values 1 - 0%, 2 - 25%, 3 - 50%, 4 - 75%, 5 - 100%.

The analysis of results revealed that out of the forty H-E bilingual children, one child did not use Hindi language at all (language exposure was 0%) who showed greater code mixing and code switching (Median=135.00) within the sample (Figure 4.5).
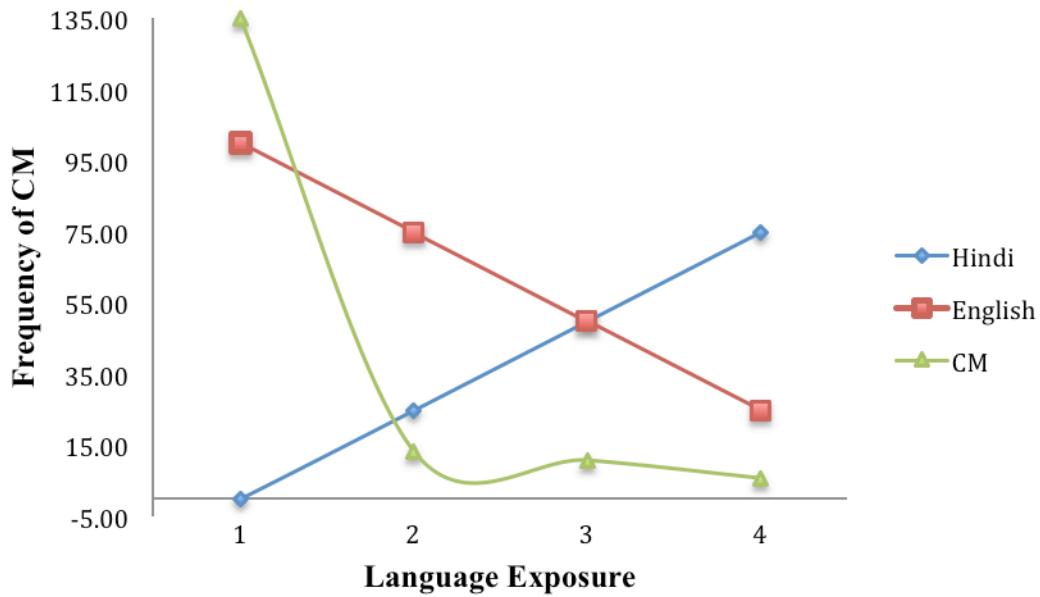
Figure 4.5 Comparison of Language Exposure and Language Use with frequency of CM

The results also revealed that six children used 75% (most of the times) of English language and 25% (rarely) of Hindi language and the median values for frequency of code mixing was 13.50. The results also revealed that twenty-five H-E bilingual children used 50% (sometimes) of both the languages and the median value of frequency of code mixing was 11.00. The results also revealed that eight H-E bilingual children used 75% (most of the times) of Hindi language and 25% (rarely) of English language and the median values for frequency of code mixing was 6.00. The results revealed that H-E bilingual children with greater use of English language had greater frequency of code mixing (Figure 4.5).

4.6   Comparison of performance of H-E bilingual children between age groups based on MLF Model

The verbal utterances of the H-E bilingual children were analyzed for the following parameters:

- Matrix Language Islands (ML Island)

- Matrix Language Shifts (ML Shifts)

- Embedded Language Islands (EL Islands)

- Matrix Language + Embedded Language (ML + EL)

- Borrowed Forms (BF)

- Embedded Language Insertions (EL Insertions)

- Revisions (R)

Descriptive statistics revealed the median and SD values. Table 4.6 shows the median and SD values for the two age groups for the parameters obtained using MLF Model.

Table 4.6

Median and Standard Deviation values between age groups for the parameters obtained using MLF Model

Age group	Parameters	N	Median	SD
6-7 years	ML Islands	20	6.50	3.36
	ML Shift	20	0.00	0.00
	EL Islands	20	0.00	0.00
	ML + EL	20	7.00	2.41
	BF	20	4.00	1.40
	EL Insertions	20	1.00	1.82
	Revisions	20	1.00	1.28
7-8 years	ML Islands	20	7.00	3.39
	ML Shift	20	0.00	0.94
	EL Islands	20	0.00	4.71
	ML + EL	20	6.00	3.23
	BF	20	3.00	1.72
	EL Insertions	20	0.00	1.19
	Revisions	20	0.00	0.82
Total	ML Islands	40	6.50	3.34
	ML Shift	40	0.00	0.69
	EL Islands	40	0.00	3.37
	ML + EL	40	7.00	2.86
	Borrowed form	40	4.00	1.56
	EL Insertions	40	0.00	1.56
	Revisions	40	1.00	1.10

ML Islands

The analysis of results revealed that the frequency of ML Islands was found to be greater in the H-E bilingual children of age group 7-8 years (Median=6.50, SD=3.36) than the H-E bilingual children in the age group of 6-7 years (Median=7.00, SD=3.39) (See Figure 4.6).
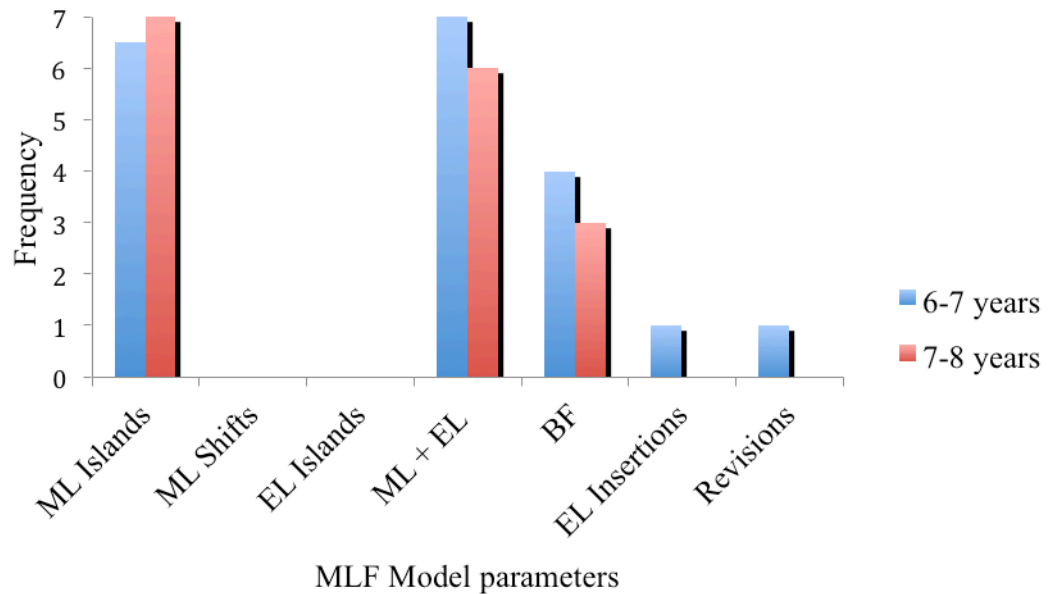
Figure 4.6 Median values for the parameters obtained using MLF Model between age groups

The comparison of the H-E bilingual children for the age groups was done using the Mann-Whitney non-parametric test. The analysis results revealed that there are no significant differences between the H-E bilingual children in the frequency of "ML Islands" ($|Z|$=0.57, p>0.05). The comparison of the male and female H-E bilingual children for the age groups was done using the Mann-Whitney non-parametric test. The analysis results revealed that there are significant differences between the male subjects and the female subjects between the age groups for the frequency of "ML Islands" ($|Z|$=2.62, p<0.05).

Two samples E and F are transcribed below according to the SALT software protocol. The samples were qualitatively analyzed for the different types of code mixing and code switching errors.

Sample E

The transcribed sample of a H-E bilingual male child in the age group of 6-7 years has been qualitatively analyzed below. The transcribed sample E according to the protocols of SALT software is depicted below.

Transcription of Sample E

1 C Yahaan par lotus[CS] hai.
2 C Yahaan par bachcha/e khel raha/e hai/e.
3 C Ladka/I ek bachche ko leke jaraha/i hai/i.
4 C Ek ladka badminton[CS] pakadke rakha hai.
5 C Ladka/i ice[CS] cream[CS] kha raha/i hai/i.
6 C Ladka/i ladka jhul raha/e hai/e.
7 C Ladka mitti.
8 C Ladka/i mitti mein khel raha/i hai/i.
9 C Ladka mitti mein castle[CS] bana raha hai.
10 C Bachcha/e pani mein khel raha/e hai/e.
11 C Bachcha/e cycle[CS] chala raha/e hai/e.
12 C Slide[CS] ke niche ghaas hai/e.
13 C Bachcha/e jhopde ke niche jhul raha/e hai/e.
14 C Panchi ud raha hai.
15 C Ladka/i bhag raha/i hai/i.
16 C Ladka/i ladka seat[CS] par baitha/e hai/e.
17 C Ladka/i ladka ja raha/e hai/e.
18 C Kamal ke ful mein se favvara nikal raha hai.
19 C Jhule ki.
20 C Ped ke piche ghaas hai/e.
21 C Bachcha/e jhule pe jhul raha/e hai/e.
22 C Slide[CS] pe elephant[CS] bana hua hai.

The results of qualitative analysis revealed that the child exhibited greater frequency of CM than CS, i.e., the child exhibited more number of intra-sentential switches. The CM errors were further classified as adult-like (grammatical) and non-adult like (ungrammatical) instances. The non-adult like (ungrammatical) errors was analyzed to find out whether they infringe any of the syntactic constraints of the base language. The intra-sentential switches followed the adult-like pattern of CS. For example, the child

spoke /slaɪd ke nitʃe gʰa:s haɪ/ (In English it meant- there is grass below the slide) in the 12th utterance of the above sample. The child used the word "slide" in English as a code mixed utterance. The child should have used the word /pʰisalpatti/ in Hindi language instead of "slide" in English language. The child made used code mixed utterances for the nouns such as lotus, badminton, ice cream, castle, cycle, seat, slide, and elephant. The child exhibited the use of borrowed forms such as badminton, ice cream, and cycle.

Sample F

The transcribed sample of a H-E bilingual male child in the age group of 7-8 years has been qualitatively analyzed below. The transcribed sample F according to the protocols of SALT software is depicted below.

Transcription of Sample F

1 C Ek ladka scooter[CS] chala raha hai.
2 C Ek ladka.
3 C Ek ladka aur ek ladka badminton[CS] khel raha/e hai/e.
4 C Do doggy/s[CS] bhag raha/e hai/e.
5 C Ek panchi ud raha hai.
6 C Ek bachcha lohe par chadh raha hai.
7 C Ekladka/i aur ek ladka/i football[CS] khel raha/e hai/e.
8 C Ek ladka aur ekladka/i see[CS] saw[CS] par khel jhul raha/e hai/e.
9 C Ek ladka/i aur ek chota/i si ladka/i fountain[CS] ke pani mein boat[CS] duck[CS] chala raha/i hai/e.
10 C Ek ladka/i tez/i se bhag raha/i hai/i.
11 C Ek ladka aur ek ladka/i jhule par jhul raha/e hai/e
12 C Ek ladka/i aur ek ladka slide[CS] pe ja raha/e hai/e.
13 C Ek papa[CS] aur ek ladka/i ek saath ground[CS] mein ghum raha/e hai/e.
14 C Ek ladka horse[CS] pe riding[CS] kar raha hai.
15 C Ek ladka/i bachche ko ghuma raha/i hai/i.

The qualitative analysis of the sample revealed that the child used greater frequency of CM than CS i.e., the child used more of intra-sentential switching. The child exhibited the adult-like pattern of CS. For example, the child spoke /do dɔggɪʒ bʰa:g rahe

hɑĩ/ (In English it meant-two dogs were running) in the 4th utterance of the above sample. In this utterance the word 'doggies' was the word used in a code mixed utterance. The child should have used the word /kuʈʈe/ in Hindi language instead of 'doggies' which is a word in English. The code mixed utterances were mostly used for nouns such as scooter, badminton, doggies, football, seesaw, fountain, boat, duck, slide, papa, ground, horse and one verb such as riding. The child also used various borrowed forms such as scooter, badminton, football, seesaw, and papa. This child used more number of borrowed forms as compared to the sample E. The example of ML Island in the above sample is /ek pantʃI ud raha hɑI/ in the sample F in the 5th utterance.

ML Shifts

The analysis of results revealed that the frequency of ML Shifts was found to be same in the H-E bilingual children of age group 7-8 years (Median =0.00, SD =0.94) and the H-E bilingual children in the age group of 6-7 years (Median=0.00,SD=0.00) (See Figure 4.6). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed significant difference between the two age groups (|Z|=2.35, $p<0.05$) for the frequency of ML Shifts. The example of ML Shift in sample C when the child changes the base language to English language- "the boy is climbing up" in the 12th utterance.

EL Islands

The analysis of results revealed that the frequency of EL Islands was found to be same in the H-E bilingual children of age group 7-8 years (Median =0.00, SD =4.71) and the H-E bilingual children in the age group of 6-7 years (Median=0.00, SD=0.00) (See Figure 4.6). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed significant difference between the

two age groups (|Z|=2.08, p<0.05) for the frequency of EL Islands. The example of ML Shift in sample C "the boy is climbing up" in the 12th utterance.

ML + EL constituents

The analysis of results revealed that the frequency of ML + EL constituents was noted to be greater in the H-E bilingual children of age group 6-7 years (Median=7.00, SD =2.41) than the H-E bilingual children in the age group of 7-8 years (Median=6.00, SD =3.23) (See Figure 4.6). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups (|Z|=1.18, p>0.05) for the frequency of ML + EL constituents. The example for ML + EL constituents is /do dɔggIʒ bʰaːg rahe hɑĩ/ (In English it meant- two dogs are running).

Borrowed forms

The analysis of results revealed that the frequency of Borrowed forms was found to be greater in the H-E bilingual children of age group 6-7 years (Median=4.00, SD=1.40) than the H-E bilingual children in the age group of 7-8 years (Median=3.00, SD=1.72) (See Figure 4.6).The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups (|Z|=0.77, p>0.05) for the frequency of Borrowed forms. The example of borrowed forms in the above sample F is the use of word "papa" in the 13th utterance of the sample.

EL Insertions

The analysis of results revealed that the frequency of EL Insertions was found to be greater in the H-E bilingual children of age group 6-7 years (Median=1.00, SD=1.82) than the H-E bilingual children in the age group of 7-8 years (Median=0.00,

SD=1.19) (See Figure 4.6).The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups (|Z|=1.29, p>0.05) for the frequency of EL Insertions. The example of EL Insertions in the above sample is /ek ladka hɔrs pe raIdIŋ kar rahe haĩ/.

Revisions

The analysis of results revealed that the frequency of revisions was noted to be greater in the H-E bilingual children of age group 6-7 years (Median=1.00, SD=1.28) than the H-E bilingual children in the age group of 7-8 years (Median=0.00, SD=0.82) (See Figure 4.6). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The analysis of results revealed no significant difference between the two age groups (|Z|=1.569, p>0.05) for the frequency of Revisions. The example of revision in the above sample is /ek ladka/ in the 2nd utterance of sample F.

To summarize the results of the present study, the results indicated that the successive bilingual H-E bilingual children showed greater frequency of CM than the simultaneous bilingual H-E bilingual children. However, there was no significant difference between the successive and simultaneous H-E bilingual children. The results indicated that the H-E bilingual children in the age group of 6-7 years showed more CM than the H-E bilingual children in the age range of 7-8 years. Whereas, the H-E bilingual children in the age range of 7-8 years showed greater CS than the H-E bilingual children in the age group of 6-7 years.

The H-E bilingual children in the age range of 7-8 years showed greater total number of utterances than the H-E bilingual children in the age group of 6-7 years which is indicative of a developmental trend from 6-7 years to 7-8 years of age in bilingual

children. The analysis of results revealed that the H-E bilingual children in the age range of 7-8 years showed greater total number of completed words, MLU-W and number of bound morphemes than the H-E bilingual children in the age group of 6-7 years. Greater number of different words and Type Token Ratio (TTR) were found in the H-E bilingual children in the age range of 7-8 years than the H-E bilingual children in the age group of 6-7 years. The results indicated that total numbers of code switches are same in both the age groups.

The results indicated that the H-E bilingual children in the age group of 6-7 years had greater lexical-semantic level of CM and CS at word level than the H-E bilingual children in the age range of 7-8 years. The analysis of results revealed that the H-E bilingual children in the age range of 7-8 years had greater lexical-semantic levels of CM and CS at phrase level than the H-E bilingual children in the age range of 6-7 years. The results revealed that H-E bilingual children with greater use of English language had greater frequency of code mixing.

Frequency of ML Islands was found to be greater in the H-E bilingual children of age group 7-8 years than the H-E bilingual children in the age group of 6-7 years. The frequency of ML Shifts was found to be significantly greater in the H-E bilingual children of age group 7-8 years than the H-E bilingual children in the age group of 6-7 years. On the other hand, frequency of EL Islands was found to be greater in the H-E bilingual children of age group 7-8 years than the H-E bilingual children in the age group of 6-7 years. Frequency of ML + EL constituents was noted to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years.

The results indicated that the frequency of Borrowed forms was found to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years. Frequency of EL Insertions was noted to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years. Frequency of Revisions was noted to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years.

Overall it was found that there was a developmental trend observed for the frequency of CM, which decreased with age and frequency of CS, which increased with age. The Total utterances and number of different words increased with age, whereas total number of completed words, MLU-W, TTR and number of bound morphemes decreased with age. The word level CM and CS decrease with age, whereas phrase level CM and CS increase with age. The number of ML Islands increased with age, whereas the number of ML + EL constituents, Borrowed forms, EL Insertions and revisions decreased with age.

CHAPTER 5: Discussion

The aim of the present study was to investigate code mixing (CM) and code switching (CS) errors in the Hindi-English (H-E) bilingual children

The objectives included:

- To compare the type, extent and level of code mixing (CM) and code switching (CS) in successive and simultaneous H-E bilingual children using SALT software (Miller & Chapman, 1981) and Perecman's levels of code mixing and code switching (Perecman's, 1984).

- To investigate the similarities and differences between code mixing (CM) and code switching (CS) in the H-E bilingual children.

Forty H-E bilingual children in the age range of 6-8 years (further subdivided into two groups 6-7 years and 7-8 years) who are native speakers of Hindi language and who acquired English language, as their second language were considered for the study. Twenty H-E bilingual children were considered in 6-7 years and 7-8 years age group of H-E bilingual children.

The data was analyzed for different parameters manually as well as using the SALT software, MLF model, Perecman's levels of CM and CS and qualitative analysis was carried out. The parameters analyzed included, frequency of CM and CS, Total number of utterances (TU), Total number of words completed (TCW), Mean Length of Utterance at words level (MLU-W), Number of different words (NDW), Type Token Ratio (TTR), Mean Length of Utterance at syllable level (MLU-S), Number of Bound morphemes (NBM), Total number of code switches (TCS) and Total number of Unrepeated Code Switches (TUCS) parameters using SALT (Version 2012) software;

and Matrix Language (ML) Islands, ML Shifts, Embedded Language (EL) Islands, ML + EL constituents, Borrowed Forms (BF), EL Insertions and Revisions parameters were analyzed using the MLF Model (Myers-Scotton and Jake, 2000); and Perecman's level of code mixing and code switching (Perecman, 1984).

The results of the present study are discussed in the following sections.

4.1   Comparison of CM and CS in successive and simultaneous in H-E bilinguals

4.2   Frequency of Code mixing (CM) and code switching (CS) in H-E bilingual children

4.3   Comparison of performance of H-E bilingual children between age groups on SALT and Perecman's Level of CM and CS

4.4   Frequency of CM and CS and effect of Language use on Frequency of CM and CS

4.5   Comparison of performance of H-E bilingual children between age groups based on MLF Model

4.1   Comparison of CM and CS in successive and simultaneous in H-E bilinguals

The results of the present study indicated that in the age group of 6-7 years the simultaneous H-E bilingual children had greater CM than successive H-E bilingual children. The results also revealed that in the age group of 7-8 years simultaneous H-E bilingual children exhibited lesser number of CM than the successive H-E bilingual children. Overall, the results indicated that the successive H-E bilingual children showed greater CM than the simultaneous H-E bilingual children(Figure 4.1).

In the present study it was observed that the successive bilingual children exhibited more CM and CS, which could be attributed to a later exposure of L2 in comparison to the simultaneous bilingual children. This phenomenon can be attributed to the most cited reasons in the literature that bilinguals were found to code mix and code switch in order to compensate for their lack of proficiency (Genesee, Nicoladis & Paradis, 1995; Lanvers, 2001, Thirumalai & Chengappa, 1986, Volterra & Taeschner, 1978). In other words code switching occurs when the individual does not know either of the languages completely. For example, the qualitative analysis of sample A (6-7 years old successive H-E bilingual child) revealed that the child is mainly exhibiting CM than CS behaviors. In other words, the child had more of intra-sentential switching pattern present than inter-sentential patterns. For example, the child in the sample A said /do dɔggɪʒ bʰɑ:g rahe hɑĩ/ (In English it meant-two dogs were running) in the 5th utterance of the above sample. In this utterance the word 'doggies' was the word used in a code mixed utterance. The child should have used the word /kuṭṭe/ in Hindi language instead of 'doggies' which is a word in English. The qualitative analysis of the sample D (7-8 years old H-E simultaneous bilingual child) revealed that the child exhibited both the CM (intra-sentential) and CS (inter-sentential) utterances. The child did CM in /ped slaɪd ke pa:s haI/ (In English it meant- tree is near the slide)in the 8th utterance of the above sample. The child used the word "slide" in English as a code mixed utterance. The child should have used the word /pʰisalpatti/ in Hindi language instead of "slide" in English language. The child did CS when he spoke the whole utterance in "the boy is climbing up" in the 12thutterance of the above sample.

Grosjean (1982) also reported that Spanish-English bilinguals code-switch because of their lack of formal knowledge in L2 (English). Similar findings were also

reported by Harini and Chengappa (2008), who studied the phenomenon of CM and CS in Kannada-English bilingual children and their results revealed that code mixing and code switching are more prevalent in successive than simultaneous Kannada-English bilingual children, but there was no significant difference between the two type of bilinguals.

In the present study the results indicated that there was no significant difference between the groups on the frequency of CM and CS between the age groups and there was no gender effect observed. The no significant difference observed in the two age groups may be attributed to the age of the H-E bilingual children taken for the study. The children in the study were taken from the age range 6-8 years. By the age of 6-8 years, the children would be exposed to English language to a greater extent especially in the school situations, so the instances of CM and CS are exhibited more due to the confusion between the appropriate lexical selections that they have to make in communication.

4.2   Frequency of Code mixing (CM) and code switching (CS) in H-E bilingual children

The frequency of CM and CS was analyzed between the two age groups (6-7 and 7-8 years). The results indicated that the children in the age range of 6-7 years showed greater CM than the CS. The results also revealed that H-E bilingual children in the 7-8 years group showed greater CM than CS (see Figure 4.2.).

A comparison of data for CM and CS in the two age groups revealed that H-E bilingual children showed greater CM in the 6-7 years group than the 7-8 years group (see Figure 4.2) indicating a developmental trend. This indicates that as children progress from 6-7 years to 7-8 years, there is reduction in terms of code mixing which means that

the older children are able to use appropriate lexical forms of L1(Genesse, Nicoladis & Paradis, 1995; Goodz, 1989; Lanvers, 2001; Lanza, 1997; Quay, 1995). Overall it was found that H-E bilingual children showed greater CM than CS (see Figure 4.2). Out of the forty H-E bilingual children, only four H-E bilingual children in the age group of 7-8 years showed the CS behaviors. The higher levels of CM in younger age group of 6-7 years can be attributed to the fact that these children are exposed to English language to a lesser extent as compared to the older age group of 7-8 years. Hence, only intra-sentential mixing (CM) was observed, whereas, a greater exposure to English language (Lb/L2) for children in the age group of 7-8 years indicated inter-sentential (CS) phenomenon in four of the twenty H-E bilingual children in the7-8 years. For example, the child (6-7 years old) in the sample E spoke /slaɪd ke nitʃe gʰaːs haI/ (In English it meant- there is grass below the slide) in the 12ᵗʰ utterance, exhibiting the CM phenomenon, whereas the child (7-8 years) in the sample D spoke "the boy is climbing up" in the exhibiting the CS phenomenon.

The presence of CS in 7-8 year old H-E bilingual children can also be attributed to the fact that these children were more competent in the usage of English language at sentence level than the 6-7 year H-E bilingual children. These results also suggest a developmental trend in the CM and CS phenomenon between the two age groups. The children with greater CM were exposed to English language not only at school, but also at the home situations by the parents while teaching and also sometimes while communicating with the child. This would have led English language to become more dominant than Hindi Language to which the exposure and use was less. This change in dominance from Hindi language to English can lead to inadequate proficiency in either of the languages. So the H-E bilingual children with higher English language exposure

levels exhibited more of CM with words used from English lexicon in the Hindi language sentences. This phenomenon could be attributed the most cited reason for CM i.e., bilingual code mix and code switch in order to compensate for the lack of language proficiency. These results are consistent with the findings of Shin and Milroy's (2000) study on CM and CS in Korean-English bilingual children in the age group of 6-8 years. Shin and Milroy's (2000) study revealed that CM and CS is limited in these two age groups and is constrained by either the preference of English language or competency in English language by the children and are mostly of CM type.

4.3   Comparison of performance of H-E bilingual children between age groups on SALT and Perecman's Level of CM and CS

On SALT analysis the results indicated that the total number of utterances (TU) was found to be greater in the older H-E bilingual children (7-8 years) than the younger H-E bilingual children (6-7 years) (see Figure 4.3). It was also found that the total number of different words and the Type Token Ratio (TTR)were greater in the 7-8 years H-E bilingual children than 6-7 years bilingual children. The older children are able to select the suitable words from their mental lexicon that would describe the concept appropriately. The younger age group children could not possibly have achieved this ability in comparison to the older children (Genesse, Nicoladis & Paradis, 1995; Goodz, 1989; Lanvers, 2001; Lanza, 1997; Quay, 1995). The results indicated that the H-E bilingual children in the age range of 7-8 years showed greater total number of different words than the H-E bilingual children in the age group of 6-7 years (see Figure 4.3). The use of more number of different words by 7-8 years H-E bilingual children than 6-7 years H-E bilingual children can be associated with greater number of words of either of the languages in the mental lexicon of the older children. The greater number of words in the

mental lexicon of the older children can be associated with the higher exposure to English language more than the younger age group.

The results indicated that the H-E bilingual children in the age range of 6-7 years had greater total number of completed words than 7-8 year old children. Mean length of utterance was found to be greater in 6-7 years H-E bilingual children than 7-8 years H-E bilingual children. The results also indicated that the number of bound morphemes were greater in the younger age group. The inappropriate selection of vocabulary from the mental lexicon as well as the confusion in selecting the appropriate language may have led to the above-mentioned results.

The results indicated that the H-E bilingual children in both the age groups 6-7 years and 7-8 years had equal number of intra-sentential code switches which are nothing but code-mixing (CM) but variability in the values of standard deviation was higher in the H-E bilingual children in the age group of 7-8 years (see Figure 4.3). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The results indicated no significant difference between the two age groups for the total number of code switches. The no significant difference observed in the two age groups may be attributed to the age of the H-E bilingual children taken for the study. The children in the study were taken from the age range 6-8 years. By the age of 6-8 years, the children would be exposed to English language equally especially at the school situation, so the instances of CM and CS are exhibited by the two groups would be similar.

The results indicated that the H-E bilingual children in the age range of 6-7 years showed greater number of un-repeated code switches than the H-E bilingual children in the age group of 7-8 years (see Figure 4.3). These findings can be attributed to the fact

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that younger children used code mixed utterances for commonly used words also such as bird, doggy, etc. as well as or borrowed forms such as ice cream, cycle, etc.

The Perecman's level of code mixing and code switching was studied across the two age groups for both the genders. The subjects did not exhibit any syntactic, morphological and phonological levels of code mixing and code switching. The absence of CM and CS at syntactic, morphological and phonological level can be attributed to the fact that the both Hindi and English language have similar syntactic pattern or concordant grammar at certain places. These features could not be observed in the two languages because the children code mixed and code switched utterances only at the word level, which consisted of both free morpheme as well as bound morphemes from the same language. Various researchers such as Meisel, 1994 (German-English bilingual children), Sauve and Genesee, 2000; Paradis, Nicoladis, and Genesee, 2000 (French-English bilingual children), Lanza, 1997 (Norwegian-English bilingual children), Vihman, 1998 (English and Estonian bilingual children), and Allen, Genesee, Fish, and Crago, 2002 (Inuktitut and English bilingual children) have found out that bilingual code mixing is grammatically constrained because children usually mix the two languages at points in an utterance where the grammar of both languages is concordant; they seldom mix at points where the grammar is not concordant

The results indicated that the H-E bilingual children in the age group of 6-7 years showed greater lexical-semantic level of CM and CS at word level than the children in the 7-8 years of H-E bilingual children (see Figure 4.4). The reason for greater word level mixing in the 6-7 years age group may be because these children are mainly exposed to the English language at its basic level and are not as proficient as the older children in speaking at sentence level in L2.The results indicated that the H-E bilingual children in

the age range of 7-8 years had greater lexical-semantic levels of CM and CS at phrase level than the H-E bilingual children in the age range of 6-7 years (see Figure 4.4). The reasons for greater CM and CS at phrase level for older age group can be attributed to the fact that children in this age group have more exposure to English language at discourse level in the school situation and also these children are more proficient in sing English at sentence level than the younger age group.

The similar performance in terms of code switched utterances in both the age groups is consistent with the findings of the study done by Shin and Milroy (2000), which revealed that the Korean-English bilingual children in the age groups of 6-7 years and 7-8 years did not have any significant difference between the two groups. According to the authors the results may be because of the reason that the data collection was done in school setup and the children mainly used the CS phenomenon as a contextualization strategy. These results are also consistent with the results of Mahalakshmi and Prema (2011) study, which reveals that the Kannada-English bilingual children in the age group of 6-7 years and 7-8 years did not have significant difference between the age groups.

The findings of the present study indicate that a developmental trend was observed for total number of utterances, type token ratio, total number of different words, phrase level CM and CS from 6-7 years of age to 7-8 years of H-E bilingual children (see Figure 4.3) and the reduction in the total number of completed words, MLU at word level, number of bound morphemes and word level 0f CM and CS.

4.4   Frequency of CM and CS and effect of Language use on Frequency of CM and CS

The Language Use questionnaire (Shanbal and Prema, 2007) was used to find out the use and exposure of each child in both the languages Hindi and English. The ratings were combined to get a total score for each of the languages. The descriptive analysis was carried out to for each of the languages with the frequency of code mixing. Table 4.5 shows the comparison of language exposure and language use with the frequency of CM. (see Figure 4.5).

The results indicated that out of the forty H-E bilingual children, one child did not use Hindi language at all (language exposure was 0%) who showed greater code mixing and code switching within the sample. The results also revealed that six children used 75% (most of the times) of English language and 25% (rarely) of Hindi language and the median values for frequency of code mixing was 13.50. The results also revealed that twenty-five H-E bilingual children used 50% (sometimes) of both the languages and the median value of frequency of code mixing was 11.00. The results also revealed that eight H-E bilingual children used 75% (most of the times) of Hindi language and 25% (rarely) of English language and the median values for frequency of code mixing was 6.00. The results revealed that H-E bilingual children with greater use of English language had greater frequency of code mixing.

The results revealed that H-E bilingual children with greater use of English language had greater frequency of code mixing. According to the questionnaire administered, the children with greater CM were exposed to English language not only at school, but also at the home situations by the parents while teaching and also sometimes

while communicating with the child. This would have led English language to become more dominant than Hindi Language to which the exposure and use was less. This change in dominance from Hindi language to English can lead to inadequate proficiency in either of the languages. So the H-E bilingual children with higher English language exposure levels exhibited more of CM with words used from English lexicon in the Hindi language sentences. This phenomenon could be attributed the most cited reason for CM i.e., bilingual code mix and code switch in order to compensate for the lack of language proficiency. Grosjean (1982) reported that Spanish-English bilinguals code-switch because of their lack of formal knowledge in L2.This phenomenon could be explained by the findings of Cummins (1980) where in he explained oral language skills in bilinguals could be influenced by the literacy factors.

4.5 Comparison of performance of H-E bilingual children between age groups based on MLF Model

The results indicated that the frequency of ML Islands was found to be greater in the H-E bilingual children of age group 7-8 years than the H-E bilingual children in the age group of 6-7 years (See Figure 4.6). The example of ML Island in the above sample is /ek pantʃI ud raha hɑI/ in the sample F in the 5th utterance. The presence of same number of ML Islands in both the groups can be attributed to the fact that the interlocutor in the study spoke in Hindi language. There are various studies, which support the fact that the language in which the bilingual speaks is highly dependent on the interlocutor (Deuchar & Quay, 2000; Genesee, Nicoladis & Paradis, 1995; Genesee, Boivin, & Nicoladis, 1996; Lanza, 1997; Meisel, 1990; Vihman, 1998). Similar findings were observed in the study of Arias and Lakshmann (2005), who studied the CM and CS phenomenon in Spanish-

English bilingual child. Their results revealed that the child could use the appropriate language according to the interlocutor. Harini and Chengappa (2008) studied CM and CS in Kannada-English bilingual children; the results revealed that the successive bilingual children exhibited more CM in the ML Islands than simultaneous bilingual children.

The results indicated that the frequency of ML Shifts was found to be same in the H-E bilingual children of age group 7-8 years and the H-E bilingual children in the age group of 6-7 years (See Figure 4.6). The example of ML Shift in sample C when the child changes the base language to English language- "the boy is climbing up" in the 12th utterance. The presence of ML Shifts more in the 7-8 years H-E bilingual group than the 6-7 year H-E bilingual group can be attributed to the fact that the older age group is exposed to English language more than the younger age group. In the school situation the older age group children are expected to speak and know English at a higher level as compared to younger age group. Thus the older age group children may be influenced the school situation and would have spoken more in English language because the recordings were carried out mainly at the school settings.

The results indicated that the frequency of EL Islands was found to be same in the H-E bilingual children of age group 7-8 and the H-E bilingual children in the age group of 6-7 years (See Figure 4.6). The two age groups were compared statistically using the non-parametric Mann-Whitney test. The results indicated significant difference between the two age groups for the frequency of EL Islands. The example of ML Shift in sample C "the boy is climbing up" in the 12th utterance. Harini and Chengappa (2008) studied CM and CS in Kannada-English bilingual children; the results revealed that the successive bilingual children exhibited more number of EL Islands than simultaneous bilingual children. The presence of EL Islands more in 7-8 years H-E bilingual children

can be attributed to the fact that the children in this age group are exposed to English language more than 6-7 years H-E bilingual children. This added exposure may have affected the English language proficiency in 7-8 years H-E bilingual children and would have let the children speak more in L2 than in L1. Another reason for more EL Islands in 7-8 years H-E bilingual children can be attributed to the fact that the children of 7-8 years are expected to speak more in L2 in the school than 6-7 year H-E bilingual children. According to Arias and Lakshmanan (2005), the presence of intra-sentential switching is dangerous than inter-sentential switching as intra-sentential switching may involve ungrammatical insertions.

The results indicated that the frequency of ML + EL constituents was noted to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years (See Figure 4.6). The example for ML + EL constituents is /do dɔggɪʒ bʰaːg rahe hɑĩ/ (In English it meant- two dogs are running).The presence of ML + EL constituents can be attributed to confusion in selecting the appropriate vocabulary for L1, so the child uses the words from L2. Various researchers such as Boeschoten and Verhoeven (1987) listed the reasons for the presence of ML + EL constituents in the speech of bilingual children. According to the authors, the limited vocabulary, gap filling for lexical content causes the children to borrow words from L2. They also hypothesized that some words may not be present in the mental lexicon of L1, which makes the child use words from L2. The last reason for code mixing is that the words in L2 may be more easily accessible than the words from L1.Harini and Chengappa (2008) studied CM and CS in Kannada-English bilingual children; the results revealed that the successive and simultaneous bilingual children exhibited equal number of ML + EL constituents.

The results indicated that the frequency of Borrowed forms was found to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years (See Figure 4.6). The example of borrowed forms in the above sample F is the use of word "papa" in the 13th utterance of the sample. The presence of BF more in the 6-7 years H-E bilingual children can be attributed to that fact that the younger age group has recently started to learn English language formally, so this may lead to confusions in the mental lexicon while selecting the appropriate vocabulary; whereas the older group can select the appropriate words due to proper activation of the words from L1.

The results indicated that the frequency of EL Insertions was found to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years (See Figure 4.6). The example of EL Insertions in the above sample is /ek ladka hɔrs pe raɪdɪŋ kar raha haĩ/. The reason for 6-7 years H-E bilingual children showing more number of EL Insertion can be attributed to the fact that the recent exposure to English language in the formal setting. This recent exposure to English may lead to confusion while selecting the appropriate words while speaking in the younger population. Harini and Chengappa (2008) studied CM and CS in Kannada-English bilingual children; the results revealed that the successive bilingual children exhibited more number of EL Insertions than simultaneous bilingual children.

The results of the present study indicated that the frequency of revisions was noted to be greater in the H-E bilingual children of age group 6-7 years than the H-E bilingual children in the age group of 7-8 years (See Figure 4.6). The example of revision in the above sample is /ek ladka/ in the 2nd utterance of sample F. The presence of revisions in the younger age group can be attributed to the fact that these children have

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not yet become proficient in the use of Hindi and English languages. This lack of proficiency or mastery may lead to the children revising the utterances frequently in order to express their ideas clearly.

Summary and Conclusions

The present study aimed at studying the code-mixing (CM) and code-switching (CS) patterns in H-E bilingual children in the age group of 6-8 years. Various researchers have studied the phenomenon of CM and CS in bilingual children in the Kannada-English language and other languages such as Korean-English, Spanish-English, French-English; but there are few studies which have compared Hindi-English bilinguals. There are insufficient studies in the literature especially in the Indian context regarding the CM and CS phenomenon in children. The objectives of the present study were to compare the type, extent and level of CM and CS in simultaneous and successive H-E bilingual children using SALT software and to investigate the similarities and differences between code mixing and code switching seen in the simultaneous and successive bilingual children.

Forty H-E bilingual children in the age range of 6-8 years (further subdivided into two groups 6-7 years and 7-8 years) who were native speakers of Hindi language and who acquired English language, as their second language were considered for the study. Twenty H-E bilingual children were considered in 6-7 years and 7-8 years age group of H-E bilingual children. A picture description task was used to elicit the children's verbal behaviour. The data was analyzed for different parameters manually as well as using the SALT software, MLF model, Perecman's levels of CM and CS and qualitative analysis was carried out. The parameters analyzed included, frequency of CM and CS, Toatl number of utterances (TU), Total number of words completed (TCW), Mean Length of Utterance at words level (MLU-W), Number of different words (NDW), Type Token Ratio (TTR), Mean Length of Utterance at syllable level (MLU-S), Number of Bound morphemes (NBM), Total number of code switches (TCS) and Total number of

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Unrepeated Code Switches (TUCS) parameters using SALT (Version 2012) software; and Matrix Language (ML) Islands, ML Shifts, Embedded Language (EL) Islands, ML + EL constituents, Borrowed Forms (BF), EL Insertions and Revisions parameters were analyzed using the MLF Model (Myers-Scotton and Jake, 2000); and Perecman's level of code mixing and code switching (Perecman, 1984).

The findings of the study indicated that the successive H-E bilingual children exhibited more CM and CS in both 6-7 years and 7-8 years, which could be attributed to a later exposure of L2 in comparison to the simultaneous bilingual children who have early exposure of L2/Lb along with L1/La. This phenomenon can be attributed to the most cited reasons in the literature that bilinguals were found to code mix and code switch in order to compensate for their lack of proficiency in L2. A comparison of data for CM and CS in the two age groups revealed that H-E bilingual children showed greater CM in the 6-7 years group than the 7-8 years group indicating a developmental trend. This indicates that as children progress from 6-7 years to 7-8 years, there is reduction in terms of code mixing which means that the older children are able to use appropriate lexical forms of L1.

The presence of CS in few children (four children out of twenty children) in the 7-8 year old H-E bilingual children could be due to the fact that these children were more competent in the usage of English language at sentence level than the 6-7 year H-E bilingual children. These results also suggest a developmental trend in the CM and CS phenomenon between the two age groups. Further, the findings indicated a developmental trend for the total number of utterances (TU), total number of different words, Type Token Ratio (TTR) from 6-7 years to 7-8 years of age. The older children are able to select the suitable words from their mental lexicon that would describe the

concept appropriately. The younger age group children could be in a stage of acquisition and in a process of developing their mental lexicon.

The findings of the study also indicated that the H-E bilingual children in the age range of 6-7 years had greater total number of completed words, longer MLU and greater bound morphemes than 7-8 year old children. The inappropriate selection of vocabulary from the mental lexicon as well as the confusion in selecting the appropriate language in the process of language alternation may have contributed to the differences in the two groups. The observations also indicated that the H-E bilingual children in both the age groups 6-7 years and 7-8 years had equal number of intra-sentential code switches which are nothing but code-mixing (CM). By the age of 6-8 years, the children would be exposed to English language equally especially it the school situation, so the instances of CM and CS could be similar.

On the analysis of Perecman's level of code mixing and code switching, it was found that the children did not exhibit any syntactic, morphological and phonological levels of CM and CS. The absence of CM and CS at syntactic, morphological and phonological level can be attributed to the fact that the both Hindi and English language have similar morpho-syntactic pattern or concordant grammar at certain places. These features could not be observed in the two languages because the children code mixed and code switched utterances only at the word level, which consisted of both free morpheme as well as bound morphemes from the same language. The H-E bilingual children in the age group of 6-7 years were also found to show greater lexical-semantic level of CM and CS at word level than the children in the 7-8 years of H-E bilingual children. The reason for greater word level mixing in the 6-7 years age group may be because these children are mainly exposed to the English language at its basic level and are not as proficient as

the older children in speaking at sentence level in L2. While at phrase level the findings indicated that H-E bilingual children in the 6-7 years of age showed lesser lexical-semantic levels of CM and CS than the 7-8 years. This could be attributed to the fact that children in the older group have better exposure to English language at discourse level in the school situation and also these children were found to show better language use in English at sentence level than the younger age group.

The findings also indicated that the frequency of ML Islands was found to be greater in the H-E bilingual children of age group 7-8 years than the H-E bilingual children in the age group of 6-7 years. The presence of same number of ML Islands in both the groups can be attributed to the fact that the interlocutor in the study spoke in Hindi language. The results indicated that the frequency of ML Shifts was found to be same in the H-E bilingual children of age group 7-8 years and the H-E bilingual children in the age group of 6-7 years, which could be attributed to the fact that the older age group is exposed to English language more than the younger age group. The results indicated that the frequency of ML + EL constituents was noted to be greater in the 6-7 years than the 7-8 years which could be due to the limited vocabulary, gap filling for lexical content causes the children to borrow words from L2. Frequency of revisions was noted to be greater in the 6-7 years group than 7-8 years. . The presence of revisions in the younger age group can be attributed to the fact that these children have not yet become proficient in the use of Hindi and English languages. This lack of proficiency or mastery may lead to the children revising the utterances frequently in order to express their ideas clearly.

To conclude, in the present study code mixing and code switching could be seen as a developmental attribute to language alternation phenomenon in H-E bilingual

children in the age range of 6-8 years of age. Also, children who showed greater use of English language had greater frequency of code mixing. This could be because the English language has become more dominant due to greater exposure in English-medium schools than Hindi Language to which the exposure and use was less. This change in dominance from Hindi language to English can lead to inadequate proficiency in either of the languages. So the H-E bilingual children with higher English language exposure levels exhibited more of CM with words used from English lexicon in the Hindi language sentences. This phenomenon could be attributed the most cited reason for CM i.e., bilingual code mix and code switch in order to compensate for the lack of language proficiency or lack of language knowledge in bilingual children

Implications of the study

The study compared the two groups of successive and simultaneous bilingual children and found out that there was no significant difference between the groups. There was a developmental pattern observed for the acquisition of parameters such as TTR, MLU and number of utterances, number of different words, etc. These findings invalidate the myths of bilingualism such as children exposed to parents who use both languages will be confused and be unable to separate the two languages, bilingual children are not able to differentiate between the two languages irrespective of the interlocutor and the phenomenon of CM and CS in children and adults follow the similar grammatical constraints. The present study supports the theoretical knowledge of bilingual acquisition and development in Hindi-English bilingual children by substantiating evidences on developmental milestones, differential use of two languages in narration and the grammatical constraints on children's bilingual code-mixing.

Findings of the present study also implicate that Hindi-English bilingual children exhibit inclusion of English (L2) in Hindi (L1) utterances indicative of dominance of second language in terms of lexical and morpho-syntactic development from 6-7 years of age to 7-8 years of age (De Houwer, 2005; Nicoladis & Genesee, 1996; Paradis & Genesee, 1996). This pattern was found to be used strategically by older children in the form of increase inter-sentential code switching than intra-sentential code mixing. Further studies are also encouraged in younger and older children right from the pre-school period till adulthood. The data and findings could prove crucial in understanding language alternations as part of developmental changes from younger to older children. The phenomenon of CM and CS studied in different Indian languages could also facilitate a comparison between the various other Indian languages with different underlying structures such as Malayalam, Bengali, Manipuri, Marathi, Punjabi, etc. and aid in exploring the similarities and differences in different contexts.

As clinicians and Speech-Language Pathologists our ever-growing concern is regarding assessment, diagnosis and management of children with language disorders who are dual language users. It often poses a challenge as to what should be assessed, how it should be assessed and what language should be the choice for management in language disorders such as Specific Language Impairment (SLI), acquired childhood aphasia (ACA), language learning disability, etc. There is evidence available on dual language acquisition by children with language impairment which indicates that they exhibit the same language-specific morpho-syntactic difficulties in each of their two languages as monolinguals and, as well, that their language impairment is of the same magnitude as that exhibited by monolingual children with SLI learning the same languages. Two studies have examined such learners, Paradis, Crago, Genesee, and Rice

(2003), who studied French-English bilingual children (mean age of 6;11) and Gutierrez-Clellen and her colleagues (2008), who examined Spanish-English bilingual children (4;5 to 6;5 years of age) in the U.S (cf Genesse, 2009). The findings of the present study would open up for scope of future research in this area in terms of studying the pattern of language impairment in Hindi-English bilingual children.

In conclusion, the present study supports and implicates that bilingual code mixing in children is not a sign of confusion or difficulty learning two languages. Code mixing could be a resource that children use to fill gaps in their developing languages and, moreover, when young bilinguals code-mix literature strongly supports that they exhibit grammatical competence rather than confusion.

Limitations

In the present study only two groups of children ranging from 6-8 years were considered. Inclusion of younger and older groups will help in an understanding and generalizing results in terms of a developmental trajectory. Only two age groups were considered for the study. Also a longitudinal sample of data in instances of bilingual studies could provide significant information on selection of languages, exposure of languages and changes in terms of developmental aspects of first and second language acquisition.

In the present study, only one type of verbal response elicitation process was carried out in the form of a picture description task. The results from the conversational analysis would have revealed issues related to socio-pragmatic interlocutor characteristics, attitude towards languages, making of linguistic identities, etc.

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