Code Mixing and Code Switching in Hindi-English Bilingual Individuals with Aphasia

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Abstract

Bilingual aphasia test and Matrix language frame model were used to see the code switching and code mixing among Hind-English bilingual individuals with aphasia. Five individuals with aphasia and 5 neurologically normal adults matched for age, gender, education level and language were taken as subjects. A comparison was made between controls and clinical group and across contexts as to levels at which code mixing and code switching occurred. Instances of code mixing and code switching were compared across different conversation contexts. The extent and type of language mixing were compared with the premorbid language use. It was noticed that embedded language (EL) insertion, ML+EL constituents were exhibited more frequently among individuals with aphasia. This finding gives an idea how code mixing and switching occurs among Hindi-English bilingual aphasics.

Introduction

Bilingualism is an integral product of globalization and social mobility. Statistics reveal an increase in this phenomenon all over the world. India has been a multilingual country right from earliest times and now English bilingualism has become an integral part of India's consciousness.

Code mixing, code switching and inter language borrowing are bilingual phenomena which occur because of interaction of two or more languages. Code mixing has been described as intra sentential and code switching as inter sentential mixing whereas in borrowing a lexical item from one language get integrated into another language (Bhatia & Ritchie, 1996).

All bilingual individuals with aphasia show some sort of deficit in each of their languages. Some of the major deficits that can be seen in bilingual individuals with aphasia are inappropriate code switching, code mixing and borrowing.

Code mixing refers to the mixing of various linguistic units (morphemes, words, modifiers, phrases, clauses and sentences) primarily from two participating grammatical system within a sentence and code switching is seen across sentences.

Code mixing and code switching have also been reported to be present in bilingual individuals with aphasia (Albert & Obler, 1978; Krupa, 2002; Munoz, Marquardt & Copeland, 1999; Paradis, 1977; Sapna, 2004). Language mixing is a frequently observed recovery pattern among bilingual individuals with aphasia characterized by alternating language use at the word

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or sentence level, spontaneous translation, unexpected language switches and/or linguistic interference at different linguistic levels (Junque, Vendrell, Vendrell-Bruet & Tobena 1989; Paradis 1995).

In spite of being a multilingual country only limited studies have been carried out on code mixing and switching in bilingual individuals with aphasia in India. Krupa (2002) investigated code switching in Malayalam-English bilinguals and Sapna (2004) investigated code mixing and code switching in Kannada-English bilingual individuals with aphasia (both Malyalam and Kannada are Dravidian languages). Comparison of type and extent of code mixing and code switching in normal and adult bilingual individuals with aphasia was done.

Method

Participants

Five individuals with aphasia and 5 neurologically normal adults matched on the basis of age, gender, education level and language were taken as subjects. Subjects were bilingual and they had Hindi as their mother tongue and learnt English as second language before the age of ten years. All the subjects were right handed which was determined using self report and information from significant others. Normal subjects were free from any history of neurological, communicative or sensory impairment. Any subject with hearing, vision or psychological problems was excluded.

All subjects had history of left hemisphere cerebro-vascular accident (CVA) confirmed by neurological examination and computerized tomography. The individuals with aphasia were administered western aphasia battery (WAB, Kertesz & Poole, 1974) for the identification of aphasia type in both Hindi and English. Individuals with aphasia had attended therapy for a maximum period of one week to 4 weeks.

Procedure

The questionnaire from part A of bilingual aphasia test (BAT, Paradis & Libben, 1987; Paradis & Vaid 1987) and Australian second language proficiency rating scale (ASLPR, Ingram 1985) were used to get information on language history of all the subjects. ASLPR was used to match individuals with aphasia and normal controls in terms of language use. All the subjects had at least minimal vocational proficiency in English and native proficiency in Hindi to classify as bilinguals in primary skills of speaking and understanding (pre-morbid proficiency was considered for individuals with aphasia).

A language usage questionnaire (Sapna, 2004) was given to all the subjects in order to investigate their usage and attitude toward usage of English language. The intention was to get information on amount and type of code mixing and code switching in relation to cultural context of Hindi-English bilinguals.

Part A and Part B of BAT were administered on bilingual individuals with aphasia for comparison of language skills across their two languages. Short version of bilingual aphasia test (Hindi-English version) was administered to the bilingual individuals with aphasia. This helped to compare different language skills in subject's two languages and gave a clear picture of effect

of aphasia on these languages. Short version was selected because it required less administration time. These tasks are: spontaneous speech, pointing, simple and semi-complex commands, verbal auditory discrimination, syntactic comprehension, synonyms, antonyms, repetition of words, repetition of sentences, series, naming, sentence construction, semantic opposites and listening comprehension. All the responses on BAT were audio-recorded and scored using instruction given in the test manual.

All the subjects participated in three conversation tasks: monolingual Hindi, monolingual English and bilingual (both languages used within a single conversation). Conversations were carried out on three different days to reduce the interference from one language to another.

Topics of conversation included hobbies for English, family for Hindi and work for the bilingual context. These three topics were reported by Timm (1975) to involve equal amount of code mixing and code switching. Subjects were prompted by the partners to maintain the topic during the conversation. The conversations were audio recorded in a quiet room with only the subject and partner present and later transcribed.

Results and Discussion

Five bilingual individuals with aphasia were taken as subjects and matched with five normal adults on the basis of age/gender, handedness (self report and information from significant offers) education and language usage (based on response to Australian second language proficiency rating scale (Ingram 1985) and Part A of Bilingual aphasia test (Poradis and Vaid, 1987). As the clinical group of bilingual individuals with aphasia was heterogeneous in terms of age and gender one to one matching was carried out to compare with the control group. All the subjects had at least minimal vocational proficiency in English and being native speakers of Hindi (Pre-morbid proficiency was considered for individuals with aphasia) had native proficiency in Hindi on Australian second language proficiency rating scale (ASLPR Ingram 1985). Language usage being an important variable was matched between the different subjects based on their responses on ASLPR and part A i.e., language questionnaire of bilingual aphasia test. All the subject were right handed without any forced change in handedness as was reported by self, spouse and significant others.

All the subjects had Hindi as their mother tongue and used Hindi and English frequently in their daily life. Hindi was acquired at home by all of them; English was learnt in the school by an average of 6 years of age and was used in conversation by 12 years of age by all. Most of them carried out all written official work in English. Two subjects (A1 and A3) showed lesser usage of English in their daily life and this change was more marked post morbidly as was reported in the questionnaire.

Western aphasia battery (WAB) revealed Broca's aphasia in two (A1 and A2) and Anomia in three subjects (A3 to A5) and the picture was same across two languages.

Part B from short version of BAT showed language deficit to be parallel across two languages of all individuals with aphasia with better scores in Hindi in most of the sections (Graph 1) except for sentence construction (may be because of the sample size).The BAT score of sentence construction was better for English.

Table 1: Maximum scores of BAT (part B), mean and S.D in English and Hindi for each subtest

Sl. No.	Subtests	Maximum Score of BAT (Part B)	English		Hindi	
			Mean	SD	Mean	SD
1	Fluency(Fl)	5	3.9	1.5	4.1	1.2
2	Accuracy(Ac)	5	5.0	-	5.0	-
3	Pointing(Pt)	10	10.0	-	10.0	-
4	Simple & Semi-complex commands	10	10.0	-	10.0	-
5	Auditory Verbal Discrimination	18	18.0	-	18.0	-
6	Syntactic Comprehension	37	34.2	3.8	36.2	1.8
7	Synonyms (Syno)	5	3.4	1.5	3.8	1.1
8	Antonyms(Ant)	5	3.4	1.5	4.0	1.0
9	Word Repition (WR)	30	30.0	-	30.0	-
10	Sentence Repition (SR)	7	6.2	1.1	6.6	.5
11	Series (Se)	44	41.6	0.5	42.0	1.2
12	Naming (Nm)	20	16.4	3.6	17.2	2.6
13	Semantic Opposite (SO)	10	7.8	2.1	7.8	2.1
14	Sentence Construction (SC)	10	9.0	1.4	8.8	1.6
15	Listening Comprehension (LC)	5	5.0	-	5.0	-
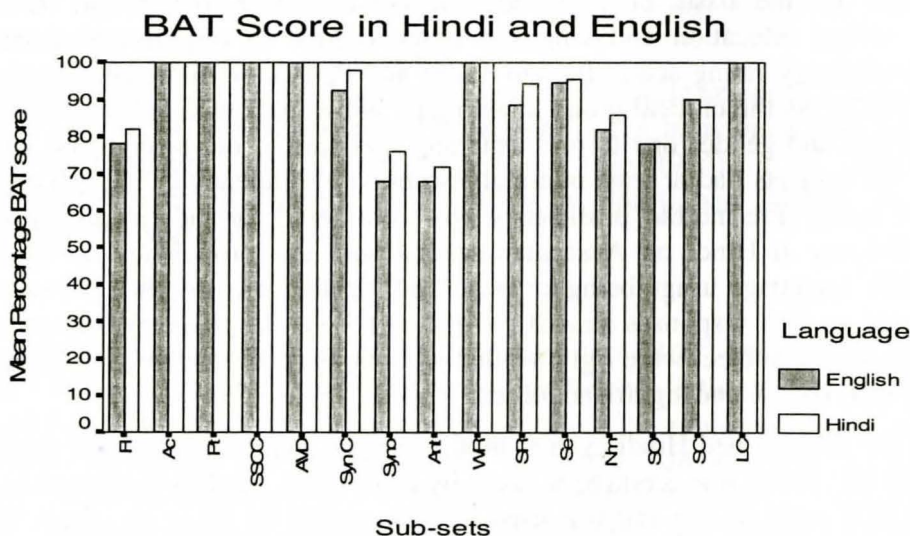
Graph 1: Depiction of Hindi and English BAT score for each subtest

The main areas affected in A1 and A2 were fluency, syntactic comprehension, sentence repetition, series and sentence construction that presents a classical profile of Broca's aphasia in two languages with supporting results of WAB. In A3-A5 synonyms, antonyms, series naming and semantic opposites were affected which matches the anomic diagnosis of WAB. Although the scores were higher in Hindi the picture was that of a parallel deficit across language.

1. Comparison of MLF constituents

Matrix language frame model (MLF, Myers-Scotton, 1993) was used to analyze code mixed and code switched constituents. MLF constituents are based on the hierarchical relation between matrix (host) and embedded (guest) language (Appendix C). The matrix language (ML) is the language that builds the morph syntactic frame of the utterance and contributes most of the system morphemes. Embedded language (EL) is the less active language and the elements from this are embedded into the structure established by the matrix language. The constituents of different matrix language frame were compared in monolingual Hindi context, monolingual English context and bilingual context for both normal and aphasic groups.

2. Frequency of code switching instances in aphasic and normal subjects

Table 2: Subjects exhibiting code switching and code mixing

| Code switch	Monolingual Hindi context		Monolingual English context		Bilingual context (Hindi-English)	
	Normal	Aphasic	Normal	Aphasic	Normal	Aphasic
ML Islands English	-	-	5/5	4/5	2/5	2/5
ML Islands Hindi	5/5	5/5	-	1/5	3/5	3/5
EL Islands	2/5	1/5	-	3/5	2/5	2/5
EL insertion	-	4/5	-	4/5	-	3/5
ML+EL constituent	3/5	4/5	3/5	4/5	3/5	3/5
ML shift and revision	5/5	5/5	5/5	5/5	5/5	5/5
Borrowed forms	5/5	5/5	5/5	5/5	5/5	5/5

3. Matrix language Islands (ML Islands)

Matrix language islands (ML islands) are constituents consisting entirely of ML morphemes. They must follow the grammatical structure of a particular language (Myers-Scotton, 1993). That is ML islands are constituents with morphemes solely from the ML and they are well formed according to the ML grammar.
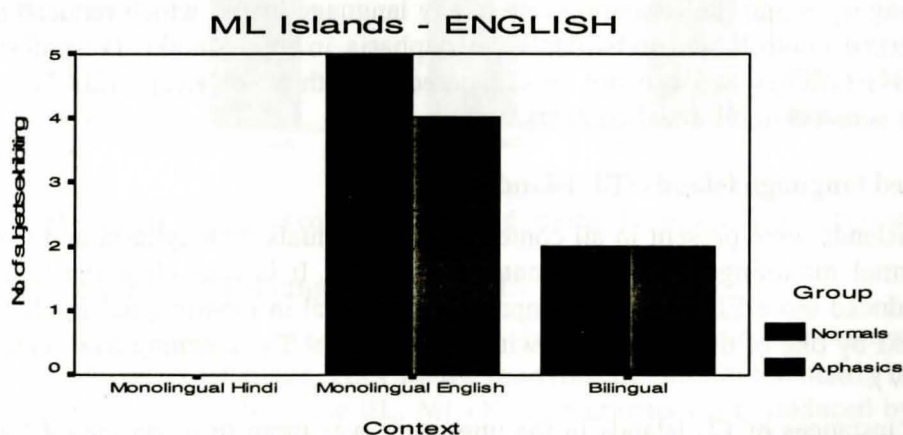
Graph 2: No. of subjects exhibiting code switching and mixing (ML islands- English) in different contexts

It was found that for all normal subjects ML islands were in the language established by the interlocutor. This constituent in normal speaker suggests increased single language utterance in normal controls in comparison to aphasics in monolingual condition.

Grosjean, (1985) suggested that language mixing could be considered abnormal only if it was used inappropriately with monolingual interlocutor. In present study, bilingual individuals with aphasia produced ML islands as most frequent constituents in monolingual condition. This stresses the fact that they did not inappropriately switch languages. Trend was similar in normal bilingual as well. Similar findings were reported by Krupa, (2002) Munoz et al (1999), Perecman, (1984) and Sapna (2004).
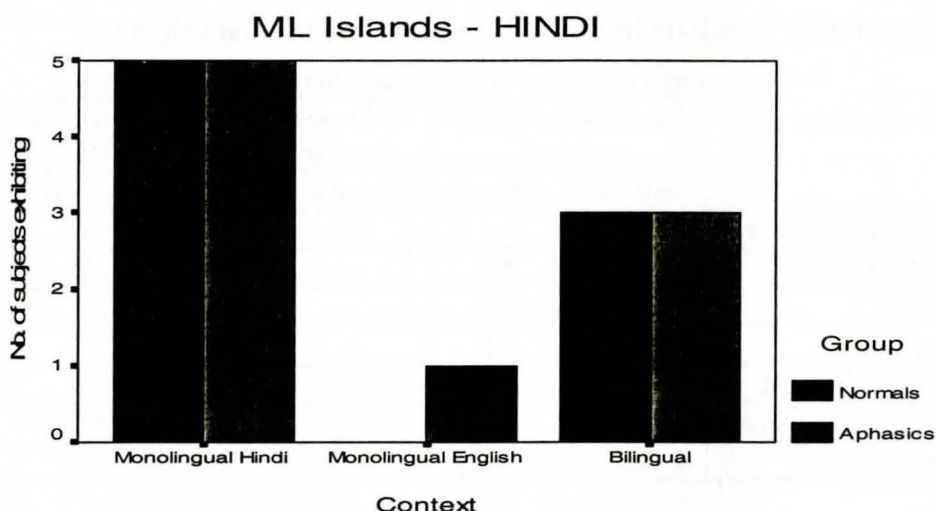
ML Islands - HINDI

Graph 3: No. of subjects exhibiting code switching and mixing (ML islands- Hindi) in different contexts

ML islands were the most frequent constituent in bilingual context. There was no significant difference across subjects in frequency of this constituent. This is in contradiction to monolingual English context where the normal individuals produced more frequent ML islands (graph 3). In bilingual context individuals with aphasia had freedom to choose their utterance from two languages and thus communicate in any language linked which reduced the difference between normal controls and individuals with aphasia in this context. Present study supports Sapna, (2004) findings and can not be compared with those of Krupa (2002) as she did not evaluate her subjects in bilingual contexts.

4. Embedded language Islands (EL islands)

EL islands were present in all contexts for individuals with aphasia and it was absent in case of normal monolingual English context (graph 4). It is also clear that individuals with aphasia produced more EL island in comparison to normal in monolingual English context. Eg. Hindi context by one of the individuals with aphasia - *mai* TV watching like *kerta hoon.* (I like watching TV).

The instances of EL islands in the utterances was more in monolingual English context for individuals with aphasia and supports Krupa's (2002) findings. This can be due to the lexical retrieval problem.
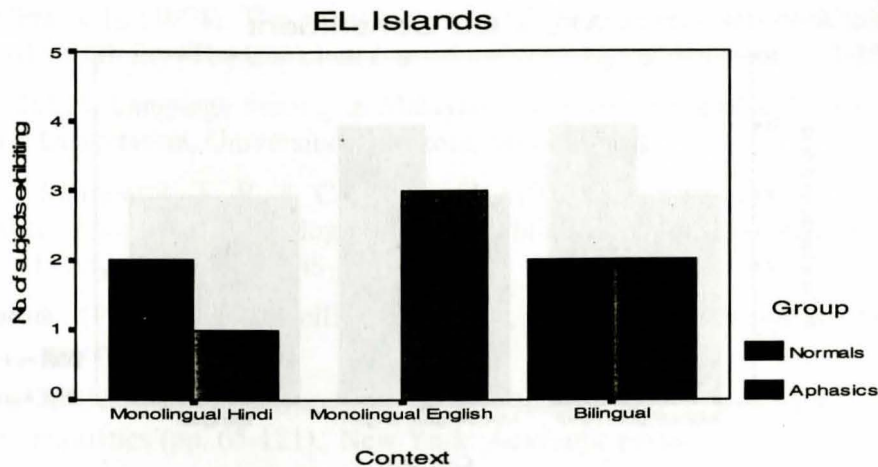
EL Islands

Graph 4: No. of subjects exhibiting code switching and mixing, EL islands- in *different contexts.*

EL Insertion

When multiple EL lexemes demonstrating no syntactic structure are inserted into the syntactic frame of any number of ML it is called EL insertion. From the graph 4 it is clear that such insertions are present in case of most of the individuals with aphasia and absent in normals in each of the contexts either it is monolingual Hindi, monolingual English or Bilingual.

Eg. (Seen in one aphasic) - *Mai* work live *ghar* (I work live home).
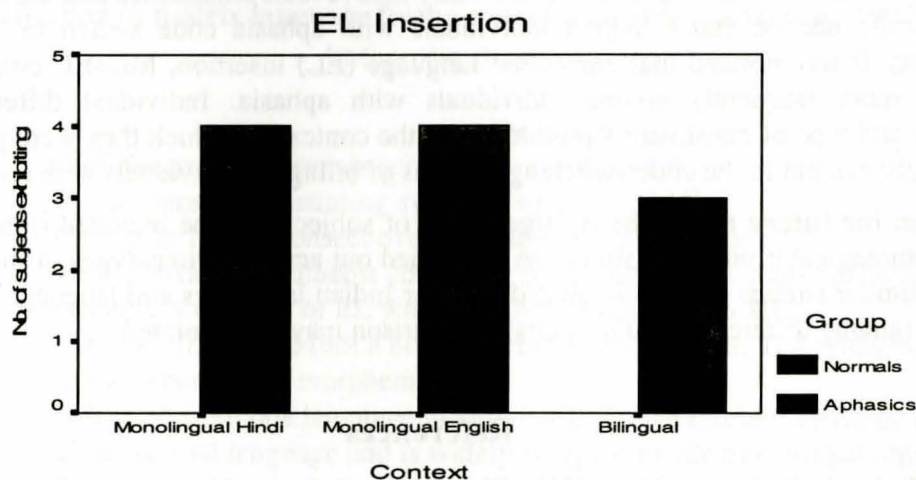
EL Insertion

Graph 5: No. of subjects exhibiting code switching and mixing, EL *insertions in different contexts*

Matrix language and embedded language (ML+EL)

ML+EL are constituents where embedded language lexemes are inserted into the syntactic structure of matrix language. They follow the syntactic rules of the matrix language and the content morphemes can be form the EL. ML+EL constituents were produced by 4 out of 5 subjects when the context was monolingual in case of individuals with aphasia and three in case of normal subjects (graph 5). Present finding replicate the findings of Krupa (2002) and Sapna (2004).
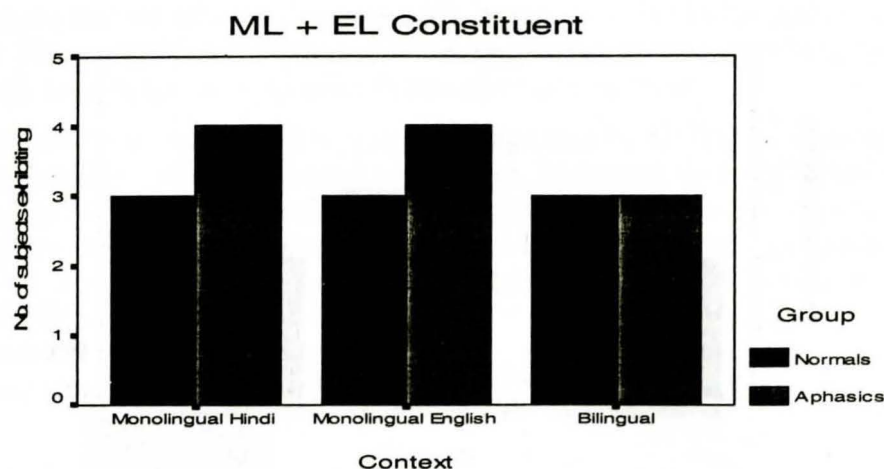
ML + EL Constituent

Graph 6: No. of subjects exhibiting code switching and mixing, Ml+EL constituents in different contexts

Graph 5 explains that individuals with aphasia appeared to be accessing the second language to meet the lexical demands more often than normal subjects in case of monolingual context. However it is same in bilingual context.

Eg. one aphasic: *Mera dost achha* run *karata hai* (My friend good runs)/ My friend runs well

The result from BAT short version pointed towards a parallel deficit across the two languages of the subjects. The result of this study thus reveals similarities and differences in how neurologically normal and bilingual individuals with aphasia code switch or mix in verbal interactions. It was noticed that embedded language (EL) insertion, ML+EL constituents were exhibited more frequently among individuals with aphasia. Individual differences in the frequency and type of constituents produced and the contexts in which they were produced were significantly evident in the code switching patterns of bilingual individuals with aphasia.

Suggestion for future research: A large group of subjects can be included in both normal as will as pathological group. The study can be carried out across various types of individuals with aphasia. Similar studies can be conducted in other Indian languages and language pairs. A cross linguistic (among different language pairs) comparison may be attempted.

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Appendix

Definition of matrix language frame constituents (Myers-Scotton, 1993)
(Munoz et al 1999)

Constituents	Definition
ML Islands	Well formed constituents consisting entirely of ML Morphemes demonstrating syntactic structure of ML
ML shift	Change in ML in consecutive utterances or clausal structures
EL islands	Well- formed constituents consisting of at least two EL morphemes showing syntactic structures of EL which has been inserted into ML.
ML+EL	A single EL lexeme (not a borrowed form) inserted into The syntactic frame of any number of ML morphemes.
Borrowed forms	A lexeme from one language incorporated into the morpho-syntactic structure of the second language and is widely accepted by the monolingual speakers of that language.
EL insertion	Multiple EL lexemes demonstrating no syntactic structure inserted into the syntactic frame of any number of ML morphemes.
Revisions	Lexical insertions that do not contribute to the meaning of the utterance including speech errors, restatements circumlocutions and are indicators of word finding problems.