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# Bilingual Code-Switching and the Open/Closed Class Distinction

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## 1 Introduction

Although much attention has been paid to the sociolinguistics of bilingual code-switching, it is only recently that syntactic constraints on the phenomenon have been investigated. For example, given a French-English bilingual who code-switches intrasententially, i.e., who produces sentences containing lexical material from the two languages, could that speaker equally well produce, for example, all the sentences of (1)?

- (1) a. *We* avons vu un tigre ['We have seen a tiger'].
- b. Nous *have* vu un tigre.
- c. Nous avons *seen* un tigre.
- d. Nous avons vu *a* tigre.
- e. Nous avons vu un *tiger*.
- f. Nous *have seen* un tigre.
- g. Nous avons vu *a tiger*.
- h. Nous *have seen a tiger*.

The question is potentially of considerable interest because the investigation may well shed light not simply on intrasentential code-switching but also on a number of other phenomena. In particular, a study of how bilinguals code-switch from one language to another within a sentence may shed light on how monolinguals organize their grammar and process sentences, as pointed

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*Note from the editors:* This paper was written in 1984 but not published until now. We include it here in order to make this widely cited work more easily available. It has not been updated and so lacks all reference to recent work on the topic.

out in Joshi 1983 and in Woolford 1983. In addition, it may inform us on how bilinguals acquire and organize the grammar of their second language, as well as how they process sentences in it.

In what follows, we shall briefly review five theories of bilingual intrasentential code-switching, Pfaff 1979, Sankoff and Poplack 1980, Woolford 1983, Joshi 1983, and Doron 1981, and we shall show that none, as formulated, appears to account for the data. We shall then outline an independent theory of second language acquisition and processing that, taken together with a theory of code-switching along the lines of the one presented in Joshi 1983, does account for the data. Evidence from psycholinguistic research will be presented to support the reasonableness of our approach.

## **2 Review of the Literature**

### **2.1 Overview**

Formal code-switching grammars have been developed within two basic frameworks: (i) the two grammatical systems are kept separate, and a switching mechanism is developed to alternate between them, and (ii) the grammatical systems of the two languages are combined into a third grammar, with modifications of and/or constraints upon the syntactic rules. Within the first framework, each constituent, including the sentence itself, is assigned to one of the two monolingual grammars; constituents are switched from one language to another.

Within the second framework, constituents are assigned to a particular language only if the syntactic structure is unique to one of the two languages. Sankoff and Poplack (1980:11) justify the existence of a third grammar by observing that code-switching is not generally accompanied by "pauses, hesitations, repetitions, corrections, or any other interruption or disruption in the rhythm of speech." However, Doron (1981:3) points out that the smooth transition between languages indicates only that code-switching is not an "erratic performance phenomenon." As additional evidence for a third grammar, Poplack (1980) states that the switching is symmetrical between the two languages; however, this follows from her definition of a switch and is not an empirical finding. And Joshi (1983) notes that a third grammar entails unnecessary complications for the parsing of monolingual sentences. The only compelling evidence for a third grammar would be the existence of a constituent consisting of lexical items from two languages, with a structure which cannot be generated by either of the two monolingual grammars; such

evidence is not claimed to exist in any of the five theories described below, nor does it exist in our own data.<sup>1</sup>

## 2.2 Pfaff 1979

Pfaff does not develop a formal code-switching model, but she does specify certain constraints on switchability, shown in (2):

### (2) Pfaff's constraints

- a. Miscellaneous Category Constraint: Tensed verbs, clitic pronoun objects, and prepositions cannot switch.
- b. Order Constraint: Nouns and adjectives within a noun phrase cannot switch unless the order of the noun phrase constituents is the same in both languages.

The question of code-switching tensed verbs requires further discussion and will be returned to below. Counterexamples to Pfaff's other constraints are shown in (3):

### (3) Counterexamples to Pfaff's constraints:

- a. Clitic pronoun objects  
 inta hang -*ha* up.  
 you            *it*  
 'You hang *it* up.'  
 (English/Arabic: Mohamed 1983)

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<sup>1</sup>Aravind Joshi has pointed out to us that a third grammar might be needed to account for the portmanteau constructions reported in Nishimura 1983, e.g. (i), and for the noncausative readings associated with the auxiliary constructions reported in Joshi 1983 for Marathi/English and in Pfaff 1979 for Spanish/English, e.g. (ii) and (iii), respectively:

- (i) Look at the things she buys for Sean *ne*. [*ne* = 'for'].  
 (English/Japanese: Nishimura 1983)
- (ii) *mi tyala ghar ghyayla persuade kela.*  
 I to-him house to-buy *persuade* did  
 'I *persuaded* him to buy a house.'  
 (Marathi/English: Joshi 1983)
- (iii) *Su hija hace teach alla en San José*  
 his daughter makes *teach* there in San José  
 'His daughter *teaches* there in San Jose.'  
 (Spanish/English: Pfaff 1979)

- b. Prepositions  
 Il devient *bhal* un perroquet.  
 he becomes *like* a parrot  
 'He becomes *like* a parrot.'  
 (French/Arabic: Bentahila and Davies 1983:315)
- c. Order Constraint:  
*Salesmen dinamiyim* can make a lot of money.  
 'Dynamic salesmen can make a lot of money.'  
 (Hebrew/English: Doron 1981:18)

That is, in (3a), we find an Arabic object pronoun cliticized onto an English verb; in (3b), we find an Arabic preposition in an otherwise French sentence; and, in (3c), we find an NP consisting of a Hebrew N and an English Adj, where the order of N and Adj in an NP is different in Hebrew and English.

### 2.3 Sankoff and Poplack 1980

Sankoff and Poplack work within the framework of a third context-free phrase structure grammar built from the two monolingual grammars. They propose two constraints, presented in (4):

- (4) Sankoff and Poplack's constraints:
- a. Free Morpheme Constraint: No switch may occur between a bound morpheme and a lexical form unless the latter has been phonologically integrated into the language of the former.
  - b. Equivalence Constraint: The order of sentence constituents on either side of the switch point must be grammatical with respect to both languages.

The lexicon of the code-switching grammar consists of the union of the lexicons of the two monolingual grammars. The set of grammatical categories is the union of the two sets of grammatical categories (marked for language). The set of phrase structure rules is the union of the two sets of phrase structure rules, modified as follows: if the switch of one of two adjacent elements of the right-hand side of a phrase structure rule violates either the Free Morpheme Constraint or the Equivalence Constraint, those two elements are marked as belonging to one of the two monolingual grammars.

Counterexamples to Sankoff and Poplack's constraints are shown in (5):

## (5) Counterexamples to Sankoff and Poplack's constraints

- a. Equivalence Constraint:  
 kahi *chairs* -war  
 some on  
 'on some *chairs*'  
 (Marathi/English: Joshi 1983:7)
- b. Free Morpheme Constraint:  
 ʔaiz t-shof el-ragl y- *swim?*  
 want.pres you-see the-man *PROG swim*  
 'Do you want to see the man *swimming?*'  
 (Arabic/English: Mohamed 1983)

That is, in (5a), we find an English N in an otherwise Marathi PP, where the order of constituents in English and Marathi PPs is different (cf. also (3c), (7), (11b)); in (5b), we find an Arabic bound morpheme attached to an English free morpheme (cf. also (3a)).

## 2.4 Woolford 1983

In Woolford's model, the lexicons and word formation components of the two monolingual grammars are kept separate. Phrase structure rules from both grammars are used; but if a phrase structure rule is unique to one of the two grammars, then the nodes created by application of that rule must be filled by lexical items from that language. In addition, Woolford states that there are constraints upon the structures which can be manipulated by the transformational rules of each monolingual grammar. Crudely put, the general prediction of Woolford's theory is shown in (6):

## (6) Woolford's constraints

- a. Word Constraint: There can be no code-switching within a word.
- b. Constituent Constraint: There can be no code-switching within a constituent in which the deep structure word order is different in the two monolingual grammars.

Woolford's theory makes no mention of the apparent non-switchability of certain lexical categories claimed by the others. We have found no counterexamples to Woolford's Word Constraint; a counterexample to her Constituent Constraint is shown in (7):

## (7) Counterexample to Woolford's Constituent Constraint:

hia *funny* awi.

it so.

'It is so *funny*.'

(Arabic/English: Mohamed 1983)

That is, in (7), we find an AdjP consisting of an English Adj with an Arabic Adv, where the order of Adj and Adv in an AdjP is different in Arabic and English (cf. also (3c), (5a), (11b)).

### 2.5 Joshi 1983

Joshi's model maintains two separate monolingual context-free phrase structure grammars, and a switching mechanism is proposed to control code-switching between their corresponding constituents. One language is designated 'matrix,' i.e., the language to which the root S belongs, the other 'embedded,' i.e., the language to which the switched constituent belongs. There are two major constraints on the switching mechanism, outlined in (8):

## (8) Joshi's constraints

- a. Asymmetry Constraint: Constituents can switch from the matrix language to the embedded language, but not vice versa.
- b. Closed Class Constraint: Closed class items cannot be switched.<sup>2</sup>

The notion of 'matrix language' requires further discussion and will be returned to below. Counterexamples to Joshi's second constraint are shown in (9):

## (9) Counterexamples to Joshi's Closed Class Constraint

- a. It goes without saying I think *que* ['that'] along with the picketing we are doing a boycott.  
(English/Spanish: Pfaff 1979:314)
- b. Any kind of book that's interesting, about Mafia *o* ['or'] love story *o* ['or'] sex books or things like that.  
(English/Spanish: Sankoff and Poplack 1981:35)

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<sup>2</sup>In addition, both Joshi's model and Doron's employ a parsing strategy which is not directly relevant to this paper.



- c. Where are they, *los* ['the'] language things?  
(English/Spanish: Poplack 1981:175)
- d. El dentiste agarraba off y se iba *fishing*.  
'The dentist would take off and go *fishing*.'  
(Spanish/English: Pfaff 1976:254)

That is, in each of the tokens in (9), we find a closed class item in one language in a sentence of another language: a Comp in (9a), a Conj in (9b), a Det in (9c), and a Prt in (9d); cf. also (3a,b), (5b).

## 2.6 Doron 1981

Doron accepts Joshi's basic framework described above, to which she adds two additional constraints, as shown in (10):

### (10) Doron's constraints

- a. [= 8a,b]
- b. Agreement Constraint: Lexical categories which must be marked for agreement cannot be inserted into a position unspecified for agreement. For example, Spanish adjectives, which are marked for agreement, cannot occur in an English noun phrase.
- c. Case Marker Constraint: Case markers, including prepositions, from one language cannot be mixed with noun phrases from another language.

Counterexamples to Doron's additional constraints are shown in (11):

### (11) Counterexamples to Doron's additional constraints:

- a. Agreement Constraint:  
I'm not *terca* ['stubborn'].  
(English/Spanish: Pfaff 1979:305)
- b. Case Marker Constraint:  
Sorekara, *his wife -ni* yattara.  
also                   to give+COND.  
'Also, if (we) give (it) to his wife...'  
(Japanese/English: Nishimura 1983)

That is, in (11a), we find a Spanish Adj, which must agree in gender and number and which here is feminine singular, in an otherwise English sentence; English Adjs are not, of course, marked for agreement. In (11b), we find a Japanese PP consisting of an English NP and a Japanese preposition (cf. also (3b)).

## **2.7 Summary**

In summary, the constraints posited by these five theories involve surface word order, lexical, morphological, and grammatical categories, and symmetry. We shall now present results from a research project which was carried out at the University of Pennsylvania on intrasentential code-switching in the speech of Yiddish-English bilinguals and which seem to falsify at least some part of each of the five theories outlined above.

## **3 Yiddish-English Code-Switching Study**

### **3.1 Corpus**

The research we are reporting is the result of an analysis of intrasentential code-switching data from approximately seven hours of taped and transcribed interviews with eight Yiddish-English bilinguals in Philadelphia and New York City. The speakers were 70 to 85 years old. Their native language was Yiddish; they had emigrated as young adults from Central and Eastern Europe to the United States, where they acquired English. Of the five interviewees, one was fluent in Yiddish, two others knew some German and could therefore understand some Yiddish, and the remaining two neither spoke nor understood Yiddish or German. The interviews were conducted with no interest in or awareness of the phenomenon of code-switching and indeed were expected to be entirely in English. A total of 247 tokens of intrasentential code-switching were found and analyzed.

### **3.2 Criteria**

A few words are in order here on the criteria used for, first, identifying an utterance as a token of code-switching and, second, coding an utterance once it has been so identified.

### 3.2.1 Criteria for Identifying Code-Switches

Deciding whether or not some utterance is or is not an instance of code-switching is highly problematic, which fact we feel has not been sufficiently appreciated in much of the literature. Languages in contact may interact in a variety of complex ways, of which code-switching is but one. Thus, the fact that a sentence appears to contain lexical material from more than one language does not entail that it is an instance of code-switching, and several (often fuzzy) distinctions must be made.

First, there is the well-known problem of distinguishing code-switching from borrowing. The distinction is important since a speaker who utters a sentence containing a borrowing is speaking a single language; thus monolinguals, for example, may well utter sentences containing a borrowing. In contrast, code-switching involves the simultaneous management of two languages. The usual test for distinguishing borrowing from code-switching is phonological: if some item has been borrowed from some foreign language, L2, into one's native language, L1, it will be phonologically adapted to L1; if it has been code-switched, it will not.<sup>3</sup> This test was not useful in our study, since our speakers all have, as far as we can tell, one phonological system, not two. In other words, they have a strong Yiddish accent.

The criterion we did use was to eliminate as borrowings those items which seem to be used by some monolingual English speakers, at least those in the large urban areas of the northeastern United States.<sup>4</sup> We are not entirely happy with this criterion, since the real distinction is whether the utterer takes the item in question to be a borrowing or not, i.e., has the (originally L2) item in his/her L1 lexicon, not whether some other group of speakers does.

Second, there is the equally well-known problem of distinguishing code-switching from interference, the influence or intrusion of one language on another as a result of an 'incomplete model' of the latter. Since we could find no test other than whether the apparent switch was intended or not (cf. Albert and Obler 1978:12), a test that we, for obvious reasons, could not apply, we presumed no interference and included all apparent code-switches

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<sup>3</sup>Note that this test is what underlies the condition on Sankoff and Poplack's Free Morpheme Constraint, presented in (4a) above. That is, Sankoff and Poplack are disallowing the cooccurrence of a bound morpheme and a free morpheme where one of them has been code-switched; they are allowing it, of course, where the free morpheme has been borrowed.

<sup>4</sup>Cf. Webster's *Third International Dictionary*, *schlepp* [slang] 'drag', 'haul', also 'steal'.

other than borrowings in our corpus of code-switches. We shall return below to the notion of interference.

Finally, it should be noted here that the English of the eight bilinguals is not 'standard.'<sup>5</sup> However, there is no doubt that they do speak some dialect of English; in fact they all speak more or less the same dialect, and the non-standardness of that dialect is, we feel, irrelevant. This, of course, is related to the problem of interference.

### 3.2.2 Criteria for Coding Code-Switches

Once an utterance has been identified as an instance of code-switching, the problem arises of coding it in a principled and non-ad hoc way. There were basically three important decisions that had to be made in this domain in this study.

First, for each mixed sentence, the matrix language had to be determined. Following Joshi 1983 and others, we used the tensed verb of each tensed S to determine the matrix language of that S, from which it follows, by the way, that by definition we cannot have a tensed verb code-switched, one of the situations explicitly disallowed in Pfaff 1979. (See, however, Doron 1981 for data that cast doubt on this criterion.)

Second, for each instance of code-switching, it had to be determined which constituent or constituents were switched. We adopted the convention of taking the highest constituent of non-matrix items to be the switched constituent. Thus, for example, in (12a), we considered there to be a single switch (PP), rather than two switches (Prep, NP) or three (Prep, Det, N). In (12b), on the other hand, since the two switched items do not constitute a constituent, we considered there to be two switches (Prep, Poss. Pro.):

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<sup>5</sup>For example, we find instances of nonstandard word order, e.g., (i), of subject and object pronoun drop, e.g., (ii) and (iii), respectively, and of a Slavic-type Gapping, e.g., (iv):

- (i) But today *is there* a lot of people out: who would help me. (SG.19ii)
- (ii) [Speaking of birthplace] [*e*] used to be Lithuania, but now [*e*] is Russian. (MK.5)
- (iii) [Speaking of the gem diamonds that he cut for a living] You pay if you eh if you break [*e*] or if you lose [*e*], yeh. (IF.166i)
- (iv) [R: You belong to the shul?] Ocean City. Two shuls. One Ø an old-fashioned, one is a modern... (YS.65)

- (12) a. Efsher zenen zey geven [[in] [[the] [gas chamber]]]... (SG.8i)  
 maybe are they been  
 'Maybe they were in the gas chamber.'
- b. Two years ago I had an operation [[oyf] [[mayn] [eye]]]. (MK.48)  
 on my

Third, for each switch we had to determine whether an open class item or a closed class one was involved. To this end, we used the traditional division of open and closed class items, with one exception: coordinate sentence conjunctions were ignored, for the reason that we could not determine the matrix language of the higher S, following an analysis where the conjunction is immediately dominated by S, since that higher S has no tensed V by which we determine matrix language. Otherwise, all phrasal categories—Ss, NPs, (untensed) VPs, PPs, AdjPs, and AdvPs—as well as Ns, (untensed) Vs, and most Advs (e.g., *slowly*) counted as open; Preps, Conjs, Prts, Dets, Quantifiers, Complementizers, Pronouns, and some Advs (e.g., *too*, *not*) counted as closed.<sup>6</sup>

### 3.3 Analysis

At first glance, our data seem to present counterexamples to all of the theories described above and, in fact, suggest that there are no constraints at all on what can be switched. In particular, closed class items, disallowed in part or in whole by four of the five theories outlined above, appear eminently switchable, constituting 39 of the total number of switches, as seen in (13):

(13) Open/Closed Class Yiddish/English code-switching:

OPEN	CLOSED
151 [61%]	96 [39%]

Examples of both types are shown in (14-16):

<sup>6</sup>But cf. Weinreich 1953, Kean 1979 for arguments that certain closed class items are 'more closed' than others. Adverbs and prepositions are shown to be particularly problematic.

## (14) Open class switches; English→Yiddish:

- a. N:  
...a *melamed* ['teacher'] that eh lived in one room with his wife and eh... and the chickens and everything. (IF.103i)
- b. NP:  
That's when they come, /a/ *khasene oder a levaye* ['a wedding or a funeral']. (SG.10ii)<sup>7</sup>
- c. AdjP:  
But the climate in Philadelphia is *zeyer shlekht* ['very bad']. (SG.5i)

## (15) Open class switches; Yiddish→English:

- a. N, NP, NP, PP:  
Bay yene [years] iz nit geven [the eh casinos] oder  
in those years is not been the casinos or  
[something] [in Atlantic City].  
something in Atlantic City  
'In those years, there weren't the casinos or something in Atlantic City.' (MK.84)
- b. NP, NP, PP, NP, NP, PP, NP, NP, PP:  
Ikh krig fun zey [widow pension], ikh krig [a widow pension] [from Aus- ] fun [Germany], ikh krig [a widow pension] [from here], un ikh krig a [pension], [social security], [from Austria].  
'I get from them widow pension, I get a widow pension from Aus- from Germany, I get a widow pension from here, and I get a pension, Social Security, from Austria.' (SG.18i)

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<sup>7</sup>Unfortunately, there is a risk of ambiguity in our presentation of the data. English utterances are presented in standard orthography; hence the indefinite article is *a*, pronounced as schwa. Yiddish utterances are presented in standard YIVO transliteration, closely related to phonemic transcription; hence the indefinite article is *a*, pronounced /a/. Thus, in (14a), the article is English, whence a switched N, while, in (14b), both articles are Yiddish, whence a switched NP.

## c. PP, (untensed) S:

[From Italy], hobn zey undz geholfn der folk: [to go out to  
from Italy have theyus helped the people to go out to  
Shanghai]...

Shanghai

'From Italy, the people helped us to go out to Shanghai.' (SG.8i)

## d. (Untensed) VP:

'Khob [got out with: 32 children from Austria].

I have got out with 32 children from Austria

'I got out with 32 children from Austria.'

(SG.8i)

## (16) Closed class switches:

- a. Comp: ...there wasn't an item *vos* ['that'] we didn't have. (IF.32i)
- b. Prt: ...and it's hanging *arum* ['around']. (SD.17)
- c. Prep: Bingo, Atlantic City, we go *mit* ['with'] the bus from the shul ['synagogue'; counted as borrowing; cf. Webster III]. (YG.65)
- d. Det: ... *der* ['the'] operation came out wonderful. (MK.53)
- e. Poss. Pro: It was *mayn* ['my'] daughter's house... (MK.30)
- f. Pro: Shpeyter kimt men: till twelve years what *me* called in Vienna folkschool. ['Later comes till twelve years what *they/one* called in Vienna folkschool']. (SG.10i)<sup>8</sup>
- g. Conj: ...look, a Jew was: a doctor, a lawyer, *oder* ['or'] a businessman. (SG.47ii)
- h. Adv: *Azoy* ['So'] is this. (IF.297ii)
- i. Adv: *Efsher* ['Maybe'] they'll make it recorded. (YG.33)

However, it turns out that, when the tokens are coded for matrix language, an interesting pattern emerges: closed class switches are overwhelmingly confined to switches from English to Yiddish, which, in the population under discussion, amount to switches from L2, the nondominant language, to L1, the dominant language. The figures are shown in (17):

<sup>8</sup>See previous note; *me* here is Yiddish, a preverbal variant of *men*, 'one'.

## (17) Open/Closed Switching by Matrix and Dominant L:

	OPEN	CLOSED
L1→L2	74	15
L2→L1	74	81
$\chi$ -square = 31.409		

At this point, the obvious question to be raised is why the situation should be as we have found it. That is, why is the open/closed class distinction salient in code-switching from L1 to L2, and why does this salience seem to disappear when the code-switching is from L2 to L1?<sup>9</sup> Before suggesting an answer for this, we note that there is a relevant body of psycholinguistic re-

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<sup>9</sup>One may wonder, of course, to what extent our Yiddish/English data are generalizable, that is, to what extent the same sort of asymmetry would show up in other corpora. Clearly, further research is required to shed light on this issue, but we note here that, in those theories cited which specify the informants' dominant language (Joshi 1981, 1983; Doron 1981), the data are consistent with the patterns we are finding: virtually no closed class switching when switching from L1 to L2. Further, consider the following observations by Bentahila and Davies (1983:326f.), reporting on Arabic/French code-switching by bilinguals dominant in Arabic:

...we find in our corpus many more examples where an Arabic determiner accompanies a French noun than we do of the contrary; prepositional phrases composed of an Arabic preposition and a French NP are much more common than ones where the preposition is in French and the NP in Arabic; and there are far more examples where an Arabic conjunction serves to link two French clauses than there are cases of a French conjunction linking two Arabic ones. In other cases, switches are common in one direction while there are no recorded examples at all of the same type of switch in the opposite direction. For instance, there are examples of Arabic demonstratives and possessives co-occurring with French nouns, of clauses in which the verb is in Arabic and the subject in French, and of the very common pattern where an Arabic disjunctive pronoun occurs in what is an otherwise entirely French sentence; but there are no instances of any of the reverse patterns... There is a tendency for [the Arabic-dominant] speakers to resort more to Arabic than to French for grammatical items or function words, such as determiners, pronouns, prepositions and conjunctions. Even when they are speaking mainly in French, they often use Arabic for such items... On the other hand, when speaking mainly Arabic, they seem to resort to French for lexical items, particularly for nouns, far more frequently than they have to resort to Arabic lexical items when speaking mainly French.



search that shows that monolinguals process open and closed class items differently, and it is to that evidence that we now turn.

#### **4 Psycholinguistic Evidence for the Open/Closed Class Distinction**

First, as is well known, children do not produce closed class items until the later stages of language acquisition, their absence being categorical in the holophrastic and two-word stages and typical in the telegraphic stage.

Second, and similarly well known, the literature on aphasia reveals that certain aphasias, e.g., anomia and Wernicke's aphasia, affect only open class items, traditionally called 'content' words, leaving closed class items, or 'function' words, intact, while the agrammatic aphasias, e.g., Broca's aphasia, have the reverse effect, i.e., impair the use of closed class items but not of open class items.

Third, Bradley (1978) reports that, while open class items show a strong effect of frequency ordering for lexical decision tasks, closed class items show no effect of frequency ordering for such tasks. That is, when subjects are asked to decide whether some item is a word or not, the amount of time required for the decision varies inversely with the frequency of the item if it is an open class word but does not vary with the frequency of the item if it is a closed class word. This suggests that open and closed class items are stored and/or accessed differently, e.g., that the two classes are stored in two sublexicons, with the items in the closed sublexicon of equal accessibility while those in the open sublexicon are accessed with respect to frequency. Further, Bradley, Garrett, and Zurif (1979) report that this difference becomes neutralized in the case of agrammatic aphasics, where closed as well open class items show an effect of frequency ordering. This can be accounted for, they suggest, if agrammatic aphasics add closed class items to their open class lexicon and lose their closed class lexicon.

Fourth, in studies of speech errors involving phonological metatheses within a sentence, e.g., spoonerisms, Fromkin (1973), Garrett (1980), and others show that it is the phonological material of open class items that is metathesized, usually over a fixed frame of closed class items. That is, the speech error in (18b) is possible; the one in (18c) is not:

- (18) a. a bone for Fido  
 b. a fone for Bido  
 c. \*a fone bor Fido

Garrett (1980) suggests that the two classes of lexical items figure in two different levels of sentence-planning: a first level where the sentence is planned syntactically and where closed class items are selected, and a second level where open class items are selected. It is at the second level, Garrett suggests, that speech errors are made.

## 5 Proposed Explanation of the Code-Switching Data: The Translation Model

Thus, we see that, although little is known of the nature of the actual mechanisms involved, it is clear that non-aphasic monolinguals process open and closed class items differently. It is therefore not surprising that, in some cases at least, bilinguals treat the two classes differently when switching from one language to another intrasententially. The crucial questions, of course, are how (adult) language learners like our informants who show apparent closed class switching, acquire, store, and access closed class items in L2 and how it is that they apparently switch them to closed class items in L1. In the absence of definitive answers to these questions, we shall make a wild speculation on what the situation may be.<sup>10</sup>

First, we shall adopt, for all speakers, a two-level sentence planning mechanism of the sort Garrett suggests. That is, at the first level, the syntax is planned and closed class items are inserted, and, at the second level, open class items are inserted. Second, let us assume that, like speech errors, code-switching is not possible at the first level but is possible at the second level and that it works as described in Joshi 1983.

Let us now consider the case of speakers code-switching from L1 to L2, where virtually no closed class switching occurs. We see that their switching of open class items but not of closed class items follows from this view.

But what then of the case of speakers switching from L2 to L1, where apparent closed class switching is typical? We shall speculate that there is a difference in the acquisition of closed class items between L1 learners and at least some adult L2 learners. That is, perhaps some adult L2 learners do not construct a closed class lexicon for L2 as children must for L1 but rather learn the closed class items of L2 as *translations* of the corresponding items of L1. (Cf. the notion of "subordinate bilingualism," Weinreich 1953:10, *inter alia*.) When planning a sentence of L2 at the syntactic level then, they must access its closed class items *via those of L1*. Sometimes the access is completely successful, in which case the item appears in L2, but sometimes

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<sup>10</sup>We take no stand, of course, on the manner of acquisition of those bilinguals who do not show apparent closed class switching.

it is only partially successful, i.e., the L1 item is accessed but not its L2 translation. In this case, the apparent effect would be one of code-switching: an L1 item appears in an L2 sentence, but in fact it is a case of premature selection rather than of code-switching and perhaps would be better characterized as a special case of interference.

We leave open the question of code-switching for these speakers at the second level of sentence planning, i.e., where open class items are stored. The Translation Model sketched here allows for three logical possibilities: (i) L2 items are directly accessed and may therefore be code-switched, (ii) L2 items are indirectly accessed as translations of L1 items (as in the case of the closed class items) and, if the corresponding L1 items are prematurely selected, there is putative code-switching, or (iii) a combination of (i) and (ii), i.e., some L2 items are accessed directly and code-switched and others are accessed indirectly, the corresponding L1 items being prematurely selected and giving the appearance of code-switching.<sup>11</sup>

It is interesting to note that the Translation Model sketched here is entirely consistent with the theory of code-switching proposed in Joshi 1983 with respect to the asymmetry of the two languages involved and with respect to the non-switchability of closed-class items—this in spite of the fact that the data at first blush seemed to contradict Joshi's Closed Class Constraint.

## 6 Empirical Predictions of the Translation Model

In order to see more clearly what follows from such a Translation Model, let us consider briefly an alternative acquisition hypothesis that would equally well account for the data: suppose that adult language learners acquire all L2 items, both open and closed, as open class items. Call this the Only-Open Model. Presumably, such a model would have equal descriptive adequacy with respect to the switchability of L2 closed class items, since these would be processed at the second level of sentence planning, along with open class items, and it is at this level that code-switching is possible. However, it turns out that the Translation Model and the Only-Open Model make very different predictions on a number of other issues.

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<sup>11</sup>It is perhaps significant that, while none of the five theories we have discussed explicitly mentions dominance, Joshi (1983) leads us to infer that the matrix language is necessarily the speaker's dominant language. Further, Doron (1981: 31) seems to find this plausible. Whether in fact this is the case, even if only for some groups of bilinguals, requires further research. The Translation Model is neutral on this issue.

First, note that, following the Only-Open Model, the apparent switches of closed class items from L2 to L1 are in fact switches, while, for the Translation Model, they are not. Thus, the Only-Open Model predicts that they would exhibit the same contextual and sociolinguistic features associated with open class switches. In contrast, the Translation Model makes no such prediction. Here a study of contextual and sociolinguistic features of code-switching is in order. However, we point out that, in our data, open class switches differ from apparent closed class switches in that the former, but not the latter, are sometimes translated/glossed by the speaker. That is, for the four of our eight informants who ever translate anything for the interviewer, all such translations are of open class items. The figures are presented in (19):

(19) Open/Closed by Translated/Not Translated:

	OPEN	CLOSED
TRANSLATED	4	0
NOT TRANSLATED	31	25
$\chi$ -square = 15.558		

Here we count as Translated all English→Yiddish switches which are being or have been explicitly translated by the informant or for which a translation is or has been offered, for those informants who ever translate anything. We count as Not Translated all those informants' English→Yiddish switches for which no translation is being or has been given or offered and which item the interviewer has not used. (Reasonably enough, there is no case of an informant translating a Yiddish item that the interviewer has already uttered.) Examples of translations and offers thereof are given in (20):

- (20) a. So: but I went to the- to the Hebrew- to the *melamed*, to a Hebrew teacher. Now don't compare him with a Hebrew teacher here... (IF.103i)
- b. My father was writing me that uh uh Shua will be a- will be a uh a rabbi, an *ilu*, you know a genius... (IF.223ii)
- c. And who were the owners, the owners you know what they were in Bardeyov, the boys?... *Tregers*. You know what a *tregers* is? [IF: They were drivers. AK: Peasants?] Dri- *tregers*, that brings eh

brings from the station: cartons, big cartons to the stores. [AK: Oh. Like porters, yeah.] *Tregers*, that's what they called them, *tregers*, yeah porters. (MF.201i)

- d. Ober ['but'] we eh don't have it: in the *kop* ['head']. You know what's a *kop*? [RP: Sure.] (YS.8)

Note, by the way, the instance of apparent closed class switching in (20d) (*ober* 'but'), which is, not surprisingly given our analysis, *not* translated (and not really 'switched').

Second, if experiments are carried out for adult bilinguals along the lines of those described by Garrett (1980) and Bradley (1978) involving lexical decision tasks of open and closed class items, the two models predict different results. The Translation Model predicts that response times for closed class items in L2 will be like those for closed class items in L1, except perhaps slower, i.e., with no frequency effect. In contrast, the Only-Open Model predicts that the response times for closed class items in L2 will be like those for open class items, i.e., will correlate with frequency, as is the case of the agrammatic aphasics reported in Bradley, Garrett, and Zurif 1979. While this experiment must of course be done to settle the issue, it should be noted at the outset that the bilinguals under discussion are not agrammatic aphasics and do in fact plan their sentences syntactically.

Third, the Translation Model predicts that a bilingual who demonstrates apparent closed-class switching of L1 items in L2 should not, following some brain lesion, exhibit agrammatic aphasia in L1 but not in L2. That is, if his/her L1 closed class lexicon is inaccessible, so should be the L2 translations associated with it. The Only-Open Model makes no such prediction; agrammatic aphasia in L1 should have no bearing on L2. We note here that none of the 108 case studies of polyglot aphasia reported in Albert and Obler 1978 where the subject acquired L2 as an adult involves agrammatic aphasia in L1 but not in L2, while two case studies seem to indicate the reverse situation.<sup>12</sup>

Finally, analyses of speech errors of bilinguals should reveal different patterns between L1 and L2. Following the Translation Model, there should be no metatheses of closed class items (or parts thereof) in L2, just as there are none in L1, since closed class items are selected at the first level of sentence planning. In contrast, the Only-Open Model predicts that L2 closed

<sup>12</sup>One case study, #76, involves motor aphasia in both L1 and L2; L2 returned "more syntactically impaired than" L1. The other, #83, involves agrammatism in written L2; "grammatical categories of [L1] interfered." (Albert and Obler 1978:130ff.)

class items, being psychologically indistinguishable from open class items and hence selected at the second level of sentence planning, should metathe-size. That is, speech errors like (18c) should be just as likely as ones like (18b) in the speech of adult bilinguals speaking L2. Again, a thorough investigation of the facts should be done, but we note in passing that we find no errors like (18c) in our data and know of none reported in the literature.

## 7 Conclusion

In this paper, we have considered bilingual intrasentential code-switching and we have found that the ban on closed class switching claimed in much of the literature is at first blush contradicted by the data. Closer examination, however, reveals that the apparent closed class switching we find is virtually limited to switches from L2 to L1. In light of this, we tentatively propose a Translation Model of acquisition and production that appears plausible on independent psycholinguistic grounds and according to which the apparent closed class switching is in fact not switching at all but rather a sort of performance error of the type that has generally gone under the rubric of 'interference'. This Translation Model, taken in tandem with a theory of code-switching along the lines of Joshi 1983, appears to account for the data. Finally, we have enumerated several areas where the model can be tested empirically, research which remains to be done.

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