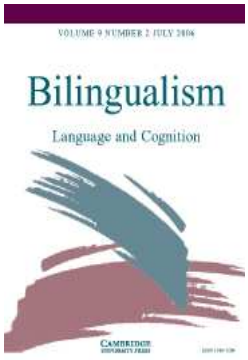

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Bilingualism: Language and Cognition / Volume 9 / Issue 02 / July 2006, pp 203 - 212
DOI: 10.1017/S1366728906002549, Published online: 22 June 2006

Bilingualism: Language and Cognition 9 (2), 2006, 203–212 © 2006 Cambridge University Press doi:10.1017/S1366728906002549

Natural codeswitching knocks on the laboratory door*

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This contribution discusses findings and hypotheses from empirical data of naturally-occurring codeswitching. The discussion is framed by some comparisons of the approaches of contact linguists and psycholinguists to bilingual production data. However, it emphasizes the relevance of naturally-occurring codeswitching to the theoretical questions asked by psycholinguists. To accomplish this, relevant grammatical structures in codeswitching are exemplified and analyzed. Analysis largely follows the Matrix Language Frame (MLF) model, but differing approaches are mentioned.

1. Introduction

This contribution comes from a linguist who studies contact phenomena. Typically, contact linguists are interested in what structural options exist when linguistic elements from two or more languages can be combined in one clause or sentence (e.g. codeswitching); or, they puzzle over linguistic outcomes that show the competing influence of more than one language (e.g. L1 attrition, creole formation, or mixed (split) languages). For us, this is the study of bilingualism. What counts as "bilingualism" for the psycholinguists, who are the major contributors to this issue, is quite different. A first goal of this paper is to describe a contact linguist's view (mine) of the different objectives when contact linguists and psycholinguists go about their research. But the main goal is to suggest how looking at bilingual speech production through the empirical window of contact data suggests answers, or at least new approaches, to the questions that psycholinguists study.

2. Shared interests, but different goals

The psycholinguists and contact linguists who are considered share two interests: We're all interested in the speech of bilinguals and its production. We all propose models to explain the surface order that characterizes bilingual speech, based on data we collect (in different ways) from language performance by bilinguals. But the two groups emphasize different sides of the issue. For many linguists in general, the goal is to achieve an abstract model of the nature of language itself (what used to be called deep structure); this is also one of the goals for some contact linguists.

In contrast, as an outsider, I see many psycholinguists as not so interested in the nature of the beast (i.e. language) as rather in how language is ACCOMPLISHED. Thus, they are interested in the system underlying bilingual production. That is, I assume many psycholinguists agree with Roelofs (1998), who wrote: "The central theoretical problem is how bilingual speakers manage to keep the options provided by the two languages apart in monolingual conversation, and how speakers are able to integrate the options in bilingual conversation where language mixing (i.e. codeswitching or borrowing) may take place" (p. 94).

Further, the similarities between the two groups of bilingualism researchers become much fewer once we move beyond basic research questions. For example, the two groups generally differ in terms of their units of analysis.

Many psycholinguists study bilingualism and production at the level of the word. Generally, these are nouns for concrete objects, such as "dog" or "house". Of course, there are more and more production studies that go beyond the word. Syntax, especially in comprehension tasks, is also studied by psycholinguists, but my point of reference here is the study of word production.

For contact linguists, the unit of analysis generally is not just a single word on its own, but units vary and which one the researcher is using is not always clear, unfortunately. Still, studies attempting to analyze grammatical structure almost necessarily must be at the intra-sentential level. The reason is that it is only in the bilingual sentence (really in the clause) that two grammars are in contact.

3. Methodologies and goals in codeswitching

Contact linguists put few controls on their data collection or analysis. Most do collect data in the same way – by recording natural or near-natural conversations in conditions such as informal interactions with friends

* I thank Albert Costa for commenting extensively on earlier versions of this manuscript and for advice from Judith Kroll. Discussions with Jan Jake helped throughout the lengthy process of arriving at the final manuscript. Of course only I am responsible for what appears here.

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and family or in relatively unstructured interviews. However, the goal of many researchers stops with detailing and quantifying the types of material that can occur from either language. That is, their approach is largely a-theoretical; their main goal is to describe, not necessarily to test hypotheses or make general predictions beyond their data. Others, such as Muysken (2000) and, to a large extent, Clyne (2003) are interested in developing typologies of codeswitching. The goal of far fewer codeswitching researchers than one finds in the psycholinguistic literature is to test an existing hypothesis or model.

4. The Matrix Language Frame (MLF) model

Some do use naturally-occurring data to formulate hypotheses. For example, the Morpheme Order and System Morpheme Principles of the MLF model are based on previously gathered data, but they are intended as testable hypotheses (to support or reject in new corpora) about the source of morpheme order and critical grammatical morphemes (called outsider system morphemes under the 4-M model of Myers-Scotton and Jake (2000, 2001, 2003). Support for these principles, in effect, identifies the Matrix Language (ML) and restricts the role of the other language, identified as the Embedded Language (EL). Just as important, support for these principles generates support for the larger Matrix Language Frame Hypothesis, which states that the ML is the source of structure for the entire morphosyntactic frame for codeswitching constituents (Myers-Scotton, 1993b [1997]). EL islands within the larger bilingual clause have their own internal structure, but even they depend on the ML for their placement in the clause. The model claims to explain only what I call "classic codeswitching". In this type of codeswitching, only one of the participating languages is the source of the morphosyntactic frame of the bilingual clause (excluding the frame of EL islands). What I define as "composite codeswitching" refers to bilingual strings in which part of the abstract structure underlying surface configurations comes from more than one language. Few analysts offer generalizations on the structure of such switching, but see Muysken (2000) on "congruent lexicalization" and Amuzu (2005) for claims about such data, as well as Myers-Scotton (2003) on mixed/split languages.

5. Illustrating codeswitching

Three brief examples are included here, to illustrate the type of codeswitching that is studied by many contact linguists when their unit of analysis is the clause or the sentence (examples (1) and (2) are sentences that each happens to be composed of a single clause; example (3) consists of two clauses). In order to provide one typical means of analysis, the MLF model is selected. The model refers to the ML as the more grammatically dominant language and the EL as the other participating language. Not all contact linguists will agree with my interpretation of the data, or what counts as data. Still, the MLF model is the most comprehensive model in the current literature because it takes account of both the ML and the EL in explaining and predicting both the basic structural makeup of mixed constituents, as well as EL islands. The model pays the most attention to predicting the structure of mixed constituents because the bulk of codeswitching within a bilingual clause occurs in mixed constituents. But neither this model nor other approaches, to my knowledge, claim to predict WHEN codeswitching will occur in a clause.

These examples were selected to illustrate some of the types of structures that are discussed in section 8 when I suggest research questions based on codeswitching data that psycholinguists could study. In example (1), Italian is the ML. The example comes from an Italian–Spanish–English multilingual who has immigrated to Australia. Note that the phrase *language italian* follows the order of Italian, not English. Its order supports the Morpheme Order Principle. (This is not an EL island because its order is not well-formed in English.) The grammatical morphemes all come from Italian, supporting the System Morpheme Principle. In fact, this support of Italian as the ML goes beyond that principle, which requires that only one type of system morpheme come from the ML. (Italian-English, Clyne 2003, p. 87)

(1) No porque quiero — dispressare a
Not because seek-1SING — undervalue INFINITIVE
mi **language italian**
my language italian
"Not that I want to undervalue my Italian language."

Example (2) illustrates two EL islands from English in a frame supplied by French. Again, note that the grammatical morphemes all come from French, the ML. (French-English, King, 2001, p.100)

(2) Ils pass-ont — des petites notes
they pass-3P.PL — DET.PL little notes
back and forth à **each other**
back and forth to each other
"They pass little notes back and forth to each other."

Example (3) illustrates Xhosa-English codeswitching in South Africa; Xhosa is the ML. Noun class numbers refer to Xhosa noun classes; noun classes spread agreements to other elements in the clause. Words from another language are typically placed in class nine. Note that all of the inflections come from Xhosa, even those on the English noun (*life*) and the English adjective (*expensive*). Critical grammatical morphemes, such as

the subject-verb prefixes (*ndi-*), which signal subject-verb agreement, come from Xhosa. (Xhosa-English, Myers-Scotton, 2005b unpublished corpus)

(3) So i-**life** y-a la-pha
so CL9.SG-life CL9-ASSOC CL9.SG.DEM-LOC
i-**expensive**
CL9.SG.COP-expensive
xa ndi-**compar** -ish-a na kw-ii-dolophu
when 1s-compare-CAUS-INDIC with LOC-CL10.PL-town
e-ndi-suk-a
CL10.PL.REL-1S-come from-INDIC
"So [the] life of here is expensive when I compare [it] with [the] towns that I come from."

5.1. Competing views of codeswitching

Contact linguists do not all agree on these examples as illustrating codeswitching or on the analysis. For example, Poplack (1980) and her associates provide constraints based on surface level equivalences across languages that imply that codeswitching largely includes only switches from full phrases (or clauses) in one language to phrases (or clauses) in another language. Some linguists try to explain codeswitching within generative syntactic models intended for monolingual data (e.g. Chomky's (1995) Mimimalist Program or his earlier models). Their claim is these generative models can predict syntactic well-formedness in codeswitching without the need to recognize the asymmetry between the participating languages that is basic to the MLF model (e.g. Belazi, Rubin, and Toribio, 1994; Toribio, 2001; MacSwan, 2005).

To recap, the basic premise of the MLF model is that the theoretical construct that best explains structure in codeswitching is asymmetry. Only one language sets the morphosyntactic frame for mixed constituents. Two principles realize this notion: The Morpheme Order and System Morpheme Principles. They hypothesize that only one language supplies critical elements in mixed constituents (morpheme order and those system morphemes that are later called outsider morphemes under the 4-M model). To the extent that these hypotheses are supported, the basic premise of the model is supported. This implies that all the morphosyntactic structure, except for the internal structure of EL islands, comes from the ML. Thus, (a) the role of only one language in setting the frame of the clause and (b) the restricted role of the other language to supplying only content morphemes in mixed constituents and EL islands in the overall bilingual clause are the sources of asymmetry between the languages.

5.2. Singly-occurring lexical elements from the EL

Not all contact linguists agree on the status of single EL words in an ML frame. Some are clearly borrowed words, but one can argue others are codeswitched elements. Along with some other researchers, Poplack and her associates would argue that the verb *compare*, which receives Xhosa inflections, in example (3) is a borrowed word, not a codeswitched element – just because it receives those inflections. Still other contested EL forms are bare forms (i.e. without ML inflections). That is, these bare forms show only syntactic integration into the ML and lack full morphological integration; but all EL forms largely retain the phonology of the EL. The empirical evidence is that: both established (i.e. uncontested) borrowings and the contested forms in codeswitching corpora conform to the requirements of the ML frame. Specifically, they do not violate the Morpheme Order and System Morpheme Principles. One can argue that an established borrowing is in the speaker's lexicon with tags for both languages but codeswitched forms are only tagged for the donor language (cf. Myers-Scotton (1993 [1997], pp. 205f.).

6. Implications from codeswitching phenomena for models of language production

In general, psycholinguists seem to identify three main problems about bilingual language production that they try to solve. Kroll and Dijkstra (2002) refer to "three central questions about lexical access: (1) What codes are activated? (2) When are these codes activated? and (3) What are the critical factors that affect lexical selection?" (p. 301). In this section, I suggest how some of the empirical evidence from codeswitching, as it is viewed in the terms of the MLF model, implies partial answers to these questions. If psycholinguists can devise ways to use these suggestions in an experimental setting, the resulting findings may help structure the next set of language production models from the psycholinguistic community.

6.1. Selecting the language

A number of psycholinguistics have suggested that language choice is part of the selection process at the conceptual level (e.g. Levelt, 1989, 2001). Evidence from codeswitching adds to such scenarios because it is especially specific about selecting the more grammatically dominant language that will frame the bilingual clause in bilingual production.

When speakers are bilingual and intend to engage in bilingual speech, they always nominate one language as the morphosyntactic frame of clauses (the ML). Selecting an ML for the frame must mean inhibiting other participating languages, at least for this role, possibly along the lines of Green (1998). Most codeswitching corpora reported in the literature come from speech in one context only and show no change of ML. However,

such changes are possible and do occur, even in the same conversational turn as in the Xhosa-English corpora of Myers-Scotton (2005b).

Often, the ML is also the L1 of the speakers, but this is not necessarily so for various reasons based on the sociolinguistics of the interaction. First, a number of L1s may be represented in a community and only one may be the ML in inter-group conversations. In such cases, this may be an inter-ethnic lingua franca (e.g. Zulu functions this way in some South African conversations when Zulu L1 speakers participate). Also, the L1 isn't always the Matrix Language for immigrants who speak an L2 predominantly within their community.

Speakers also consider each other's proficiencies when they think that codeswitching is an option. They must be able to produce well-formed utterances in the language selected as the ML because this language will provide the morphosyntactic frame for the bilingual clause. They can be less proficient in the EL because its role is much more limited. Finally, of course the process of selecting a code is largely unconscious although it draws on resources in the participants' memories and takes account of the current context.

6.2. Competition between languages and word selection

Once we recognize the framing asymmetry between languages and that it must be set up at the pre-verbal level, some proposed answers to questions about word selection make more sense. Two of the main questions psycholinguists have asked are: Do words from the bilingual's languages compete? Also, even within one language, how does selection converge on one word and not a related word? Examining most codeswitching corpora shows that a large part of selecting a content word from one language rather than the other may well depend on the pragmatic aspects of word meaning.

This recognition answers a question often asked by newcomers when they discover codeswitching: What motivates codeswitching in the first place? Contrary to some views, the main answer is not that it is because the bilingual speakers can't continue speaking in the same language with which that they began a clause. As already noted, in order to engage in codeswitching at all, bilinguals must be very proficient in at least one of the languages involved, the ML, because this language will provide the morphosyntactic frame for the bilingual clause. It doesn't make sense to argue that they switch FROM this language (the way switches typically go) because of fluency problems.

This discussion motivates the argument that when speakers switch languages, it is generally because a word or phrase in the other language conveys the speaker's pragmatic intentions better. The evidence comes from the linguistic utterance itself, but also from the context in the discourse and in the community in which the conversation occurs, and from memory resources.

This view is compatible with La Heij's (2005) argument about lexical access. He characterizes his view as "complex access, simple selection" (p. 290). His point is that the preverbal message itself contains information about the target language and can activate the corresponding lexical representations to a larger extent than those of the non-response language. This will certainly reduce the chances for cross-language lexical competition.

6.3. Switching costs? Yes or no

For most psycholinguists, the question of whether language switching has costs in terms of reaction time is no longer a question to be asked. The evidence from a variety of experiments involving bilingual production tasks shows that there are switching costs, at least under experimental conditions that involve concrete nouns, but also in experiments that study longer units in sentences (e.g. Dussias, 2001). Still, whether there is a clear explanation for observed differences in reaction times across the bilingual's languages when the switch of a single word is part of a full clause is still open for discussion, at least based on findings in Costa and Santesteban (2004) and discussions in Costa (2005) and Meuter (2005).

However, contact linguists must disagree about switching costs at all even though they are aware that psycholinguists deal in milliseconds. Admittedly, no contact linguist has measured elapsed time when a speaker switches languages, at least to my knowledge. But the general impression is that there is, at most, a negligible cost incurred. It doesn't matter whether the speaker is assembling on line a verb that includes prefixes and suffixes from the ML and an EL verb stem (e.g. *a-ba-**deserv**-a-yo* "they who deserve", or just producing switches between words (e.g. *so a-kho **control*** "so there is no control" (Xhosa-English data, Myers-Scotton, 2005b). Except in special circumstances, spontaneous codeswitching appears to contact linguists to be not only rapid but also generally without hesitations. Based on some reports in the literature, psycholinguists seem to have assumed otherwise. Part of the reason may be that many seem to think the findings of Poulisse (1997) can be generalized across the bulk of bilingual speech. Poulisse, of course, reports that Dutch L1 speakers in the early stages of learning English sometimes produced Dutch demonstratives when they were instructed to speak English only. Also, some may rely on early reports on hesitations in switching by speakers who may well not be accustomed to codeswitching. This may be the case in the early data from Clyne (1980) that

Meuter (2005) mentions. Possibly these data come from long-term immigrants to Australia who do not engage in much codeswitching. Natural codeswitching between people who are accustomed to switching is another type of phenomenon altogether.

In general, contact linguists argue there is little evidence that there are unintended intrusions from one language into the other or pauses except to "flag" a word to call attention to its semantic-pragmatic message. Also, except possibly for aspects of prosody, empirical natural-occurring evidence shows that EL integrated into the ML retain their segmental EL phonology (for discussion, see MacSwan, 2000; Jake, Myers-Scotton and Gross, 2002).

Thus, the impressions of contact linguists about natural codeswitching challenge a number of assumptions in the psycholinguistic literature about processing when bilinguals engage codeswitching. To a greater extent than has been done, experimental conditions need to reflect natural codeswitching if the goal is to study this processing accurately.

7. Differential access in language production

To turn now in another direction, findings from code-switching about differences in the distribution of different types of lexical categories and affixes should alert psycholinguists to new sources of evidence about bilingual language processing. The 4-M model, was motivated by empirical evidence of the MLF model's prediction that one type of system morpheme must come from the ML in mixed constituents. This prediction, embodied in the System Morpheme Principle, is that the type of system morpheme that includes affixes marking subject-verb agreement, as well as other grammatical morphemes that co-index relations across phrases, must come from the ML in mixed constituents. The prediction is supported by all but a handful of examples across diverse codeswitching corpora. The 4-M model gives this type of morpheme a name, outsider late system morpheme.

Myers-Scotton and Jake (2000) devised the 4-M model as a model of morpheme classification to explain morpheme distribution, not just in codeswitching, but in other types of linguistic data as well. This model identifies four types of morpheme: content morphemes and three types of system morpheme. Morpheme types are distinguished on the basis of their syntactic roles and their distribution patterns in contact phenomena as well as in many other types of speech (e.g. speech errors, speech of Broca's aphasics, accuracy in L2 language learning).

7.1. Early system morphemes and their content morpheme heads

The 4-M model groups one type of system morpheme, called early system morphemes, with content morphemes in regard to an important feature: They are both conceptually-activated, even though only content morphemes receive or assign thematic roles. The premise is that both of these types of morpheme become salient in language production at the level of the mental lexicon.

Early system morphemes flesh out, or make more specific, the meaning of their content morpheme heads. They depend on their content morpheme heads for their presence and for information about their form. For example, in Spanish, determiners showing plurality or gender do so because their noun heads are plural or carry a specified gender. As a class, early system morphemes include determiners, plural affixes, as well as satellites in what are sometimes called phrasal verbs. For example, *over* in *she thought over the material* is such a morpheme, with a change in morpheme type and meaning from *over* in *she threw the ball over the fence*.

Their activation along with their content morpheme heads offers an explanation for the occasional appearance of EL early system morphemes with their Embedded Language heads in codeswitching corpora, even when the early system morpheme has no clear function because they only double ML counterparts. For example, in an Acholi–English corpus the noun *lu-civilian-s* appears with the ML (Acholi) prefix (*lu-*) marking plurality as well as the English suffix for plurality (Myers-Scotton and Bernsten, 1995). Such doubling in codeswitching happens most often with plural affixes, although it can and does occur with other early morphemes; it is important to note that it does not happen with other types of system morpheme (cf. Myers-Scotton, 2002, pp. 91–93).[1] The occasional nature of these doublings points toward mis-timing; presumably when lemmas are activated in the mental lexicon the noun pulls along the lemma marking plural in on-line production.

7.2. Late system morphemes

Of even more interest to psycholinguists is the premise of the 4-M model regarding the ways that the two sub-types of system morpheme called "late" system morphemes differ from other morpheme types in how they are processed. Empirical evidence from codeswitching and other phenomena show that their distributions in natural data are different from that of other morphemes (Myers-Scotton and Jake, 2000).

[1] In some data sets, only an EL plural affix appears in the surface structure of a mixed constituent; that is, the EL appears to be supplying the active marker of plurality. However, in such cases, the ML's counterpart for a plural morpheme has as one of its allomorphs a zero. Thus, one can argue that the ML counterpart is present as a null in these cases. Also, evidence in some data sets makes it clear that the EL plural morpheme is not active (e.g. it appears on a noun with a singular modifier). See Myers-Scotton (2002, p. 91–93) for a fuller discussion of early system morphemes in codeswitching.

These differences imply that while the accessing of both content morphemes and "early" system morphemes happens early in language production, it is not until language-specific directions on how to assemble larger constituents are sent to the formulator that both types of late system morphemes become salient. The Differential Access Hypothesis below is based on the notion that both content and early system morphemes are conceptually-activated, but "late" system morphemes are structurally-assigned at the formulator.

There are two types of late system morpheme, bridges and outsiders. Bridges satisfy language-specific requirements that make a specific constituent type well-formed. In a possessive phrase, such as *bone of my dog*, *of* is a bridge. Outsiders are the ones that build structure between phrases in the larger clause; in effect, they knit together the clause by indicating relationships between elements within the clause. For this reason, they are the most critical morphemes in the clause from the grammatical point of view.

These morphemes are called outsiders because they depend for information about their form on elements outside the maximal projection in which they occur. As already noted when the codeswitching examples (1) through (3) were discussed, outsiders signal subject-verb agreement on verbs; agreement is marked on the verb, but it is determined by the subject, which is outside the verb phrase, of course. Also, outsiders indicate other relations in the clause (e.g. case-marking affixes indicate the thematic or grammatical role of noun phrases). For example, in many languages with case as an overt feature, such as German, case affixes occur with elements in NPs, but they are assigned by verbs and sometimes prepositions.

As already indicated, differences in the distribution of morpheme types in codeswitching initially motivated the 4-M model, but evidence from other contact phenomena supports the classification (see Myers-Scotton, 2005a on codeswitching, but see also Myers-Scotton, 2001, 2002 on data from attrition and creole development and Myers-Scotton, 2003 on mixed/split languages). More important to psycholinguists is that the model implies a Differential Access Hypothesis that suggests that differences in how morphemes are activated in language production are behind the surface level distribution of morpheme types. This is the hypothesis: Relevant information in lemmas supporting surface-level morphemes does not all become salient at the same level of language production. Information supporting content morphemes and early system morphemes is salient in the mental lexicon, but information about late system morphemes does not become salient until the level of the Formulator when larger constituents are assembled (Myers-Scotton, 2002, p. 78).

Obviously, the extent to which the hypothesis is supported complicates how language production must be envisioned. The next section contains suggestions as to how psycholinguists might test this hypothesis.

8. Codeswitching motivates suggested psycholinguistic experimentation

Empirical findings from codeswitching motivate four types of research questions that could be investigated via psycholinguistic experiments. The questions refer to how processing times for various structures that occur in codeswitching could provide evidence of how these structures are organized in production or comprehension models.

No assumptions are made about the specific methods that might be used to examine this set of research questions; only general predictions for processing are sketched out based on the assumptions of the MLF or 4-M models, or other approaches. The few studies in the literature that have examined switching have largely generated predictions based on the cost of switches of only one word. The research questions suggested here largely call attention to full phrases or clauses and in formats that mimic naturally-occurring codeswitching.

8.1. Processing differences and types of constituents

(1) In codeswitching, are mixed constituents or EL islands favored? The codeswitching literature seems to show more mixed constituents (a phrase framed by the ML, but with singly-occurring EL words, with or without ML affixes, or EL islands within the larger phrase). The type of constituent favored may be a function of how proficient the speaker is in the EL. The reason is that it should be easier to insert a single EL word into an ML phrase than it is to produce an entire EL island (a full phrase). Some studies (e.g. Backus 1996) show that speakers who are very proficient in both languages tend to produce many full clauses in both languages and produce fewer EL islands or even fewer singly-occurring EL words in an ML frame. Therefore, psycholinguists could address the main question, but also could use degree of proficiency as a variable.

This question is motivated by two different types of claims in the codeswitching literature, one implying no differences in the processing of codeswitching based on the ML versus EL distinction, and the second suggesting that proficiency accounts for some differences in the types of structures speakers produce. First, MacSwan (2005) states, "Nothing constrains codeswitching apart from the requirements of the mixed grammars." He goes on to say, "... *constrain* is used in a technical or theoretical sense, and as such implies that there are not statements, rules or principles of grammar which refer to CS"

(p. 5). That is, he specifically argues against the need to postulate an ML at all to explain codeswitching. He is silent on accounting for the type of presence the EL has in the bilingual clause. Second, Owens (2005) suggests that "different competences in the contact languages result in different [EL] insertional patterns" (p. 35). He also mentions lexical frequency effects.

8.2. Processing and constituent composition

Questions under the second rubric have a different focus because they refer to variation WITHIN A CONSTITUENT, not to constituent type.

(2) Is processing in either comprehension or production sensitive to codeswitches consisting of one EL word, a larger EL constituent, or a full EL island? Also, when word orders in the participating languages are different, is there cost to processing? If not, it would suggest that the control of codeswitching is occurring at a higher level.

(2a) For example, in Spanish–English switching, is there a time difference between producing *el suit*, *el new black suit*, or *new black suit*? Similarly, in French–English switching, is there a time difference between *avec notre friends* and *avec friends?*

(2b) Is the cost of processing different when the word order or morpheme order for a phrase (or the entire clause) in the EL differs from that in the ML? (According to the MLF model, the ML sets word order throughout the clause except in EL islands.) For example, compare production or comprehension of *building high-rise* (produced in French order when the rest of the clause is clearly framed by French as the ML) and *high-rise building* when this NP can be considered an EL island within the larger ML frame.

8.3. Is cross-linguistic equivalence important in processing?

(3) Does a syntactic or other type of structure that is equivalent across participating language promote a switching of languages?

(3a) Or, a stronger version of this question is this: Does a word in one language TRIGGER a switch to the EL if the "triggering word" is similar in some way (e.g. optimally both form and meaning) to a counterpart in the EL?

A motivation for (3a) is the work of Clyne (2003 and many earlier works). He defines triggering as "transversion as the result of trigger-words, words at the intersection of two language systems" (2003, p. 80). Later in the same work, he refers to different types of "facilitation". For example, he writes, "according to Facilitation Principle 3, if syntactic rules overlap between the languages switching is facilitated" (p. 177). He gives an example from Australian German–English switching: *Wir haben aus* FOR LUNCH *gegangen* "We have out for lunch gone/We went out for lunch" (p. 178). In this example, congruence is not complete, but one could argue there is abstract congruence between English verb + satellite, *go out*, and the German separable verb, *aus gegangen*.

(3b) Does any type of triggering only happen in typologically similar languages?

(3c) And if there is syntactic triggering in typological dissimilar languages, is it slower than in typologically similar languages?

One motivation for this hypothesis comes from the Poplack (1980 and later studies) who proposed an Equivalence Constraint on switching between phrases. She states, "Code-switches will tend to occur at all points in discourse where juxtaposition of L_1 and L_2 elements does not violate a syntactic rule of either language, i.e. at points around which the surface structures of the two languages map onto each other" (p. 586).

8.4. Morpheme types and processing levels

Finally, a number of related questions suggest experiments to test the hypothesized divisions (morpheme types) postulated in the 4-M model. Arguably, these questions are the most important ones to address because they deal with a little studied topic that has implications about the nature of language well beyond surface structure. In regard to contributing to the modeling of language production, the most far-reaching questions concern the Differential Access Hypothesis, which the 4-M model implies. This hypothesis suggests that different morpheme types become salient at different levels in the language production process. In the following I give some examples of the types of experiments that test differences in morpheme type and their effects on processing.

(4a) Is there a processing difference in producing or comprehending an EL island with no EL affixes compared to an EL island that includes EL affixes if these affixes are outsider late system morphemes (as defined in the 4-M model)? For example, German case affixes (on determiners and adjectives but also elsewhere) are such outsider morphemes. In switching between English-German or Dutch-German (with German as the EL), does this difference show up?

(4b) What is the response time of pseudo-reflexives in Romance languages compared with true reflexives?

In codeswitching, compare the response time with both of these types of reflexives when the Romance language is the EL. One method might be to ask a participant to describe different pictures: some that call for a pseudo-reflexive (e.g. *je me souviens* "I remember") and others that call for a true reflexive as in *Jean se regardait* (*dans un tableau de lui-même*) "Jean looked at himself (in a picture of he, himself)".

(4c) The 4-M model predicts that there should be a difference in processing time in English with different types of prepositions that follow verbs. Some are content morphemes, some are early system morphemes and some may be bridges. Compare *up* in *Mary looked up the telephone number* (where *up* is considered an early system morpheme) with *Mary looked up the flagpole* (where *up* is considered a content morpheme assigning the thematic role of direction). Verbs with prepositions/particles as satellites (early system morphemes) should be produced or comprehended faster than verbs followed by prepositions that are other types of morphemes. The same format could be used to compare other lexical categories in any language. For example topicalized pronouns could be compared with clitics in languages that have clitics, such as Spanish.

Comparisons in codeswitching with Spanish as a participating language might compare processing time with the use of the preposition *á* with animate objects versus the use of other Spanish prepositions, but also with the counterpart in English to prepositional phrase calling for *á* in Spanish. Under the 4-M model, *a* is considered an outsider system morpheme because its appearance depends on the fact its object has a [+human} thematic role and is selected at the time the structure of the clause is being mapped out. Blázquez-Domingo (2001) presents evidence that English learners of Spanish have more trouble producing this Spanish preposition accurately than others.

(4d) Is a partitive morpheme in a language such as French really a bridge late system morpheme? If it is, it should take longer to produce/comprehend than determiners (early system morphemes) or prepositions that are content morphemes. A related question is this: Is it possible to switch from French to English after partitive *de*? That is, if a participant is presented with the string *je besoin de* and then asked to switch to English (e.g. *je besoin de/meat/la viande* OR *du/bread/du pain*, etc. is this possible?

(4e) Similarly, when a language that has case is the EL, what types of switches are possible and how does their processing time compare with that of languages in which case is not overt? Recall that under the 4-M model case is an outsider late system morpheme. If certain switches are not possible, this is evidence that case is an outsider? For example, with an English–German bilingual, ask for a switch from *I am missing* to German for the equivalent of "something is missing". Or, begin in German *es fehlt*. and ask the bilingual to finish the clause in English (using reference to the self). It should be impossible because switching to a pronoun (*me*) which doesn't get its case from the construction (as English does in *between you and me*) should be impossible. In German, case here is assigned by the verb.

(4f) If bilinguals are proficient in a language that has the complex possessive constructions that include outsider late system morphemes (e.g. Hungarian, Farsi, Turkish), are these bilinguals faster to produce/comprehend mixed NPs (e.g. determiner from the ML, but noun from the EL) or such possessive constructions (nouns from the EL, but inflections from the ML)? The prediction is that mixed NPs should be faster because the ML determiner is an early system morpheme and the possessive constructions include outsider system morphemes.

(4g) Finally, in another experiment, switches could take account of phrase structure as well as outsider system morphemes. German-English bilinguals could be presented with only parts of such strings as *Er kaufte einen neuen Anzug* or *he bought a new suit*. That is, if participants are given only *he bought a* (and he is shown a picture of a man who has just bought a new suit) how will they finish the sentence in German? Will they assign its standard case to "new" (*einen*)? This experiment would address these questions: Does the speaker correctly assign case to the adjective? If so, is there a source for outsider system morphemes in the EL when the speaker engages in codeswitching (such that the verb comes from the EL)? Or, is the ML source counterpart active? (In German, a verb would assign case in this example.) Similarly, the participant could be given *Er kaufte einen* and then asked to switch to English to complete the string. Is this even possible? Or, of course, the required switch could occur after *Er kaufte*.

9. Conclusions

There are several general conclusions to glean from natural codeswitching. First, selections of language and how to encode intentions seem to occur at the pre-linguistic level. This is where complexity and competition occurs. Second, not all lemmas in the mental lexicon seem to have the same type of entries or are accessed

at the same level of language production. Entries for some content morphemes combine with other entries cross-linguistically in "fast and clean" on-line production. The entries for some other content morphemes are parts of holistic multi-morphemic units that are readily integrated into ML frames, but they are not discussed here (cf. Myers-Scotton, 2002, Backus, 2003). Finally, grammatical elements called late system morphemes may not be salient until the Formulator: Those morphemes that are conceptually-activated become salient on one level and those that are structurally-assigned on another level.

Psycholinguists are not getting a very full picture of the flexibility of the bilingual's processing system unless they can devise experiments that mimic natural codeswitching. Whatever its shortcomings in methods and articulating goals, the research of contact linguists on naturally-occurring codeswitching does offer a number of insights about the nature of language that either complement existing psycholinguistic findings or suggest new avenues for study.

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Received February 1, 2005
Revision received July 12, 2005; September 9, 2005
Accepted September 10, 2005