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9 CODE-SWITCHING AND GRAMMATICAL THEORY

Pieter Muysken

In the last fifteen years, a large number of studies have appeared in which specific cases of intra-sentential code-switching were analysed from a grammatical perspective, involving a variety of language pairs, social settings and speaker types. It was found that code-switching is a quite normal and widespread form of bilingual interaction, requiring a great deal of bilingual competence. In individual cases, intra-sentential code-switching is not distributed randomly in the sentence, but rather it occurs at specific points.

Where much less agreement was reached is with respect to general properties of the process. Various 'constraints' and 'models' regulating intra-sentential code-switching (the type most interesting from the grammatical perspective) have been proposed and tested, with the result that some cases appear to fall under one constraint, and others under another. This is by itself unsatisfactory. We do not know in any systematic way how different the models proposed are, neither intrinsically nor in their predictions. It should be mentioned at this point that many of the studies do not make the constraints or models very explicit, limiting themselves to descriptive statements. Therefore, an account is needed of the grammatical notions relevant to code-switching. These notions can then be used both to characterise specific instances of intra-sentential switching and to relate the various proposals in the literature to each other.

I will organise this chapter around five main questions:

(i) to what extent is code-switching seen as alternational and symmetrical (and hence involving properties of both languages involved) or insertional (and hence primarily governed by features of one dominant language)?

(ii) to what extent are restrictions on the code-switching process seen as absolute or relative?

(iii) to what extent is the relevant syntactic representation of the switch point seen as involving syntactic dependency?

(iv) to what extent are sentential and lexical phenomena seen in the same perspective?

(v) to what extent does equivalence between patterns or elements of the languages involved play a role, and how should this equivalence be characterised?

Before treating these five questions one by one, it is important to discuss further the relation between grammatical theory and code-switching. There are at least two connections between the two. First, I think this type of research is crucial for linguistics as a scientific discipline. What makes code-switching so special that it warrants relatively complex and time-consuming, hence costly, research is the following: one of the crucial questions in modern linguistics is the division of labour between the lexicon and the grammar of a language. To what extent do we rely on properties of individual words, when we produce and comprehend utterances, and to what extent on general rules of the language we speak? Related to this question – and for many researchers the same question phrased differently – is the following: can we reduce the differences between languages to lexical differences? If so, all that is specific about a language is its lexicon, and the lexicon plays a very major role in sentence production and comprehension. In the latter case, we should note, there *are* no rules specific to the language we speak, independent of lexical items. This complicated cluster of questions has produced much research and a so far inconclusive debate in the linguistic literature. I think the study of code-switching and language contact can uniquely contribute to elucidating and perhaps ultimately resolving these issues. When sentences are built up with items drawn from two lexicons, we can see to what extent the sentence patterns derive from the interaction between these two lexicons.

Second, the sociolinguistic study of code-switching cannot proceed without a solid, theoretically based 'structural analysis'. To understand which cases are of the same type, and which are different, to see which patterns are exceptional or marked and which are not, to be able to do quantitative research, for all this we need to know what the structural features of the patterns are. The present chapter discusses some of the descriptive tools that can be used for the analysis.

Clearly we should aim for universal explanations when looking for grammatical constraints. Much recent research into code-switching constraints is characterised by an attempt to relate two observations: (a) in different contact situations different switch patterns are found; (b) the differences are related, at least in part, to typological characteristics of the languages involved.

We can imagine two approaches to account for this.

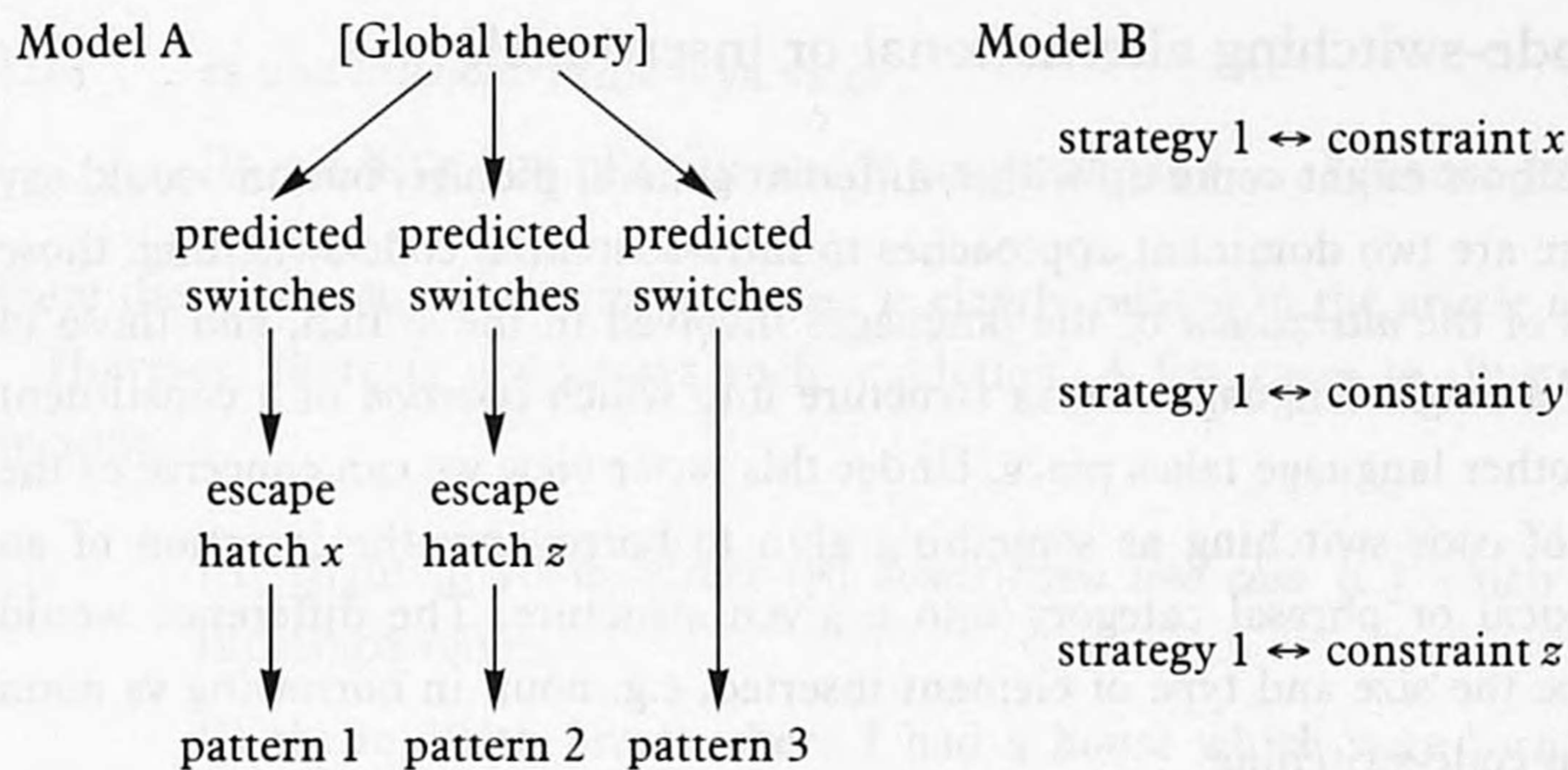


Figure 9.1

(A) A model that believes there is a general set of constraints on code-switching, constituted, for example, by structural equivalence (Poplack 1980, this volume), or government (DiSciullo, Muysken and Singh 1986), or a matrix language/embedded language asymmetry (Myers-Scotton 1993b, this volume). In model A, the assumption is that the global theory makes a more limited set of switch sites available in specific instances than would be desirable. In those cases, escape hatches are needed, making additional switch sites possible.

(B) In model B, implicit in at least some of the recent work by Poplack and associates, different switching strategies occur – flagging, constituent insertion, etc. – governed by constraints specific to those strategies. There is no specific relation between linguistic properties of the languages involved and the choice of the strategy. What unifies both approaches is that both end up with a series of different language-mixing patterns or strategies.

In my view, it is methodologically desirable to aim for approach A, for three reasons. First, A makes a unified account possible. Second, in B it is not clear why in a given situation one strategy is preferred over another. Third, in the absence of a global theory, the relation between specific strategies and constraints remains unclear.

Model B has advantages over A if it turns out that the choice of a specific switching or mixing pattern is not motivated by structural considerations, and a combination of both models is called for if it is only partially motivated by structural considerations.

Keeping these observations in mind, we will now consider the five principal issues in the grammatical analysis of code-switching.

1 Is code-switching alternational or insertional?

Other authors might come up with a different general picture, but one could say that there are two dominant approaches to intra-sentential code-switching: those in terms of the *alternation* of the languages involved in the switch, and those in terms of a single-language matrix structure into which *insertion* of a constituent from another language takes place. Under this latter view we can conceive of the process of code-switching as something akin to borrowing: the insertion of an alien lexical or phrasal category into a given structure. The difference would simply be the size and type of element inserted, e.g. noun in borrowing vs noun phrase in code-switching.

It is clear there is alternation between codes in, for example, inter-sentential switching, and insertion with single borrowed elements. The question is whether we can establish objectively which process we are dealing with in the other cases. Some criteria:

(i) when several constituents in a row are switched, which together do *not* form a constituent, alternation is more likely – otherwise we would have to assume multiple contiguous insertions; conversely, when the switched elements are all single, well-defined constituents, e.g. noun phrases or prepositional phrases, insertion is a plausible option.

(ii) when the switched element is at the periphery of an utterance, alternation is a clear possibility; conversely, when the switched string is preceded *and* followed by material from the other language, insertion may be more plausible, particularly if the surrounding material is grammatically linked in some kind of structure.

(iii) longer stretches of other-language material are more likely to be alternations.

The modality of these criteria makes it clear that there will be many undecidable cases. Is a subject in language A followed by a verb phrase in language B a case of alternation, of subject insertion, or of verb phrase insertion? For many language pairs the order of subject and verb phrase will be identical, so the clause as a whole may not belong to one language.

Consider a few examples:

(1) Yo anduve *in a state of shock* pa dos días.

‘I walked in a state of shock for two days.’ (Pfaff 1979: 297)

Here the temporal expression *pa dos días* is clearly related to the verb *anduve*. Similarly:

- (2) es una *little box* asina y ya viene . . .
 [It is a little box like this and it comes already . . .] (Lance 1975: 145)

Here the post-nominal determiner *asina* is clearly related to the article *una*.

However, there is not always such a relation. A few cases to illustrate this include:

- (3) [A] Right to 104th Street [B] *donde tenía una casa* [C] which were furnished rooms.

[Right to 104th Street where I had a house which were furnished rooms.] (Sankoff and Poplack 1981: 35)

Here the Spanish fragment (B) modifies *Street* in (A) and the second English stretch (C) modifies *casa* ('house') in (B). Clearly the English fragments (A) and (C) are not syntactically related. Similarly:

- (4) [A] Why make Carol *sentarse atras* [B] *pa'que* everybody has to move [C] *pa'que se salga*.

[Why make Carol sit at the back so that everybody has to move so that she can get out.] (Poplack 1980: 589)

Here the sentence fragment (B) is a complement to (A), and (C) is a complement to (B). Notice that the first Spanish fragment here contains both a verb phrase, *sentarse atras*, and purposive complementiser, *pa'que*. Neither between the English fragments nor between the Spanish ones is there a particular grammatical relation. A final example:

- (5) [A] *Se me hace que* [B] I have to respect her [C] *porque 'ta* . . . older.

[It appears to me that I have to respect her because [she] is . . . older.]

(Lance 1975: 143)

Again, (B) is a complement to (A), and (C) modifies (B). Notice that *porque 'ta* (because [she] is) does not form a unique constituent, excluding other elements – in this case 'older'.

It is clear that this type of data cannot be handled very well in a model which takes insertion into a matrix and a dependency relation between matrix and inserted material as its primes. Rather, the type of data has led to the idea that order equivalence across the switch point is what constrains code-mixing here.

1.1 Determining the base-language

In those cases where it is reasonable to assume that there is a base-language (also termed: matrix language) in a code-switched sentence, as in insertion models (e.g. Myers-Scotton 1993b, this volume), how do we determine which one it is? The answer to this question is in part empirical, in part theoretical in nature.

A discourse-oriented way of determining the base-language is: the language of the conversation. A statistical answer would be: the language in which most words or morphemes are uttered. A psycholinguistic answer could be: the language in which the speaker is most proficient. None of these answers is particularly satisfactory from the point of view of grammatical analysis. From that perspective, two types of answers have been given. In a model that attaches great importance to a parsing procedure from left to right, the first word or set of words in the sentence determines the base-language (such a model is reported on in Joshi 1985), triggering a set of analytic rules. Whatever insights this yields, care should be taken that switched left-peripheral interjections, exclamatives or adverbial adjuncts are not taken as the first element. These elements do not in any way determine the structure of the rest of the sentence.

In a structurally oriented model, some element or set of elements determines the base-language: often the main verb, which is the semantic kernel of the sentence, assigning the different semantic roles and determining the state or event expressed by the clause, is taken to determine the base-language. Plausible though adoption of the main verb as determining the base-language may be, in many languages there is a strategy to incorporate alien verbs, e.g. through agglutinative prefixes, as in Swahili, or through an auxiliary verb such as 'do', as in Hindi. In these cases, taking that borrowed verb as determining the base-language is clearly not correct. In the Matrix Language Frame model proposed by Myers-Scotton, the grammatical morphemes have to be from the base-language.

In the perspective of the government model (DiSciullo *et al.* 1986; see section 3), there need not be a single base or matrix language for the clause. Still, there is a notion of base or matrix present in that model: each governing element (e.g. verb, preposition, auxiliary) creates a matrix structure. If the chain of government were unbroken, the highest element in the tree would determine the language for the whole tree; this would often be the inflection on the finite verb, as in the theory proposed by Klavans (1985) and taken up by Treffers-Daller (1991). In subordinate clauses, this would be the complementiser.

1.2 Function and content morphemes

In much of the literature on code-switching, and particularly in insertional models, the distinction between function and content morphemes plays an important role (Joshi 1985; Myers-Scotton, this volume). There is no single valid criterion for distinguishing these two classes: rather, different sub-classes can be distinguished on the basis of at least four different criteria. A first one is 'open' versus 'closed' class. Nouns and verbs typically belong to open classes, pronouns typically to closed ones. Adjectives in many languages form an open class, but in some a small closed one. There is often only a limited number of co-ordinating conjunctions and adpositions in a language, but equally often elements could still be added to these categories.

A more precise criterion would therefore be whether a given closed class is *paradigmatically* organised, i.e., whether the elements in it are defined in opposition to each other (present vs past, singular vs plural, definite vs indefinite etc.). Pronoun and tense systems particularly tend to be tightly organised paradigmatically.

A third criterion may be *role in structuring the clause*. Some elements, such as subordinating conjunctions and agreement and tense markers, play a central role in the clause; others, such as diminutive markers and degree adverbs, a more peripheral role.

Finally, an important distinction is that between *bound* and *free* morphemes. In many, but not all, languages – e.g. the Northwest Coast Amerindian languages form an exception – the bound morphemes are function elements.

Given these different criteria different sub-classes can be distinguished in the categorial systems of various languages, in a way that needs to be made more precise. The same holds for the role these sub-classes play in theories of switching. The Matrix Language Frame model rests on the assumption that code-switched sentences have one base-language, or matrix language. This matrix language determines the order of the elements in mixed constituents and provides the 'system morphemes' (function morphemes) in such constituents.

2 Absolute or relative restrictions

Many models propose principles ruling out certain types of switch, but what is the nature of the predictions made? Poplack (1980), working in the variationist framework, proposes general constraints which are supposed to hold for the majority of cases. DiSciullo *et al.* (1986) make absolute, all-or-nothing, claims. In more recent

work exploring the implications of the theory of government for code-switching, however – e.g. Treffers-Daller (1991) – a probabilistic perspective is taken. Rather than just trying to predict which switches are disallowed, an attempt is made to establish which kinds of switches are the more frequent ones. Sankoff and Poplack (1981) explored this direction as well, but interpreted the results as showing that there were no fundamental differences in probability for any switch site, and did not return to it in later work. Myers-Scotton (1993a) proposes to account for the unmarked cases of code-switching, allowing the socially marked cases to fail the predictions made.

At the present stage my own bent is towards probabilistic statements. Absolute constraints, that could be invalidated by as few as one counterexample, are less appropriate for performance data, particularly data which arise from quite complex factors, not all of which are always under control. Just making a general statement about which type of switch is not likely to occur, as in the Poplack (1980) paper, misses the point that some types of switches are less frequent than others, within a given corpus.

Statements in terms of markedness as a yes/no factor, as in the work of Myers-Scotton (this volume, and the references cited there), seem somewhat unsatisfactory to me, for three reasons: (i) it is hard to argue for the (un)markedness of any single instance of switching; (ii) so far there is little indication that the patterns of code-switching in communities where code-switching is not a discourse mode are highly unusual; (iii) suppose the restrictions on code-switching are in part due to factors determined by our grammatical competence. Then we should look to what extent rules of our grammar are violated in stylistically marked registers of the monolingual speech mode. The answer is: not a great deal. There are specific stylistically marked syntactical patterns, but they do not depart from our grammar as a whole in significant ways. Hence there is no immediate reason to expect socially marked code-switching to do so.

I want to stress here that it is as important to consider the non-occurring switches as the ones that do occur. In which places in the sentence do we find that speakers refrain from switching? From the perspective of structural analysis these would correspond to the starred examples in a Chomskyan article, and from that of Labovian sociolinguistics, to the non-application cases. Nortier (1990: 124–40), for instance, shows that in her corpus there are switches at every conceivable juncture in the sentence (although not always equally frequently), but this has not been demonstrated for other cases of switching.

A very complicated issue concerns the relation between qualitative structural and quantitative distributional analysis. Since intuitions about code-switching are

not always reliable (and we do not know when they are and when they are not), and psycholinguistic experimental techniques to study grammatical factors in code-switching are not yet well developed, we have to work with natural speech data. Since we do not know how the grammar and the lexicon interact with other psychological faculties to produce actual speech, we clearly cannot ignore phenomena such as frequency of occurrence and regularity. This would lead us to take the frequent types of switches as the main body of evidence, and to consider the infrequent ones as possibly fluke phenomena, performance errors and the like (*pace* the need to consider non-occurring switches).

Two (possibly related) complications arise, however. First, frequency may result from the conventionalisation of a certain type of switch, rather than from a crucial grammatical factor. Second, we do not yet know enough about the relation between frequency distributions of specific grammatical patterns in monolingual speech data and properties of the grammar to handle frequency in bilingual data with any assurance.

3 Head/dependent relations: the syntactic government model

In some perspectives on code-switching the relation between a lexical element and its syntactic environment plays an important role, e.g. Bentahila and Davies (1983) and DiSciullo *et al.* (1986). The idea behind these perspectives is that a lexical item will often require specific other elements in its environment, and this requirement may be language-specific and can be formulated in terms of the head-complement relations of X-bar theory.

The traditional assumption behind X-bar theory is that syntactic constituents are endocentric, i.e., that their properties derive from those of their head. Thus a noun phrase inherits many of its features from the head noun; the internal constituency of a verb phrase in terms of number of objects, etc., derives from the properties of the verb. Another way of saying this is that the head noun or head verb project their features in the phrase, but not beyond it. The central notions involved here are exploited in the code-switching literature under the government constraint: not only the categorial and semantic features of a lexical head are projected in the constituent, but also its language index.

The relation between a head and its syntactic environment is thus circumscribed by the relation of government. For code-switching the government constraint was formalised in DiSciullo *et al.* (1986) as follows:

- (6) * [X^p Y^p], where X governs Y, and p and q are language indices

The nodes in a tree must dominate elements drawn from the same language when there is a government relation holding between them. In this formalisation the notion of government was taken willy-nilly from Chomsky (1981), where the general structural dependence on a syntactic head within a maximal projection was meant, e.g. between *see* and *THE BOOK* or between *on* and *THE BENCH* in *did you see THE BOOK* and *on THE BENCH*.

For the purposes of the government constraint, this notion was inappropriate in two ways. First, the class of governors included not only content words (such as verbs and prepositions) but also functional categories such as inflection, the complementiser, etc. Thus the frequent switches between, for example, the inflected verb and the subject or between the complementiser and the clause were ruled out. In spite of the theoretical appeal of this constraint and of its empirical success, it has the drawback that it must explain why the following government relations fall outside the constraint:

- (7) between INFL and the subject:

Les canadiens^f *scrivono* 'c'ⁱ.
 'The Canadians write "c".'

- (8) between Det/Q and N:

- a. Io posso fare iⁱ *cheques*^f.
 'I can make [out] the checks.'
 b. Mettava tantoⁱ *maquillage*^f sulla facciaⁱ.
 'She put so much make up on her face.'
 (DiSciullo *et al.* 1986: 13–15)

- (9) between V and Adv:

Uno no podía comer carne^s *every day*^e.
 [We couldn't eat meat every day.] (Sankoff and Poplack 1981: 27)

For (7) there was no real explanation. (8) was explained by assuming that government is minimal and that minor categories mark the phrase they are contained in by their index without governing their complement (not in accordance with Aoun and Sportiche 1983). The assumption that government is minimal, i.e. holding only on the level of V' (the minimal verb phrase), was meant to explain (9) as well.

Second, the domain of government was too large, including in principle the whole maximal projection. Thus switches between determiners or quantifiers and the noun they modify or between the verb and a locational adverb are predicted to be ungrammatical as well, again contrary to the evidence. For this reason the government constraint was modified in Muysken (1990):

- (10) * $[X^p Y^q]$, where X L-marks Y , and p and q are language indices
(1990: 124)

L-marking is a more restricted notion of lexical government by a non-function word under thematic marking. The domain of lexical dependency is a proper sub-domain of the domain of structural dependency: government, in exactly the right way. L-marking corresponds to the notion of government in the grammatical tradition. The notion of L-marking has the theoretical attraction that the language indices needed to account for the possible patterns are induced from the lexicon. In this revised view code-switching is possible where the chain of local dependencies resulting from L-marking is broken. If we assume that INFL does not L-mark (to account for (7)), that determiners and quantifiers are heads (hence determiner phrase, quantifier phrase) but not L-markers (so that the switches in (8) are not excluded), and that V does not L-mark time adverbs (as in (9)), then it accounts for the cases listed.

Even in this more limited form the government constraint is simply too strong, whatever its initial appeal. Counterexamples abound, for example in Nortier (1990), where the government constraint is explicitly tested on data from Moroccan Dutch–Arabic switching. Verbal and prepositional object noun phrases are often in a different language from their governing verb or preposition. Crucial counterexamples include (with the number of incidences in Nortier's corpus given in parentheses):

- (11) [a] *žib li-ya een glas water of zo.* (7)
'Get for-me a glass of water or so.'
[b] *anaka-ndir intercultureel werk.* (14)
'I I-am-doing intercultural work.'
[c] *wellit huisman.* (10)
'I-became "houseman".' (Nortier 1990: 131)

We get seven cases of switching between indirect and direct object (11a), no less than fourteen cases of switching between verb and direct object (11b), and ten cases involving a predicate after a copula-type verb, (11c). I should also mention the occurrence of ninety-seven switches of object noun phrases involving a single noun.

The data in (11) are particularly damaging since switching between subject and verb is, if anything, less frequent in Nortier's corpus than switching between object and verb. We also find fifteen cases where a Dutch noun phrase is the complement of a Moroccan Arabic preposition, as in (12).

- (12) [a] u dewwezna f- *zelfde tijd*
and we-spent in same time
- [b] ka-yxxes bezzaf dyal *generaties voorbijgaan*
it-must much of generations pass (Nortier 1990: 139)

These data clearly show that the government constraint, even in the revised form of Muysken (1990), cannot be maintained. The distribution of switched noun phrases is much wider than predicted. A way to salvage what is valuable in the government constraint is presented in section 5 below. What is valuable in it is that it predicts in a general way that the looser the syntagmatic relation is in a sentence, the easier it is to switch. This prediction is borne out by all available data.

It may be worthwhile to discuss the relation between government models and the model elaborated by Myers-Scotton (1993b). Both models share the idea of an asymmetry between a matrix and an embedded language. For the purpose of the discussion let us call the matrix language the governing language. Where the two models differ is in what counts as a governor. While the government model, particularly in its later versions, specifically excluded functional elements from being relevant governors in terms of code-switching constraints, as outlined above, the Myers-Scotton models are focussed on functional elements as governors for code-switching. It is fair to say that this latter option must be much closer to the truth.

4 Similarities between sentential and lexical phenomena

In many situations of intense language contact, a number of phenomena involving 'mixing' are going on at the same time: lexical borrowing, code-switching, interference, calquing, relexification, semantic borrowing, L1 transfer in L2 learning, possibly convergence. It is not always possible to decide beforehand what is what and therefore it is important to depart from a set of clear cases, abstracting away from the others, and setting up models which will divide, perhaps artificially, the domain of study into distinct sets of phenomena (e.g. borrowing and code-switching, or syntactic convergence and code-switching).

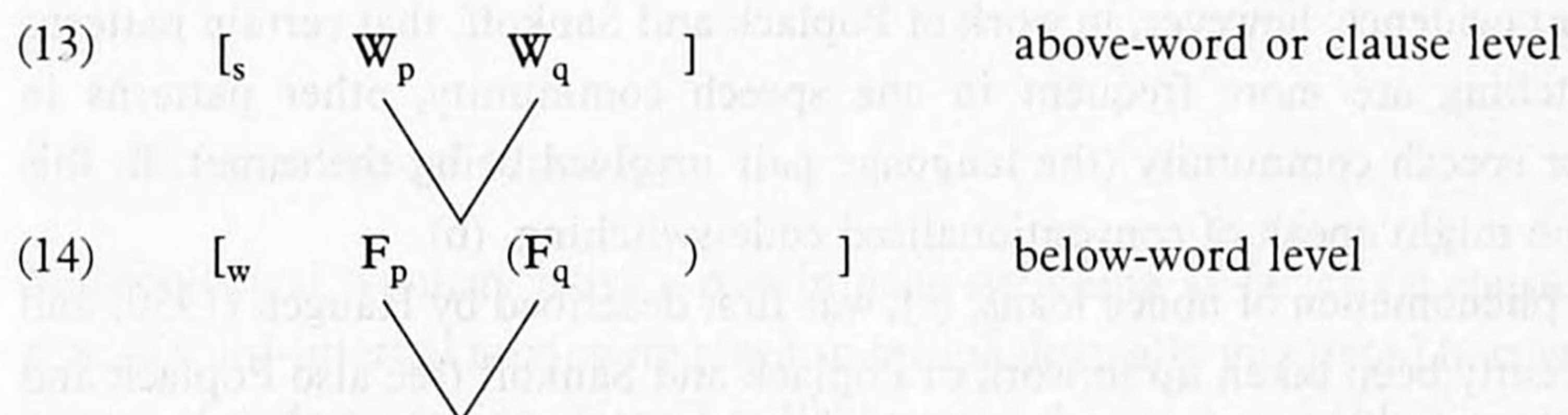
This procedure of abstraction will be justified if it is possible in the next stage of research either to unify the initially separate domains at a higher level of abstraction or to make strong empirical claims about the properties of the distinct sets of data, allowing one to subsequently classify the unclear cases. Thus it appears that at present the general contours of the phenomenon of lexical borrowing are

becoming firmly established; this will allow us to separate it from phenomena such as calquing, if these are indeed systematic.

4.1 The borderline between borrowing and switching

Code-switching is the use of two languages in one clause or utterance. As such code-switching is different from lexical borrowing, which involves the incorporation of lexical elements from one language in the lexicon of another language. Here I will try to deal with this distinction in somewhat more precise terms; the notions of word, and the above-word and below-word levels, play a central role.

Code-switching can be conceived of as involving words with different language indices, marked with p and q subscripts here, inserted into a phrase structure (13), where the brackets labelled S mark the clause level, while lexical borrowing can be conceived of as involving formatives (F) inserted into an alien word structure (14) (the word structure is alien because it behaves externally like an element from the host language):



Here the brackets labelled W mark the word level. I will use the term sub-lexical for mixing below the level of insertion of a word into a syntactic tree; and the term supra-lexical for mixing at the level of insertion into a tree and in the syntactic projection of a word. Thus a word can be inserted into a syntactic tree as, say, English, even though some of its components are French. This conception has several interesting results.

There are two dimensions to what I will pre-theoretically call lexical interference (both code-switching and borrowing): (a) whether a particular case occurs at the supra-lexical or sub-lexical level, in the sense just described; and (b) whether it involves being listed (DiSciullo and Williams 1989) or not.

The dimension of listedness refers to the degree to which a particular element or structure is part of a memorised list, which has gained acceptance within a particular speech community. We can arrange linguistic elements on a scale running from essentially creative to essentially reproductive.

Jackendoff (1975) and others have pointed out, of course, that these two dimensions are not entirely separate. The sub-lexical mode is primarily reproductive (listed), the supra-lexical, syntactic mode primarily creative. Nonetheless, there are many languages, for example polysynthetic and agglutinative languages, in which processes of word-formation can be highly creative. Similarly, there are aspects of phrase structure, most clearly in idioms and collocations, which are to some extent reproductive. For this reason, it is better to see these dimensions as separate.

When we look at linguistic interference in terms of these dimensions, the following picture emerges:

(15)		not-listed	listed
	supra-lexical	code-switching (a)	conventionalised code-switching (b)
	sub-lexical	nonce loans (c)	established loans (d)

Most code-switchings are of course spontaneously formed in discourse, (a). There is recent evidence, however, in work of Poplack and Sankoff, that certain patterns of switching are more frequent in one speech community, other patterns in another speech community (the language pair involved being the same). In this case one might speak of conventionalised code-switching, (b).

The phenomenon of nonce loans, (c), was first described by Haugen (1950) and has recently been taken up in work of Poplack and Sankoff (see also Poplack and Meechan, this volume); elements are borrowed on the spur of the moment, without yet having any status in the receiving speech community. Finally, established loans, (d), are a familiar phenomenon.

Taking this set of distinctions into account, we can now turn to the problem that has dominated the field in recent years: the demarcation between borrowing and code-switching. In Poplack and Sankoff (1984), which summarises much earlier work, the following distinctions were listed between code-switching and borrowing:

(16)		borrowing	code-switching
	no more than one word	+	-
	adaptation: phonological	±/+	±/-
	morphological	+	-
	syntactic	+	-

frequent use	+	-
replaces own word	+	-
recognised as own word	+	-
semantic change	+	-

Notice that we can identify the phenomena associated with lexical borrowing with those associated with ordinary morphological derivation. It has often been noted that lexical borrowing, in contrast with code-switching, involves gradual semantic specialisation over time, blurring of morpheme boundaries, lexical unpredictability, etc. These strikingly resemble the properties of derivational morphology. Both can be viewed as the consequences of lexicalisation typical of sub-lexical structures. Code-switching has the ordinary, supra-lexical, productive properties of syntax.

Much of the recent and very productive work in generative morphology, however, is based on the premise that there is a common set of formal principles to morphological and syntactic structure, such as headedness, government, etc., independent of the phenomenon of lexicalisation. Similarly, we may explore the possibility that parallel constraints govern borrowing and code-switching.

4.2 Morphological typology

Morphological typology plays a role in code-switching as far as we consider the type of word-internal mixing involved in morphologically integrated borrowing as a type of code-switching. Here I will illustrate the issues involved in trying to unify the grammatical constraints on borrowing with those on code-mixing, in terms of the notion of local coherence imposed by language indices. Code-mixing can be conceived of as involving words with different language indices inserted into a phrase structure tree, while lexical borrowing can be conceived of as involving formatives inserted into an alien word structure. Following the general notions of government or L-marking elaborated above, borrowing is predicted to be easier when the components of a word are more loosely connected, as in agglutinative or compounding morphology.

The unified perspective adopted here allows us to link the ways in which elements are borrowed to the morphological typology of languages. Several cases come to mind. In Hindi and other languages of the Indian subcontinent it is possible to form complex verbs by appending a semantically neutral verb 'do' to a content word. This morphological possibility makes it extremely easy to borrow verbs:

- (17) *onti kare*
 [to hunt] SRANAN
bewijs kare
 [to prove] SRANAN/DUTCH BORROWING

These examples are from Surinam Hindustani (Kishna 1979). The verb *kare* 'do' is the morphological head of the construction, and assigns its Hindustani language index to the whole verb, without internally imposing lexical restrictions ('L-marking' in the framework of Chomsky 1986) on the alien element (Muysken 1993). Similar constructions are found in examples from Tamil (Sankoff *et al.* 1990) and from Navaho (Canfield 1980). In the analysis proposed here, these cases are made possible because the auxiliary verb does not L-mark, i.e. does not specifically select, its complement.

A second case involves highly agglutinative languages. In these languages elements can easily be incorporated and can receive affixes productively. Consider a Finnish example:

- (18) *Misis K. oli housekeeper-iina*
 Mrs. K. was [essive case]
 [Mrs. K. was the housekeeper] (Poplack *et al.* 1987: 38)

There is L-marking on the phrasal level, which is unproblematic because the noun is Finnish externally, but there is no L-marking between the case affix and the noun.

We predict that fusional languages are highly resistant to borrowing, since there the shapes of the formatives are highly interdependent. This prediction is borne out. In fusional languages we see the typical noun/verb asymmetries in borrowability most clearly: nouns, which can generally occur uninflected, are frequently borrowed, while verbs rarely are.

5 Equivalence

In much work on language contact, at least since Weinreich (1953), and including, for example, the tradition of contrastive grammar research, the notion of equivalence plays an important role. The guiding assumption is that equivalence between the grammars of two languages facilitates bilingual usage, be it second language learning, lexical borrowing, or code-switching.

There can be equivalence of categories (lexical elements, phonemes, phrase structure nodes, morpho-syntactic features) or of relations between categories,

in structuralist terms. The latter are either syntagmatic (e.g. word-order or agreement rules) or paradigmatic (equivalent oppositions).

5.1 Categorical equivalence

Here I will consider just word-order equivalence and categorical equivalence. Word order equivalence is a sub-case of categorical equivalence, under the government theory, since the rightward governing verb is not directly equivalent to a leftward governing verb, just like a postposition (governing leftward) is not immediately perceived as the categorical equivalent of a preposition (governing rightward). In the Sankoff and Poplack (1981) and Sankoff and Mainville (1986) formalisations there is the preliminary idealisation of categorical equivalence: there is assumed to be a match between both the terminal and the non-terminal nodes in the syntactic tree of the languages involved in the switch. It has been pointed out before that this idealisation is unwarranted; in fact there is no exact match between categories in different languages. Well-documented problem areas in categorical equivalence include clitic versus non-clitic pronouns, types of determiners and demonstratives, and types of auxiliary elements.

We may need to conceive of equivalence not only as a grammatical notion, but also from a psycholinguistic perspective. This allows us to treat processes of code-switching in diachronic and sociolinguistic terms. Assume that one bilingual speech community does not recognise the categories from different languages as equivalent, and another one does. This will have immediate impact on code-switching patterns, of course. We can think then of the recognition of categorical equivalence as the first step in the process of syntactic convergence. A category often recognised as equivalent may be 'noun', and frequently also 'noun phrase' will be recognised as such, whereas conjunctions are perhaps less likely to be interpreted as equivalent. In addition, phonological and morphological factors (e.g. similar paradigms) may be involved in furthering the recognition of equivalence.

5.2 Word order equivalence

The word order equivalence constraint was given an informal formulation in Poplack (1980) – switching is only possible at points where the order of linguistic elements in both languages is the same – and was then formalised in Sankoff and Poplack (1981) and in Sankoff and Mainville (1986). In the latter work the following formalisation of the constraint is presented:

Given a 'set E of immediate descendants of the node directly above the two constituents', then 'the symbol for any nodes in E to the left of the boundary between the two constituents must precede the symbols for all nodes in E to the right of the boundary, in the right side string of the two rules from the two grammars'. (Sankoff and Mainville 1986: 6)

Thus the formal definition of the word order equivalence constraint is in terms of the immediate daughters of a given phrase structure node. The precise definition of word order equivalence is crucial, as can be seen when we compare Dutch and English word order in the light of the equivalence constraint (Adelmeijer 1991). In simple main clauses, surface strings are similar:

(19) Mary eats apples./Marie eet appels.

In informal linear terms a switch would be allowed at every point, then, in these sentences. Notice, however, that many grammarians, adhering to different theoretical models, assign rather different structures to these sentences. In some Government and Binding analyses, for instance, the English verb *eats* occupies the auxiliary position, and the Dutch verb has been moved into the complementiser position (e.g. Koster 1978). The English subject is in its canonical position, while the Dutch subject has been moved into sentence-initial position. A switch between subject and verb would not be possible under the more formal configurational definition in terms of sister nodes.

The opposite result is found when we take main clauses with a fronted adverbial. In English this element will precede the subject, while in Dutch it will occur in pre-verbal first position instead of the subject:

(20) Now Mary eats an apple./Nu eet Marie een appel.

Under a purely linear conception of equivalence, a switch would not be allowed after *now/nu*; the element following differs in both languages: the subject in English, the finite verb in Dutch. Under the more formal conception of equivalence in terms of sister constituents, there is equivalence between the clausal constituents following the fronted adverbial, and hence switching would be allowed.

One of the conceptual problems with the notion of word order equivalence is that the order of elements in the sentence is expressed in phrase structure configurations, but results from the interaction of a number of independent principles (see particularly the work of Stowell (1981), Travis (1984) and Koopman (1984)). Some of these principles include:

- (21) directionality of government (Case, Theta)
 [NP V], * [V NP] under leftward government
 [P NP], * [NP P] under rightward government
- (22) adjacency or other locality conditions on government
 [V NP X], * [V X NP], since case assignment is local
- (23) iconicity
 [E1 E2], * [E2 E1], where E1 and E2 are coordinate events and E1 preceded E2 in time
- (24) Considerations of given/new, functional sentence perspective, topic/comment, etc.
 [given information new information]
- (25) prosodic considerations
 [short constituent long constituent]

Now with respect to these principles (and undoubtedly there are more), two things may be said. First, they do not form a natural class, and derive from different components of linguistic theory in the wide sense. Second, only the first two are likely to be language specific, generally speaking, and hence pertinent to the equivalence constraint. Notice now that (21) and (22) are directly determined by government.

Thus a formulation of the equivalence constraint that realistically covers word order differences involves the notion of government. The constraint at the intersection of the earlier approaches may then be formulated as:

- (26) * [X_p, Y_q], where *X* L-marks *Y*, *p* and *q* are language indices, and there is no equivalence between the category *Y* in one language and the category *Y* in the other language involved.

To see what this means we must return to the issue of equivalence. The linear notion of equivalence would translate in this framework as *X_p* governing leftward or rightward.

6 Conclusion

A more general way of approaching equivalence in code-switching research is through the notion of neutrality. If we take a strong system-oriented view and

conceive of the juxtaposition of material from different languages in one utterance as theoretically problematic – when the grammar of each single language is viewed as a system *où tout se tient* [everything holds together], in Saussure's terms – then we can imagine there to be various strategies to make mixing, juxtaposition, less offensive. In other words, code-switching is impossible in principle, but there are numerous ways that this fundamental impossibility can be circumvented. Something that should be ruled by the very coherence imposed by the sentence seen as syntagmatic unit, is made possible in any of four ways, thus neutralising the system conflict:

- (i) switching is possible when there is no tight relation (e.g. of government) holding between two elements, so-called paratactic switching;
- (ii) switching is possible under equivalence;
- (iii) switching is possible when the switched element is morphologically encapsulated, shielded off by a functional element from the matrix language;
- (iv) switching is possible when at the point of the switch a word could belong to either language, the case of the homophonous diamorph (e.g. *in* in English, German or Dutch).

The loose, associative, style of this survey of grammatical notions relevant to the analysis of code-switching is not accidental. It reflects my perception of the present state of the field as characterised by pluralism and the growing recognition that various mechanisms may play a role in different code-switching situations.

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