

The Role of Syntactic Theory in the Analysis of Intrasentential Code-switching

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Introduction

Research into code-switching has traditionally focused on either its sociolinguistic or its grammatical aspects. Sociolinguistic research has led to proposals regarding, amongst other things, the reasons people engage in code-switching, the functions code-switching may fulfil, and the contexts in which code-switching is common and/or viewed as appropriate (cf., e.g., Blom and Gumperz 1972; Gumperz 1982; Myers-Scotton 1993; Wei 1998). Research on the grammatical aspects of code-switching, on the other hand, has led to a number of proposals regarding where codes may be switched in a sentence. Such proposals have most often been formulated in terms of constraints on intrasentential code-switching¹. Studies leading to the proposal of such grammatical constraints have typically been carried out within the framework of particular theories of grammar, the choice of theory differing somewhat from one researcher to the next. Thus, in the literature, one finds that researchers apply different theories, or different interpretations of the same theory, furthermore differing in the ways in which the theory is applied.

The present paper describes various recent applications of gram-

¹ Intrasentential code switching entails switching within a clause boundary (Hamers and Blanc 2000:260), such as in the English-Afrikaans code switched utterance *I don't like to bother the mense te veel* ('I don't like to bother the people too much').

mathematical theory to the analysis of code-switching, from early Government and Binding (GB)-based accounts to more recent analyses within the framework of minimalist syntax. In order to orientate the reader, a brief overview of developments within the field of generative grammar, culminating in the proposal of the minimalist program (or MP) (Chomsky 1993, 1995a), is given in the following section. This section also contains a brief exposition of the minimalist program, the research program which has led to the formulation of theories of minimalist syntax, followed by a discussion of the potential merit of the application of such syntactic theories to code-switching research. Following this, an exposition is given of a number of applications of grammatical theory to the analysis of code-switching and shortcomings of these approaches are pointed out. In the final section, suggestions for future research are discussed.

Generative Grammar: An Overview

Generative Grammar

Research in the generative tradition is carried out against the background of the three levels of adequacy which grammatical descriptions have to meet, as set out by Chomsky (1964:28,29). The lowest level of success is that of observational adequacy, attained when the grammar correctly characterises specific observed linguistic data (e.g., that in a corpus). The second level is descriptive adequacy, attained when a grammar additionally provides an account of the speaker-hearer's linguistic intuitions and offers meaningful generalisations expressing the underlying regularities of the observed linguistic data. The third level of success is that of explanatory adequacy, attained when the theory associated with the grammar presents an explanation for the linguistic intuitions of the speaker-hearer and, crucially, also for how principles underlying these intuitions could have been acquired. Within the tradition of generative grammar, an adequate theory is one which attains all three levels of success.

Early work within the framework of generative grammar led to the postulation of various rules. These were proposed to account for a multitude of syntactic phenomena in a wide variety of languages. Tension then arose between the needs for descriptive and explanatory adequacy, as it did not appear possible that a single grammar could simultaneously (i) account for

the structures observed in individual languages, thereby attaining descriptive adequacy, and (ii) capture the fact that these structures derive from a single, universally specified (innate) set of structures, thereby attaining explanatory adequacy. A quest for descriptive adequacy leads to increasing levels of complexity and variety in the systems of rules accounting for syntactic phenomena, different for each language. On the other hand, a quest for explanatory adequacy requires the structure of different languages to be largely invariant (Chomsky 1997a:5). Questions about ways to resolve this tension led researchers to follow what became known as the 'principles and parameters' approach within generative grammar (cf. Chomsky 1981, 1986a, b).

Within the principles and parameters framework, the multitude of language-specific rules of the early generative tradition are replaced by principles and parameters that are assumed to be universally present, forming the basis of the language faculty. Thus, Chomsky (1995a:170) proposes that Universal Grammar (UG) provides a 'system of principles and a finite array of finitely valued parameters'. These principles and open parameters comprise the initial state of the language faculty, and each parameter can be set to a particular value, on the basis of the input to which the speaker-hearer is exposed. Each language (L) is the result of the fixed set of principles and a certain configuration of parameter settings.

The principles and parameters framework provides a research program within which certain questions about the language faculty and languages are asked and answered in a certain way, the ultimate aim being to provide an account in terms of which all syntactic phenomena are shown to be the product of interaction between fixed and universal principles and language-specific parameter settings. Thus, as Chomsky (1997a:6) notes, the principles and parameters program 'suggests how the theory of language might satisfy the conflicting conditions of descriptive and explanatory adequacy'.

GB theory was the most influential theory of grammar within the principles and parameters framework from the late 1970s to the early 1990s (cf. Chomsky 1981, 1986a, 1995a), and has been regarded as 'the most fully worked out version of a principles and parameters approach to UG' (Hornstein, Nunes and Grohmann 2001a:1). According to GB theory, there are four levels of grammatical representation, namely, (i) deep structure (D-

structure), (ii) surface structure (S-structure), (iii) logical form (LF), and (iv) phonetic form (PF).

D-structure is the level at which grammatical functions are expressed in terms of theta roles and phrase structure rules are applied (Hornstein, Nunes and Grohmann 2001b:2). Between D-structure and S-structure, movement of syntactic elements takes place (Cook and Newson 1996:153). 'Move' is one of the rules of the transformational component of GB theory (Hornstein et al. 2001b:4). Specifically, GB theory proposes a rule called 'Move α ', according to which anything can be moved anywhere. This rule replaced the (construction-specific) transformational rules of earlier generative grammar, e.g. wh-movement in questions, NP movement for passives, etc.

S-structure links PF and LF, as it is the level at which the derivation splits into two representations, one for the PF component, which determines aspects of the pronunciation of the sentence, and another for the LF component, which computes those aspects of meaning which are associated with syntactic structure (Cook and Newson 1996:152, 153; Hornstein *et al.* 2001b:3). Within GB theory, PF and LF are thus interface levels which provide the grammatical information needed to assign phonetic and semantic interpretations to the sentence (Hornstein *et al.* 2001b:3).

GB theory was the most successful theory of grammar within the principles and parameters framework. However, more recent developments within the minimalist program (cf. Chomsky 1993, 1995a) have led to a reconsideration of various assumptions and devices of the principles and parameters framework, one of these considerations being the elimination of the levels of S-structure and D-structure associated with GB theory.

The Minimalist Program

Throughout the history of research within the framework of generative grammar, there has been a preference for simpler syntactic analyses over more complex ones, for the smallest number of rules and the smallest number of elements. This preference for simplicity can be seen to dominate recent work in the generative tradition. Indeed, according to Chomsky (2002:95) and Tomalin (2003:1251), this increased emphasis on economy and simplicity has led to the development of the minimalist program.

Within the minimalist program, Chomsky (2001:1) suggests that the properties of a language (L) are the result of interaction among three factors. The first of these is the initial state of the language faculty, an instantiation of the fixed set of universal principles. The second is the primary linguistic data (PLD), also known as 'language input', i.e., the empirical basis in accordance with which the parameters are set. The third, which was not addressed by early work within the principles and parameters framework, comprises general properties of organic systems. Chomsky (2001:2) explains the need to ask 'not only what the properties of language are, but why they are that way'. The belief is that, once the tension between descriptive and explanatory adequacy is overcome by work within the principles and parameters framework, one can go beyond explanatory adequacy and focus on questions arising from the third factor above, i.e., the nature of the language faculty as an organic system and the role that this plays in determining the properties that natural language systems must have.

Specifically, Chomsky (2002:108) asks the question: is language optimally designed in terms of the systems with which it must interact? This is the line of questioning taken up in the minimalist program, which provides a framework within which questions can be posed regarding the optimality of language design (cf. Chomsky 1997b, 1999, 2000). The minimalist program seeks to explore the question of whether language is a perfect system, in as much as it is a perfect solution to externally imposed constraints (Chomsky 1995a:1). Such externally imposed constraints arise due to the interaction of the language faculty, as a cognitive system, with other performance systems, such as the sensorimotor and conceptual systems. According to Chomsky (1997b:4), the language faculty interacts with these performance systems by means of levels of linguistic representation. The output of the language faculty must satisfy so-called 'legibility conditions' imposed by these systems if the systems are to process the output of the language faculty. A strong minimalist thesis is that 'language is an optimal solution to legibility conditions' (Chomsky 2000:112). The assumption then is that the language faculty (i) provides only the machinery that is necessary to satisfy the minimal requirements of legibility, and (ii) functions in as simple a way as possible.

The performance systems with which the language faculty must interact, according to Chomsky (1995a:168), are of two general types,

namely articulatory-perceptual (A-P) and conceptual-intentional (C-I). These are the systems for which a linguistic expression, the output of the language faculty, must provide instructions. Accordingly, it is claimed that there are two interface representations, namely, PF at the A-P interface and LF at the C-I interface (Chomsky 1995a:2), which provide instructions for the A-P and C-I systems, respectively. Chomsky (1995a:169) proposes that these two levels are the only conceptually necessary levels, and so assumes that they can be taken to be the only levels. The GB levels of S-structure and D-structure, in contrast, are empirically rather than conceptually motivated, and research within minimalist syntax has suggested that the empirical burden of these two levels of representation can be more adequately borne by mechanisms operating between the lexicon and PF and LF (cf. Hornstein et al. 2001b:5-36). Thus, the conceptually unnecessary levels of D- and S-structure are eliminated in the spirit of economy, according to which two levels of representation are better than four. The assumption of PF and LF as the only levels of representation, based on the notion of virtual conceptual necessity, forms an important part of the minimalist program.

The above-mentioned strong minimalist thesis holds that all states of the language faculty (initial and attained) must satisfy the interface legibility conditions, and so puts aside the distinction between descriptive adequacy (for a theory of an attained state of the language faculty) and explanatory adequacy (for a theory of the initial state) (Chomsky 2002:131). The assumption that all states of the language faculty satisfy legibility conditions in an optimal way is central to questions posed by the minimalist program. The task of the minimalist program, according to Chomsky (2001:3), is to examine the devices employed to characterise language and to determine the extent to which such devices can be eliminated in favour of a principled account in terms of general conditions of computational efficiency and interface conditions that the organ – in this case, the language faculty – must satisfy in order to function.

It is important to note that the minimalist program is a research program, not a theory. Specifically, it is a research program which assumes the framework of the principles and parameters approach, and which provides leading questions about the optimality of language design, specifically questions about the legibility conditions which the language faculty has to meet in order to interact with other systems of the mind/brain.

In an interview with Cheng and Sybesma (1995:32), Chomsky notes that one cannot speak of a minimalist approach to something, as 'there is no minimalist approach. There is a set of minimalist questions', and in this sense the minimalist program is a 'set of questions that guide inquiry'.

Research within the framework of (i) assumptions associated with the principles and parameters approach (e.g., Chomsky 1981, 1986a, b) and (ii) linguistic research questions raised by the minimalist program (cf., for example, Chomsky 1995a, 1999, 2000; Lasnik 1999) has led to the development of a number of theories of grammar, proposed to account for various syntactic phenomena, and these theories can collectively be referred to as 'minimalist syntax'. Thematic role assignment and feature checking are examples of such theories. The various mechanisms and devices associated with these theories, e.g., 'Move' and 'Agree' in the case of feature checking, are mechanisms and devices of minimalist syntax, rather than properties or components (or some such) of the minimalist program. Misconceptions of what the minimalist program entails and what it is intended to achieve abound in the literature at present, as does the lack of a distinction between the minimalist program and minimalist syntax. In view of these issues, the use of terms such as 'minimalist program-style syntax', 'minimalist account' and 'minimalist approach' may need to be reconsidered.

Chomsky (1995a:168) proposes that the language faculty consists of two components, namely a lexicon and a computational system for human language (C_{HL}). The lexicon specifies the lexical items with their idiosyncratic features. C_{HL} derives a linguistic expression, also known as a structural description (SD), on the basis of a selection of lexical items, called a 'numeration' N (Chomsky 1995a:169). The derivation proceeds as the operation Merge strings the lexical items together in binary fashion, and the operation Move carries out the necessary movement of lexical items. C_{HL} consists of two parts, namely the PF component, relevant to PF (at the A-P interface), and the LF component, relevant to LF (at the C-I interface) (Chomsky 1995a:169). A linguistic expression of L is then a pair (π, λ) , where π is a PF representation and λ an LF representation (Chomsky 1995b:390). Chomsky (1995b:394) posits that π and λ are 'differently constituted', and that elements interpretable at the PF interface are not interpretable at the LF interface, and vice versa. The computation must split at some point, into a part forming π and a part forming λ . This point is

known as 'Spell-Out' (Chomsky 1995b:394). At Spell-Out, the elements relevant only to PF are stripped away and mapped onto π , while the remainder continue in the computation to LF to be mapped onto λ .

On the basis of universal and invariant principles and fixed parameter settings, a language *L* determines an infinite set of SDs, each a (π , λ) pair. A derivation is said to 'converge' if it produces a legitimate SD, and to 'crash' if it does not (Chomsky 1995a:171). A derivation can converge or crash at either PF or LF, and must converge at both PF and LF if it is to converge at all (Chomsky 1995a:171). The above-mentioned legitimacy of an SD is determined by the principle of Full Interpretation, whereby the features associated with lexical items must be 'checked'. Move is the operation whereby lexical items move in order that feature-checking can take place. Specifically, feature checking entails that interpretable features associated with a particular lexical item² are checked against the corresponding features of a functional head, remaining visible to the rest of the computation, while uninterpretable features, once checked, are deleted, and become invisible to the computation. Thus, movement for the purposes of feature checking is said to be triggered by the need to eliminate uninterpretable features from the computation (Hornstein, Nunes and Grohmann 2003:3).

Applying Minimalist Syntax to the Analysis of Code-switching Data

In studies of grammatical aspects of intrasentential code-switching, the question to be answered concerns which linguistic principles define code-

² Within the framework of minimalist syntax, it is assumed that lexical items consist of bundles of features, namely phonological, semantic and formal (syntactic) features. Phonological features are readable at PF and not at LF, while semantic features are readable at LF and not at PF. These two types of features are separated at Spell-Out, where phonological features are sent along in the computation from *N* to π and the semantic features in the computation from *N* to λ . Uninterpretable formal features, legible at neither PF nor LF, must be eliminated by feature checking (cf. Hornstein et al. 2003:4).

switching boundaries within sentences. According to MacSwan (1999:xxv), the aim of working within the framework of minimalist syntax is to make use of a minimal theoretical apparatus i.e. to eliminate mechanisms that are not necessary on conceptual grounds and, to make minimal and only the most necessary theoretical assumptions to account for linguistic data (MacSwan 1999:146). He further suggests that such assumptions would 'favour accounts of code-switching which make use of independently motivated principles of grammar over those which posit rules, principles or other constructs specific to it'. On the basis of his analysis of Spanish-Nahuatl code-switching data, MacSwan (1999:234) argues against the existence of specific code-switching constraints on the basis of the principles of scientific parsimony: code-switching phenomena can be accounted for in terms of the same theory that accounts for monolingual phenomena.

Applications of Syntactic Theory to the Analysis of Code-switching

As early as 1966, Lehtinen queried the possibility of grammatical constraints on code-switching, her focus being on the 'surface grammar of sentences' (Muysken 2000:11). The idea that there are rules which govern the switch sites in a sentence has prompted much research, and various constraints have been proposed (cf., among others, Lipski 1978, Poplack 1980, Bentahila and Davies 1982, Woolford 1983, Joshi 1985, Clyne 1987, Ritchie and Bhatia 1999). A brief discussion of some of the more prominent applications of syntactic theory to code-switching research follows.

The Government Constraint

Di Sciullo, Muysken and Singh (1986) applied the then current version of GB theory to an analysis of intrasentential code-switching. Specifically, they proposed the Government Constraint, according to which a governing element must be in the same language as its complement (Di Sciullo *et al.* 1986:6). Di Sciullo *et al.* (1986:2) state that the question is not whether or not there are constraints on intrasentential code-switching, but how best to characterise such constraints, and whether they can be made to follow from independently motivated principles. In their application of syntactic theory to code-switching analysis, Di Sciullo *et al.* (1986:7) suggest that code switching requires 'no specific stipulation', and is only subject to the

'syntagmatically coherent principle of government'. Government, accordingly, was proposed to explain the grammaticality of both monolingual and bilingual utterances.

A theoretical problem with the proposal of a Government Constraint is that, within the framework of minimalist syntax, it has been argued that the government relation is neither conceptually desirable nor empirically necessary. According to Cook and Newson (1996:316), the notion of government is abandoned in minimalist syntax, as its effects can be 'reduced to more fundamental relations.' Besides this theoretical shortcoming, the Government Constraint also fails empirical testing (cf. MacSwan 1999:44, 2000:39). The attested South African English-Afrikaans code-switches in (1) and (2), for example, containing switches between governors and their complements, constitute empirical data which cannot be accounted for by the Government Constraint (*also cited in Van Dulm 2002:69,70*).

1. Ek kan haar sien *as a preschool teacher*.
I can her see as
(*I can see her as a preschool teacher.*)
2. I just met *die man van my drome*.
the man of my dreams
(*I just met the man of my dreams.*)

It appears that the application of grammatical theory to code-switching research in the case of the Government Constraint has not lead to a theoretically and empirically adequate account of intrasentential code-switching³. However, the idea that it is possible to account for structural aspects of intrasentential code-switching in terms of the same theory that accounts for structural aspects of monolingual utterances remains an attractive option.

³ Note that later adaptations were made to the Government Constraint, in terms of which the operative relation was one of so-called 'L-marking' (cf. Muysken 2000), but the mechanisms remained code switching-specific devices, not related to those of current syntactic theory within the minimalist program, despite Di Sciullo et al.'s suggestion that code switching requires 'no specific stipulation' (cf. p. 11).

The Null Theory of Code-switching

Mahootian (1993:138) proposes the Null Theory of intrasentential code-switching which states that there are no mechanisms specific to code-switching. Specifically, Mahootian (1993:139,140) proposes that the two lexicons, with their associated phrase structures, remain separate, and that access to both systems does not lead the speaker to generate utterances anomalous to either one (e.g., *apple green* when English, a head-first language, is in contact with a head-last language). The Null Theory is expanded in Mahootian and Santorini (1996:470), where it is proposed that heads determine the syntactic properties of their complements both in code-switching and in monolingual speech. Specifically, Mahootian and Santorini (1996:472) propose that a head determines the phrase structure position, syntactic category and feature content of its complement. For instance, a verb (a lexical head) dictates the position of its complement, allowing the switch in (3a) below between a V-complement language and a complement-V language, but not that in (3b).

(3a) (cited in Mahootian 1993: 152)

You'll buy xune-ye jaedid
house-POSS new
(You'll buy a new house.)

(3b) (cited in Mahootian and Santorini 1996:472)

You'll xune-ye jaedid buy
house-POSS new

A conceptual problem with the approach of Mahootian (1993) concerns the use of the Tree Adjoining Grammar (TAG) formalism in the analysis, in which branching directionality, proposed to be encoded in the head, is realised by so-called 'auxiliary trees', representing the complement to the left or to the right of the head (MacSwan 1999:45). This is in contrast to GB theory, in which branching directionality was not encoded, as well as some current theories of minimalist syntax, which posit left branching across the board (Kayne 1994; Zwart 1997). A further conceptual problem with Mahootian and Santorini's (1996) approach concerns the central role proposed for the head-complement relation in code-switching. As noted by MacSwan (1999:47), there should be no limit on the syntactic relations and operations relevant to code-switching. Instead, 'all syntactic operations and

principles will be relevant in defining the class of well-formed code-switching constructions'. Such would be the basis of a truly 'null' theory of code-switching.

The Functional Head Constraint

On the basis of the idea that 'it is desirable to exploit distinctions and relations already present in the grammar' to account for code-switching, Belazi, Rubin and Toribio (1994:228) propose the Functional Head Constraint. Belazi *et al.* (1994) appeal to the notion of f-selection (cf. Abney 1987; Chomsky 1993), one of a number of feature checking processes. Specifically, Belazi *et al.* (1994:221, 228) propose a reformalisation of the notion of f-selection, whereby one of the features to be checked is language (i.e., whether it is, e.g., English, Afrikaans or Xhosa that is being spoken). The Functional Head Constraint proposes that 'the language feature of the complement f-selected by a functional head ... must match the corresponding feature of that functional head' (Rubin and Toribio 1995:177). The constraint does not allow switching between a functional head and its complement, leaving undisturbed switching between lexical heads and their complements. Empirical evidence against the Functional Head Constraint is offered by MacSwan (2000) and Van Dulm (2002), among others. Consider, for example, the switch between the Afrikaans functional head *is* ('is') and its English complement *down your throat* in (4) (also cited in Van Dulm 2002:70).

- (4) Watse thingy is down your throat?
 which is
 ('Which thing is down your throat?')

Conceptual arguments against the Functional Head Constraint are raised by Mahootian and Santorini (1996) and MacSwan (1999, 2000). As these authors point out, Belazi *et al.* (1994) propose that their analysis of code-switching according to the Functional Head Constraint eliminates a code-switching specific mechanism, but the notion of a language feature is not independently motivated, and so remains a notion specifically formulated to account for a particular set of code-switched utterances. Furthermore, recent

developments within minimalist syntax indicate that only head-head (head adjunction) and spec-head configurations are checking domains (Chomsky 1993, 1995a; Hornstein *et al.* 2003), whereas the functional head constraint proposes checking within the head-complement domain. This, too, would be a code-switching specific mechanism, unless established as independently motivated. It is also important to note, once again, the question of why the relation between a functional head and its complement would play a particularly central role in code-switching. A more economical account would be one in which all relations relevant to monolingual utterances are also relevant to code-switching. Such an account is discussed below.

A Minimalist Assumption Regarding Code-switching

On the basis of an extensive study of intrasentential code-switching between Spanish and Nahuatl, MacSwan (1999:14) proposes that 'nothing constrains code-switching apart from the requirements of the mixed grammars'. MacSwan (1999:xxv) suggests that his research program is minimalist in two respects: (i) the proposal makes use of the minimal theoretical apparatus, corresponding to the so-called 'virtual conceptual necessity' that is central to the minimalist program; and (ii) the code-switching data are analysed within the minimalist framework. MacSwan (1999:66) thus works within the boundaries of a syntactic theory in which parameters are restricted to the lexicon (cf. Chomsky 1991, 1993, 1995a). This entails that variations in surface word order of languages relate to the movement of lexical items triggered by lexically-encoded morphological features (MacSwan 1999:67). The implication is that distinctions between languages do not feature in syntactic theory, and should play no role in an account of code-switching (MacSwan 1999:146).

MacSwan's (1999:97) main research question concerns the principles that define code-switching boundaries within sentences. Specifically, he seeks an 'explanation of the code-switching facts in terms of conflicts in the lexical requirements of words which are independent of code switching-specific mechanisms' (MacSwan 1999:151). The strategy in pursuing such a goal is to locate language-specific conflicts in the feature specifications of functional categories in order to explain the code-switching data (MacSwan 1999:156). MacSwan (1999, 2000) goes on to account for

the Sapanish-Nahuatl data within this framework. By way of illustration, consider the switches in (5) to (7).

- (5) Die onderwyser sê al die *kinders* look ill.
the teacher says all the children
- (6) The teacher said all the *kinders* lyk siek.
children look ill
- (7) *Die onderwyser sê die kind look ill.

In (5), the [+PLURAL] number feature of the English verb *look* agrees with the [+PLURAL] number feature of its Afrikaans subject *kinders*, and so can be checked in the course of the derivation. In (6), the number feature of *lyk* need not be phonetically expressed. This entails that verbs in Afrikaans have only one form for both singular and plural subjects (cf. *Die kind lyk siek* ('The child looks ill') and *Die kinders lyk siek* ('The children look ill')). In (7), the [+PLURAL] number feature of the verb *look* mismatches with the [-PLURAL] number feature of *kind*, and so the derivation crashes, accounting for the ill-formedness⁴ of the switch in (7). Note, however, that such a switch may be uttered and/or regarded as acceptable by a mother tongue speaker of Afrikaans, as that language has no requirement of overt (phonetically realised) number agreement between a subject and a verb. This indeed appeared to be a possibility in Van Dulm's (2002) study of South African English-Afrikaans code-switching. The examples above offer a very basic illustration of the application of feature checking theory to code-switching data. The situation would become significantly more complex if the movement involved in the checking process were illustrated here.

⁴ Note that the term 'ungrammaticality' is avoided here, as this is a descriptive term for sentences which do not conform to the rules of the grammar being used as the basis for analysis. The term 'unacceptability' is also avoided here, as judgments of acceptability are based on intuition, and so are subject to variation under the influence of a variety of extralinguistic factors (cf., e.g., Botha 1981). The terms 'well-formedness' and 'ill-formedness', in contrast, are more appropriate here, as one can specify, for example, whether an utterance is well- or ill-formed in terms of its structure, phonology or morphology, depending on the focus of the analysis.

A further important aspect of MacSwan's (1999, 2000) approach to the analysis of intrasentential code-switching concerns his proposal of the PF Disjunction Theorem, according to which code-switching is not possible in the computation from N to π , i.e., in the PF component. The ban on code switching in the PF component is due to the nature of this component, which differs from that of the LF component, in that the computation from N to π modifies structures, including the internal structure of lexical items, by processes that are different in nature to those of the computation from N to λ (Chomsky 1995a:229). Specifically, the PF component contains phonological rules which build structure on the basis of specific morphological material with its phonetic content (MacSwan 2000:45). Such rules are necessarily ordered, and such ordering is language-specific. This ordering of rules may not be maintained when the PF components of two languages are mixed. In order to allow for the language-specificity of the PF component, MacSwan (1999:187) posits the PF Disjunction Theorem, which is an instantiation of Full Interpretation, and predicts that there will be no code-switching below the level of an X^0 ⁵, i.e., no code-switching within an X^0 , as X^0 's are inputs to the PF component (MacSwan 2000:46). Note that the PF Disjunction Theorem is not a constraint on code-switching, of the nature of those proposed by, for example, Di Sciullo et al. (1986) and Belazi et al. (1994). Rather, it is 'a theory about the relationship between the phonological components of a bilingual's linguistic system, and is deduced from the nature of phonological rules' (MacSwan 2000:46). Thus, MacSwan (1999:xxv) maintains the assumption that 'nothing constrains code switching apart from the requirements of the mixed grammars'.

As an illustration of how the predictions of the PF Disjunction Theorem are borne out, MacSwan (2000:46) considers Poplack's (1980:586) example of **eat-iendo* ('eating'), where a switch is disallowed between the English stem *eat* and the Spanish bound morpheme *-iendo*. The possibility of a switch being allowed between, for example, the Afrikaans past participle *ge-* and the English verb *park* in *ge-park* is explained by MacSwan (2000:46) in terms of borrowing. The assumption is that morphologically

⁵ X^0 denotes a word level category, which may, for example, be a simple noun like *pen*, or a complex noun like *ballpoint pen*. Examples of verbal X^0 's include the simple *mark*, and the complex *marked* and *re-marking*.

complex words like *geparkeer* ('parked') in Afrikaans and *parked* in English are formed by word formation devices internal to the lexicon (cf. Chomsky 1995a), and that a switch is allowed here if one assumes that the English stem has been borrowed into the speaker's Afrikaans lexicon.

Note that criticism may be levelled against the use of borrowing as a so-called 'escape hatch', in that a switch between a free and a bound morpheme, which cannot be explained in terms of the theory at hand, can simply be classified as a borrowing. It may be preferable to pursue an alternative account of such switching, making use of the existing operations and devices of minimalist syntax, eliminating the need to classify exceptions as borrowings in order that the PF Disjunction Theorem may be maintained. In view of potential objections to aspects of the theorem, further research in code-switching and other language contact phenomena is required in order to clarify matters.

The brief overview of MacSwan's (1999, 2000) approach given above is aimed at illustrating the potential merit of the application of syntactic theory developed within the minimalist program to the analysis of code switching data. The underlying assumption is that the grammatical principles and operations relevant to monolingual language phenomena are relevant to bilingual language phenomena, thus that no principle of grammar may refer specifically to code-switching or to separate languages (MacSwan 2000:43).

Directions for Future Research

The application of syntactic theory to the analysis of code-switching data provides a potentially fruitful avenue of research. Such application may be hindered, however, by the swiftness of developments in the theory. Consider, for example, the Government Constraint (Di Sciullo *et al.* 1986), the issues of its empirical validity aside. No sooner had researchers applied to code-switching research a notion central in the syntactic theory of the time, than the notion itself was done away with in the theory. Such adaptations to the underlying theory do not necessarily detract from the potential merit of the application of the theory. In the case of the Government Constraint, for example, it was illustrated that an account of code-switching data in terms of current syntactic theory is viable. Furthermore, it makes sense to propose

that the structural aspects of code-switching can be made to follow from independently motivated principles (Di Sciullo et al. 1986:2).

The possibility should also be considered that the successful application of syntactic theory to the analysis of code-switching may be extended by further research into other language contact phenomena. If, for example, the operations and devices of feature checking theory are shown to provide an adequate account of intrasentential code-switching, researchers may consider investigating accounts of other language contact phenomena in terms of the same operations and devices. The ultimate aim should be to account for the structural aspects of all utterances, whether monolingual or bilingual, in terms of the same syntactic theory. It should, for example, be possible to account for the structural aspects of utterances in a converged variety⁶ in terms of the same principles and mechanisms used to account for structural aspects of monolingual utterances.

In this paper, various possibilities concerning the application of syntactic theory to code-switching research have been discussed. As noted by Muysken (1995:178), the study of code-switching requires theoretically-based structural analysis, the aim of which is to provide universal explanations for code-switching and monolingual data alike. Research into structural aspects of code-switching should be firmly based on adequate syntactic analyses. As suggested by Woolford (1983:521), such research can, in turn, provide evidence bearing on questions in grammatical theory. The challenge is for researchers to keep themselves informed of theoretical developments.

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⁶ A converged variety is the result of extensive mixing of two languages by speakers in a community, leading to convergence on lexical and grammatical levels, to the extent that the mixed code becomes the norm. An example is the non-standard Afrikaans spoken by inhabitants of District Six (cf. McCormick 2002).

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