

BIBLIOTHÈQUE DES CAHIERS DE L'INSTITUT  
DE LINGUISTIQUE DE LOUVAIN — 130

In and Out of Africa  
Languages in Question

*In Honour of Robert Nicolai*

VOLUME 1

Language Contact and Epistemological Issues

edited by

Carole DE FÉRAL



PEETERS  
LOUVAIN-LA-NEUVE – WALPOLE, MA  
2013

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# ON THE UNITY OF CONTACT PHENOMENA: THE CASE FOR IMPOSITION

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## 1. INTRODUCTION

The emergent field of Contact Linguistics faces a number of fundamental challenges, not least of which is to reach agreement on a unified theoretical framework for the study of contact-induced change. All of the frameworks that have been proposed so far follow the classification established by Weinreich (1953), who distinguished between “borrowing” and “interference” as the two basic types of cross-linguistic influence. This classification also formed the basis of Thomason & Kaufman’s (1988) very comprehensive framework for contact-induced change, in which they examined a wide variety of outcomes of language contact. Thomason & Kaufman also classified contact-induced changes into two broad types — those due to borrowing, and those due to interference through shift (1988: 37). Other scholars have proposed modifications to these traditional frameworks, but essentially preserve the same basic classification of changes. For instance, Johanson’s (2000, 2002) “code-copying” framework distinguishes between two broad vehicles of contact-induced change — “adoption” (a term that Johanson prefers to borrowing) and “imposition”, which corresponds closely to interference via shift.

The apparent agreement concerning the broad distinction between the two major “mechanisms” of contact-induced change masks some significant differences in conceptions of what these mechanisms involve, as we will see later. In addition, scholars have proposed a variety of labels and terminology to describe types of contact-induced changes. Among the distinctions made are the following:

- Borrowing versus grammatical replication (Heine & Kuteva 2005:6)<sup>1</sup>
- Global copying versus selective copying (Johanson 2002:291)<sup>2</sup>

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<sup>1</sup> The former refers to “contact-induced transfer involving phonetic substance of some kind or another” (2005: 6). On the other hand, grammatical replication refers to the transfer of grammatical use patterns, e.g. syntactic relations, and grammatical categories, i.e., meanings or functions (2005: 2).

<sup>2</sup> The former refers to the total transfer of a linguistic element, including its form and functions. The latter refers to the copying of selected structural properties without the material forms of the elements in question (Johanson 2002: 291).

- Direct versus indirect diffusion (Aikhenvald 2002)
- Replication of linguistic matter (MAT) versus pattern replication (PAT)<sup>3</sup> (Matras & Sakel 2007)

These distinctions seem to be based largely on the nature of the features that are transferred, and all differentiate between the transfer of overt material and the transfer of more abstract structural features.

All of these frameworks and their attendant classifications of contact phenomena have added a great deal to our understanding of contact-induced change. However, with few exceptions, they fail to establish clear and precise relationships between the outcomes themselves, and the processes or mechanisms of change that produce them. This has led in many cases to misleading or inaccurate classifications of the contact phenomena themselves, as well as to misunderstanding and misrepresentation of the mechanisms of change involved. Nowhere is this more apparent than in the case of contact phenomena that involve structural or semantic transfer across languages. These are the phenomena that have been referred to variously as “interference via shift”, “selective copying”, “pattern replication” “convergence” (Croft 2003: 51; Myers-Scotton 2002) and so on. Henceforth I will follow Heine & Kuteva in referring to such phenomena as cases of grammatical replication.

For the most part, scholars have been content with the classifications summarized above, which are based primarily on the results of contact-induced change, rather than on the (psycholinguistic) mechanisms involved. Those scholars who do propose some connection between particular outcomes and particular mechanisms often fail to make the connection clear or explicit, as I will argue further in Section 3. Moreover, the “mechanisms” proposed seldom speak to the actual psycholinguistic processes that initiate change as a result of the contact between competing linguistic systems in the minds of individual speakers who are themselves the agents of change. In the rest of this paper, I argue that a unified explanation of the phenomena loosely referred to as cases of “grammatical replication” is possible, if we focus our attention on the psycholinguistic mechanism that underlies them all. I propose that the mechanism at play is imposition — one of the two universal mechanisms of contact-induced change proposed by van Coetsem (1988, 2000). In the following section, I provide a brief account of van Coetsem’s

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<sup>3</sup> The former is defined as “direct replication of morphemes and phonological shapes from a source language” (Matras & Sakel 2007: 829). In the case of PAT, on the other hand, “it is the patterns of distribution of grammatical and semantic meaning, and of formal-syntactic arrangement at various levels [...] that are modeled on an external source” (Matras & Sakel 2007: 829-830).

framework, focusing primarily on his concept of imposition as a psycholinguistic mechanism of change. I also illustrate the outcomes of imposition with examples from various contact situations described in the literature. In Section 3, I discuss the differences between van Coetsem's framework and the other frameworks mentioned above. I argue that his approach offers a more consistent, accurate, and principled explanation for grammatical replication in a variety of different types of language contact, including second language acquisition, creole formation, language attrition and others. In section 4, I discuss psycholinguistic models of bilingual language production, and suggest ways in which the concept of imposition might be interpreted in terms of such models. Section 5 discusses directions and problems for future research on the role of imposition in language contact.

## 2. VAN COETSEM'S FRAMEWORK

The major contribution of van Coetsem was to refine and clarify the traditional distinction between "borrowing" and "interference" by distinguishing the types of mechanism and agency that they involve. His approach classifies contact-induced changes into two types — those due to borrowing, and those due to imposition. In both types of transfer, there is a source language and a recipient language.<sup>4</sup> The direction of transfer is always from the source language to the recipient language, and the agent of the transfer is either the recipient language speaker or the source language speaker. In the former case we have borrowing (recipient language agentivity), in the latter, imposition (source language agentivity). The distinction between these two types of transfer is based, crucially, on the psycholinguistic notion of language dominance. This refers roughly to the degrees of proficiency that the speaker has in each language, though it must be emphasized that a speaker may have different degrees of proficiency in different areas of a language. Generally, however, a speaker is linguistically dominant in the language in which he is more proficient or fluent — which is usually, but not necessarily, his first or native language (van Coetsem 1988: 13). In borrowing, the speaker, as agent of change, introduces elements from an external source language (SL) into a recipient language (RL) in which he is linguistically

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<sup>4</sup> The distinction between recipient and source language is more consistent than others that have been used in the literature, such as donor versus replica language, superstrate versus substrate language, and the like.

dominant. Hence borrowing involves RL agentivity. As van Coetsem (1988: 3) explains,

If the recipient language speaker is the agent, as in the case of an English speaker using French words while speaking English, the transfer of material (and this naturally includes structure) from the source language to the recipient language is *borrowing (recipient language agentivity)* [italics in original].

In imposition, on the other hand, the speaker, as agent, is linguistically dominant in the source language, and hence transfers features of it into his version of the recipient language, via SL agentivity, “as in the case of a French speaker using his French articulatory habits while speaking English.”

In this framework, it is crucial to distinguish linguistic dominance, which is an individual psycholinguistic phenomenon, from social dominance, which is a socio-political concept, based on the power or prestige standing of one of the languages. The socially dominant language may or may not be the linguistically dominant language of the speaker. In addition, both linguistic and social dominance relationships may change over time, in individual speakers and in the community at large. Such shifts in dominance result in differences in the nature and direction of change in the languages in contact. The asymmetry between borrowing (RL agentivity) and imposition (SL agentivity) also explains why the linguistic consequences of these two mechanisms differ so markedly. This is related to another key concept in van Coetsem’s framework, which he calls the stability gradient of language. This refers to the fact that certain components of a language, such as phonology, morphology, and syntax, tend to be more stable and hence resistant to change, while others, such as vocabulary, are less stable and thus more amenable to change. A speaker will tend to preserve the more stable components of the language in which he is linguistically dominant. This is why borrowing tends to involve transfer primarily of vocabulary and some kinds of functional elements, while imposition tends to involve transfer of phonological and grammatical elements and structures.

To sum up, in borrowing, the RL is the dominant language of the speaker. Hence borrowing involves transfer from a linguistically non-dominant SL to a linguistically dominant RL. The speaker will tend to preserve the more stable components of his grammar, e.g., phonology, morphology, syntax. In imposition, the SL is the dominant language of the speaker; hence imposition involves transfer from a linguistically dominant SL to a linguistically non-dominant RL. The speaker will tend to preserve, and transfer, more stable components of the dominant language, including phonology, syntactic patterns, grammatical categories, etc.

The concept of imposition, as defined here, is of course quite compatible with notions such as interference due to shift with imperfect learning,

substratum influence, or transfer in second language acquisition. All of these involve transfer from a linguistically dominant first language into a non-dominant second language, so they are clear cases of imposition or SL agentivity. In all cases, the transfer involves some kind of grammatical replication, i.e. the replication of some L1 grammatical pattern, meaning, or function in the L2. The vast majority of the literature is in fact concerned with this kind of transfer (from L1 to L2) in situations involving tutored and natural SLA, as well as creole formation. Examples of the outcomes of such change abound in the literature, so I will provide just a few here, just for illustration. Thomason & Kaufmann (1988: 133-135) list a variety of changes at all levels of linguistic structure, which were introduced into Ethiopic Semitic under substratum influence from Cushitic languages. These included the introduction of a future tense, new morphological patterns to express functions such as negative perfect and the causative, the development of ‘converbial’ (gerund) constructions, and changes in word order. With regard to creole formation, it has been shown that a great deal of the grammar of Atlantic creoles is modeled on that of their West African substrates. For example, Caribbean creole languages have a wide range of serial verb constructions that replicate similar structures in the substrates. For example Migge (1998) demonstrates that Ndjuka, a Surinamese creole, employs a range of SVCs with ‘give’ as the V2, where ‘give’ introduces a range of thematic roles (recipient, benefactive, substitutive, etc.) that are also found in Gbe and other languages that were the principal substrates for the Surinamese creoles.

(1) Ndjuka *Mi seli a osu gi en* (Migge 1998:236)  
 1sg sell DET houseSV 3sg  
 ‘I sold the house to him/her’

(2) Ewegbe *ye d3ra mafina-a ne amba*  
 3pl sell machine-the SV Amba  
 ‘They sold the computer to Amba’

We find similar kinds of grammatical replication in more contemporary contact situations as well. For example, Odlin (1990) reports that, in Andean Spanish, the SVO order of general Spanish is often replaced by an SOV pattern due to Quechua influence, as in the following example (Odlin 1990: 103):

(3) *Y mi hermano aquí otro paloma hembra había chapado*  
 ‘And my brother here another dove female had caught’

Similarly, Sanchez (2006) discusses cases of what she calls “functional convergence” between Quechua and Andean Spanish, as exemplified in the latter’s use of the Spanish verb *querer* ‘to want’ to convey the sense of an imminent



action, on the model of the Quechua affix *-naya-*, which expresses both a desiderative sense, and the imminent nature of a verbal action. The following examples from Sanchez (2006: 289), produced by the same bilingual child, illustrate:

- (4) And. Span. *Y el perrole (e)sta queriendo morder a ese sapo*  
 And the dog is wanting to.bite P that toad  
 ‘And the dog wants to/is about to bite the toad’
- (5) Quechua *Achku miku-naya-yka-n*  
 Dog eat-DES-PROG-3  
 ‘The dog wants to/is about to bite.’

### 2.1. Imposition and L1 attrition

By contrast with the vast literature on L1 to L2 transfer, there is a surprising dearth of studies dealing with transfer in the other direction, from L2 to L1. Such transfer is particularly common among bilinguals for whom the L2 becomes the primary and dominant language, and whose L1 undergoes varying degrees of attrition. Such bilinguals often impose features of the L2 on their L1 to compensate for their loss of proficiency in the latter. A well documented case of this is the variety of Spanish used by English-dominant bilinguals in Los Angeles (Silva-Corvalán 1998). They produce structures like the following:

- (6) a. LA Spanish *Se lo dió p’atras*  
 3sg.dat 3sg.accus gave back  
 ‘S/he gave it back to him/her.’
- b. Gen. Spanish *Se lo volvió*  
 3sg.dat 3sg.accus returned  
 ‘S/he gave it back to him/her.’

Here, *dar p’atras* is a direct calque on the English expression *give back*, which is normally conveyed by *volver* ‘to return’ in General Spanish. Similarly, Clyne (2003) discusses various examples where English syntactic patterns are replicated in the ancestral languages of Dutch and German immigrants in Australia, who have become dominant in English, leading to attrition of their L1s.

- (7) a. Aus. German *Wir haben gegangen zu Schule in Tarrington*  
 We have gone to school in Tarrington
- b. St. German *Wir sind in Tarrington zur Schule gegangen*  
 we Aux.be in Tarrington to school gone  
 ‘We went to school in Tarrington’ (Clyne, 2003: 80)
- (8) a. Aus. Dutch *je heb te look voor een ander job*  
 You have to look for an other job

- b. St. Dutch *je moet een andere baan gaan zoeken*  
 you must an other job go seek  
 ‘You have to look for another job.’ (Clyne 2003: 178)

Other examples of grammatical replication can be found in the attriting L1 of bilingual immigrant children for whom the L2 of a host community is becoming dominant. Matras & Sakel (2007: 855) provide the following example of English influence on a trilingual child’s Hebrew and German:

- (9) a. Child’s Hebrew *ani kar*  
 I cold.m  
 b. St. Hebrew *kar l-i*  
 cold to-1sg  
 ‘I am cold.’
- (10) a. Child’s German *ich bin kalt*  
 I am cold  
 b. St. German *mir ist kalt*  
 me.DAT is cold  
 ‘I am cold.’

In both cases, the child employs a predicative adjective construction based on the model of English, instead of the Standard Hebrew and German constructions in which ‘cold’ is the subject and the experiencer is in oblique (dative) case. There are many other studies of similar kinds of convergence due to imposition from a newly dominant language on the attriting L1 of bilingual children.

This brief overview is meant to show that grammatical replication is an extremely common result in a wide range of situations in which one language dominates the other in bilingual individual’s competence and production. This happens under circumstances of language shift, with L1 features being imposed on an L2 in the course of SLA, and in cases of L1 attrition, with L2 features being imposed on the L1. By and large, there seems to be consensus that, at least in SLA and creole formation, the transfer of grammatical patterns and categories is due to similar mechanisms, identified variously as “transfer”, “substratum influence” and the like. I propose that the mechanism of imposition offers a more satisfactory explanation of such cases of grammatical transfer. However, with regard to the kinds of grammatical replication involved in cases of language attrition, there seems to be less consensus as to what mechanisms are involved. In fact, this area of contact-induced change has traditionally been neglected, and most of the major frameworks discussed earlier fail to provide any account, far less explanation, of how cases of language attrition fit into the general scheme of things. Hence it is not surprising that precisely these

kinds of grammatical replication have been the subject of most misunderstanding and misinterpretation in the field. In the following section, I discuss how such phenomena have been treated in some of the major frameworks, and then discuss them in the light of van Coetsem's model. I argue that the latter offers a more accurate explanation of changes due to language attrition, which other frameworks have either neglected or mischaracterized.

### 3. PROBLEMS WITH CURRENT FRAMEWORKS

Thomason & Kaufman's (1988) seminal contribution to the field of contact linguistics introduced a comprehensive framework for the study of language contact, which established the foundation for future work in the field. They provided a very broad overview of contact phenomena and the various kinds of contact situation in which they emerge. And they emphasized the interaction of linguistic and social factors, and the key role played by the sociolinguistic history of the community, in determining the nature and degree of contact-induced change.

However, their classification of contact-induced changes into cases of "borrowing" versus "interference via shift" is highly problematic in some respects. Smits (1998: 377) points out that "their classification unnecessarily obscures our understanding of the linguistic effects of language contact." This is because they define borrowing as inextricably linked to language maintenance, and interference exclusively as a product of shift that produces 'imperfect' second language acquisition. An unfortunate consequence of this, as Smits points out, is that Thomason & Kaufman include under borrowing a variety of contact induced phenomena that are in fact due to an entirely different mechanism — imposition. It turns out, in fact, that Th&K's concept of borrowing leads to mischaracterization of a broad range of contact-induced changes that occur in situations of language maintenance, where speakers are engaged in shift to a second language, while maintaining their original first or native language. When such speakers become linguistically more proficient or dominant in their second language, they tend to transfer features from it to their original language. Given the new linguistic dominance relationship between their languages, such changes fall under the ambit of imposition via SL agentivity. These are the kinds of changes that have been mistakenly characterized as cases of structural borrowing in the work of Thomason & Kaufman and others. A well-known case in point is that of Asia Minor Greek, which changed drastically at all levels of structure under the influence of Turkish. Thomason & Kaufman (1988) treat this as a case of structural borrowing, arguing that, "if Turks did not shift to Greek, all of the interference

must be due to borrowing” (p. 218). Winford (2005: 408) notes that “this overlooks the strong possibility that bilinguals, especially those that were Turkish-dominant, played a key role in introducing these changes”. This is in keeping with van Coetsem’s observation that “the linguistic dominance relation between the RL and the SL [...] determines whether RL or SL agentivity will result from the contact” (1988: 83).

Smits (1998: 387) criticizes Th&K’s approach for including under the umbrella of borrowing both changes that are due to RL agentivity, and others that are due to SL agentivity or imposition. She notes that, in their approach,

[...] borrowing not only entails interference from a linguistically non-dominant language into a maintained *linguistically dominant* RL... but also entails interference from a linguistically dominant SL into a *linguistically non-dominant* RL [italics in original].

As a consequence, Th&K’s notion of borrowing “refers to two fundamentally different contact situations, yielding fundamentally different linguistic effects” (ibid.). Smits supports her case convincingly by demonstrating that structural changes in Iowa Dutch under English influence are far better explained in terms of imposition than borrowing. Within the Dutch speaking community in Iowa, English has become the linguistically dominant language for most speakers, though Dutch is maintained. As a consequence, many speakers are no longer very proficient or fluent in their ancestral language. The linguistic consequences are precisely what van Coetsem’s model would predict.

- Lexical influence from English is highly marginal;
- The Dutch inflectional system has been seriously affected both by internal processes of reduction and external influence from English;
- There is a great deal of phonological and syntactic interference from English.
- Smith concludes from this that the changes in Iowa Dutch are clearly the result of imposition.<sup>5</sup>

Another framework that has gained currency in recent times is that of Johanson (2002), who uses the term “code copying” to refer to language contact phenomena in situations of bilingualism. As noted earlier, Johanson distinguishes between two broad categories of contact-induced change — global and selective code copying (2002:291). The latter type “is traditionally known as “loan phonology”, “loan semantics”, “loan syntax”, etc.” (2002: 292), and

<sup>5</sup> Thomason (2003: 692) revises her distinction between borrowing and shift-induced change, defining the former as transfer into a language spoken fluently, and the latter as transfer into a language that is learned imperfectly. But, as Smits (p. 386) notes, she still mischaracterizes as “borrowing” changes that are due to imposition.

leads to what we are referring to here as grammatical replication. According to Johanson, code copying comes about in two ways, through “adoption”, and through “imposition”. Adoption refers essentially to what others have called borrowing — a term that Johanson rejects as being “based on a deceptive metaphor” (2002: 288). At first glance, it would seem that Johanson’s distinction between adoption and imposition is equivalent to van Coetsem’s distinction between borrowing and imposition. This is further suggested by the fact that Johanson also appeals to “dominance relations” to distinguish adoption from imposition. But in fact, Johanson’s interpretation of dominance, and hence of imposition, is radically different from van Coetsem’s.

In Johanson’s framework, the dominance relations between languages refer specifically to *social* dominance, not linguistic dominance. He claims that

[...] the dynamics involved in language contact depend on asymmetrical dominance relationships between a sociolinguistically-dominated or “weak” code A and a sociolinguistically-dominant or “strong” code B. Code B enjoys prestige among A speakers because it is associated with some kind of power or status (2002: 289).

Johanson further claims that these (social) dominance relationships “produce different kinds of linguistic dynamics with respect to directionality” (ibid.), leading to adoption in some cases and imposition in others.

In the case of adoption, speakers of a sociolinguistically-dominated code A insert copies from a sociolinguistically-dominant code B. In the case of imposition, speakers of the sociolinguistically-dominated code A insert copies from it into their own variety of the sociolinguistically-dominant code B (2002: 290).

This strict equation of transfer type with a particular social dominance configuration of course runs completely counter to the psycholinguistically-based association of a transfer type with a particular linguistic dominance configuration, as in van Coetsem’s model. For Johanson, any form of transfer from a socially dominant to a subordinate language must be borrowing, while any form of transfer in the opposite direction must be imposition. We have seen from the example of Iowa Dutch that this is a mistaken view of how transfer works, since it is (changing) linguistic dominance that determines when borrowing or imposition takes place. Indeed, some of the examples of the “adoption of selective copies” that Johanson himself provides seem clearly to be the result of imposition (in our sense). For instance, he cites Jones’ (2002) description of English influence on Guernésiais as an instance of adoption. Examples provided by Jones include the following:

- The tendency to prepose adjectives;
- Copying of the syntax of passive constructions;

- Use of a single preposition ‘with’ for both comitative and instrumental meanings;
- Change of meanings and connotations of Guernésiais verbs due to formal similarities to English verbs.

Such cases of transfer can be better explained in terms of the growing dominance of English among speakers of Guernésiais, leading to imposition of the same sort that Smits describes for Iowa Dutch.

Johanson himself has nothing to say about linguistic dominance relationships and the role they play in contact-induced change. In fact, he specifically eschews any attempt to explain contact phenomena in psycholinguistic terms:

[...] changes due to code-copying will be discussed exclusively in terms of observable linguistic structures. It will not be claimed that copies are psycholinguistically produced or processed in the steps discussed (2002: 287).

Such an approach is unfortunate, since it incorrectly assigns many instances of contact-induced change to the wrong category of adoption (that is, borrowing), rather than recognizing them as cases of imposition in van Coetsem’s sense of the term.

The implications are far-reaching, since imposition can occur in any situation of bi- or multi-lingualism where the dominance relationship between the languages changes. For the most part, these are situations of gradual language shift, with attrition of the ancestral language, accompanied by increasing influence from a second (usually a socially dominant) language, which is becoming the primary language of the shifting group. As we have seen, contemporary bilingual situations provide rich and abundant illustration of these patterns of change.

In the next section, I provide further support for the role of imposition as the mechanism underlying grammatical replication from psycholinguistic studies of bilingualism. Following that, I suggest ways in which psycholinguistic models of language production might enrich our understanding of the dynamics of imposition.

#### 4. LANGUAGE PROCESSING AND PRODUCTION IN BILINGUALS

The literature on second language acquisition has shown that acquisition of the L2 is mediated by transfer from the more dominant L1 (Odlin 1989; MacWhinney 2005). Similarly, psycholinguistic studies of second language acquisition have provided substantial empirical support for transfer from the L1 to the L2 at the level of sentence processing (MacWhinney 1997, 2005). There is now a substantial body of evidence from both psycholinguistic and SLA studies that “the acquisition of a native language has a fundamental and

long-lasting effect on how the sub-lexical and lexical units of a language are perceived and acquired” (Schwartz & Kroll 2006: 975).

At the same time, there is abundant evidence that the acquisition of an L2 has an impact on the L1 (Schwartz & Kroll 2006: 968). For example, studies have shown that parsing processes that develop in L2 acquisition can transfer, and modify the parsing strategies that take place during online L1 processing (Dussias 2003). As Schwartz & Kroll (2006:968) point out,

Bilinguals are rarely equally proficient or balanced in their use of the two languages, rendering one of the languages the more dominant language. Typically, the more dominant language will be the first or native language, but for bilinguals who have lived in their L2 environment for many years, the L2 may be functionally more dominant, at least for certain language processing tasks.

Particularly relevant are studies that demonstrate how a bilingual’s degree of proficiency in the two languages has consequences for the degree and direction of transfer. Hamers & Blanc (2000: 175) point out that psycholinguistic studies of lexical access have demonstrated that “the degree of interlingual interference depends [...] on the bilingual’s proficiency in both languages”, and that “for dominant bilinguals the dominant language caused more interlingual interference than the weaker language.” The same is true with regard to syntactic processing (Hamers & Blanc 2000: 180ff). Evidence for this comes from psycholinguistic studies of sentence interpretation among bilinguals. For example, Liu, Bates & Li (1992) investigated the sentence processing strategies used by Chinese-English and English-Chinese bilinguals in San Diego. Their goal was to see whether speakers would follow the English strategy of relying on word order, or the Chinese strategy of relying on animacy, to determine what the subject of a sentence was. They presented subjects with a set of sentences in both languages, in which they varied the word order as well as the animacy of the nouns. Their results showed different patterns of processing for different groups of bilinguals. First, late bilinguals (those who had acquired either English or Chinese as an L2 after age 20) showed strong evidence of transfer of their L1 processing strategies into the L2. Liu & al. refer to this as “forward transfer.” Second, early bilinguals (native Chinese speakers who were exposed to English before age 4) displayed competing patterns, including differentiation (use of animacy strategies in Chinese and word order strategies in English), as well as “backward transfer”, i.e., “the use of L2 processing strategies in L1, a possible symptom of language loss” (1992: 451). A third group, Chinese-English bilinguals who had come to the USA between 12-16 years of age, also showed strong evidence of backward transfer from English to Chinese. We can assume that the different patterns of transfer are closely related to the dominance relationships between English and Chinese for each group of bilinguals.

Most of the psycholinguistic research has been focused primarily on language comprehension, to the neglect of language production. However, studies in second language acquisition and contact linguistics have provided evidence that both  $L1 > L2$  or “forward” transfer, and  $L2 > L1$  or “backward” transfer, also occur in language production. It still remains to be seen how the findings of this empirical research can be linked to the language production process itself, particularly at the level of grammatical encoding. Moreover, the implications of bilingual language production for processes of contact-induced change are still under-explored. The challenge now is to explain how models of language production can shed light on the processes by which such changes come about.

## 5. A MODEL OF LANGUAGE PRODUCTION

Scholars who have attempted to explain the linguistic production of bilinguals have usually based their approach on models of unilingual language production such as Levelt’s (1989) “Speaking” model. The basic aim of this model is to describe the normal language production of a speaker, and to explain how, in the course of speech production, conceptual structures are mapped onto linguistic form. It is generally agreed that three types of mental processes are involved:

- conceptualization processes that specify which concepts are to be expressed verbally;
- formulation processes that select appropriate lexical items and construct the syntactic and phonological structure of the utterance; and
- articulation processes that realize the latter as overt speech (Roelofs 1993: 108).

The basic outline of the model is shown in Figure 1.

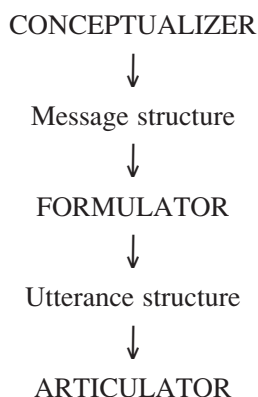


Figure 1. *A simplified model of language production*



As figure 1 suggests, the process of speaking starts with the concepts and message the speaker wishes to convey. This provides the raw material for two components of the production process — the Formulator, which is concerned with grammatical processing or encoding, and the Articulator, which is concerned with phonological encoding, i.e., spelling out the phonological structure of the utterance. Our main concern here is with the processes of grammatical encoding via which messages are mapped onto linguistic form. Bock & Levelt (1994: 946) offer a more detailed model of the production process, shown here as Figure 2.

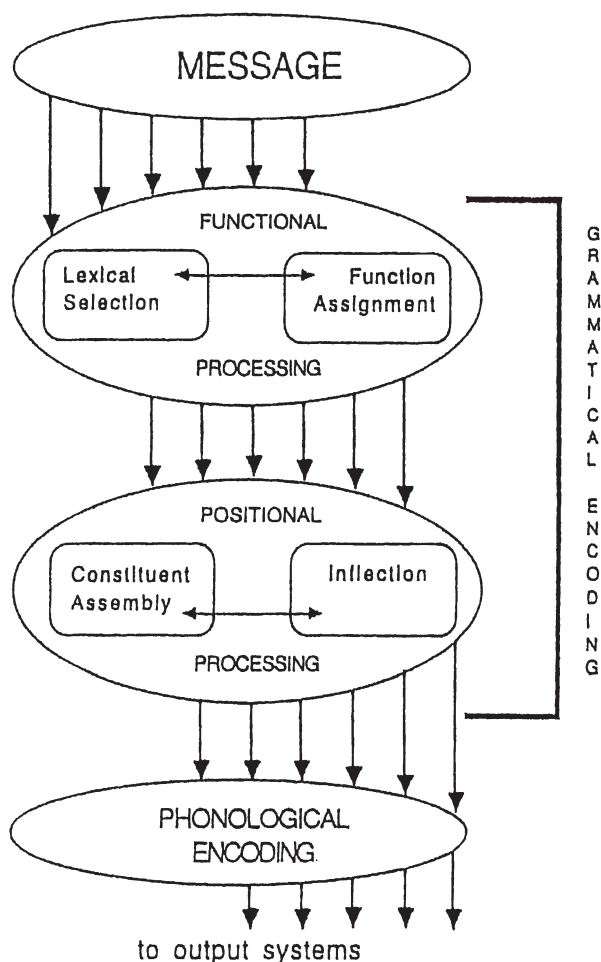


Figure 2. *Language production processes* (Bock & Levelt 1994: 946, Figure 1)

As Figure 2 shows, grammatical encoding involves two subcomponents, functional and positional processing, each consisting of two steps. At the level of functional processing, the first step is lexical selection, which “involves identifying the lexical concepts and LEMMAS suitable for conveying the message” (Bock & Levelt 1994: 947). Lemmas contain information about the selected lexical concepts, such as their semantics, form class membership, and grammatical properties. The second step in functional processing is function assignment, which involves assigning syntactic or grammatical functions such as subject-nominative, object-accusative, etc., to relevant lexical concepts. For instance, in producing an utterance such as “The dog bit the boy”, the lemma for ‘dog’ will be linked to the nominative (subject) function, the lemma for ‘boy’ to the accusative function, and the lemma for ‘bite’ to the main verb function. Lemmas are distinct from lexemes, which represent the phonological form of the word, which is spelt out only at the stage of articulation (phonological encoding). Note that the assumption here is that “verbs somehow control function assignment” (Bock & Levelt 1994: 966). For instance, the lemma for ‘bite’ specifies that it requires two arguments — an agent, and a patient. The assignment of the nominative and accusative functions to the agent and patient respectively, creates a simple utterance. The centrality of the verb to the organization of clause and sentence production is a crucial point in explaining many cases of imposition — a point to which we return below. To sum up, Bock & Levelt state:

Functional processing, as we have described it, yields an activated set of lemmas and a set of syntactic functions, linked together via the argument structures of the lemmas (notably that of the verb) (1994: 968).

The next step in language production, positional processing, fixes the order of elements in the utterance. It consists of two steps — constituent assembly, and inflection. The former involves “the creation of a control hierarchy for phrasal constituents that manages the order of word production and captures dependencies among syntactic functions” (Bock & Levelt 1994: 947-8). Such a hierarchy can be represented as a syntactic tree, and is “largely predictable from the types of syntactic functions that have to be represented and from the syntactic features of the selected lemmas” (Bock & Levelt 1994: 948). The final step in grammatical encoding, inflection, involves generating the elements that carry information about notions like number, gender, tense, etc., which have to be attached to the relevant words. Bock & Levelt illustrate the products of grammatical encoding as shown in Figure 3, using the utterance “She was handing him some broccoli” as the target to be generated.

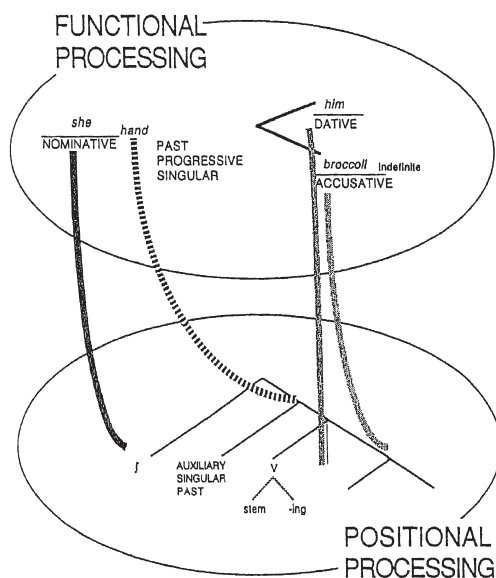


Figure 3. *Processes of grammatical encoding* (Bock & Levelt 1994: 977, Figure 6)

## 6. A MODEL OF BILINGUAL LANGUAGE PRODUCTION

From the perspective of a theory of interference in bilingual speech, the challenge is to design a model of language production that can shed light on the specific types of crosslinguistic influence that occur. De Bot (2001) has suggested various ways in which Levelt's model of monolingual production can be adapted to account for bilingual speech. Obviously, as he points out, the model must not only account for crosslinguistic influences of various types, but also "deal with the fact that the speaker does not master both language systems to the same extent" (2001: 425). Hence, such a model must be able to account for the following aspects of bilingual language production (De Bot 2001: 425):

- The two language systems involved can be used independently of each other, or they may be mixed in various ways (as in code switching, for example);
- The two systems may influence each other;
- The bilingual speaker may have different degrees of proficiency in each system;
- Interactions can take place between languages that are typologically similar or dissimilar.

The last three points, concerning crosslinguistic influence and degrees of proficiency, are directly relevant to our present concern with grammatical replication. The sources of such influence lie at various points in the language production process, beginning with the level of conceptualization, and proceeding through each stage of grammatical encoding, to phonological encoding. For example, a model of bilingual production would have to account for how lexical selection takes place in bilinguals, which in turn “entails the question of how the systems are kept apart or mixed depending on the situation” (De Bot 2001: 432). De Bot adopts Paradis’ (1987) “Subset Hypothesis”, which holds, among other things, that the bilingual lexicon is a single storage system in which links between elements are enforced through continual use (2001: 430). This implies that elements from one language are more strongly linked to each other than to elements of another language, leading to formation of subsets of elements that can be retrieved separately. At the same time, for bilinguals who practice frequent code switching, the links between elements from the two languages may be similar to those in a monolingual lexicon (*ibid.*). De Bot discusses some of the empirical evidence that provides support for his adapted model of bilingual language production. For instance, skilled bilinguals can and do keep their languages apart, but their patterns of code switching suggest that there are in fact subsets of the lexicon that can be activated (2001: 439). More relevant to our concerns is his point that the majority of bilinguals will not have a complete command of both languages, and that this can lead to interference at the level of lemma access. As he puts it:

It is clear that when the speaker has very little knowledge of the L2 he can still make utterances in that L2 by making some (internal) extensions to the L1 system. In this way it is plausible to think that it is only the morpho-phonological information for lexical items in the L2 which is L2 specific, while syntactic information from the L1 translation equivalent is activated” (2001: 441).

In other words, it is possible for a single lemma to be associated with two lexemes from the two languages. This kind of association seems to lie behind cases of lexical as well as grammatical interference in the production of speakers for whom one of the languages is dominant. In such cases, the speaker may treat a lexeme in the less dominant language as an alternative phonological shape to that of an L1 lexeme, and associate the latter’s lemma with both. Interference phenomena such as “semantic loans or extensions” and “calquing” are well known examples of this at the lexical level. A similar explanation lies behind phenomena that are common in the early stages of second language acquisition, where the learner acquires L2 lexical items but not all aspects of their grammatical properties, including often their grammatical category, their precise semantic content, and their subcategorization requirements This explains

why early learners sometimes assign the incorrect category to L2 items, treating adjectives as nouns, or nouns as verbs, and so on (Pienemann 1999: 50). Similarly, it explains why early learners cannot produce L2 sentences with the appropriate constituent structures, since that relies crucially on the syntactic subcategorization of lexical material, as contained in lemmas (Pienemann 1999: 51). Faced with the need to produce utterances in an L2 with which they are not familiar, learners often resort to L1 knowledge and procedures. One solution they adopt is to attach an L2 lexeme to an L1 lemma as an alternative phonological shape. As Pienemann suggests:

If the L2 word is simply attached to the L1 lemma as an alternative morphophonological form, then the complete L1 syntactic information would be available upon accessing the lemma. (1999: 83)

De Bot (2001: 442) similarly suggests that, for many bilinguals, “a lemma can be linked to various form characteristics depending on the language or languages involved.”

All of this has implications for the kinds of grammatical replication that occur in cases where differences in language dominance lead to influence from the more dominant language on the other. In the following sections, I attempt to show how insights from psycholinguistic models of language production can shed light on the specific kinds of crosslinguistic influence that occur in bilingual speech, and particularly the kinds of grammatical replication discussed here. I then apply these insights to cases of contact-induced change that have occurred in the past, as discussed earlier. The challenge is made harder by the fact that the available models were not designed to account for processes of change, or for development from one stage to another in bilingual language competence and production (2001: 440). However, we will proceed on the assumption that the same processes of bilingual language production that can be observed at any synchronic moment were also involved in the processes of innovation that yielded the results of contact-induced change. The insights from the recent research on bilingual language use, and the kinds of language mixture or interference it involves, are particularly instructive for our purposes.

## 7. THE WORKINGS OF IMPOSITION

In this section, I discuss cases of grammatical replication that result from both “forward” and “backward” transfer, and argue that the mechanism involved in both cases is imposition, which simply involves employing the production procedures of the more dominant language in producing the less dominant one.

### 7.1. *Imposition from L1 to L2*

As discussed earlier, it is now well known that learners' L1s exert varying degrees of influence on their acquisition and production of an L2, leading to transfer at potentially every level of structure. Most of the research on forward transfer has concentrated on the acquisition of L2 phonology and lexicon (see Schwartz & Kroll 2006 for further discussion). But there is also abundant evidence that learners' L1 influence their production of the L2 at every level of structure. As a first step toward explaining these kinds of crosslinguistic influence, we might try to establish what types of transfer occur at different stages of grammatical encoding, using the model suggested by Bock & Levelt (1994), as outlined earlier. We can begin with the level of functional processing, which includes lexical selection, and function assignment. Recall that lexical selection involves identifying the lexical concepts and lemmas that are suitable for conveying the message. As we saw earlier, one of the assumptions of language production models is that lemmas activate or trigger syntactic procedures that correspond to their syntactic specifications. Thus, a verb will trigger construction of a VP, a noun the construction of an NP, a preposition the construction of a PP, and so on.

The argument structure and syntactic subcategorization properties of verbs, in particular, are crucial to appropriate assignment of functions to the constituents of a sentential structure. Verbs are associated with specific thematic roles (such as "agent", "patient", "theme", etc.), which in turn are mapped onto particular grammatical functions (e.g., "subject", "object" etc.) in language-specific ways. This kind of information is what is accessed at the level of functional processing. There is evidence from the SLA literature that many cases of transfer from L1 to L2 involve the assignment of an L1 lemma to an L2 verb form or lexeme, which results in production of L2 utterances which have the grammatical pattern of the L1. For instance, Nemser (1991) provides the following examples of L2 English, produced by L1 German learners in Austria.

- (11) L2 English    *Explain me something*  
       German        *Erklär mir was*
- (12) L2 English    *You just finished to eat*  
       German        *Du hast gerade aufgehört zu essen*

In these cases, the L2 English verbs assume the subcategorization properties of their semantically equivalent German counterparts. This comes about because learners assign the lemma of German *erklären* and *aufhören* to English *explain* and *finish* respectively. As a result, the function assignment procedures of German are used to produce the L2 English utterances. This

kind of grammatical replication is quite common in SLA, particularly in the early stages, when learners have acquired L2 lexemes, but have not acquired the lemmas associated with them. As Pienemann (1999: 76) has pointed out:

[...] the L2 learner is initially unable to deposit information into syntactic procedures, because (1) the lexicon is not fully annotated and more importantly (2) because even if the L1 annotation was transferred, the syntactic procedures have not specialized to hold the specific L2 grammatical information.

A typical solution, then, is to assign the lemmas associated with L1 lexemes, to what learners perceive to be semantically equivalent lexemes in (their version of) the L2. Recall that De Bot (2000: 441) makes a similar point about bilingual speech in general. This strategy is particularly common in cases of natural SLA, where access to the TL is limited. But it can also be found among classroom learners who are forced to produce utterances in an L2 that they have not fully acquired. For example, Helms-Park (2003) discusses examples of “forward” transfer like the following, from the L2 English of elementary-level Vietnamese learners.

- (13) L2 English    *Suzie cooked butter melted* (2003: 228)  
                           ‘Suzie melted the butter’
- Vietnamese    *Hoà đun                    nu’ó’c    soi* (2003: 217)  
                           Hoa cook(liquid)    water    boil  
                           ‘Hua boiled the water’
- (14) L2 English    *Harry is shake the bell rang*  
                           ‘Harry rang the bell’
- Vietnamese    *Giáp rung    cái            chuông    reo*  
                           Giap shake    CLAS    bell            ring  
                           ‘Giap rang the bell’

Helms-Park (2003: 213) notes that this is a fairly common strategy in SLA, by which learners, faced with incomplete TL information, “treat TL verbs as though they had the lexico-semantic structure and accompanying argument structures of their ostensible L1 translation equivalents.” The examples from Helms-Park also illustrate how differences in lexicalization patterns between languages can result in transfer. Lexicalization involves the ways in which information from CS [conceptual structure] is mapped onto lemma representations and grammatically encoded, so as to trigger procedures for lemma retrieval and, ultimately, syntactic composition (Bierwisch & Schreuder 1993: 49). Thus, “a given conceptual structure may be split up into different chunks corresponding to lexical items, depending on language-specific conditions of the lexical system” (Bierwisch & Schreuder 1993: 56). In the examples

provided by Helms-Park, the Vietnamese learners use the lexicalization pattern associated with causative constructions in their L1 to produce equivalent English structures.

Similar kinds of transfer are found in creole formation, which is now widely viewed as a somewhat unusual form of SLA in which learners drew quite heavily on L1 knowledge to compensate for their restricted access to and command of the superstrate languages. This often resulted in learners' production of sentential structures containing superstrate lexemes, but with the grammatical structure of substrate constructions. For example, Migge (2003: 96) provides examples of serial verb constructions in Pamaka, a maroon creole of Suriname, which have the structure of similar constructions in Gbe languages.

(15) PM *Den e hali a boto e go a liba*  
 3pl PROG drag DET boat PROG go LOC river  
 'They are dragging the boat to the river'

(16) Waci *ɔ la dɔn saki a yi afɔ-mə*  
 3pl FUT drag bag DET go house-in  
 'They'll drag the bag to the house'

Winford (2008: 140) argues that these types of grammatical replication can be explained as cases of imposition, in which the abstract argument structures and subcategorization properties of Gbe motion or transfer verbs like *dɔn* are imposed on superstrate lexical items such as *hali*. Like *dɔn*, *hali* requires that its Theme be mapped onto a direct object, while its Goal must be expressed by a directional VP complement headed by a verb like *go*, which indicates the direction of the transfer. This might be represented as follows:

(17) Agent	Theme	Direction	Ground
NP1	NP2	V[direction]	PP

There are numerous other examples of this type in creole formation, which demonstrate that the learner's L1, as the dominant language, controls language production processes at the level of Functional Processing, thus determining functional role assignment, subcategorization properties, complementation, and other procedures. This is in keeping with one of the key assumptions of current models of language production, which holds that "[...] the mapping between event [thematic] roles and functional roles seems to be heavily influenced by the specific requirements of different verbs and verb forms" (Bock & Levelt 1994: 964).



## 7.2. Imposition from L2 to L1

So far we have been concerned with cases where the speaker's first or native language, as the more dominant language, affects language production in the weaker L2. However, it is well known that bilinguals who use their L2 as the primary language often become more proficient in it, while losing some degree of proficiency in their L1 or ancestral language. As a result, they may employ the language production of the L2 in producing the L1 — a phenomenon which we referred to earlier as “backward transfer”. Silva-Corvalán (1998: 233) has documented examples of Spanish utterances like the following, produced by Spanish-English bilinguals in Los Angeles, for whom English has become the dominant language.

- (18) a. LA Spanish *Yo gusto eso*  
           I like-1s that
- b. Gen. Span. *A mi me gusta eso*  
           To me pro please-3s that  
           ‘I like that’

As Winford (2008: 141) argues, this is a clear example of imposition at the level of function assignment, which, as we saw earlier, is controlled primarily by the specific properties of the verb. In this case, the speaker activates the lemma associated with English *like*, and imposes it on the Spanish lexeme *gustar*. While both verbs have the same argument structure (requiring an Experiencer and a Theme), the mapping of thematic roles onto grammatical functions differs in the two languages. Thus, in General Spanish, the Theme of *gustar* is mapped onto the subject function, while the Experiencer role is mapped onto an indirect object. This mapping can be represented as follows:

- (19) Experiencer    Experience    Theme
- |                 |      |         |
|-----------------|------|---------|
|                 |      |         |
| Indirect object | Verb | Subject |

The English-influenced Spanish utterance in (18a), however, is clearly modeled on the English function assignment procedure associated with English *like*, in which the Experiencer role is mapped onto the subject function and the Theme role onto the object function.

- (20) Experiencer    Experience    Theme
- |         |      |        |
|---------|------|--------|
|         |      |        |
| Subject | Verb | Object |

This procedure is motivated by the speaker's perception of a semantic equivalence between *like* and *gustar* — a classic trigger for imposition.

## 8. IMPOSITION VERSUS “PIVOT-MATCHING”

The claim that imposition is the mechanism underlying the kinds of grammatical replication just discussed seems to be intuitively more economical and feasible than other explanations that have been proposed for similar cases of grammatical replication in the attriting L1 of bilinguals. An interesting case in point is the “pivot-matching” hypothesis proposed by Matras & Sakel (2007). They focus on what they refer to as “pattern replication”, in which “the patterns of distribution, of grammatical and semantic meaning, and of formal-syntactic arrangement at various levels (discourse, clause, phrase or word) [...] are modeled on an external source” (2007: 829). It’s clear that they are referring to various types of grammatical replication. They further suggest that the language-processing mechanism responsible for this type of replication “involves identifying a structure that plays a pivotal role in the model construction and matching it with a structure in the replica language, to which a similar, pivotal role is assigned in a new replica construction” (2007: 830). This is what they refer to as “pivot matching.” To demonstrate how this concept applies, they refer to the examples cited earlier as (9), repeated here as (21).

- (21) a. Child’s Hebrew *ani kar*  
I cold.m
- b. Standard Hebrew: *kar l-i*  
cold to-1sg
- (22) a. Child’s German: *ich bin kalt*  
‘I am cold’
- b. St. German *mir ist kalt*  
me.DAT is cold  
‘I am cold’

Matras & Sakel argue that, in this case, “the morphosyntactic construction of an adjectival predication [...] is selected as a pivot to express the feeling of cold, based on the English model” (2007: 856). It’s not clear, however, precisely what acts as the “pivot” in either of the recipient languages. One might suppose that the relevant pivot would be syntactic structures such as *NP Adj* and *NP Cop Adj*, which also exist in Hebrew and German respectively. Indeed, Matras & Sakel point out that sentences like *Ani kar* and *Ich bin kalt* are available in Hebrew and German respectively, but that they convey the meaning that “the speaker regards himself as a cold object (as in “My food is cold”), rather than as the experience of a cold feeling” (2007: 855). However, they reject the possibility that such constructions could have served as pivots for the grammatical replication in question, claiming that “the particular construction

selected by the child is not one that is available in his repertoire of either Hebrew or German” (2007: 856). So it is not clear what the “pivot” is in this case, or what this implies for Matras & Sakel’s claim that the mechanism behind “pattern replication” involves matching a pivotal construction in the model language with one in the replica language to which a similar pivotal role is assigned. This really offers no real explanation, since it is based on the erroneous assumption that the trilingual child in this case can actually match entire constructions in his three languages as a basis for replicating one in the other. This assumes far greater metalinguistic awareness on the part of the child than he may actually possess. Such awareness may be true of some balanced bilinguals, and this may allow them to “experiment” with various ways of mixing their languages. But, in normal circumstances, it would be odd to expect such a bilingual to transfer a grammatical pattern from one language to another, if he or she were equally proficient in each. On the other hand, unbalanced bilinguals are surely more likely to do this, especially when they begin to lose proficiency in one or the other language, and increase their proficiency in the other. This is apparently what happened in the case of this trilingual child, as he gained fluency in English, at the expense of lost fluency in his first two languages. Matras & Sakel (2007: 855) point out that the child produced these kinds of construction in Hebrew and English from the age of 5 onward, after starting school in an English-speaking environment, and using English as his principal language of interaction outside the home. So it seems clear that the child’s Hebrew and German production was due to imposition by his more dominant language, English, on his other two languages. In other words, all that is involved here is that the child uses the language production procedures of his newly dominant language, English, to produce English-like predicative structures in his less dominant languages. This suggests that the child has lost control of Hebrew and German function assignment procedures in favor of those from English. There is no need to appeal to any notion of pivot matching, involving some kind of matching of full constructions in the languages in question. Imposition in this case operates at the level of functional processing and constituent assembly simultaneously. In the first place, the child employs the function assignment procedures of English, to produce a predicative adjective construction in which the experiencer role is mapped onto the subject and the experience (‘cold’) is mapped onto a predicative adjective on the model of English, instead of the respective Standard Hebrew and German constructions in which the experience ‘cold’ is mapped onto the subject and the experiencer role is mapped onto an indirect object in dative case. Secondly, the child applies English word order at the level of positional processing, rather than the word order of Hebrew and German. In other words, the child has transferred the

abstract structure of English predicative construction to his now attriting versions of Hebrew and German (though preserving the Hebrew pattern of copula-less predication in the process).

Other cases of “pivot matching” leading to grammatical replication which are discussed by Matras & Sakel also lend themselves more easily to an explanation in terms of imposition. For example, they offer the following example of a German-dominant tourist’s production of an L2 English utterance.

- (23) *It was to*  
 “It [a gate] was closed”

They note that this is clearly modeled on the following German construction:

- (24) *Es war zu*  
 It was to  
 ‘It was closed’

In this case, they argue, the polysemy of the German model *zu* ‘to, closed’, acts as the pivotal feature of the model construction. Presumably, English *to* acts as the matching “pivot” of the tourist’s English construction. But a simpler explanation would be that this is a case of imposition at the level of lexical access, in which the lemma associated with German *zu* is transferred in its entirety to English *to*, triggered by the tourist’s recognition of the partial semantic equivalence between the two lexical items. This is a typical example of how bilinguals tend to assign a single lemma to two lexemes from different languages which they perceive to be related in some way, as was pointed out earlier. From this perspective, Matras & Sakel are right to point out that, in this case, the process of “pivot matching” involves speakers’ identification of “parallel items in the two languages as translation equivalents” (Matras & Sakel 2007: 833). That insight goes back to Weinreich’s (1953) observation that “interlingual identifications” are at the heart of most kinds of interference. But merely stating that speakers make such identifications and match “pivots” across their languages does not explain the mechanism behind such types of grammatical replication. An explanation in terms of imposition, as explained above, seems to capture this process more transparently, and with more economy.

We might note, finally, that Matras & Sakel’s claim that “pattern transfer” is often excluded when there is no available structure in the replica language which can assume the role of the “pivotal feature” of the model construction (Matras & Sakel 2007: 847) makes little sense for most cases of grammatical replication, particularly those involving learners who attempt to use an L2 with which they are not familiar. In such cases, as we have seen, learners clearly

have no knowledge of the grammatical encoding procedures of the L2, far less any knowledge of L2 “structures” that might be equivalent to those of their L1. Yet they manage to replicate quite complex L1 grammatical patterns in their version of the L2. The concept of imposition offers a compelling account of how such replication takes place, for instance through the transfer of L1 lemmas to L2 lexemes, as explained earlier for such cases of the development of serial verb constructions in Creole languages. It is precisely because learners have no proficiency in L2 procedures that they adopt those of the L1 to compensate. This is why the products of natural SLA so often represent what van Coetsem calls “catastrophic” modifications of an original TL.

The empirical evidence shows that there is potential for imposition at every stage of the language production process, from the level of lexicalization, to lexical selection and function assignment as parts of functional processing, to positional processing involving constituent assembly (including word order), to the selection of morphological categories and their realization, all the way to the level of lexeme selection and phonological encoding. The following table offers an outline of some of the types of imposition discussed here. The list can be expanded to include other cases of imposition discussed in the literature.

Level of language production	Examples
Lexicalization	Causative-type SVCs in the L2 English of Vietnamese speakers
Functional Processing	
a. Mapping of theta-roles onto syntactic functions	Assigning the mapping of English <i>like</i> to Spanish <i>gustar</i> ; Assigning the mapping of English <i>cold</i> to German <i>kalt</i>
b. Subcategorization of verbs	Serial verb constructions in creoles
Positional processing	
Constituent assembly	Use of Quechua SOV order in Andean Spanish

## 9. CONCLUSION

We have seen that imposition, as a mechanism of contact-induced change, has been attested in many cases of language contact, including second language acquisition, creole formation, and attrition of an ancestral language under conditions of shift to a new primary language. What is common to all of these situations is an unequal dominance relationship between the languages in contact, which encourages transfer from the linguistically more dominant to the less dominant language. In such situations, when speakers attempt to produce a language in which they are not proficient, they resort to using the language processing procedures associated with the more dominant language as a compensatory

strategy. This is what accounts, to a large extent for the similarities in the processes that we have observed in the various kinds of grammatical replication examined in this paper. An approach like this allows us to unite, under a single umbrella, a wide variety of contact phenomena that have been described in a variety of frameworks for a wide variety of contact situations. Hopefully, it will contribute toward constructing a unified theoretical framework for the study of language contact, but there is still much work to be done.

One of the challenges facing the field of Contact Linguistics is to integrate psycholinguistic approaches to cross-linguistic transfer more fully with linguistic approaches. Levelt's model of language production drew on lexicalist approaches to syntax such as Lexical Functional Grammar (Bresnan 1982). This can be seen as a clear invitation to contact linguists to pursue the connections between linguistic and psycholinguistic models. Recent research on SLA has set the stage for further exploration of these connections. For instance, Helms-Park (2003: 213) points out that "the use of L1 information in TL syntax-semantics mappings has recently become established as a significant transfer phenomenon in SLA, evident in the spurt of recent publications reporting empirical research in this area" (see Helms-Park 2003: 213-215 for a detailed overview). Many of these studies draw on lexicalist approaches to syntax, which assign a central role to the lexicon in the construction of sentences. This is in keeping with Levelt's view that "the lexicon is an essential mediator between conceptualization and grammatical encoding" (Levelt 1989: 51). Similarly, Pienemann (1999: 51) points out that "[...] recognition and/or production of the constituent structure of a sentence relies crucially on the syntactic sub-categorization of lexical material."

Approaches such as these provide a great deal of insight into the workings of imposition in SLA and creole formation. We've seen a number of cases in which speakers apply various production procedures of their more dominant language when they attempt to produce the less dominant language. So far, however, research on L1 > L2 imposition (or forward transfer) has commanded most of the attention in every field of research on cross-linguistic influence. There is therefore need for a great deal more research, both empirical and theoretical, on L2 > L1 or backward transfer, which has so far been seriously neglected. In addition, psycholinguistic research on transfer at the levels of morphosyntax and syntax has been lagging far behind the research that has been conducted in SLA and contact linguistics. Moreover, such psycholinguistic research as has been done focuses mainly on comprehension. Future research should therefore attend more to language production by bilinguals, so that we can achieve a greater integration of linguistic and psycholinguistic approaches to language contact.

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