

# The Bilingual Mental Lexicon



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By

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Dedicated to my grandsons,

Dylan and Gavin



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## PREFACE

As a commonly observed bilingual speech behavior, bilinguals may switch between two linguistic codes within sentence boundaries at a certain point during a discourse with other bilinguals who share the same languages. Such a bilingual speech behavior is called intrasentential code-switching (CS for short). Several profound theoretical models established by the leading scholars and the important findings provided by the expert researchers in CS have laid the solid theoretical foundation and provided directions for my research in this field. However, most studies have focused on describing surface configurations of switched items, that is, where the switching is structurally possible, and the switched items, that is, what items can be switched. Such studies view constraints on CS as typological, lexical or syntactic issues. Different from such studies, this book is a study of CS at an abstract level of bilingual speech production process in relation to the nature and activity of the bilingual mental lexicon. It redefines CS as a phenomenon of languages in contact, to be more specific, as a phenomenon of lemmas in the bilingual mental lexicon in contact. Lemmas are defined as abstract entries stored in the mental lexicon about individual lexical items. Lemmas are abstract in the sense that they contain phonological, semantic, morphological, syntactic, and pragmatic information about a particular lexical item. The Bilingual Lemma Activation (BLA) Model of Wei (2006, 2009a, 2015) specifically claims that lemmas in the bilingual mental lexicon are language-specific and are in contact during a discourse involving CS. Adopting the Matrix Language Frame (MLF) Model of Myers-Scotton (1993b [1997]), this book proposes a shared, distributed, asymmetrical model for the bilingual mental lexicon, which claims that the bilingual's two languages are never equally activated, one being activated at both grammatical and lexical levels and playing an absolute role in providing the sentential frame for utterances involving CS, and the other being activated at a lexical level for some psycholinguistic and conceptual reasons and supplying only certain lexical items (i.e., content morphemes). The BLA Model further argues that CS naturally occurs because certain lemmas underlying the lexical items in the bilingual mental lexicon are language-specific. Thus, CS is regarded as conceptual projection of language-specific lemmas, and

linguistic constraints on naturally occurring CS instances are explained at an abstract level.

This book also regards second language acquisition (SLA) as a phenomenon of languages in contact and argues interlanguage (IL) system (i.e., second language learners' developing system of the target language) is governed by the same principles which govern any other linguistic system, such as CS, as an outcome of languages in contact. It applies the 4-M Model of Myers-Scotton and Jake (2000a, 2016) as well as the MLF Model and the BLA Model to the explanation of second language (L2) morpheme acquisition and sources of learner errors. The 4-M Model classifies morphemes into 4 types at an abstract level to predict with precision the distribution of morphemes in classic CS, including the distribution of morphemes in other language contact situations, such as creole formation and SLA. Unlike previous classifications of morpheme largely based on their surface distributions, this model offers a different perspective on the differences among morpheme types by focusing on how morphemes are elected in the language production process at an abstract level: whether they are elected at the conceptual level (i.e., conceptually activated) or at the functional level (i.e., structurally assigned). The 4-M Model aims to show how the surface roles of morpheme types can be linked to a model of language production in general and a model L2 morpheme acquisition in particular. As discussed in this book, much of the early SLA research often described L2 morpheme acquisition sequence as having a value in its own right and gave a universal order as a reason, but the so-called natural morpheme acquisition order itself is not the reason for learner errors, and the order itself is not an explanatory generalization about errors. One of the most important motivations for this book to apply the 4-M Model to the study of L2 morpheme acquisition is to provide an explanation for this 'natural' order so as to make some right predictions about IL development.

The research in CS presented in this book provides not only empirical evidence for structural constraints on switched codes and inputs to current grammatical theory but also a site for testing claims about constraints on IL development sequence. One of the major assumptions made in the BLA Model is that SLA is a language contact phenomenon and structural principles governing other language contact phenomena, such as classic CS, also govern IL. One of the languages involved in classic CS is identified as the Matrix Language (ML), and the other as the Embedded Language (EL). It is the ML which provides the grammatical frame, all syntactically relevant system morphemes and most content morphemes, but the EL only provides some content morphemes for certain semantic-

pragmatic reasons. Though IL is not the same as classic CS in terms of a clear distinction between the ML and the EL, IL contains abstract entries (i.e., lemmas) of lexical items, types of morphemes, and grammatical structures from two or more languages. The central argument is that in all language contact situations, there must be an ML projecting a grammatical frame that structures the surface constituents. However, in SLA, the incompletely acquired TL cannot be the ML projecting the grammatical frame for IL utterances, and the L1 cannot be the ML either because L2 learners are always aware that it is not their intended or targeted language. This book provides evidence that several linguistic systems are involved in IL: learners' L1, their current IL, and the TL, and claims that unlike other language contact phenomena, the ML of IL is a composite of the *de facto* ML (i.e., a mix of learners' L1 and their current IL) and the intended ML (i.e., the TL). It further claims that like other language contact phenomena, learners' L1 is identified as the EL, which may influence the *de facto* ML by partially contributing L1 abstract lexical structure to IL utterances. This book regards SLA as a language contact phenomenon in the abstract sense that the composite ML is constrained by the roles of the linguistic systems in contact in the IL developing system, the TL being the 'preferred' ML because it is always learners' 'targeted' language and the L1 being an 'unfavorable' but 'unavoidable' EL because it may play an interfering role in IL development. What becomes crucial to the concept of a composite ML and to the concept of the contributing EL is that abstract lexical structure becomes complex and organized into subsystems in IL. Based on IL performance data, this book explores sources of abstract lexical structure in the composite ML in relation to the nature of the bilingual mental lexicon and their impact on IL construction.

The theoretical assumptions and analytical features of the BLA Model introduced in this book are intended to offer some important implications for bilingual speech involving CS, sources of language transfer in SLA, the developing IL system, and the nature of the bilingual mental lexicon.

—L. W.

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—L. W.

## SYMBOLS AND ABBREVIATIONS

/	between
+	carrying the feature
-	not carrying the feature
±	carrying or not carrying the feature
>	to be acquired before ...
*	ungrammatical
*Z	statistically significant
4-M	four types of morpheme
A, ADJ	adjective
ABL	ablative
ACC	accusative
ACCUS	accusative
ADV	adverb
ADVP	adverb phrase
AFFIRM	affirmative
AGR	agreement
AP	adjective phrase
APPL	applied
ASP	aspect
AUX	auxiliary
BLA	bilingual lemma activation
CA	contrastive analysis
CAH	contrastive analysis hypothesis
CL	noun class
CLASSIF	noun classifier
CM	Competition Model
COMP	complementizer
COND	conditional
CONJ	conjunction
CONSEC	consecutive
COP	copula
CP	projection of complementizer
CS	intrasentential code-switching
CSM	Concept Selection Model
DAT	dative
DEF	definite article

DEM	demonstrative
DER	derivational affix
DFM	Distributed Feature Model
DET	determiner
DO	direct object
EA	error analysis
EL	embedded language
EMPH	emphatic
ESL	English as a second language
F	feminine
FV	final vowel
GPSG	generalized phrase structure grammar
IL	interlanguage
IMP	imperfect
INDIC	indicative
INF, INFIN	infinitive
INFL	inflection
INTJ	interjection
INTERROG	interrogative
IO	indirect object
IP	inflection phrase
L1	first language
L2	second language
LAD	language acquisition device
LF	logical form
LFG	lexical functional grammar
LOC	location, locative case
M	masculine
MANN	manner
MHM	Modified Hierarchical Model
ML	matrix language
MLF	matrix language frame
MP	minimalist program
N	noun
NEG	negative
NL	native language
NOM	nominative
NP	noun phrase
O, OBJ	object
OBLIG	obligatory
P, PL	plural

PART	participle
PARTIC	particle
PAST, PST	past
PERF	perfect
PF	phonetic form
POSS	possessive
PRT	past participle
PP	prepositional phrase
PR	poisson regression
PREP	preposition
PRES	present
PRO	pronoun
PROG	progressive
Q	quantifier
QUE	question
REFL	reflexive
RHM	Revised Hierarchical Model
S	sentence
S, SG, SING	singular
SAM	Shared Asymmetrical Model
SFP	sentence final particle
SLA	second language acquisition
SOV	subject object verb
SUBJ	subject
SVO	subject verb object
TAM	tense or aspect marker
TIM	time
TL	target language
TNS	tense
TOP	topic
UG	universal grammar
V	verb
VP	verb phrase
VPRES	verb present tense



# TOWARD A NEW APPROACH TO THE BILINGUAL MENTAL LEXICON

## 1 Introduction

As this book is entitled *The Bilingual Mental Lexicon*, some terminological preliminaries become necessary. The ‘mental lexicon’ generally refers to the permanent store of words in an individual’s memory. The mental lexicon stores the speaker’s declarative knowledge about the words and idioms in his/her language. For each item known to the speaker, in addition to declarative knowledge about the word’s meaning, the mental lexicon contains its lemma information about its syntax and morphology which is necessary for constructing the word’s syntactic environment (Levelt 1989, 6). According to some researchers, the mental lexicon is thought to be organized in a semantic network, which is related to the spreading activation model, as one word (i.e., node) is activated, words that are semantically and lexically related will also be activated. According to other researchers, each lexical item contains lemmas at an abstract level. ‘Lemmas’ are defined as abstract entries stored in the mental lexicon about individual lexical items. Lemmas are abstract in the sense that they contain phonological, semantic, morphological, syntactic and pragmatic information about a particular lexical item. In other words, the mental lexicon differs from the lexicon in that it is not just a general collection of words; instead, it deals with how those words are activated, stored, processed and retrieved by each speaker. The ‘bilingual mental lexicon’ contains lemmas (i.e., abstract entries) underlying lexical items from two languages. Lemmas in the bilingual mental lexicon are assumed to be language-specific in that each lemma is tagged for a specific language and supports the realization of an actual lexeme. Evidence has been found to support the view that bilingual individuals have the same conceptual system for both of their languages, that is, the convergence of a new language into a preexisting mental lexicon. When a person first learns a second language (L2), the L2 has its own conceptual system and is heavily reliant on the first language (L1) to gain

understanding and meaning of the new words. For example, an English learner is learning the word ‘cat’, and will refer back to his/her native language (e.g., Chinese) to translate it into ‘mao’ to gain its phonological, semantic, morphological, syntactic, and pragmatic information (i.e., lemmas) surrounding that word. However, when an individual gains more advanced or native-like proficiency in another language, the two conceptual systems will eventually converge into one, where one language influences the other and vice versa. Some other researchers propose the dual-coding theory that two systems are responsible for the encoding and retrieval of lexical information from memory. The verbal representation system encodes verbal information, such as words. This theory enunciates that these two systems can operate independently, as well as interdependently. Therefore, verbal cues can be activated independently of images, and vice versa.

Following the above lines of thinking and differing from them, this book proposes a shared, distributed, asymmetrical model for the bilingual mental lexicon. To test this model, the bilingual speech data are from naturally occurring intrasentential code-switching (hereafter CS for short) instances (i.e., language items switched from one language into another within sentence boundaries).<sup>1</sup>

The model proposed in this book claims that the bilingual’s two languages are unequally activated, one being more activated at both lexical and morphosyntactic levels and playing a more important role in sentence framing, and the other being activated at a lexical level for some psycholinguistic and conceptual reasons. It argues that CS naturally occurs because certain lemmas underlying the lexical items stored in the bilingual mental lexicon are language-specific.

To further test this model, second language acquisition (SLA) data are analyzed to identify, describe and explain sources of language transfer or learner errors at different stages of learning. Thus, ‘interlanguage’ (IL) (i.e., second language learners’ developing linguistic system of the target

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<sup>1</sup> The Chinese/English CS data were collected from the daily conversations of the native speakers of Chinese who were students studying at the University of South Carolina or other universities and colleges in South Carolina and their family dependents living with them. All of them were adult learners of English as a second language. The data collection was conducted over a period of two years as part of the research project under NSF grant SBR-9319780 to Carol Myers-Scotton and Janice L. Jake.

language (TL)) is one of the predictable outcomes of languages in contact,<sup>2</sup> and along the IL continuum,<sup>3</sup> L2 learners will gradually separate their two linguistic systems while moving toward the TL proficiency.

This book aims to explore bilingual speech production processes and constraints by studying the nature and activity of the bilingual mental lexicon in CS and SLA at an abstract level.

## 2 Code-switching and Issues Involved

As a commonly observed bilingual behavior, bilinguals may carry out a conversation in two languages, freely switching between two linguistic systems at will. That is, bilinguals may switch to another language (i.e., another code) at a certain point in their utterance production. Code-switching may occur across sentence boundaries, that is, one sentence(s) is completely delivered in one language, and another sentence(s) is completely delivered in another language. This is called intersentential code-switching, which involves a switch at a clause or sentence boundary, where each clause or sentence is well formed according to one of the languages involved within the stretch of speech in a discourse.

Code-switching may also occur between speaker turns. However, this type of switching requires great proficiency in both languages. In [1], both speakers switch between Chinese and English intersententially. It seems that both speakers follow up each other in expressing certain concepts or ideas in complete English sentences at a certain point in their conversation.

[1] Lin and Jiang are graduate students and will graduate soon. They talk about their graduate financial support and the job market. (L = Lin; J = Jiang)

L: Xiao Jiang, *I haven't seen you for a long time. How are you doing?*

J: *I'm fine. Ni zenme yang?*

---

<sup>2</sup> Language contact phenomena include lexical borrowing, grammatical convergence, first language attrition, mixed languages, pidgins, creoles, code-switching, and so on. *Contact linguistics* is a critical investigation of what happens to the grammars of languages when speakers or language learners are involved in a language contact situation.

<sup>3</sup> Corder defines IL as “the learner language at all points of his learning career” and claims that “his behavior is rule governed, and there, in principle describable in linguistic terms” (1981, 56). He defines an *IL continuum* as “a dynamic goal-oriented language-system of increasing complexity” (1981, 90).

'I'm fine. How are you?'

L: *mamafufu ba. Very busy, you know. I have to work twenty hours a week for my advisor.*

'Just so-so. Very busy, you know. I have to work twenty hours a week for my advisor.'

J: *But your financial support is enough to save your body. Right?*

L: *hen lei a. wo zhiwang biye hou I can find a job. xianzai xue jisuanji de ren yuelaiyue duo le. The competition is very keen, you know.*

'Very tired. I hope I can find a job after my graduation. Now more and more people study Computer. The competition is very keen, you know.'

J: *You don't need to worry. You will get a good job. I'm sure.*

L: *I wish I could. shizai bu xing de hua, zai xue yi-men zhuanye.*

'I wish I could. If nothing really works, I will take another major.'

J: *You always worry too much.*

Bilinguals may often engage in CS (i.e., intrasentential code-switching) when communicating with another person who also speaks the same languages. CS involves different types of constituents inserted into the syntactic slots within a clause or sentence boundary. Most switched elements are 'lexical morphemes' (i.e., morphemes with their semantic meanings), such as verbs, nouns, adjectives, and adverbs rather than 'grammatical morphemes' (i.e., morphemes with their grammatical functions). In [2], both speakers switch certain English words or phrases into the Chinese sentential frame.

[2] Setting: Two graduate students talk about taking exams and taking courses in summer. Fang is a Ph.D. candidate and just took his comprehensive exam. Guo has almost completed all the courses for a Ph.D. program. They also talk about buying a computer. (F = Fang; G = Guo)

F: *zuijin gang took comp. wo hai dei zhunbei oral. Jishi yiqie shunli, zhuo dissertation zhishao hai dei one year ba. Ni xianzai zenmeyang?*

'Recently I just took comp. I still have to prepare for the oral. Even if all goes smoothly, it will take one year at least to write my dissertation. How are you doing now?'

- G: *I think so. wo xianzai course xiu de chabuduo le, dan hai dei xiu ling-men foreign language, jiashang qualifying he comp. ... a very long way to go.*  
 ‘I think so. I’ve now taken almost all the courses, but I still must study two foreign languages in addition to the qualifying and comp. ... a very long way to go.’
- F: *Summer Two wo xuan yi-men German, danshi Summer One meiyou wo yao zuan de ke. Fall semester wo keyi take Japanese. Tingshuo bixu du liang-ge semester.*  
 ‘I’ll take German in Summer Two, but there is no course I want to take in Summer One. I can take Japanese in the fall semester. I’ve heard that we must study for two semesters.’
- G: *you xie jiaoshou very crazy, very hard, you know.*  
 ‘Some professors are very crazy, very hard, you know.’
- F: *wo kuai zhuo dissertation le. wo xiang mai tai pianyide computer. wo xiawu qu Circuit City. Tingshuo you bu sao computer on sale. Ni qu-bu-qu kankan?*  
 ‘I’ll soon write my dissertation. I want to buy a cheap computer. I’m going to Circuit City this afternoon. I heard there are many computers on sale. Do you want to take a look?’
- G: *qu kankan ba.*  
 ‘Let’s go and take a look.’

From the sociolinguistic point of view, bilinguals switch from one language to another during a discourse for some social motivations, such as particular speech contexts, social relationships, and communicative intentions. That is, bilinguals employ the socio-psychological associations of the languages that they know to produce desirable communicative outcomes (cf. Myers-Scotton 1993a; Wei 2016).<sup>4</sup>

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<sup>4</sup> Myers-Scotton’s Markedness Model of code-switching (1993a) draws on rational choice theory with a focus on the interaction between social norms and rationality. This model assumes that human conversation is guaranteed with the speaker’s rational behaviors. One of the most important premises of this model is that all speakers have an innate ‘markedness evaluator’, as part of their linguistic capacity or their general cognitive capacity, which predisposes speakers to assign readings of markedness to the linguistic codes which they interpret or chose in any specific interactions. Wei (2016) claims that speakers’ rationality is the crucial mechanism in linguistic choices, and although the social contact is important and indispensable, the social context alone cannot be the crucial determinant in linguistic choices. Wei’s bilingual cognitive faculty and pragmatic markedness model explores why speakers engage in code-switching, and explains what motivates their choice of codes.

From the psychological point of view, code-switching not only represents flexibility in bilingual production but also is a means of solving the special 'coordination problem' in bilingual speech involving CS. This special coordination causes psychological stresses that CS itself creates. This book considers how such stresses on the grammars of the participating languages involved in CS are handled in a principled, general way.

Most previous studies of CS (e.g., Lipski 1977; Pfaff 1979; Poplack 1980; Sridhar and Sridhar 1980; Gumperz 1982; Woodford 1983) focused on describing surface configurations of switched items in terms of the switch points (i.e., where the switching is structurally possible) and the switched items (i.e., what items from another language can be switched). Different from such studies, this book is a study of CS at an abstract level of the bilingual speech production process in relation to the nature and activity of the bilingual mental lexicon. It defines CS as a phenomenon of languages in contact, to be more specific, as a phenomenon of lemmas from the bilingual mental lexicon in contact when the sentence contains linguistic items switched from another language. The nature of the bilingual mental lexicon and the importance of lemmas in contact in bilingual speech production involving CS will be discussed in detail in the following chapters.

While this book will explain CS in terms of the activity and flexibility of the bilingual's two linguistic systems, it will mainly deal with CS by testing some essential structural principles governing it and constraints on its grammatical structure as proposed in the Matrix Language Frame (MLF) Model (Myers-Scotton 1993b [1997]). According to the MLF Model, one of the participating languages in CS is identified as the Matrix Language (ML), which is the main language in CS utterances in a number of ways, and the other language is identified as the Embedded Language (EL), which is commonly known as the guest language and plays a lesser role. The fundamental argument of the MLF Model is that the ML sets the morphosyntactic frame of sentences containing switched items. Setting the morphosyntactic frame means specifying the surface word (i.e., morpheme) order and supplying all the syntactically relevant morphemes in constituents containing morphemes from both participating languages. It also means determining when constituents must occur entirely in the EL in CS. The differential or unequal roles played by the ML and the EL in CS and their implications for understanding the nature and activity of the bilingual mental lexicon will be further explored by adopting the Bilingual Lemma

Activation (BLA) Model<sup>5</sup> (Wei 2006b, 2009a, 2015) to describe and explain the bilingual speech production process involving CS. The BLA Model differs from most other models because it describes and explains CS at a deeper level and regards CS as the conceptual projection of language-specific lemmas in the bilingual mental lexicon.

### 3 Second Language Acquisition and Issues Involved

It has been long observed that early adult learners of English as a second language (ESL) from different L1 backgrounds show striking linguistic similarities in their L2 production and follow the so-called natural morpheme acquisition order (to be discussed in Chapter 4).<sup>6</sup> It has also been commonly observed that beginning or early stage ESL learners tend to produce utterances which mainly consist of some ‘content’ words,<sup>7</sup> such as simple nouns, descriptive adjectives, a few commonly used verbs, some semantically transparent prepositions, a small number of adverbial expressions, and some formulaic chunks or routine expressions. Such early stage utterances usually show few or no inflectional morphemes for verbs or nouns and few or no ‘function’ words,<sup>8</sup> such as certain determiners, prepositions, and auxiliary verbs. The following examples illustrate many of these features.

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<sup>5</sup> Wei’s BLA Model was initially proposed to relate CS to second language morpheme acquisition and IL development. This model applies the major principles of the MLF Model to IL studies at an abstract level (see Wei 2015).

<sup>6</sup> SLA researchers like Dulay and Burt (1973, 1974a) and Bailey, Madden, and Krashen (1974) have claimed that there exists an acquisition order of English morphemes to which learners of English as a second language, despite their different ages and language backgrounds, adhere. Thus far, however, no single cause has been shown for this phenomenon, and an explanation for the occurrence of such a morpheme acquisition order has eluded researchers.

<sup>7</sup> ‘Content’ words are those which contain transparent lexical or semantic content. The traditional distinction between ‘free’ and ‘bound’ morphemes is not sufficient enough to identify content words in that a ‘free’ morpheme may not necessarily be a content word. For example, in English most determiners, certain prepositions, auxiliary verbs, and infinitive marker *to* are free standing words or morphemes but are not content words.

<sup>8</sup> ‘Function’ words are those which do not contain any transparent lexical or semantic content. Such words are grammatically required items: they play particular grammatical functions. Though they are ‘free’ standing words or morphemes, they lack ‘content.’

- [3] Climate very good. Street also wide. Beijing winter very long.
- [4] I think I not watch TV too much, just some news.
- [5] (The speaker is describing activities in a picture.) This family eat something. Father eat hot dog, and mother give something to her baby eat.
- [6] (The speaker is describing activities in a picture.) Some people look plane. This son listen radio.  
(Chinese learners' IL data; Wei 1995, 1996b)<sup>9</sup>

Among other errors, in [3] the definite articles, the plural *-s*, the possessive *-s*, and the copula *be* are missing; in [4] the auxiliary verb *do* required for negation is missing; in [5] the indefinite article, the auxiliary verb *be* and *-ing* for progressive aspect marking are missing; in [6] the plural *-s*, the definite article, the auxiliary verb *be* and *-ing* for progressive aspect marking, and the prepositions *at* required for 'look' and *to* for *listen* are missing.

Although there has been a rich literature of SLA studies concerning IL development (e.g., Selinker 1972; Corder 1981), there have been few comprehensive studies concerning the overall organizing principles governing IL developing systems and structural constraints on IL in different developmental stages (cf. Perdue 1993; Wei 2015). This book explores how IL grammatical structures are sequentially developed and how they are related to the structural principles of other language contact phenomena, such as CS. Furthermore, from some psycholinguistic perspectives, this book relates IL production phenomena to the nature and activity of the bilingual mental lexicon during speech production (cf. Levelt 1989, 1995; Wei 2001a, 2001b, 2002, 2015). Accordingly, morphemes are not classified by categorical defining features at a surface level but by complex lexical structure at an abstract level.<sup>10</sup>

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<sup>9</sup> The interlanguage performance examples for the book are from Wei's unpublished Chinese learners' interlanguage data (1995) and unpublished doctoral dissertation (1996b): "Variation in the Acquisition of Morpheme Types in the Interlanguage of Chinese and Japanese Learners of English as a Second Language." University of South Carolina, Columbia, SC.

<sup>10</sup> Lexical structure is 'abstract' and 'complex' in the sense that it contains several discrete but interacting subsystems: lexical-conceptual structure., predicate-argument structure, and morphological realization patterns.



Unlike previous studies of L2 morpheme acquisition in relation to IL development, this book addresses developmental stages in IL of adult learners of ESL by applying the principles of the MLF Model (Myers-Scotton 1993b, 2002) of describing and explaining CS to many aspects of both IL grammatical forms and developmental directions. This book takes the previous research in CS as a starting point and goes on to demonstrate that the language contact principles governing linguistic performance, which have been clearly reflected in CS phenomena, are also at work in IL performance and development. A key premise underlying this book is that the general principles which govern language contact performance data (e.g., pidgins, creoles, and CS) also apply to the organizing and structural principles which govern IL grammars at a rather abstract level. That is, IL grammars will be described and explained as some predictable outcomes of languages in contact. The general principles governing language contact performance are thus taken into consideration in accounting for the real-time framing considerations that constrain actual language use, for the learner's 'incomplete' L2 grammar, and for the possibility of what is traditionally called 'interference' or 'transfer' between linguistic systems. This book, therefore, offers a testable claim about the nature and activity of the bilingual mental lexicon as observed in bilingual speech production involving CS and IL development.

#### **4 A Preview of the Matrix Language Frame Model**

Different from most models of CS which focus on surface structural configurations of utterances containing codeswitched elements, the MLF Model differentiates both the participating languages and morpheme types at a number of abstract, pre-linguistic levels in sentence production containing CS. It emphasizes two asymmetries in CS as follows.

The first asymmetry is the unequal roles of the participating languages in CS. The central grammatical processing unit, the speech production FORMULATOR<sup>11</sup> (Levelt 1989), receives directions from the mental lexicon which indicate that different roles are to be assigned to the languages participating in CS. The ML plays a dominant role in framing the sentence containing codeswitched constituents (i.e., structuring the

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<sup>11</sup> The speech production 'formulator' is one of the processing components (conceptualizer, formulator, articulator, audition, and speech comprehension system) in Levelt's model of monolingual speech production process (1989, 9). The formulator translates a conceptual structure from the conceptualizer into a linguistic structure, including grammatical encoding and phonological encoding, for the speech production articulator.

grammar of the sentence) and is more activated than the EL in that the occurrence of the ML morphemes is freer and more frequent than that of the EL. The ML refers to the language which sets the morphosyntactic frame of sentences showing CS, and the EL refers to the other participating language(s) in CS, but with a lesser and limited role (Myers-Scotton 1993b [1997], 2002; Wei 2000a).

The second asymmetry is the unequal participation of the morphemes in CS. Speakers access content and system morphemes<sup>12</sup> differently in utterances containing CS (Myers-Scotton 1993b [1997], 1994a; Jake 1994; Wei 1996a, 1996b, 2000b). The ML provides all syntactically relevant system morphemes as well as content morphemes, while the EL only provides some content morphemes (see Chapters 2 and Chapter 4 for further definitions and discussion). CS is claimed to occur within the constraints of a lexical-conceptual frame, and this frame is set by structural procedures dictated by the ML. Below are a few phenomenal examples of these two asymmetries.

- [7] **Only small prizes** moratta ne.  
 only small prizes get-PAST  
 ‘We got only small prizes.’  
 (Japanese/English; Nishimura 1985, 128)
- [8] ki Syria uske sath **diplomatic relations** kayam kare.  
 that Syria it with diplomatic relations establish do  
 ‘... that Syria establishes diplomatic relations with it.’  
 (Hindi/English; Bhatt 1997, 228)
- [9] want ou Tex laat ons daai **group join**.  
 because old Tex make 1PL DEM group join  
 ‘Because old TEX made us join that group.’  
 (Tsotsitaal/English; Slabbert and Myers-Scotton 1997, 332)

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<sup>12</sup> According to Myers-Scotton (1993b, 6), differences between content and system morphemes are determined by three features: System morphemes are categories with the feature [+ Quantification], which “pick out individuals or events.” Prototypical system morphemes “include quantifiers, specifiers, and inflectional morphology. Thus, morphemes with the feature [- Quantification] are “potential content morphemes.” However, to qualify as a content morpheme, a morpheme must have the feature [+ Thematic Role-Assigner] or [+ Thematic Role-Receiver]. System morphemes are neither thematic role-assigner nor thematic role-receiver. See *the System Morpheme Principle* and *the system vs. content morpheme hierarchy* in Chapter 2 for their implications for CS.

- [10] vas al **grocery** coño?  
 [You]2.SING are going to-V-ING \*\*nt-EXPLETIVE  
 ‘Are you going to the grocery store \*\*nt?’  
 (Spanish/English; Sotillo 2016, 14)
- [11] It’s Colombian and their **empanadas**.  
 DET pies-N  
 ‘It’s Colombian and their pies.’
- [12] Pero **she has like** una mala fama.  
 But-CONJ a-DET ad-ADJ reputation-N  
 ‘But she has a bad reputation.’  
 (English/Spanish; Sotillo 2016, 14)
- [13] Tengoque arreglar **my cousin’s computer**.  
 [I-1.SING] have to-OBLIG INF fix-VPRES  
 ‘I have to fix my cousin’s computer.’  
 (Spanish/English; Sotillo 2016, 15)

In [7], *only small prizes* is a content noun phrase (NP) switched from English (EL), into the Japanese (ML) sentential frame (i.e., grammatical structure), following the Japanese object verb (OV) order. In [8], *diplomatic relations* is a content NP switched from English (EL) into the Hindi (ML) sentential frame, following the Hindi OV order. In [9], *group join* is a content verb phrase (VP) switched from English (EL) into the Tsotsitaal sentential frame, following the Tsotsitaal OV order. In [10], *grocery* is a content morpheme switched from English (EL) into the Spanish (ML) sentential frame, where the switched item is followed by ‘coño’, a common insert/expletive. *Empanadas* in [11] and *una mala fama* in [12] are content morphemes switched from Spanish (EL) into the English sentential frame, following the English VO order. In [13], *my cousin’s computer* is a content NP switched from English (EL) into the Spanish sentential frame. It should be noted that the head of this NP is *computer*, which is introduced by the EL system morpheme, *my cousin’s*. It seems that EL system morphemes may also be switched, but they cannot be switched without the EL content morphemes which they introduce. The whole NP *my cousin’s computer* is recognized as an ‘EL island’ (to be introduced under Chapter 2).

Accordingly, the MLF Model contains two principles: *the Morpheme Order Principle and the System Morpheme Principle* (Myers-Scotton 1993b, 1997) (see Chapter 2 for their definitions and exemplifications). These two principles can be interpreted as hypotheses about the differing roles of the

participating languages in CS. They specify what elements in a bilingual utterance must come from the ML.

The MLF Model differs substantially from other models which consider CS phenomena either as surface, linear constructions, or as derived only from the same structural relations posited for monolingual syntax (see Chapter 2 for a review of different approaches to the study of CS). It can be characterized as a speech production model which explains the actual process in which codeswitched constituents are produced, specifies certain structural principles which predict actually occurring codeswitched constituents, and makes crucial distinctions between the roles of the ML and the EL in constructing codeswitched utterances and between the potentials to access content and system morphemes from either language involved. This model has great explanatory and predictive power, accounting for not only the linguistic phenomena of CS but potentially also those of any other language contact performance, such as SLA in general and L2 morpheme acquisition order in particular.

## **5 A Preview of the Bilingual Lemma Activation Model**

A lemma is defined as the “nonphonological part of an item’s lexical information,” including semantic, syntactic, and some aspects of morphological information, and claims that “it is the lemmas of the mental lexicon that conceptual information is linked to grammatical function” (Levelt 1989, 162). In other words, lemmas are abstract entries in the mental lexicon and underlie surface configurations of speech production. Each lemma in the mental lexicon contains its own lemma specification, comprising declarative knowledge about the word’s meaning as well as information about its syntax and morphology. For example, the lemma for the verb ‘like’ requires a subject that expresses the thematic role of EXPERIENCER and an object that expresses the thematic role of THEME; the lemma for ‘she’ specifies that the word must refer to a female and that any following present-tense main verb must have the inflectional morpheme ‘-s’ for subject-verb agreement (see Chapter 3 for a detailed description and discussion of Levelt’s model).

It seems obvious that the activation of lemmas in the mental lexicon plays a central role in speech production. The BLA Model (Wei 2006b, 2009a, 2015) confronts and expands on Levelt’s model of monolingual speech production by explaining and emphasizing the role of lemma activation. It claims that lemma activation of particular lexical items in the mental lexicon must mediate between conceptualization and speech

formulation as an indispensable level of speech production. The role of lemma activation in speech production can be schematized as in Figure 1.

Levelt's model of speech production was designed for describing the major components and processes of monolingual speech production, and it must be adapted to account for bilingual speech behavior such as CS and L2 production. This book proposes that the bilingual mental lexicon differs from the monolingual mental lexicon in that the former contains lexemes and their lemmas from two languages. Thus, it is the speaker's preverbal message/intention that activates language-specific lemmas in the bilingual mental lexicon. In other words, it is the semantic/pragmatic feature bundles selected by the CONCEPTUALIZER that trigger the appropriate lemmas into activity before the FORMULATOR has access to the relevant lexical item in the mental lexicon. As Figure 1 shows, lemmas in the mental lexicon, whether monolingual or bilingual, mediate between the CONCEPTUALIZER and the FORMULATOR (see Chapter 3 for the BLA Model adapted from Levelt (1989), Myers-Scotton and Jake (2000a) and Wei (2002)).

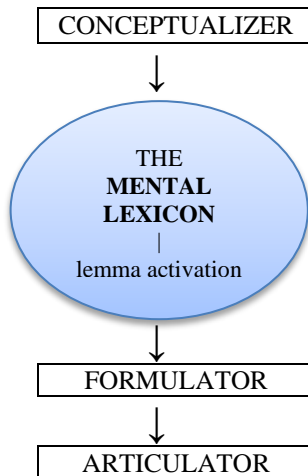


Figure 1. Lemma activation in speech production  
(Adapted from Levelt 1989; Wei 2009a)

## 6 General Questions to Be Addressed

This book studies the nature and activity of the bilingual mental lexicon from two specific perspectives: bilingual speech production containing CS

and SLA with a focus on L2 morpheme acquisition and language transfer in IL development. The study is based on general organizing principles governing all language contact phenomena on structural grounds at an abstract level. It addresses the following general questions:

1. Is it true that, as proposed in the MLF Model, one of the languages involved in CS is identified as the ML and the other as the EL, and the ML of classic CS plays a more dominant role by ‘framing’<sup>13</sup> CS utterances and the EL plays a more limited role, essentially only being able to contribute content morphemes?
2. Is it true that, as proposed in the BLA Model, language-specific lemma activation must mediate between pre-verbal message (i.e., CONCEPTUALIZER) and speech production (i.e., FORMULATOR) in CS?
3. Do the roles of the L1, the TL and the developing IL relate to the ML vs. EL distinction and its accompanying structural principles proposed in the MLF Model? If yes, what are the nature and developmental directions of IL systems?
4. Does the approach to the study of the bilingual mental lexicon proposed in this book provide explanations for the following observations about bilingual speech behavior in CS and adult SLA?
  - a. CS is driven by the unequal activation of the bilingual’s two linguistic systems, and language-specific lemmas activated in the bilingual mental lexicon motivate switched items (Wei 2006b, 2009a).
  - b. ILs are systematic in their own right (Jakobovits 1970; Selinker 1972; Selinker, Swain, and Dumas 1975; Corder 1983; Ellis 1989; Lasen-Freeman and Long 1991; Klein and Perdue 1993) but show different degrees of L1 influence in different developmental stages (Ellis 1989, 1994). IL is a composite linguistic system and its development is a gradual convergence with the TL (Myers-Scotton 1994b; Jake 1998; Wei 1996a, 1996b, 2015).

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<sup>13</sup> Myers-Scotton (1993b, 76) uses the term ‘frame’ to refer to “a pre-S structure configuration (i.e., prior to surface realization) such that a frame consists of (a) specifications for morpheme order and (b) directions for the realization of system morphemes.” According to the MLF Model, it is the ML which ‘frames’ utterances containing switched items (i.e., provides the sentential frame for such utterances).