

Original Paper

Contact Linguistics of Interlanguage

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Abstract

Different from traditional definitions of “interlanguage” and descriptions of interlanguage production, this study defines interlanguage in terms of its outstanding linguistic characteristics at the level of abstract lexical structure, including its three sublevels: lexical-conceptual structure, predicate-argument structure, and surface morphological realization patterns (Myers-Scotton and Jake 1995). Also different from most previous studies of interlanguage, this study views interlanguage or any interlanguage system as an outcome of a language-contact phenomenon. Adopting the Matrix Language Frame model (Myers-Scotton 1993[1997]) of bilingual intrasentential codeswitching in particular and contact linguistics in general, this study identifies the “matrix language” or the grammatical frame which structures interlanguage and reviews such a matrix language as a composite (Jake 1998; Wei 2009c). By adopting the Bilingual Lemma Activation model (Wei 2002, 2015, 2020), this study explores the nature and activity of the bilingual mental lexicon during interlanguage development. Accordingly, it proposes a particular approach to the nature and sources of second language learner errors or first language transfer in second language learning. It concludes that any interlanguage system must be driven by an incompletely acquired target language system in general and by an incompletely acquired target language abstract lexical structure in particular.

Keywords

interlanguage, matrix language, embedded language, codeswitching, lexical structure, learner error, language transfer

1. Introduction

In the studies of interlanguage (IL) (i.e., second language learners' developing linguistic system), the role of learners' first language (L1) in second language (L2) learning and the relationship between L1 and L2 in IL development have witnessed an intense debate in the past 50 years (Lado, 1957; Corder, 1967, 1971; Bailey, Madden, & Krashen 1974; Krashen, Butler, Birnbaum, & Robertson, 1978; Dulay,

Burt, & Krashen, 1982; Larsen-Freeman, 1991). Most previous studies of IL focused on sources of L2 learner errors or language transfer and related them either to L2 learners' L1 or to the process of IL development itself. Most such studies remain at an observational or superficially descriptive level. One of the weaknesses of such studies is that the relationship between L2 learners' L1 and L2 or the target language (TL) and the relationship between learners' IL and TL are largely ignored. Some relatively recent studies adopting universal approaches have found reconciliatory solutions between the behaviorist and cognitive approaches to language transfer or cross-linguistic influence (e.g., Selinker, 1972; Færch & Kaspar, 1987; Ringbom, 1987; Odlin, 1989; Dechert & Raupach, 1989; White, 1989, 1995; Gass & Selinker, 1992; Bialystok, 1995; Yip, 1995). For example, Gass and Selinker (1992) propose that it is compatible to regard second language acquisition (SLA) as being affected by learners' utilization of their L1 knowledge and knowledge of other languages known to them and also learners' build-up of a body of developing knowledge in which they test hypotheses formed on the basis of the L2 data available to them. However, from the perspective of contact linguistics, this study attempts to answer several questions about the developmental nature of IL: If learners build up and revise the interim linguistic system by gradually increasing the complexity of the TL system, what is the origin of IL? If the TL is not sufficiently known to learners to project the TL grammatical or sentential frame, is there no frame at all? Is there evidence that there is always necessarily a frame, and that learners may first fall back on an L1 frame and then incrementally move toward a TL frame? In addition to the frame, if learners do not have complete knowledge of the TL abstract lexical structure, is there evidence that learners may fall back on their L1 abstract lexical structure to convey their intended meanings? If so, what are the outcomes or consequences of linguistic systems of IL in contact?

Based on but also different from such previous studies of IL, this study explores sources of learner errors or language transfer beyond surface levels of observation or description. It claims that there are at least three linguistic systems involved in SLA: learners' L1 or native language (NL), their L2 or TL, and their current developing IL (cf. Jake, 1998; Fuller, 1999; Myers-Scotton & Jake, 2000; Wei, 2000a, 2009c). This study defines IL in terms of its linguistic characteristics at three sublevels of abstract lexical structure: Lexical-conceptual structure, predicate-argument structure, and morphological realization patterns (Myers-Scotton & Jake, 1995; Wei, 2002, 2009c). More importantly, this study views IL or any developing IL system as an outcome of languages in contact. That is, IL is viewed as several linguistic systems being in contact as observed in other language contact phenomena. For this study, two particular models are adopted or tested. One is the Matrix Language Frame (MLF) model of intrasentential codeswitching (i.e., switching codes within a sentence boundary) (hereafter, CS for short) in particular and contact linguistics in general (Myers-Scotton, 1993[1997]; Jake, 1998; Wei, 2009c)), and the other is the Bilingual Lemma Activation (BLA) model (Wei, 2002, 2015, 2020). This study proposes a particular approach to the nature and sources of learner errors or language transfer in L2 learning. It concludes that any IL system must be driven by an incompletely acquired TL abstract

lexical structure at each of its sublevels.

2. Interlanguage as a Phenomenon of Language Contact

This study assumes that an IL system at any stage of SLA (i.e., along the IL continuum (Selinker, 1972)) is an outcome of linguistic systems in contact. One of the major claims of this study is that the principles governing language contact phenomena, such as pidginization and creolization, primary language attrition, bilingualism, and CS, also govern the developing system of IL.

Studies of pidginization and creolization have contributed valuable insights to the understanding of the process of L2 learning and IL development. Andersen and Shirai (1996) relate the processes of pidginization and creolization to the processes of SLA. They claim that the traditional notion of L1 transfer itself is not adequate enough to explain sources of learning difficulty or learner errors in producing certain L2 grammatical morphemes for tense/aspect marking, such as the overextension of “-ing” for the progressive aspect marking. They propose that L2 development involves an interaction between universal factors like markedness and prototype as observed in pidginization and creolization and L1 factors may come into play. According to them, such a type of interaction may affect various aspects of SLA. As evidenced in phonology (Eckman, 1977; Major, 1987), phonology and morphology (Hatch, 1983), morphology (Andersen 1983a, 1983b; Wei 1996b, 2000a, 2000b; Jake 1998), syntax (Zobl, 1980a, 1980b; Gass, 1984), and semantics (Tanaka 1983; Shirai 1989), such a type of interaction affects various aspects of IL production and language transfer is a predictable outcome. Wei (2002) proposes that such a multiple factorial interaction is in fact a phenomenon of languages in contact in general and a phenomenon of bilingual lemmas in contact in particular.

Studies of primary language attrition have provided evidence that many properties of bilinguals’ grammatical competence are similar to those of L2 learners’ grammatical competence at various stages of IL development. As observed by Seliger (1996), bilinguals tend to experience primary language attrition when they start using mixed linguistic forms in situations where their speech behavior is not sociolinguistically appropriate and where discourse participants do not speak the same L2 or share the same TL. Seliger provides evidence that speech performance features of primary language attrition resemble forms of language mixing in normal bilingual speech.

Pfaff (1979), Kuhberb (1992) and Cook (2003) also provide evidence that primary language attrition exhibits some outstanding syntactic and morphological features as observed in L2 and the calque of certain linguistic forms or elements from L2 to L1. According to Seliger (1996, p. 617), “One source of change is the other grammar that exists in the mind of the bilingual, the grammar of the L2 and the other source is what remains of UG abilities.” Thus, changes in the L1 grammar contain various linguistic elements transferred from the L2, and those elements in the L2 which are more congruent with core universals (Chomsky, 1986) are predicted to be more easily transferred than those which are not. As observed by Polinsky (1997, p. 401), “The loss of grammatical system is non-random” and

“Even significant language loss has a principled grammar of its own.” According to Myers-Scotton (2002, p. 185), “A language may be marked by extensive analogical leveling and substitutions, but there is always a clear morphosyntactic frame, even if a composite Matrix Language is its source.” Wei (2009c, 2015) provides evidence that, in the developing linguistic system of IL, L2 learners’ intended Matrix Language (ML) and their de facto ML are in contact, and the outcome is a composite ML.

Studies of individual and societal bilingualism view bilingual development as a phenomenon of languages in contact. Dorian (1981) posits that, depending on their current levels of proficiency in one of the languages, individual bilinguals can be located at various points along a proficiency continuum between two languages in contact. According to Dorian’s observations (1981, p. 15), when languages are in contact in individual bilingualism, effects on “healthy languages” will occur. One of such observations reveals that individual bilinguals may simplify or eliminate one or more competing structures through the reanalysis of such structures. Andersen (1982) observes that speakers experiencing language attrition tend to preserve and overuse the syntactic constructions which reflect more transparent underlying semantic and syntactic relationships. Beniak, Mougén and Valois (1984/1985) find that when languages are in contact, new forms or rules in one language may be introduced to another language where they already exist and are in contact, resulting in interference. One of their observations is that the loss of the accusative postposition in the Kupwar variety of Kannada because of its long-term contact with the other languages which do not possess accusative postpositions. They view such a gradual elimination of non-congruent forms in languages in contact as a phenomenon of linguistic “convergence”. Studies of societal bilingualism also find evidence of linguistic outcomes of languages in contact. Romaine holds that “Where languages are in contact, linguistic phenomena such as borrowing, interference and transfer will generally be found” (1989, p. 77). She claims that it is the unstable balance between languages in contact that may cause linguistic change over time. Thus, as an outcome of languages in long-term contact, a bilingual community may shift from the use of one language to another, causing imbalance between the two languages (i.e., unequally developed linguistic codes) and, consequently, gradual linguistic changes. In other words, the bilingual system is not the same as the monolingual system because the former involves languages in contact, resulting in some predictable linguistic outcomes.

Studies of CS have provided empirical evidence of structural constraints on mixed codes. Directly relevant to studies of IL are the two distinctions as identified in CS (Myers-Scotton 1993 [1997]; Myers-Scotton & Jake, 1995): matrix vs. embedded languages, and content vs. system morphemes. The MLF model posits that the ML and the EL play unequal roles in CS. It is the ML which provides the grammatical frame for CS and provides most content morphemes and all syntactically relevant system morphemes, but the EL only provides certain content morphemes for some semantic-pragmatic reasons. CS is seen as a language contact phenomenon because at least two languages are involved in the same sentence (i.e., switches within a sentence boundary). Although there are a number of criteria as

proposed to identify the ML in discourse involving CS, the existence of the ML and its role in structuring CS has been commonly recognized. Although there are a number of different approaches to the morphosyntactic analysis of CS, most studies have recognized that CS is not a randomly “mixed” system but is governed by a set of “internalized” principles and constrained in some identifiable and testable ways. Studies of CS also provides a site for testing claims about the sequence of IL development.

The BLA model views IL as an outcome of languages in contact and claims that morphosyntactic principles governing other language-contact phenomena also govern IL at an abstract level. This study explores the linguistic and developmental nature of IL at an abstract level because IL contains abstract elements from two or more language systems, such as lemmas for particular lexemes contained in the bilingual mental lexicon, types of morphemes, and grammatical structures. It is in this sense that this study regards IL as an outcome of bilingual systems in contact.

3. Matrix vs. Embedded Languages and Content vs. System Morphemes

The MLF model claims that in all language contact situations, such as pidginization, creolization, and CS, there must be an ML which projects a grammatical frame to structure surface constituents.

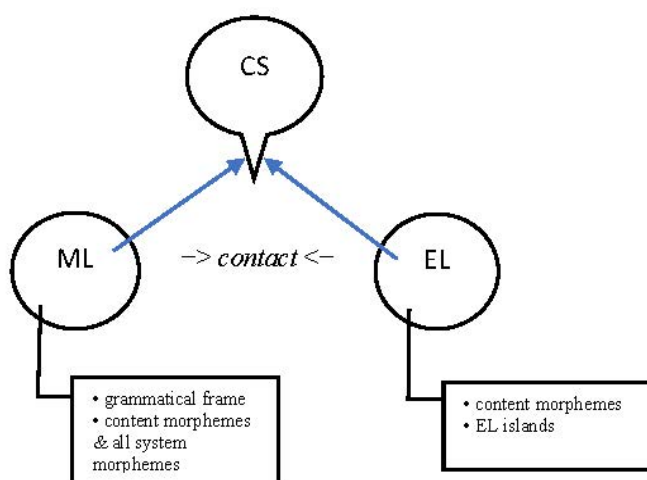


Figure 1. Classic CS as an Outcome of Languages in Contact

As illustrated in Figure 1, classic CS is viewed as an outcome of languages in contact, that is, the ML and the EL are in contact during CS production. The ML and the EL are in contact but play unequal roles. It is the ML which projects a grammatical frame for ML + EL constituents, content morphemes, and all system morphemes. That is, in ML + EL constituents, all system morphemes having grammatical relations external to their head constituents must come from the ML. The EL only provides certain content morphemes and EL islands to be switched into the ML grammatical frame.

Content morphemes are the lexical categories having their independent lexical content, such as lexical nouns, verbs, adjectives, adverbs, and most prepositions. Lexical nouns are thematic role receivers, and lexical verbs are thematic role assigners. Lexical adjectives, adverbs and prepositions contain their descriptive meanings. Lexical prepositions are also thematic role assigners. "The characteristic properties of content morphemes should be largely self-evident; they convey the core semantic/pragmatic content of language" (Myers-Scotton & Jake, 2000a, p. 1054).

System morphemes are auxiliary/model verbs, determiners, degree words, inflectional morphemes, and certain prepositions. Such morphemes do not have independent lexical content and only play grammatical/functional roles. *EL islands* consist of only EL morphemes and are well formed according to the EL grammar to show internal structural dependency relations.

[1] a ʃ u ad-qa-**hku**-q kam a-**xalt**-I Zaina?

what perfective aff-2nd sing fem aff- tell-2nd sing aff you Oh- aunt-1st sing pos clit aff Zaina

"What can you tell us aunt Zaina?"

[2] hədaar aθ-□**aqa**ε-q əl-**mux**-iw.

watch (it)-null imperative aff 2nd sing fem aff-annoy-2nd sing aff def-brain-1st sing possessive clit aff

"Be careful you started to annoy my brain."

(Berber/Algerian Arabic; Benhattab, Ouahmiche, & Labed, 2017, p. 7)

[3] **Idea** bubua de gale asiwoa?

"Do you have another idea?"

(Ewe/English; Dzameshie, 1989, p. 2)

[4] anata wa **registration** o shimashi-ta ka?

you TOP registration OBJ do-PERF PARTIC/QUE

"Have you done your registration?"

(Japanese/English; Wei, 2006b, p. 170)

[5] dore gurai koko ni **stay** suru no?

how long about here PREP/LOC stay do PARTIC/QUE

"About how long will you stay here?"

(Japanese/English; Wei, 2006b, p. 164)

[6] **Mailbox** li you nidexin.

mailbox PREP/in exist your letter

“There’s a letter for you in the mailbox.”

(Chinese/English; Wei, 2015, p. 55)

[7] Ha-u ku-on-a a-ki-ni-**buy**-i-a **beer** sikuhiyo?

NEG-2s NEG.PST-see-FV 3s-PROG-1s.OBJ-buy-APPL-FV beer day CL9.that

“Didn’t you see him buying beer for me that day?”

(Swahili/English; Myers-Scotton, 2002, p. 98)

[8] wo zuijin hen **busy**. you san-fen **paper** bixu zaiyue-di qian **finish**.

I recently very busy have three-CLASSIF paper must PREP/TIM month-end finish

“I’m recently very busy. I must finish three papers before the end of this month.”

(Chinese/English; Wei, 2018, p. 85)

In [1], “hku” (tell) is a verbal stem, and “xalt” (aunt) is a noun. Both are content morphemes from Algerian Arabic, the EL. The affixes on the verb and the noun are system morphemes from Berber, the ML. In [2], “□aɖæ” (annoy) is a verb, and “əl-mux” (the brain) is a noun. Both are content morphemes from Algerian Arabic, the EL. The affixes on the verb and the noun are system morphemes from Berber, the ML. In [3], the noun “idea”, a content morpheme from English, the EL, is switched into the Ewe sentential frame, where the object noun being questioned occurs in the sentence initial position and follows the Ewe modifier “bubua” (another) in accordance with the Ewe morpheme order. In [4], “registration”, a content morpheme from English, the EL, is switched into the Japanese predicate verb, where the switched noun occurs before the Japanese verb, following the Japanese subject-object-verb order. In [5], “stay”, a content morpheme from English, the EL, is switched into the Japanese “suru” (do) structural phrase, where the verb is introduced in conjunction with “suru”. In [6], “mailbox” is a compound content noun from English, the EL, is switched into the Chinese sentential frame for the prepositional phrase, where the switched compound content noun occurs before the Chinese “li” (in) rather than after it in English. In [7], the switched items “buy” and “beer” are content morphemes from English, the EL, but it is Swahili, the ML, which provides the sentential frame. In this example, “buy” takes two objects, but the sentential frame of Swahili determines how those objects are realized; the beneficiary is realized as an object prefix on the verb “-ni-” and is further mapped on the sentential frame through the applied verbal suffix “-i-” on the EL verb from English. In [8], “hen busy” (very busy) is a mixed constituent, where the adjective “busy” is from English, the EL, and the degree word “hen” “very” is a system morpheme from Chinese, the ML. The noun phrase “san-fen paper” (three papers) is a mixed constituent, where the system morpheme “san” (three) (a numeral) and “fen” (a noun classifier) are from Chinese, the ML, and the content morpheme *paper* is from English, the EL. It should also be noticed that in this mixed noun phrase, the English “-s”, a system morpheme, for plural marking does not appear. The

whole utterance is grammatically framed by the ML, where the object noun phrase “san-fen paper” occurs before the prepositional phrase “zaiyue-di qian” (before the end of this month) and the verb *finish*, a content morpheme from the EL.

The above typical examples of classic CS demonstrate distinctive roles of the ML and the EL participating in CS. It is the ML which grammatically frames the utterances containing the items switched from the EL and provides most content morphemes and all system morphemes. The EL switches only content morphemes into the sentential slots provided by the ML.

[9] **The first one** que era elque llevaba para Maracaibo.

the first one COMP COP.S.IMP DEF.M.S. COMP go.3s.IMP PREP Maracaibo

“The first one, that was the one which was going to Maracaibo.”

(Spanish/English; Blazquez-Domingo, 2000, cited in Jake, Myers-Scotton, & Gross, 2002, p. 81)

[10] Eb dann simmer go **le pentole** bring.

exactly then be.1.PL [we] go the.F.P.pan.P take-INF

“Exactly, and then we took the pans there.”

(Swiss German/Italian; Preziosa-Di Quinzio, 1992, Appendix XXX)

[11] ta dui xueshen **very strict**.

she to student very strict

“She’s very strict to students.”

(Chinese/English: Wei, 1992)

[12] It’s **totemo muzukashi** to find a convenient and **yasui** apartment here.

it’s very difficult to find a convenient and cheap apartment here.

“It’s very difficult to find a convenient and cheap apartment here.”

(English/Japanese; Wei, 2006b, p. 167).

In [9], the NP “the first one” is an EL island where both the system morpheme “the” and the content morphemes “first one” are from the EL. In [10], the NP “le pentole” is an EL island where both the system morpheme “le” (the) and the content morpheme “pentole” (pans) are from the EL. In [11], the AP “very strict” is an EL island where both the system morpheme “very” and the content morpheme “strict” are from the EL. In [12], the AP “totemo muzukashi” (very difficult) is an EL island where both the system morpheme “totemo” (very) and the content morpheme “muzukashi” (difficult) are from the EL.

The above examples of classic CS demonstrate that EL system morphemes can be switched only if they are accessed together with EL content morphemes.

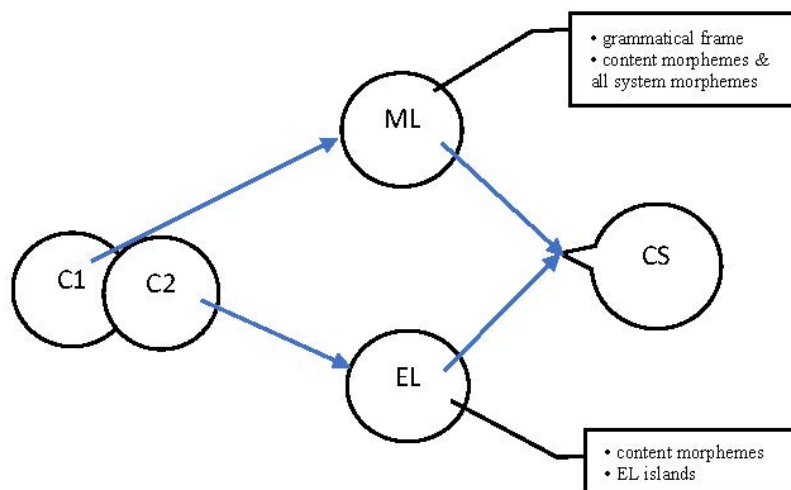


Figure 2. Roles of the ML and the EL in Classic CS

(Adapted from Wei, 2015)

Figure 2 illustrates the differential roles of the ML and the EL in classic CS. C1 (code 1) and C2 (code 2) are the participating codes (i.e., two languages involved in CS). One of them must be activated as the ML (presumably C1), and the other must be activated as the EL. It is the ML which projects the grammatical frame to structure the sentence containing switched constituents and provide both content and system morphemes. The EL provides certain content morphemes and EL islands which are constituents consisting only of morphemes from the EL, including EL system morphemes.

This study aims to demonstrate how and why the organizing principles governing classic CS also govern the process of IL development.

4. Interlanguage Linguistic Systems in Contact

Unlike classic CS, IL exhibits a less clear distinction between the ML and the EL. There are at least three linguistic systems involved in SLA: the L1, the TL, and the IL (i.e., the learner language or the developing linguistic variety). The linguistic components of IL are sketched in Figure 3.

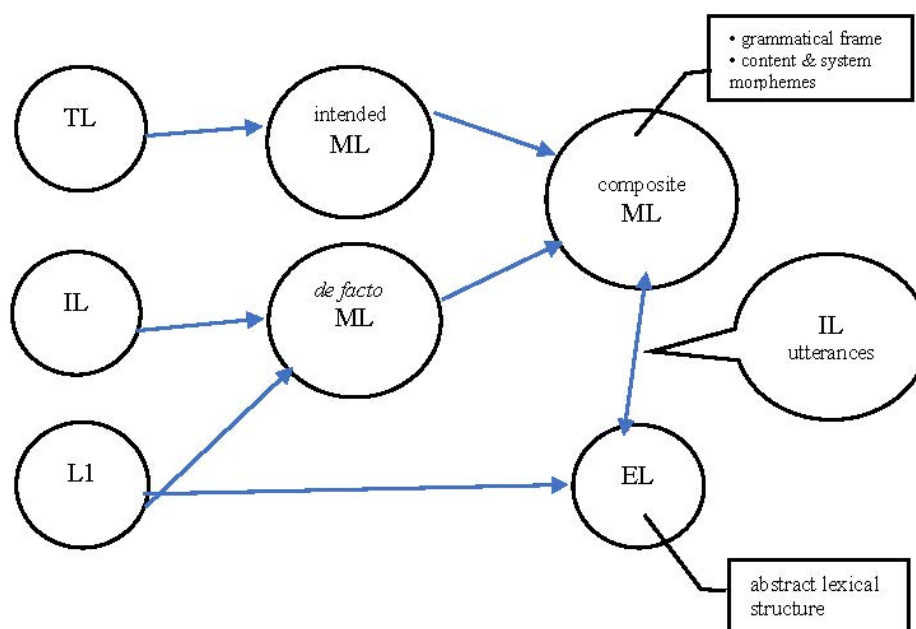


Figure 3. Roles of the Composite ML and the EL in IL Development

(Adapted from Wei, 2015)

This study assumes that IL performance and development are also governed by the similar general principles governing language contact performance data. Different from other language-contact phenomena, in SLA, the incompletely acquired TL cannot be the ML which fully projects the grammatical frame for IL utterances. As commonly observed, IL utterances may not be fully composed of TL linguistic material and L2 learners may not have full access to the TL along the IL continuum. The L1 cannot be the ML either. This is because L2 learners it is not their intended or targeted language. The IL performance data to be discussed in this study provide evidence that there are several potential linguistic systems involved in IL, such as the learner's L1, their developing IL (i.e., the current status of their IL), and the TL (cf. Selinker, 1972; Eugank, Selinker, & Sharwood Smith, 1995). However, this observation by itself remains descriptive rather than explanatory (cf. Gass & Selinker, 1983; Flynn, 1987; Gass & Schachter, 1989; White, 1989, 1995; Bialystok, 1995; Yip, 1995). This study aims to develop an explanatory account of developmental structure of IL and claims that IL is a "composite" linguistic system as an outcome of bilingual systems in contact (cf. Jake, 1998; Fuller, 1999; Myers-Scotton & Jake, 2000; Wei, 2000a, 2009c, 2015).

Figure 3 show that there are two potential MLs: the TL as the intended ML, and the developing IL and the L1 as the *de facto* ML. Thus, the ML of IL is the composite of the intended ML and the *de factor* ML. In contrast to the composite ML, the other linguistic system, the L1, is the EL. However, because IL is not exactly the same as classic CS, their EL roles are also somewhat different. The L1 is identified

as the EL in IL at an abstract level in that the L1 acts as the EL and may influence the *de facto* ML by partially contributing abstract lexical structure (see the detailed discussion in Section 5) to IL utterances. The composite ML contributes both content and system morphemes and substantially to the grammatical frame of IL utterances. What becomes crucial to the concept of a composite ML and to the concept of a contributing EL is that abstract lexical structure is complex and organized into subsystems. The composite nature of the ML of IL is caused by different constraints on the roles of the linguistic systems involved in the IL developing system. The role of the EL in IL is restricted because the TL is always learners' "intended" or "preferred" ML and the L1 is an "unfavorable" but "unavoidable" EL because it may play an interfering role in the process of IL development.

This study defines IL as a composite developing linguistic system based on the following assumptions.

(1) The early IL system is a composite developing system because at different times different linguistic systems, such as learners' L1, the TL and the current developing IL, are in contact, and each contributes different amounts to learners' intended or preferred ML of IL (Jake, 1998; Myers-Scotton, 1998; Fuller, 1999; Wei, 2009c).

(2) Learners may fall back on their L1 linguistic strategies so as to map surface forms onto function in the TL. Their progression along the IL continuum will increase their knowledge of TL morphosyntactic structures, and such increased knowledge will lead to a gradual fading of initially useful but inappropriate word choice or ill-formed sentences. Thus, the intended ML of IL or the TL will gradually become dominant in learners' developing IL system (Jake, 1998; Wei, 2000a, 2000b).

(3) The mental lexicon does not simply contain lexemes but language-specific lemmas, which are pieces of information about particular lexemes. The bilingual mental lexicon contains language-specific lemmas, which are in contact in IL production (see the detailed discussion in Section 5) (Myers-Scotton and Jake 1995; Wei 2002). Lexical structure is abstract in the sense that it contains several discrete but interacting subsystems: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns (Chomsky, 1981; Talmy, 1985; Jackendoff, 1990). Abstract lexical structure in IL may have different or mixed sources, such as those from learners' L1 and/or the TL (Wei, 2003, 2006a, 2009c).

(4) The idea that abstract lexical structure is complex and organized into several subsystems is crucial to the concept of a composite ML of IL and to the concept of a contributing EL in the developing IL system. Abstract lexical structure is modular and can be split and recombined in novel yet constrained ways in constructing the linguistic system underlying IL. Parts of the abstract lexical structure from learners' L1 lexical entries may influence the abstract lexical structure of incompletely acquired TL lexical entries in the developing IL (Myers-Scotton & Jake, 1995; Myers-Scotton, 1998; Jake, 1998; Wei, 2000a, 2000b).

4.1 Abstract Lexical Structure

As briefly introduced above, the mental lexicon contains abstract elements called "lemmas", which are

pieces of information about lexemes. For example, the lemmas for *he* require this pronoun to be used of a male and any main verb in the present tense to be inflected with -s for the subject-verb agreement; the lemmas for *explode* do not allow this verb to take an object noun and require a subject noun to be assigned the thematic role of THEME which undergoes a sudden or violent outburst as a result of internal pressure; the lemmas for *kill* require a noun to express the thematic role of AGENT which performs the act of killing and another noun to express the thematic role of THEME which becomes dead as a result of killing; the lemmas for *eat* require a noun to express the thematic role of AGENT which performs the act of eating and allow this verb to take an object noun to express the thematic role of THEME which must be something edible, and also contain the information about this verb's inflectional forms for tense/aspect/voice marking. Lemmas also contain information about a lexical verb's particular subcategorization frames (i.e., each verb is subcategorized for the number of argument nouns and their respective thematic roles), and information about a word's phonological segments and composition, its syllable structure and its accent structure. Lemmas also contain information about a lexical item's register, the kind of discourse it enters into, and its pragmatics, stylistics and affect.

Thus, lexemes in the mental lexicon have more abstract elements than surface lexical items, and such abstract elements make lexical structure abstract and complex (cf. Kempen & Huijbers, 1983; Talmy, 1985; Rappaport & Levin, 1988; Levelt, 1989, 1995; Jackendoff, 1990; Roelofs, 1992; Bock & Levelt, 1994; Kroll & de Groot, 1997). As illustrated in Figure 4, abstract lexical structure contains three subsystems: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns.

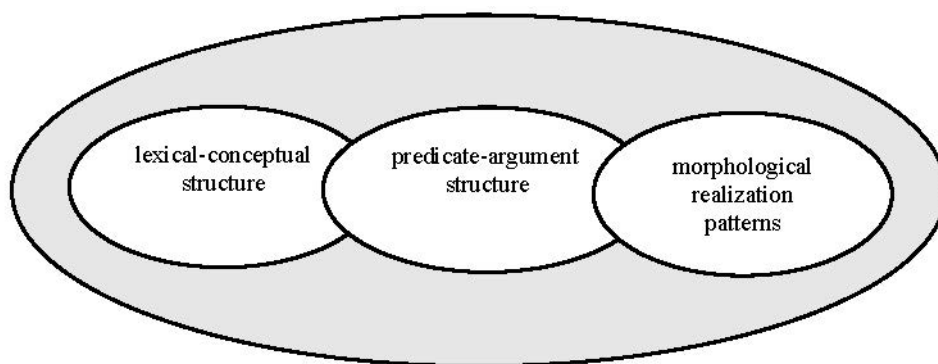


Figure 4. Abstract Lexical Structure

The subsystems make abstract lexical structure complex in that they play their distinctive and interactive roles in language production. Lexical-conceptual structure conflates universally available conceptual information about lexical entries as prelexical feature bundles. That is, the lexical-conceptual structure of a particular lexeme contains its semantic and pragmatic feature bundles and pointers to other lexemes with which it occurs (Levelt, 1989; Bock & Levelt, 1994).

Predicate-argument structure specifies the properties of verbs in terms of their individual subcategorization frames. That is, the predicate-argument structure of a particular verb determines the number of arguments it may take and the thematic role each argument it assigns. Morphological realization patterns spell out surface devices for word order, agreement, tense/aspect/voice/mood marking, and all other grammatical features (Myers-Scotton & Jake, 1995; Jake, 1998; Wei, 2002). These subsystems or abstract levels of language production sequentially interact each other. Lexical-conceptual structure at the conceptual level maps onto predicate-argument structure at the functional level to satisfy the theta criterion (i.e., each required argument must be assigned a particular thematic role) (cf. “lexicalization patterns” discussed in Talmy (1985)). Predicate-argument structure ensures each thematic role assignment and then maps onto morphological realization patterns at the positional level to encode the realization of a particular morpheme or word order for surface speech production. As commonly discussed in syntax, it is the lexical heads which project particular morphological realization patterns as well as other surface requirements. For example, the English morphological realization patterns encode the realization of the thematic role of THEME as an object of a verb (e.g., The teacher gave a book to the boy.), as an object introduced by a verb + satellite (e.g., Mary and John gave up their plan.), as an object introduced by a verb + preposition (e.g., The boy listened to the music.), as an object introduced by a noun + preposition (e.g., John is a student of linguistics.), or as an object introduced by an adjective + preposition (e.g., The cat is afraid of the dog.). It should be noted that certain predicate-argument structures may be morphologically realized in more than one pattern. For example, the teacher gave a book to the boy/the teacher gave the boy a book/a book was given to the boy by the teacher. What should be clear is that each predicate-argument structure must be syntactically realized in a particular morphological realization pattern(s).

4.2 Abstract Lexical Structure of Interlanguage and Its Composition

The developing linguistic system of IL is commonly recognized as a natural linguistic system. Thus, like any other linguistic system, it also has its abstract lexical structure. One of the key assumptions of the BLA model is that it is the lemmas for particular lexemes which become speakers’ knowledge of abstract lexical structure and its three subsystems. One of the other key assumptions of the BLA model is that lemmas are language-specific, and language specific lemmas are in contact in the bilingual mental lexicon. It is in this sense that the abstract lexical structure of IL is composite. Figure 5 illustrates the composite nature of IL abstract lexical structure.

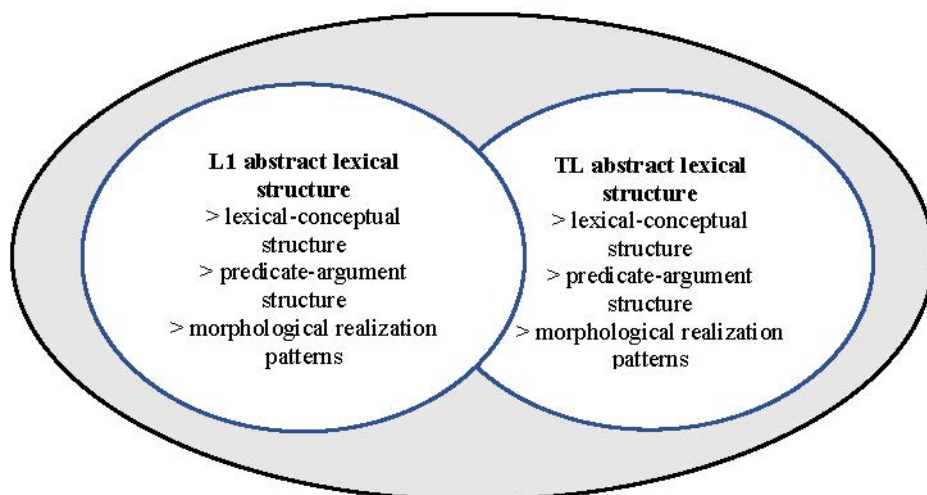


Figure 5. Composite Abstract Lexical Structure of IL

Figure 5 shows that the composite of the IL abstract lexical structure contains various sources. The BLA model claims that at various stages of L2 learning, parts of the IL abstract lexical structure may contribute different amounts to the incompletely acquired TL abstract lexical structure. Consequently, each of the three subsystems of the IL abstract lexical structure may contain elements (i.e., lemmas) from learners' L1 and/or TL. This is because along the IL continuum, learners may use the L1 abstract lexical structure to fill gaps at various abstract levels in the composite ML of IL.

Such a formal consideration of abstract lexical structure in general and composite abstract lexical structure of IL in particular has several implications for studies of IL and SLA.

(1) In language contact situations, there is always a clearly identified ML and the grammatical frame projected by the ML is always complete. IL is viewed as an outcome of languages in contact. However, unlike other language contact situations, in IL production, the ML of IL is incomplete and composite because learners do not have full access to the intended ML, that is, their knowledge of the TL is incomplete. As commonly observed, the ML of IL may generate elements at each abstract level of lexical structure from learners' L1 and/or incompletely acquired TL.

(2) Language-specific lemmas are in contact in the bilingual mental lexicon and affect IL production. L1 transfer should be understood as L1 lemma transfer at several abstract levels (i.e., the three subsystems of abstract lexical structure). That is, certain lemmas from learners' L1 may be transferred to fill particular gaps in the incompletely acquired TL lexical items. However, the contributions caused by L1 lemma transfer at these abstract levels are more constrained than those of the TL to the developing linguistic system of IL.

5. Bilingual Lemmas in Contact in Interlanguage Production

The BLA model proposes a particular approach to IL studies by regarding the developing linguistic system as an outcome of bilingual systems (specifically, bilingual lemmas) in contact in SLA. Adopting the MLF model, it claims that the ML of IL is a composite in the sense that its abstract lexical structure contains cross-linguistic lemmas for particular lexemes, such as lemmas from learners' L1 and TL. Thus, the nature and function of the composite ML of IL can be explored based on some observable consequences of bilingual lemmas in contact at three abstract levels of lexical structure: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns. Accordingly, departing from traditional approaches, the present study describes and explains sources of learner errors or language transfer in terms of lemma transfer.

5.1 Interlanguage Lexical-Conceptual Structure

As commonly observed, languages differ in lexicalizing the component of a given conceptual structure (cf. Talmy, 1985; Levelt, 1989; Jackendoff, 1991; Levin & Pinker, 1991; Bierwisch & Schreuder, 1992; Wei, 1995; Kroll & de Groot, 1997; Jake, 1998; Jiang, 2000; Wei, 2003). As assumed in the present study, the bilingual mental lexicon contains language-specific lemmas for particular lexemes, and language-specific lemmas are in contact and affect IL production at three levels of abstract lexical structure. The first level is lexical-conceptual structure. The BLA model claims that IL lexical-conceptual structure of a particular lexeme may contain certain L1 semantic/pragmatic features. This is because although learners' L2 lexicon contains only L2 lexical entries (i.e., vocabulary items), some of these lexical entries are not yet fully specified for their semantic, pragmatic, syntactic and/or morphological information. In other words, certain L2 lexical entries may be learned but not completely acquired. The incompletely acquired L2 lexicon can be recognized as the IL lexicon. Dewaele (1998), Jiang (2000) and Wei (2003) provide evidence that when learners' knowledge of the TL lexical items is partial or when their TL lexical items they "know" are not sufficient enough for them to express their intended meanings, they may turn to equivalent or similar lexical items in their L1 to serve their IL production. According to Talmy (1985) and Choi and Bowerman (1991), a different lexicalization pattern available to learners may be enforced at a certain point in IL production to realize learners' communicative intention. Wei (1994, 1996a, 1996b, 2002) reports that language-specific lemmas for particular lexical items in the bilingual mental lexicon can be activated, resulting in language transfer. Consequently, language transfer in lexical-conceptual structure results in lexical errors or inappropriate lexical choices in IL production.

[13] She now **do** meal.

[14] **Open** air condition.

[15] You **close** light.

[16] You come my **house**?

(Chinese L1; Wei, 1995)

[17] I go to the **oven** in the morning to buy bread.

[18] My father is a **long** thin man.

(Chinese L1; Jiang, 2000, p. 61)

[19] Yesterday in library I **look** Japanese magazine.

[20] My parent want **do** me teacher ... teach English in Japan.

(Japanese L1; Wei, 1996a, p. 423)

[21] My husband doesn't **wash** ... never **wash** the dishes.

[22] When I've cold I **eat** medicine, cold medicine.

[23] In Japan student **do** many tests and exams in class.

(Japanese L1; Wei, 2003, p. 65)

[24] watashi wa mai nichi juuni ji ni hirugohan ga **aru**.

"I have lunch at 12 o'clock every day."

[25] kare wa shaken o **toru**.

"He'll take the test."

[26] watashi wa tenisu o **asobu**.

"I play tennis".

[27] toru anata ni denwa o **ageru**.

"(I) will give you a call in the evening."

[28] haha wa shokuji no atode shokki o **suru**.

"(My) mother do the dishes after the meal."

(English L1; Wei, 2003, p. 65)

The above examples show that learners may implore their L1 lexical-conceptual structures in IL production of their intended meanings, and such L1 lexical-conceptual structures do not match those of the TL. In [13], "do" in Chinese means "cook" and other meanings like "play/work/write". In [14], "open" in Chinese means "turn on" or "start". In [15], "close" in Chinese means "turn off" or "stop/shut". In [16], "house" in Chinese also means "apartment/building/home". In [17] the learner uses "oven" rather than "bakery" probably because he has not learned "bakery" or does not make a lexical-conceptual distinction between "oven" and "bakery". The potential source of such a learner error may be that the concept of "oven" and the concept of "bakery" are relatively new to Chinese. In [18], the learner uses "long" rather than "tall" most probably because he is not aware of the

lexical-conceptual distinction between the two adjectives in English. In [19], “look” in Japanese means “read” and contains other meanings like “see/look at/visit/observe”. In [20], “do” Japanese means “make” and contains other meanings like “try/act/play”. In [21], “wash” in Japanese means “do”. It seems that the learner does not know the collocation of “do the dishes” in English. In [22], “eat” in Japanese means “take”. In [23], “do” in Japanese means “take”. In [24], the learner uses the English concept “aru” (have) for “have lunch” rather than “taberu” (eat) for the equivalent concept. In [25], the learner uses “toru” (take) rather than “ukeru” (receive) for the equivalent English expression “take the test”. In [26], the learner uses “asobu” (play) based on the English expression rather than “suru” (do) as used in combination with other relevant nouns in Japanese. In [27], the learner translates the English concept into Japanese by using “ageru” (give) rather than “suru” (do) as required in Japanese. In [28], the learner translates the English collocation “do the dishes” into Japanese by using “suru” (do) rather than “arau” (wash).

The above typical examples of L1 lexical-conceptual structure in IL production reveal that in early-stage L2 learning the TL lexical-conceptual structure is not available to learners. Learners always try to use the TL lexical items known to them, but their selection of those lexical items may be caused by their incomplete knowledge of the TL lexical-conceptual structure for particular lexemes or may be influenced by their L1 lexical-conceptual structure. According to Talmy (1985) and Jake (1994), learners acquire simple TL content morphemes first which match up possible L1 conflation categories of semantic notions (i.e., several semantic notions are conflated in a single lexical item (cf. Pinker, 1989a, 1989b)).

5.2 Interlanguage Predicate-Argument Structure

Predicate-argument structure is defined as the number of arguments (i.e., lexical nouns) required by the verb, and each argument is assigned a particular thematic role by the verb. For example, the verb “kill” minimally requires two arguments, and it assigns the thematic role of AGENT to one of the animate nouns which must be capable of performing the act of killing and the thematic role of THEME to the other animate noun whose death must be caused by the act of killing.

In addition to language transfer (i.e., lemma transfer) in lexical-conceptual structure, language transfer also often occurs in predicate-argument structure. As commonly observed in SLA, learners may choose the right TL verbs known to them, but they may use them inappropriately or incorrectly in their IL production because of their incomplete knowledge of the predicate-argument structure which must be satisfied by those verbs in the TL. Wei (1995, 1996a, 1996b, 2009c) finds strong evidence that learners may use their incompletely acquired TL verbs to project the number of arguments and assign the thematic roles to those arguments as their counterparts in their L1. Also, certain incompletely acquired TL lexical-conceptual structure may map onto incompletely acquired TL predicate-argument structure, resulting in language transfer in predicate-argument structure. Below are some typical examples of lemma transfer of L1 predicate-argument structure in IL production.

[29] Please help me **look** my child.

[30] You're **listening** music?

(Chinese L1; Wei, 1995)

[31] Today he **help** dinner.

[32] She **cost** me hundred dollar, ... bad tooth.

[33] Yes ... teacher **report** parent grade.

(Chinese L1; Wei, 1996a, p. 422)

[34] I can **wait** you here.

[35] Why you ask many questions **for me**?

[36] He is funny. His words in class **laugh** me.

(Japanese L1; Wei, 1995)

[37] Wait. I first **fill** water in glass. Wait.

[38] He busy. He not **help** my homework.

[39] Parent **provide** money to me.

(Japanese L1; Wei, 1996a, p. 422)

[40] densha o **totte** gakkoo e iku.

“(I) take the train to go to school.”

[41] gozen chuu kare o **yonda**.

“(I) called him in the morning.”

[42] kereno uchi made **noseru o ageta**.

“(I) gave him a ride home.”

(English L1; Wei, 2003, pp. 67-68)

In [29], “look” assigns the THEME directly to “my child” without the preposition “after”, which should be the thematic role assigner in this sentence, as required in English. This violation seems to be caused by the Chinese counterpart verb “zhaoliao (look/take care)”, which is a transitive verb and can take the THEME as its internal argument. In [30], “listen” assigns the THEME directly to “music” without the preposition “to” as required in English. Such a violation is most probably caused by the Chinese counterpart verb “ting (listen/hear)”, which is a transitive verb and thus does not need a preposition to assign this thematic role. That is, “ting” alone is the thematic role assigner and can take the THEME as its internal argument. Again, the examples in [31]-[33] reflect the typical Chinese predicate-argument structure used in IL production. In [31], “help” assigns the THEME directly to “dinner” without the

preposition “with” as required in English. In [32], “cost” takes the AGENT (i.e., the person who spends the money) as the subject, rather than the THEME (i.e., the thing on which the money is spent). In [33], “report” assigns the GOAL, rather than the THEME, to the indirect object in the double-object construction. In [34], “wait” assigns the THEME directly to “you” without the preposition “for” as required in the English predicate-argument structure for the intransitive verb “wait”. This violation seems to be caused by the Japanese counterpart verb “matsu (wait)”, which is a transitive verb and can take an object as its internal argument. In [35], “me” is assigned the GOAL by the preposition “for”, the thematic role assigner in this case, structurally subordinate to the internal argument of the verb, “many questions”, which the THEME. Such a predicate-argument structure seems to be affected by the Japanese counterpart verb “suru (ask)”, which projects the GOAL as a postpositional object with the postposition “ni” as the thematic role assigner. In [36], the predicate-argument structure and also its morphological realization patterns seem to be affected by the Japanese causative lexical-conceptual structure. In this example, “me” is the PATIENT, which should be “I”, the AGENT, in English and “his words” is the causer, which should be a prepositional stimulus “at his words” in English (e.g., I laugh at his words in class.). In [37], “fill” assigns the THEME to “water”, rather than assigning the PATIENT to “glass”, “water” should be assigned the THEME by the preposition “with” as required in English, and “glass” is assigned the LOCATION by the preposition “in”, rather than the PATIENT assigned by “fill” as required in English (e.g., I first fill the glass with water.). In [38], the preposition “with” as required in English to introduce the THEME does not appear. Such a violation seems to be caused by the Japanese counterpart verb “tatsudau (help)”, which can assign the thematic role directly to its internal argument. In [39], “provide” assigns the THEME to “money”, rather than the RECIPIENT to “me”. In this case, the THEME must be introduced by the thematic role assigner “with” (e.g., My parents provide me with money.). Such an error is most probably caused by the learner’s incomplete knowledge of the predicate-argument structure driven by “provide” in English. In [40], the learner uses the English predicate-argument structure for the verb “toru/totte” (take) where the means of transportation “densha” (train) is assigned the THEME and is introduced as the internal argument of “toru/totte”. This violates the Japanese predicate-argument structure where “densha” must be assigned the LOCATIVE by the preposition “ni” as part of the verb “noru/otte (take)” (e.g., densha ni notte gakkoo e iku.). In [41], the learner uses the English predicate-argument structure for the verb “call (yoru/yonda)” where the semantic features of “communicate with by telephone” are conflated in the verb “call”. In English, “call” takes its internal argument and assigns the RECIPIENT to it, but in Japanese, the RECIPIENT must be introduced by the preposition “ni” and the phone-call itself must be introduced and assigned the THEME by a specific verb like “kakeru” or “suru” (e.g., gozen chuu kere ni denwa o kaketa. Gozen chuu kere ni danwa o shita.). In [42], the learner seems to translate the English expression “give a ride” into Japanese. In English, “ride (nosu)” is introduced and assigned the THEME by the verb “give” as its internal argument, but in Japanese, the means of transportation

must be introduced and assigned the INSTRUMENT by the preposition “de (by)” (e.g., kereno uchi made kuruma de okutte ageta (“I sent him to his home by car.”)).

The above typical examples of L1 predicate-argument structure in IL production reveal that L1 may contribute to the composite ML of IL. While it is true that learners’ target is always and should be the L2 predicate-argument structure, because of their lack of or incomplete knowledge of the L2 predicate-argument structure, their L1 seemingly equivalent one may be used in IL production. In other words, though learners use the L2 lexical items as needed for their intended meanings, they may fail to produce the predicate-argument structure as required for a particular L2 verb. Thus, the IL system is predictably a composite of structures from multiple sources, such as L2 lemmas for certain lexemes and incompletely acquired ones in the TL.

5.3 Interlanguage Morphological Realization Patterns

As introduced earlier, lemmas also contain information about particular lexical items’ morphological realization patterns, which are defined as surface devices for word order, agreement, inflectional morphology of tense/aspect/voice/ mood marking, and so on at the positional level of speech production. As often observed in early-stage learners’ IL production, learners may implore their L1 morphological realization patterns before the TL ones are completely acquired. Below are some typical examples of lemma transfer of L1 morphological realization patterns in IL production.

[43] I English not speak.

[44] My husband in USC study.

[45] I like ... accounting people job because study English, just more study English.

(Chinese L1; Wei, 1995)

[46] You too go? We have three ticket.

[47] Outside code, inside warm.

[48] (on the phone) Hello ... she not in home. She at outside at playground playing.

[49] go swim? No. Parent no go, you no go swim.

[50] You not go library, I go.

[51] Tomorrow I no go work. I sick.

(Chinese L1; Wei, 1996a, p. 421)

[52] In Japan student English junior high school start.

[53] I in Japan my city like.

(Japanese L1; Wei, 1995)

[54] I from Japan arrive, now live in room ... apartment, I, friend and EPI teacher, EPI

teacher help me English speak ... kind, nice teacher.

[55] Here everything expensive. I everyday use bike. Taxi? No. I live not far.

[56] I go to party with friend tomorrow. We together cook, interesting.

[57] I English speak not well.

(Japanese L1; Wei, 1996a, p. 421)

[58] Sorry. Only little English I know.

[59] Tomorrow to New York we'll go with some friends.

(Japanese L1; Wei, 2003, p. 69)

[60] watashitachi wa shigoto ni iku mainichi.

“We go to work every day.”

[61] watashi wa moou kakiowatta watashi no repooto.

“I already finished my report.”

(English L1; Wei, 2003, p. 69)

Examples [43]-[45] show that though beginning Chinese learners of English use L2 content morphemes to express their intended meanings, they may employ their L1 morpheme order (cf. Givon, 1984; Talmy, 1985). The Chinese basic word order is Subject-Verb-Object, but any constituent can be placed in the sentence initial position or before the verb or topicalization or emphasis. In [43], the direct object “English” is placed before the verb. In [44], the prepositional phrase of location “in USC” is placed between the subject and the verb. In [45], “more” is placed before the verbal phrase “study English”. In Chinese, based on the context, any constituent, such as the copula “be”, the argument for AGENT or THEME, can be left out (i.e., be implicit), as shown in [47], [48] and [49]. In Chinese morphological realization patterns, there are few auxiliary verbs for negation, interrogative or other grammatical functions and no system morphemes for 3rd person singular, plural or tense/aspect marking. Thus, in Chinese morphological realization patterns, tense/aspect is expressed implicitly, as in [46], [48] and [49] or by other means, such as by time adverbials, as shown in [51]; negation is realized by placing the negative particle immediately before the verb, as in [43], [49], [50] and [51]; interrogative is realized by rising intonation, as in [46] and [49]; “-s” for the subject-verb agreement is missing, as in [44], and plural is realized by specific cardinal numbers, as in [46].

Examples [52]-[59] show that beginning Japanese learners of English tend to arrange L2 content morphemes based on their L1 morphological realization patterns. The basic Japanese order is Subject-Object-Verb, as in [52], [53], [54], [57], [58] and [59], and any constituent must be placed before the verb, as in [52], [53], [54] and [56]; negation is realized by placing the negative particle right after the verb, as in [55] and [57]. Japanese is also lack of auxiliary verbs for tense/aspect marking,

negation, etc. and other system morphemes similar to those as required in English, such as certain determiners, as in [55] and [56], “-s” for the subject-verb agreement, as in [54]; and plural, as in [56]. Similarly, beginning English learners of Japanese may also employ their L1 morphological realization patterns. In [60], the sentence basically follows the Japanese verb final word order, but the adverbial of time “mainichi” (every day) is placed in the sentence final position, which is not allowed in Japanese. In [61], the sentential elements are arranged in the typical English word order where the object follows the predicate verb.

As assumed in the BLA model, the ML of IL is a composite (see Figure 3), and abstract lexical structure of IL is also a composite where lemmas in the bilingual mental lexicon are language-specific and are in contact (see Figure 5). Language-specific lemmas contain all the information necessary to project actually occurring surface forms. L1 lexical structure at the level of morphological realization patterns may also be employed by early stage L2 learners to fill a “gap” in the abstract lexical structure projected by the incompletely acquired ML of the TL. Thus, language transfer or influence at any level of abstract lexical structure in IL development can be understood as an outcome of bilingual lemmas in contact in L2 learning.

6. Nature of Language Transfer and Its Implications for Second Language Acquisition

Although researchers have different theories and assumptions about the nature and role of language transfer and some earlier views become outdated or discredited, the notion of language transfer remains fundamental in SLA research. Without exploring sources of language transfer, research in IL would become rather superficial and less valuable. Some researchers have found that L2 learners may transfer certain properties of their L1 into their current IL but they do not do so blindly (Selinker, 1972; Selinker, Swain, & Dumas, 1975; Corder, 1983). This study aims to discover what L1 properties can be expected to transfer or incorporate into the developing linguistic system of IL under the assumption that language transfer is an unavoidable outcome of languages in contact, to be more specific, bilingual lemmas in contact.

Drawing on and departing from earlier observational and descriptive models of language transfer theories, and adopting the MLF model, the BLA model explores the nature and activity of the bilingual mental lexicon during the development of the linguistic system of IL. This study offers several implications for SLA.

(1) Any analysis of IL surface forms will remain at an observational level if it fails to relate what is observed to what is going on in learners’ mental activity. This is because the phenomenon of language transfer reflects learners’ non-native like processing routines driven by their bilingual mentality, and such non-native like processing routines must have a vital role to play in their IL development. Unlike monolingual mental lexicon, the bilingual mental lexicon contains language-specific lemmas in contact and can be activated in IL production. In other words, bilingual mental activity comes into play at an

abstract level.

(2) Language transfer should be viewed primarily as learners' production strategies rather than an automatic or unconscious process. As assumed in the cognitive paradigm, language transfer should be characterized as learners' problem-solving procedures or learning strategies. Learners may utilize their L1 knowledge to solve a learning or spontaneous communication problem (cf. Kellerman, 1977; Jordens, 1977; Sharwood Smith, 1979; VanPatten, 1984a, 1984b, 1995; Jake, 1998; Wei, 2000a, 2000b).

(3) Learners' production or formalization of a given L2 is affected not only by their L1 but also by the current state of their IL. Language transfer takes place proactively or retroactively, that is, old knowledge (in this case, L1 knowledge) may influence new knowledge (in this case, L2 knowledge), and new knowledge may influence old knowledge. As assumed in cognitive learning theory, existing knowledge plays a role in internalizing any new information (cf. McLaughlin, 1978; Sharwood Smith, 1979, 1986; McDonough, 1981; Færch & Kasper, 1986; Jake, 1998; Wei, 2015). As claimed in the BLA model, language transfer is an accommodation process (i.e., a natural developmental process) to successful SLA, which can predict the directions of IL development.

(4) IL is an incremental and transitional linguistic system and must be governed by some underlying principles. "*The target-language principle*: To the extent possible, construct the IL from the TL lexical structure" (Jake 1998, 341). As claimed in the BLA model, this is because starting in early stages of L2 learning, learners attempt to construct the developing IL from the TL abstract lexical structure which may be incomplete. "All IL surface structures are projected by TL-based lexical items in the grammatical system underlying IL" (Jake, 1998, p. 342). Due to the composite nature of the abstract lexical structure of IL, language transfer or influence of L1 abstract lexical structure is unavoidable but must be sufficiently target-like so as to contribute to the developing system of IL. As predicated, all language transfer or L1 influence is target-oriented (cf. Kellerman, 1989; Giacobbe, 1992; Wei, 2000a, 2000b). "*The complete-projection principle*: To the extent possible, satisfy the requirements of the grammar of the matrix language through the specification of all requisite grammatical features of the entries in the mental lexicon (i.e., lemmas)" (Jake, 1998, p. 342). This principle stipulates that learners attempt to fill all levels of the abstract lexical structure (i.e., lexical-conceptual structure, predicate-argument structure, and morphological realization patterns) of IL based on their current knowledge of the abstract lexical structure of the TL. As claimed in the BLA model, when the TL lexical entries in the bilingual mental lexicon are insufficiently acquired or incompletely specified, certain features of the L1 abstract lexical structure may be used in learners' L2 production for learners' immediate communicative needs, resulting in an incomplete projection of the TL lexical entries. As further claimed in the BLA model, IL abstract lexical structure in various stages of learning reflects learners' incomplete projection of the TL abstract lexical structure, and such an incomplete project may contain certain linguistic features of learners' L1 and TL, resulting in the composite abstract lexical

structure of IL.

7. Conclusion

From some perspectives of contact linguistics, this study reaches several conclusions regarding the developmental nature of IL, the nature and activity of the bilingual mental lexicon, and sources and roles of language transfer or learner errors in SLA.

(1) The developing linguistic system of IL can be viewed as an outcome of languages in contact on the assumption that there are several linguistic systems in contact in SLA: the L1, the TL, and the developing IL. Each of them plays its role in the IL development. As claimed in the MLF model, there must be an ML in any language-contact situation. This is because it is the ML which provides the grammatical frame and controls abstract lexical structure, including its three subsystems: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns. Different from other language-contact situations, IL has its very special ML because two linguistic systems become ML candidates: The TL is always learners' intended ML, but the abstract grammatical system underlying the developing IL is the *de facto* ML (Jake, 1998; Wei, 2002). As commonly observed in any SLA research, at various stages of L2 learning, learners' knowledge of the TL is insufficient, and thus their intended ML is predictably incomplete. For this reason, learners' *de facto* ML may contain elements of abstract lexical structure from other sources which must come into play in IL production. Thus, learners' L1 abstract lexical structure and/or the generalized TL abstract lexical structure will fill gaps in learners' *de facto* ML (Jake, 1998; Wei, 2002, 2015). The ML of IL is regarded as a composite which contains TL-based IL abstract lexical structure with L1 elements from each of the subsystems.

(2) The bilingual mental lexicon contains language-specific lemmas for particular lexemes, and such language-specific lemmas are in contact in L2 learning. As claimed in the BLA model, all instances of language transfer should be viewed as lemma transfer. This is because learners may activate their L1 knowledge at several distinct but related levels of abstract lexical structure (i.e., three subsystems of abstract lexical structure) in IL production. If SLA is regarded as a particular language-contact situation in which the intended ML is a *de facto* ML, L1 abstract lexical structure can be split and recombined to build a developing target ML. However, the contribution of the L1 is rather constrained. As proposed in the BLA model, and also as observed in the phenomena of language transfer in L2 learning, only abstract lexical structure projected by lemmas underlying certain L1 content morphemes can contribute to the developing composite ML. Thus, learners' activation of their L1 knowledge may unavoidably occur because of their incomplete knowledge of particular L2 lexical items or, to be more specific, their incomplete knowledge of particular L2 lemma specifications for each of the subsystems of the abstract lexical structure in the L2. Thus, any successful SLA must involve the full access to lemmas for all L2 lexical entries (i.e., L2 vocabulary items).

(3) The notion of language transfer should be related to the notion of interaction between learners' L1 knowledge and L2 knowledge being learned. As predicted in the BLA model, sufficient acquisition of language-specific lemma specifications for the L2 abstract lexical structure becomes absolutely necessary for successful SLA. To make this happen, language-specific lemmas in the bilingual mental lexicon must be clearly separated during the process of L2 learning. This is because though successful SL involves language transfer as an unavoidable and transitional strategy, language-specific lexicalization and grammaticalization patterns must be learned as they are. As predicted by the target-language principle (Jake, 1998), as more and more TL lexical-conceptual structure, predicate-argument structure, and morphological realization patterns become available to learners, the successful projection of TL at each of these levels of abstract lexical structure will replace those underlying the developing linguistic system of IL.

References

- Andersen, R. W. (1982). Determining the linguistic attributes to language attrition. In R. Lambert, & B. F. Freed (Eds.), *The loss of language skills* (pp. 83-118). Rowley, MA: Newbury House.
- Andersen, R. W. (1983a). *Pidginization and creolization as language acquisition*. Rowley, MA: Newbury House.
- Andersen, R. W. (1983b). Transfer to somewhere. In S. M. Gass, & L. Selinker (Eds.), *Language transfer in language learning* (pp. 177-201). Rowley, MA: Newbury House.
- Andersen, R. W., & Shirai, Y. (1996). The primary of aspect in first and second language acquisition: The pidgin-creole connection. In W. C. Ritchie, & T. K. Bhatia (Eds.), *Handbook of second language acquisition* (pp. 527-570). San Diego, CA: Academic Press.
- Bailey, N., Madden, C., & Krashen, S. D. (1974). "Is there a "natural sequence" in adult second language learning?" *Language Learning*, 24, 235-244.
- Benhattab, A. L., Ouahmiche, G., & Labed, Z. (2017). The feasibility of content and system morpheme hierarchy in the analysis of Tamazight bilingual corpora: The case of Kabyle and Mzabi bilingual speech in Oran. *International Journal of Language and Linguistics*, 5(1/3), 6-14.
- Beniak, E., Mougen, R., & Valois, D. (1984/5). Sociolinguistic evidence of a possible case of syntactic convergence in Ontarian French. *Journal of the Atlantic Provinces Linguistic Association*, 6(7), 73-88.
- Bialystok, E. (1995). Why we need grammar. In L. Eubank, L. Selinker, & M. Sharwood Smith (Eds.), *The current state of interlanguage: Studies in honor of William E. Rutherford* (pp. 56-61). Philadelphia: Benjamins.
- Bierwisch, M., & Schreuder, R. (1992). From concepts to lexical items. *Cognition*, 41, 23-60.
- Blazquez-Domingo, R. (2000). Spanish-English CS data. Unpublished corpus, University of South Carolina, Columbia, SC.

- Bock, K., & Levelt, W. J. M. (1994). Language production: Grammatical encoding. In M. A. Gernsbacher (Ed.), *Handbook of psycholinguistics* (pp. 945-984). New York: Academic Press.
- Choi, S., & Bowerman, M. (1991). Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. *Cognition*, 41, 83-121.
- Chomsky, N. (1981). Principles and parameters in syntactic theory. In N. Hornstein, & D. Lightfoot (Eds.), *Explanations in linguistics: The logical problem of language acquisition* (pp. 32-75). London: Longman.
- Chomsky, N. (1986). *Barriers*. Cambridge, MA: MIT Press.
- Cook, V. (Ed.). (2003). *Effects of the second language on the first language*. Clevedon: Multilingual Matters.
- Corder, S. P. (1967). The significance of learners' errors. *International Review of Applied Linguistics*, 5, 161-170.
- Corder, S. P. (1971). Idiosyncratic dialects and error analysis. *International Review of Applied Linguistics*, 9, 149-159.
- Corder, S. P. (1983). A role of the mother tongue. In S. M. Gass, & L. Selinker (Eds.), *Language transfer in language learning* (pp. 85-97). Rowley, MA: Newbury House.
- Dechert, H., & Raupach, M. (Eds.) (1989). *Transfer in language production*. Norwood, NJ: Ablex.
- Dewaele, J-M. (1998). Lexical inventions: French interlanguage as L2 versus L3. *Applied Linguistics*, 19, 471-490.
- Dorian, N. (1981). *Language death: The life cycle of a Scottish Gaelic dialect*. Philadelphia: University of Pennsylvania Press.
- Dulay, H. C., Burt, M. K., & Krashen, S. D. (1982). *Language two*. New York: Oxford University Press.
- Dzameshie, A. (1989). Codeswitching in EWE and English. Paper presented at African Linguistics Conference, Urbana, IL.
- Eckman, F. (1977). Markedness and the contrastive analysis hypothesis. *Language Learning*, 27, 315-330.
- Eubank, L., Selinker, L., & Sharwood Smith, M. (1995). The current state of interlanguage: Introduction. In L. Eubank, L. Selinker, & M. Sharwood Smith (Eds.), *The current state of interlanguage: Studies in honor of William E. Rutherford* (pp. 1-10). Philadelphia: Benjamins.
- Færch, C., & Kasper, G. (1986). Cognitive dimensions of language transfer. In E. Kellerman, & M. Sharwood Smith (Eds.), *Crosslinguistic influence in second language acquisition* (pp. 49-65). Elmsford, NY: Pergamon Press.
- Færch, C., & Kasper, G. (1987). *Introspection in second language research*. Clevedon: Multilingual Matters.
- Flynn, S. (1987). *A parameter-setting model of L2 acquisition*. Dordrecht: Reidel.
- Fuller, J. M. (1999). The role of English in Pennsylvania German development: Best supporting actress?

- American Speech, 74(1), 38-55.
- Gass, S. M. (1984). A review of interlanguage syntax: Language transfer and language universals. *Language Learning*, 34, 115-132.
- Gass, S. M., & Schachter, J. (1989). *Linguistic perspectives on second language acquisition*. Cambridge: Cambridge University Press.
- Gass, S. M., & Selinker, L. (Eds.) (1983). *Language transfer in language learning*. Rowley, MA: Newbury House.
- Gass, S. M., & Selinker, L. (Eds.) (1992). *Language transfer in language learning*. Amsterdam: John Benjamins.
- Giacobbe, J. (1992). A cognitive view of the role of L1 in the L2 acquisition process. *Second Language Research*, 8(3), 232-250.
- Givón, T. (1984). Universals of discourse structure and second language acquisition. In W. E. Rutherford (Ed.), *Language universals and second language acquisition* (pp. 109-136). Amsterdam: John Benjamins.
- Hatch, E. (1983). *Psycholinguistics: A second language perspective*. Rowley, MA: Newbury House.
- Jackendoff, R. (1990). *Semantic structure*. Cambridge, MA: MIT Press.
- Jackendoff, R. (1991). Parts and boundaries. *Cognition*, 41, 9-45.
- Jake, J. L. (1994). Intrasentential codeswitching and pronouns: On the categorical status of functional elements. *Linguistics*, 3, 271-298.
- Jake, J. L. (1998). Constructing interlanguage: Building a composite matrix language. *Linguistics*, 36, 333-382.
- Jake, J. L., Myers-Scotton, C., & Gross, S. (2002). Making a minimalist approach to codeswitching work: Adding the matrix language. *Bilingualism: Language and Cognition*, 5(1), 69-91.
- Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics*, 21(1), 47-77.
- Jordens, P. (1977). Roles, grammatical intuitions and strategies in foreign language learning. *Interlanguage Studies Bulletin*, 2, 5-76.
- Kellerman, E. (1977). Towards a characterization of the strategies of transfer in second language learning. *Interlanguage Studies Bulletin*, 2, 58-145.
- Kellerman, E. (1986). An eye for an eye: Crosslinguistic constraints on the development of the L2 lexicon. In E. Kellerman, & M. Sharwood Smith (Eds.), *Crosslinguistic influence in second language acquisition* (pp. 35-48). Oxford: Pergamon.
- Kellerman, E. (1989). The imperfect conditional. In K. Hyttenstam, & L. K. Obler (Eds.), *Bilingualism across the lifespan: Aspects of acquisition, maturity, and loss* (pp. 87-115). Cambridge: Cambridge University Press.
- Kempen, G., & Huijbers, P. (1983). The lexicalization process in sentence production and naming:

- Indirect election of words. *Cognition*, 14, 185-209.
- Krashen, S., Butler, J., Birnbaum, R., & Robertson, J. (1978). Two studies in language acquisition and language learning. *ITL; Review of Applied Linguistics*, 39-40, 73-92.
- Kroll, J. F., & de Groot, A. M. B. (1997). Lexical and conceptual memory in the bilingual: Mapping form to meaning in two languages. In A. M. B. de Groot, & J. F. Kroll (Eds.), *Tutorials in bilingualism: Psychological perspectives* (pp. 169-200). Mahwah, NJ: Erlbaum.
- Kuhberg, H. (1992). Longitudinal L2-attribution versus L2-acquisition, in three Turkish children – empirical findings. *Second Language Research*, 8(2), 138-154.
- Lado, R. (1957). *Linguistics across cultures: Applied linguistics for language teachers*. Ann Arbor, MI: University of Michigan Press.
- Larsen-Freeman, D. (1991). Second language acquisition research: Staking out the territory. *TESOL Quarterly*, 25, 315-350.
- Levelt, W. J. M. (1989). *Speaking: From intention to articulation*. Cambridge, MA: MIT Press.
- Levelt, W. J. M. (1995). The ability to talk: From intention to spoken words. *European Review*, 3, 13-23.
- Levin, B., & Pinker, S. (1991). Introduction. Special issue of *Cognition on Lexical and Conceptual Semantics*. *Cognition*, 41, 1-7.
- Major, R. (1987). Phonological similarity, markedness, and rate of L2 acquisition. *Studies in Second Language Acquisition*, 9, 63-83.
- McDonough, S. H. (1981). *Psychology in foreign language teaching*. London: Allen and Unwin.
- McLaughlin, B. (1978). The monitor model: Some methodological considerations. *Language Learning*, 28, 309-332.
- Myers-Scotton, C. (1993 [1997]). *Duelling languages: Grammatical structure in codeswitching*. Oxford: Clarendon Press.
- Myers-Scotton, C. (1998). A way to dusty death: The matrix language turnover hypothesis. In L. A. Grenoble, & L. J. Whaley (Eds.), *Endangered languages: Current issues and future prospects* (pp. 289-316). Cambridge: Cambridge University Press.
- Myers-Scotton, C. (2002). *Contact linguistics: Bilingual encounters and grammatical outcomes*. New York: Oxford University Press.
- Myers-Scotton, C., & Jake, J. L. (1995). Matching lemmas in a bilingual language competence and production model: Evidence from intrasentential code switching. *Linguistics*, 33(5), 981-1024.
- Myers-Scotton, C., & Jake, J. L. (2000). Four types of morpheme: Evidence from aphasia, codeswitching, and second language acquisition. *Linguistics*, 38(6), 1053-1100.
- Odlin, T. (1989). *Language transfer*. Cambridge: Cambridge University Press.
- Pfaff, C. (1979). Constraints on language mixing: Intrasentential code-switching and borrowing in Spanish/English. *Language*, 55, 291-318.
- Pinker, S. (1989a). *Learnability and cognition*. Cambridge, MA: MIT Press.

- Pinker, S. (1989b). Resolving a learnability paradox in the acquisition of the verb lexicon. In M. L. Rice, & R. L. Schiefelbusch (Eds.), *The teachability of language* (pp. 13-61). Baltimore, MD: Brushwood Graphics.
- Polinsky, M. (1997). American Russian: Language loss meets language acquisition. In W. Browne, E. Dornish, N. Khondrashova, & D. Zec (Eds.), *Annual workshop on formal approaches to Slavic linguistics* (pp. 370-406).
- Preziosa-Di Quinzio, I. (1992). Teoreticamente la firma la indietro: Frammistione di italiano e Schwyzertüsch nella conversazione one di figli di emigrati. Università di Zurigo, Facoltà de Lettere e di Filosofia: Vavoro di licenza in linguistica Italiana.
- Rappaport, M., & Levin, B. (1988). What to do with theta-roles. In W. Wilkins (Ed.), *Syntax and semantics, Vol. 21: Thematic relations* (pp. 7-34). New York: Academic Press.
- Ringbom, H. (1987). *The role of the first language in foreign language learning*. Clevedon, Avon: Multilingual Matters.
- Roelofs, A. (1992). A spreading-activation theory of lemma retrieval in speaking. *Cognition*, 42, 107-142.
- Romaine, S. (1989). *Bilingualism*. Oxford: Blackwell.
- Seliger, H. W. (1996). Primary language attrition in the context of bilingualism. In W. Rithie, & T. Bathia (Eds.), *Handbook of second language acquisition* (pp. 605-627). New York: Academic Press.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics*, 10, 209-230.
- Selinker, L., Swain, M., & Dumas, G. (1975). The interlanguage hypothesis extended to children. *Language Learning*, 25, 345-361.
- Sharwood Smith, M. (1979). Strategies, language transfer and the simulation of the language learner's mental operations. *Language learning*, 29, 345-361.
- Sharwood Smith, M. (1986). The competence/control model, crosslinguistic influence and the creation of new grammars. In E. Kellerman, & M. Sharwood Smith (Eds.), *Crosslinguistic influence in second language acquisition* (pp. 10-20). Elmsford, NY: Pergamon Press.
- Talmy, L. (1985). Lexicalization patterns: Semantic structure in lexical items. In T. Shopen (Ed.), *Language typology and syntactic description, Vol. 3* (pp. 57-149). Cambridge: Cambridge University Press.
- VanPatten, B. (1984a). Processing strategies and morpheme acquisition. In F. Eckman, L. Bell, & D. Nelson (Eds.), *Universals in second language acquisition* (pp. 88-98). Rowley, MA: Newbury House.
- VanPatten, B. (1984b). Learners' comprehension of clitic pronouns: More evidence for a word order strategy. *Hispanic Linguistics*, 1, 57-67.
- VanPatten, B. (1995). Cognitive aspects of input processing in second-language acquisition. In P. Hashemipour, R. Maldonado, & M. van Naerssen (Eds.), *Studies in language learning and Spanish*

- linguistics in honor of Tracy D. Terrel* (pp. 170-183). New York: McGraw-Hill.
- Wei, L. (1994). Organizing principles governing early second language acquisition. Paper presented at the Annual Meeting of New Ways of Analyzing Variation (NWAV), Stanford University, CA.
- Wei, L. (1992). Chinese/English codeswitching data. Unpublished corpus, University of South Carolina, Columbia, SC.
- Wei, L. (1995). Chinese and Japanese learners' interlanguage data. Unpublished corpus, University of South Carolina, Columbia, SC.
- Wei, L. (1996a). Organizing principles behind code switching and interlanguage development in early adult second language acquisition. In J. Arnold, R. Blake, B. Davidson, S. Schwenter, & J. Solomon (Eds.), *Sociolinguistic variation: Data, theory, and analysis* (pp. 417-431). Stanford, CA: CSLI Publishers.
- Wei, L. (1996b). *Variation in the acquisition of morpheme types in the interlanguage of Chinese and Japanese learners of English as a second language*. Unpublished doctoral dissertation, University of South Carolina, Columbia, SC.
- Wei, L. (2000a). Unequal election of morphemes in adult second language acquisition. *Applied Linguistics*, 2, 106-140.
- Wei, L. (2000b). Types of morphemes and their implication for second language morpheme acquisition. *International Journal of Bilingualism*, 4(1), 29-43.
- Wei, L. (2002). The bilingual mental lexicon and speech production process. *Brain and Language*, 81, 691-707.
- Wei, L. (2003). Activation of lemmas in the multilingual mental lexicon and transfer in third language learning. In J. Cenoz, B. Hufeisen, & U. Jessner (Eds.), *The multilingual lexicon* (pp. 57-70). Dordrecht: Kluwer Academic Publishers.
- Wei, L. (2006a). The multilingual mental lexicon and lemma transfer in third language learning. *International Journal of Multilingualism*, 3(2), 88-104.
- Wei, L. (2006b). Intrasentential codeswitching as conceptual projection of lemmas in the bilingual mental lexicon. *Journal of Cognitive Science*, 7(2), 149-178.
- Wei, L. (2009c). The composite nature of interlanguage as a developing system. *Research in Language*, 7, 5-30. de Gruyter.
- Wei, L. (2015). *Interlanguage: The abstract level in language acquisition*. New York: The Edwin Mellen Press.
- Wei, L. (2018). Abstract lexical structure in second language learning. *Studies in Linguistics and Literature*, 2(3), 223-243.
- Wei, L. (2020). *The bilingual mental lexicon*. UK: Cambridge Scholars Publishing.
- White, L. (1989). *Universal grammar and second language acquisition*. Amsterdam: John Benjamins.
- White, L. (1995). Chasing after linguistic theory. In L. Eubank, L. Selinker, & M. Sharwood Smith

(Eds.), *The current state of interlanguage: Studies in honor of William E. Rutherford* (pp. 64-71). Philadelphia: Benjamins.

Yip, V. (1995). *Interlanguage and learnability: From Chinese to English*. Amsterdam: Benjamins.

Zobl, H. (1980a). The formal and developmental selectivity of L1 influence on L2 acquisition. *Language Learning*, 30, 43-57.

Zobl, H. (1980b). Developmental and transfer errors: Their common bases and (possibly) differential effects on subsequent learning. *TESOL Quarterly*, 14, 469-479.