The Bilingual Mental Lexicon and Language Transfer in Second Language Learning

Longxing Wei
Montclair State University
1 Normal Avenue, Montclair
New Jersey 07043, USA

Xuexin Liu
Spelman College
350 Spelman Lane SW, Atlanta
Georgia 30314, USA

Abstract

This study describes and explains language transfer in second language learning by exploring the nature and activity of the bilingual mental lexicon. It assumes that the bilingual mental lexicon contains language-specific lemmas, which activate language-specific morph syntactic procedures in speech production, and second language learners' activation of lemmas for target language items may be influenced by the first language lemmas stored in their mental lexicon. As evidenced, language transfer may occur at three levels of abstract lexical structure: the lexical-conceptual structure, the predicate-argument structure, and the morphological realization patterns. The findings provide evidence that non-acquisition or partial acquisition of the target abstract lexical structure may cause learners to activate their first language lemmas in second language production. The study concludes that the activation of first language lemmas is the major source of language transfer, and successful second language acquisition requires learners to acquire the abstract lexical structure of the target language.

Keywords: bilingual, mental lexicon, interlanguage, lemma, activation, transfer, abstract lexical structure

1.Introduction

Language transfer has been undeniably recognized as one of the most important factors which shape second language (L2) learners' interlanguage (IL). The origins of the term 'language transfer' go back to behaviorism and its view that learners' first/native language habits influence their acquisition of the second/foreign language habits. Although the behaviorist view of language transfer is discredited, the notion of language transfer has remained as one of the most fundamental issues in second language acquisition (SLA) research. Those adopting the Contrastive Analysis Hypothesis (Lado, 1957) view SLA essentially as a process of overcoming learners' first language (L1) linguistic habits. This is based on the assumption that differences between L1 and L2 cause learning difficulties whereas similarities between the two facilitate SLA. However, based on the evidence of universal (i.e., common) orders of linguistic development as manifested in the performance of learners of English with different L1 backgrounds, Dulay and Burt (1972), Bailey, Madden, and Krashen (1974), and Dulay, Burt, and Krashen (1982) reject the importance of language transfer. They claim that L2 learners with different L1 backgrounds follow similar developmental paths and that the observed orders are similar if not completely identical to those observed in L1 learners. They argue that apparent cases of language transfer must be reinterpreted as cases of regularization or overgeneralization (cf. Selinker, 1972). In their interpretation of learner errors, Dulay and Burt (1972) argue that a mere contrast between an L2 learner utterance and an equivalent native speaker utterance is not sufficient enough to justify the assumption that L2 learners resort to the psycholinguistic process of language transfer. Nevertheless, subsequent researchers, such as Rosansky (1976), Andersen (1978) and Kellerman (1984), tend to confirm the importance of language transfer by providing the morpheme acquisition data that reveal learners' L1 interference. Although there have been many debates over universal principles and language transfer, any study of SLA is in fact the study of transition from one primary language to another. As commonly observed, the existence of primary languages gives rise to special transitional systems, which are identified as ILs (Selinker, 1972; Selinker, Swain, & Dumas, 1975; Corder, 1983).

Many research findings indicate that early L2 learners may transfer certain properties of their L1s into their current ILs, but they do not do so indiscriminately. Researchers have been trying to discover what L1 properties can be expected to transfer or incorporate naturally into their IL developing systems. That is, how learners' 'incomplete' or 'partial' target language (TL) system can be explained in terms of the IL developmental process and directions remains as one of the most important issues.

Although researchers have different opinions about the role of language transfer, they recognize language transfer as a pervasive phenomenon in SLA. What becomes important is an adequate explanation of such a phenomenon so as to describe and explain the nature and developmental directions of IL systems. In other words, it becomes necessary to explore the nature and activity of the bilingual mental lexicon in the process of SLA. Wei (2002) proposes the Bilingual Lemma Activation (BLA) Model, which redefines the role of language transfer. This paper recapitulates the essential motivations of the BLA Model for exploring the relationship between the bilingual mental lexicon and language transfer in L2 learning.

2.The Bilingual Lemma Activation Model

The mental lexicon is generally defined as the store of information about particular words in one's language. As Richards (1976), Faerch and Kasper (1984), Nation (1990), Ringbom (1987), Wei (2001a, 2001b, 2002) and others have explained, knowing a word means the ability to retrieve the word from the mental lexicon about its spelling and pronunciation, its meaning(s), its grammatical class and syntactic environment, its collocations and syntagmatic associations, its lexical and conceptual associations, and its registers. In speech production, speakers map what they intend to say onto words retrieved from lexical items currently stored in the mental lexicon. In other words, speakers conceptually retrieve the appropriate words from the mental lexicon to correctly express their intended meanings (cf. de Bot & Schreuder, 1993; Poulisse & Bongaerts, 1994). A lexical item retrieved from the mental lexicon not only contains its lexical content (i.e., its meaning) but also phonological, morphological, and syntactic information. Thus, a lexical item is a rather complex entity. When speakers construct an utterance, they build a sentential frame without much regard for the phonological aspects of words (see evidence in Levelt, 1989; Levelt, Roelofs, & Meyer, 1999) by using the syntactic information and aspects of the morphological information contained in the lexical items as retrieved from the mental lexicon. Such lexical information is called *lemma information* (for short, *the lemma*) (cf. Kempen & Huijbers, 1983; Kempen & Hoenkamp, 1987). Thus, the mental lexicon does not simply contain lexemes and their meanings but more abstract elements called 'lemmas'. Lemmas are defined as abstract entries in the mental lexicon that support the surface realization of actual lexemes. They are abstract in the sense that for each lexical item, the mental lexicon contains lemma information, that is, declarative knowledge about the word's meaning, and information about its syntax and morphology which is necessary for constructing the word's syntactic environment. For instance, the lemmas of *know* require a subject that expresses the theta role of EXPERIENCER, and object that expresses the theta role of PERCEPT (i.e., what is known), and these elements appear in a particular order; the lemmas of *he* require the word to be used of a male and that the inflectional morpheme *-s* for the third person singular must be attached to the following present-tense main verb (i.e., inflectional morphology for tense marking). Lemmas also contain information about the word's phonological structure, syllabic composition, and accent structure. In addition, lemmas may contain information about the word's register, the kind of discourse it typically enters into, and its pragmatic function. Thus, the mental lexicon is defined as speakers' internal representation of language specific knowledge about the surface forms, that is, lemma representation.

It seems that the mental lexicon, or, to be specific, the activation of lemmas in the mental lexicon, plays a central role in speech production. According to Levelt (1989, p. 181), the whole set of formulation processes is lexically driven:

This means that grammatical and phonological encodings are mediated by lexical entries. The preverbal message triggers lexical items into activity. The syntactic, morphological, and phonological properties of an activated lexical item, in turn, the grammatical, morphological, and phonological encoding procedures underlying the generation of an utterance. Thus, lemma activation of particular lexical items in the mental lexicon mediates between conceptualization and speech formulation as a necessary level of speech production (as schematized in the figure).

Although there is some disagreement about the exact nature of lemma representation in the mental lexicon, it is generally assumed that lemmas are language-specific for lexicalization patterns of a particular language. One often cited example is from Talmy (1985, p. 69) for the notion of language-specific lemmas: (English) *The bottle floated into the cave* versus (Spanish) *La botella entró a la Cueva flotando* (The bottle moved into the cave floating). The lexicalization pattern differs across the two languages. While English can conflate motion with manner or condition of movement into a single lemma (i.e., FLOAT), in Spanish a different pattern is required to express the notion of FLOATING periphrastically using the gerund. Thus, in English a semantic form in the mental lexicon is available for both motion and the manner of motion, but in Spanish a different pattern is required. Lemmas in the mental lexicon are argued to form a connection between the lexical features and conceptual features, which map to and from syntax (cf. 'The distributed lexical/conceptual feature mode' by see Kroll &de Groot, 1997). This paper assumes that each lemma in the bilingual mental lexicon is tagged for a specific language and supports the realization of an actual lexeme. In other words, language-specific lemmas in the bilingual mental lexicon activate language-specific sets of morph syntactic procedures in speech production.

The figure illustrates a sequence of speech production. The speaker's preverbal message/intention at the conceptual level activates language-specific feature bundles, which are then mapped onto lemmas in the mental lexicon. Lemmas activated at the lemma level send directions to the FORMULATOR at the functional level for projecting language-specific morph syntactic procedures. Finally, at the positional level, morphological/phonological surface patterns are realized. As shown, lemma activation mediates between the conceptual level and the functional level.

Based on the model of lemma activation in speech production, Wei (2002) proposes the BLA Model byclaiming that lemmas contained in the bilingual mental lexicon are language-specific and such language-specific lemmas are in contact during L2 production at each of these levels of abstract lexical structure (cf. Myers-Scotton & Jake, 1995, 2001; Grosjean, 1994, 1997). Accordingly, language transfer in L2 production is described and explained in terms of activation of language-specific lemmas at any of these levels of abstract lexical structure.

The BLA Model as designed to describe and explain the sequence of bilingual speech production also draws on some contemporary proposals and assumptions about the nature and activity of bilingual language modes in speech production. For example, regarding the activation and deactivation of language modes, Faerch and Kasper (1986) and Grosjean and Soares (1986) assume that the bilingual's language systems can be kept separate because they may be activated at different levels, depending on whether they are used at the moment. Green (1986) and Paradis (1987, 1997) propose that the bilingual language system is organized in two subsets, one for each language, that can be selectively activated, activated simultaneously to various degrees, or deactivated independently of one another. Thus, it is assumed that when the bilingual is in a monolingual mode, the other language must be deactivated. Green (1986) even proposes that the other language must be inhibited. Green (1986) postulates that bilingual speakers who wish to select a particular language for the current communication must ensure that its activation exceeds that of the competing language(s). So, when bilinguals speak L2, L2 must be selected and highly activated, and L1, which is still active, must be deactivated. According to Soares and Grosjean (1984), Green (1986), Grosjean (1997), Paradis (1997), and Berg and Schade (1992), deactivation, in fact, is rarely total, as clearly evidenced in the interference effects in bilinguals' production of the speaker-specific deviations from the TL being spoken. This is clearly due to the influence of the deactivated language.

Green's (1986) model of activation vs. deactivation of language modes offers two advantages. One advantage is that it postulates a specifier to set the activation going. It is this specifier which directs how the bilingual system is to be controlled. The other advantage is that it pays much attention to the resources that are needed to control the activation levels. Green describes such resources as energy or fuel, which must exist in order for the bilingual system to function. Green's postulation of such resources makes it possible to explain why beginning learners of L1 experience more L1 interference effects than advanced learners. This is because beginning learners need to invest much more energy or fuel in speaking L2 before their L2 production becomes automatized. In other words, they need more L2 resources to suppress the activation level of their L1. Grosjean and Soares point out that "this deactivation has led to much theorizing and much controversy around the notion of a language switch or a monitor system," but "what is certain, however, is that bilinguals rarely deactivate the other language totally. This is seen in various types of production interference – the involuntary influence of one langue on the other - …" (1986, p. 146). Following the above lines of thinking, Wei (2000a, 2000b, 2002, 2006) assumes that in early stages of L2 learning, learners' two linguistic systems (i.e., L1/guest language and L2/base language) are in
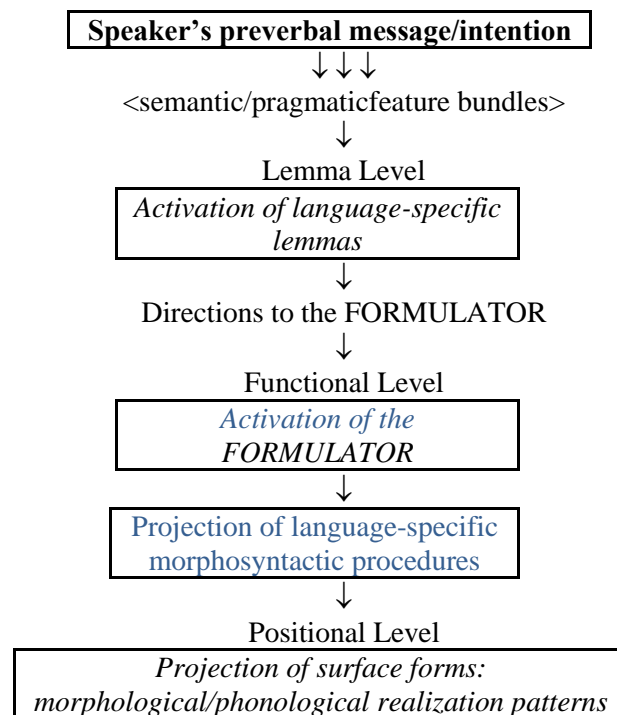
contact and can be activated to a certain degree at an abstract level. The BLA Model redefines the role of language transfer by considering the following implications.

(1) According to Sharwood Smith (1986) and Kohn (1986), language transfer may operate on both underlying IL knowledge and the retrieval of that knowledge. Thus, there is no need to separate the processing dimension from the knowledge dimension. The assumption underlying the BLA Model is aligned with the view that analysis of IL surface forms will lead to unwarranted conclusions about the acquisition process if L2 learners' spontaneous production is assumed to be a direct reflection of their competence. This is because L2 learners' immature processing routines may have an obvious role to play in their IL production.

(2) Language transfer should be seen primarily as L2 learners' production strategy rather than an automatic process. This view differs from the behaviorist paradigm that regards language transfer as the consequence of L2 learners' already established linguistic habits influencing the new ones being learned (Osgood, 1953; Jakobovits, 1970). It follows the cognitivist paradigm that characterizes language transfer as L2 learners' problem-solving procedure, or learning strategy, by utilizing L1 knowledge to solve a learning or communication problem (Jordens, 1977; Kellerman, 1977; Sharwood Smith, 1979; VanPatten, 1984a, 1984b, 1995; Myers-Scotton, 1993 [1997], 1994a, 1994b; Jake, 1998; Wei, 2000a, 2000b).

Wei (2002, 2003, 2015) views language transfer as the creative activation of L1 knowledge at different levels of consciousness and the activation of highly automatized L1 knowledge in the absence of conscious control. As assumed, SLA involves a complex interaction of skills at various levels of cognitive control (e.g., McLaughlin, 1978; Sharwood Smith, 1979, 1986; McDonough, 1981; Faerch & Kasper, 1986). Also, there are psycholinguistic procedures which are responsible for bringing about changes in the learner's IL representation of the L2, and the procedures which are utilized for productive and receptive purposes in spontaneous verbal interaction. Following Myers-Scotton (1994a, 1994b, 2002; Jake, 1998), Wei's study investigates language transfer as a planning procedure (i.e., synchronic) in speech production for learners' immediate communicative purposes and also as a restructuring procedure (i.e., diachronic) in L2 change.

(3) Language transfer should be seen to take place proactively or retroactively. That is, old knowledge influences new knowledge or new knowledge influences old knowledge. Thus, the direction of language transfer is assumed to be two ways: L1 may influence L2 to different degrees in different developmental stages, and L2 may influence L1 in a later stage of learning (i.e., L2 becomes less influenced by L1). As assumed in cognitive learning theory, existing knowledge is relevant to the internalization of any new information. The BLA Model integrates the language transfer phenomenon into the cognitive learning and retains the term 'language transfer' as a description of the interrelatedness between what is known and what is to be learned.

Conceptual Level

| **Speaker's preverbal message/intention** |

↓↓↓

<semantic/pragmaticfeature bundles>

↓

Lemma Level

| *Activation of language-specific lemmas* |

↓

Directions to the FORMULATOR

↓

Functional Level

| *Activation of the FORMULATOR* |

↓

| Projection of language-specific morphosyntactic procedures |

↓

Positional Level

| *Projection of surface forms: morphological/phonological realization patterns* |

The Bilingual Lemma Activation Model
(Adapted from Levelt, 1989; Myers-Scotton & Jake, 2001; Wei 2002)

The BLA Model recognizes that learners' production or formalization of a given L2 may be affected not only by their L1 but also by the current state of their IL. This implies that there is no need to redefine the term 'language transfer' in order to interpret IL data in SLA research. The BLA Model acknowledges the existence of interaction between L1 and L2 and the positive role that language transfer may play in L2 learning (i.e., learners' L1 knowledge may facilitate their learning of L2 material). This model attempts to offer a more explanatory approach to investigating the developmental characteristics of SLA along the IL continuum.

(4) Due to the nature and activity of the bilingual mental lexicon in the process of L2 learning, language transfer does not work independently or compete with the creative construction process in the TL but accommodates to natural developmental processes (i.e., IL development). The BLA Model assumes that such an accommodation is indispensable for successful SLA and can be predicted as learners' IL system moves in the direction of the TL system. Under this assumption, L1 plays a specific but rather transitional or limited role in IL development, and such a role will change as learners' IL system moves closer to the TL system along the IL continuum.

3.*Abstract Lexical Structure in the Bilingual Mental Lexicon*

Three assumptions are made about the composite nature of the IL developing system. They are recapitulated here to identify sources of abstract lexical structure in the bilingual mental lexicon in relation to IL development.

(1) Lemmas are abstract entries in the mental lexicon about particular lexemes, and lemmas are language-specific in the bilingual mental lexicon. Language-specific lemmas are in contact in IL production.

(2) Abstract lexical structure contains several discrete but interacting subsystems: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns, each of which deals with a particular component of grammar. Such an abstract lexical structure in IL may have different sources.

(3) Abstract lexical structure is modular and can be split and recombined in novel, yet constrained ways in constructing the IL linguistic system. Parts of the abstract lexical structure from learners' L1 lexical entries (i.e., lemmas) may influence the abstract lexical structure of incompletely acquired TL lexical entries in IL production.

As introduced earlier, lexical structure is abstract in that lexemes have more abstract elements than surface lexical items and such abstract elements are contained in complex lexical structure that lexemes have (cf. Talmy, 1985; Rappaport & Levin, 1988; Pinker, 1989a, 1989b; Levelt, 1989; Jackendoff, 1990; Bock & Levelt, 1994; Myers-Scotton & Jake, 1995; Jake, 1998; Fuller, 1999; Wei, 2001b, 2002, 2003). The three subsystems in the complex lexical structure play their respective and interactive roles in language production. Lexical-conceptual structure maps onto predicate-argument structure because the theta criterion requires the mapping of lexical-conceptual structure (i.e., thematic structure) onto predicate-argument structure (i.e., syntactic structure). In addition to the thematic structure, 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). Myers-Scotton and Jake (1995) and Jake (1998) propose that morphological realization patterns be included in a formal consideration of lexical structure (cf. 'lexicalization patterns' discussed in Talmy (1985)).

The abstract and complex lexical structure in the bilingual mental lexicon and the composite nature of the developing IL system offer several implications for IL construction.

(1) As evidenced in language-contact situations, the languages involved do not play equal roles in structuring constituents containing elements from both languages. There is always a clearly identified TL in a language-contact setting and the grammatical frame projected by the TL is always complete. However, in IL production, the TL of IL is a composite because learners may not have complete access to the intended TL.

In other words, learners' knowledge of the TL, which is the intended language that frames constituents, is incomplete. The TL of IL is a composition because it may contain elements of the abstract lexical structure from learners' L1 and the TL, resulting in learners' current IL construction.

(2) As in other language-contact situations, IL construction is necessarily projected by the lexical structure of the TL; however, the TL of IL is incomplete because it lacks certain aspects of the lexical structure of the TL. Consequently, learners may turn back on their L1 lexical structure and/or their partially acquired TL lexical structure in order to frame IL constituents.

(3) Language transfer or L1 influence in IL construction should be understood as transfer of lexical structure at several abstract levels from L1 morphemes. In IL development, such a transfer becomes necessary for learners to fill particular gaps in the incompletely acquired TL lexical items. However, the contributions (i.e., language transfer or L1 influence) of L1 lexical structure at various abstract levels are more constrained than those of the TL to the composite TL of IL.

Thus, this study describes language transfer phenomena beyond the surface level of describing configurations of such transfer effects. In so doing, it offers some explanations for the phenomena at an abstract level. The abstract level is call the 'lemma level' in a model of multilayered levels of speech production, where language transfer may occur with predictable consequences in L2 learning. As the BLA Model assumes, language transfer in L2 learning can be better explained in terms of 'lemma transfer'.

4.*Abstract Lexical Structure of Interlanguage and Language Transfer*

As assumed in the BLA Model, the abstract lexical structure of IL is a composite. This assumption has several implications for language transfer in IL construction. This is because in SLA, L1 lexical structure may fill gaps at the various abstract levels in the composite IL. When this happens, there will be consequences in IL construction at each of the three levels of abstract lexical structure: lexical-conceptual structure, predicate-argument structure, and morphological realization patterns. The typical instances of language transfer discussed below are recapitulated from Wei (2009, 2015).

*Transfer of L1 lexical-conceptual structure.*Although the conceptual structure may not be language-specific (Level, 1989; Bierwisch & Schreuder, 1992), languages do not lexicalize the components of a given conceptual structure in the same way (Talmy, 1985; Jackendoff, 1991; Levin & Pinker, 1991). As commonly observed in SLA research, the lexical-conceptual structure of an IL lexeme may contain semantic/pragmatic features from an L1 counterpart. This is because some of the L2 lexical items that learners have learned are not yet fully specified in terms of their semantic, syntactic and/or morphological information. In other words, learners' L2 lexicon may be partial or incomplete (i.e., IL lexicon). As a common practice, when the incompletely acquitted L2 lexical items are not sufficient enough for learners to express their intended meanings, they may turn to similar or equivalent lexical items in their L1 in their IL production (Wei, 1995; Dewaele, 1998; Jake, 1998). Although preverbal message is not language-specific, learners' L1 lexicalization patterns may be enforced at a certain point in IL production (Talmy, 1985; Choi & Bowerman, 1991). L1 lexical-conceptual structure in the composite IL results in inappropriate lexical choices. Below are some typical examples of L1 lexical-conceptual structure in the composite ML.

[1] She now do meal.
[2] Open air condition.
[3] You close light.
[4] You come my house?
(Chinese L1; Wei 1995)
[5] There have English class, free. You go?
(Chinese L1; Wei 1996a, p. 423)
[6] I study English for work in Japan. My parent want do me teacher … teach English in Japan.
[7] Yesterday in library I look Japanese magazine.
(Japanese L1; Wei 1996a, p. 423)
[8] He is funny. His words in class laugh me.
(Japanese L1; Wei 1995)
[9] a. In the late of Maracaibo was discovered the oil.
b. I have mentioned that in my country does not appear to exist any constraint on awoman's right tochoose a husband.
c. And then at last comes the great day.

(Spanish L1: Rutherford 1989, p. 178)

In [1], *do* means 'cook', and it also means 'play, work, write' in the L1. In [2] *open* means 'turn on', and it also means 'start' in the L1. In [3], *close* means 'turn off', and it also means 'stop, shut' in the L1. In [4], *house* also means 'apartment, building, home' in the L1, and the preposition 'to' is missing because MOTION and GROUND are conflated in the verb in the L1. In [5], *have* means both 'possess' and 'exist' in the L1. In [6] *do* means 'make', and it also means 'try, act, play' in the L1. In [7], *look* means 'read', and it also means 'see, look at, visit, observe' in the L1. In [8], the semantic feature of 'cause' is incorrectly extended. The resulting causative lexical-conceptual structure affects the predicate-argument structure and its morphological realization patterns. In this example, the 'causee' is *me*, the PATIENT, which should be 'I' (the AGENT), in the TL, and *his words*, the 'causer', should be a PP *stimulus* (at this words) in the TL. In [9], a discourse-pragmatic feature projects the verb-subject order as a structure to focus new information in certain kinds of grammatical structure in the L1. It seems that the learner has not acquired a particular lexeme *there*, and the structure it introduces (i.e., the NP is introduced by a nonthematic pronoun in a 'there' construction). The 'gap' between the L1 and the TL is not only pragmatic but also lexical and syntactic.

Wei (1994, 1996a, 1996b) reports evidence that 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. Talmy, 1985; Pinker, 1989a, 1989b; Jake, 1994). The above examples reveal the lexical-conceptual structure of the TL lexical structure is not available to early-stage learners. In IL production, although learners use the TL lexical items, the selection of those items may be caused by their incomplete knowledge of the TL lexical-conceptual structure of particular lexemes. Consequently, language-specific lemmas for the universal concepts based on learners' L1 may activate or retrieve the TL lexical items in an inappropriate manner, resulting in L1 lexical-conceptual structure in the composite IL. As assumed, parts of lexical structure can be split and recombined (Jake, 1998) in the developing IL. As predicted, along the IL continuum, as learners acquire more and more knowledge of the TL lexical structure, their bilingual mental lexicon will expand to include the TL lexical-conceptual structure of particular lexemes, without which, the TL lexicalization patterns would be impossible.

Transfer of L1 predicate-argument structure. In addition to language transfer in lexical-conceptual structure, because of their incomplete knowledge of certain TL lexical items, although they may choose the right TL verbs, they may not know the predicate-argument structure as required by those verbs and use them inappropriately in IL production (Wei, 1996a, 1996b, 2009). Consequently, IL verbs (i.e., incompletely acquired TL verbs) may project the number of arguments as required and the thematic roles assigned to each of the arguments as their counterparts in the L1, resulting in L1 predicate-argument structure in the composite IL. Also, incomplete TL lexical-conceptual structure may map onto incomplete TL predicate-argument structure, one inducing the other. For example, in [8], the resulting causative lexical-conceptual structure affects the predicate-argument structure and the morphological realization patterns. Below are some typical examples of L1 predicate-argument structure in the composite IL as observed in Chinese learners' early-stage IL production.

> [10] Today he help dinner.
> [11] She cost me hundred dollar, … bad tooth.
> [12] Yes … teacher report parent grade.
> (Chinese L1; Wei 1996a, p. 422)
> [13] Please help me look my child.
> [14] You're listening music?
> (Chinese L1: Wei 1995)

These examples show that early-stage learners attempt to use TL lexical items to express their intended meanings; however, these TL lexical items occur in their L1 predicate-argument structure. In [10], *help* assigns the THEME directly to the object without the preposition 'with' as required in the TL. In [11], *cost* takes the AGENT (the person who spends the money) as the subject, rather than the THEME (the thing on which the money is spent). In [12], *report* assigns the GOAL, rather than the THEME, to the object in the double-object dative construction.
In [13], the preposition 'after' does not appear to introduce the THEME *my child*, since the Chinese counterpart verb 'zhaoliao' ('look after') does not need a preposition to introduce the THEME. Again, in [14], the THEME *music* is the internal object of the verb *listen*, without being introduced by the preposition 'to' as required in the

TL, since the Chinese counterpart verb 'ting' ('listen') does not need a preposition to introduce the THEME. Such a transfer of L1 predicate-argument structure is also observed in Japanese learners' early-stage IL production.

[15] Wait. I first fill water in glass. Wait.
[16] He busy. He not help my homework.
[17] Parent provide money to me.
(Japanese L1; Wei 1996a, p. 422)
[18] I can wait you here.
[19] Why you ask many questions for me?
(Japanese L1; Wei 1995)

In [15], *fill* assigns the THEME to *water*, rather than assigning the PATIENT to *glass* and introducing the THEME by the preposition 'with', and *glass* is assigned the LOCATION by the preposition 'in', rather than the PATIENT as required in the TL. In [16], the preposition 'with' as required in the TL does not appear to introduce the THEME, since in Japanese the verb *help* itself can assign the thematic role directly to the object. In [17], *provide* assigns the THEME, rather than the RECEIPIENT, to the object, violating the TL predicate-argument structure where the THEME is introduced by the preposition 'with'. In [18], the THEME 'you' is introduced directly by *wait* without the preposition 'for' as required in the TL, since the Japanese counterpart verb 'matsu' ('wait') can take its internal object. In [19], the GOAL *me* is introduced in a prepositional phrase, structurally subordinate to the verb internal object *many questions*, the THEME. This predicate-argument structure reflects the Japanese counterpart verb 'suru' ('ask') which projects the GOAL as a postpositional object with the postposition 'ni', rather than the verb internal object indicated by the particle 'o'.

These examples show in early-stage of learning how L1 predicate-argument structures affect IL production and contribute to the composite IL. As commonly recognized, though learners' 'target' is always and should be the L2 lexical structure, in this case, the predicate-argument structure, the developing IL system is predictably a composite of structures from multiple sources. These sources may include not only L1 lexical-conceptual structures or the intended TL but also L1 predicate-argument structures and incompletely acquired ones in the TL. Consequently, the morphosyntactic frame that the composite IL projects does not match that of the TL (Myers-Scotton, 1994a; Jake, 1998; Wei, 1996a. 1996b, 2009). Thus, in addition to other levels of abstract lexical structure, the projection of L1 predicate-argument makes IL a composite.

Transfer of L1 morphological realization patterns. Morphological realization pattern is another level of abstract lexical structure, which, at the positional level, deals with surface devices for word order, case, agreement, tense/aspect marking, etc. Like the other two abstract levels of lexical structure, L1 morphological realization patterns in the composite IL can be obvious in learners' early-stage IL production. Below are some typical examples.

[20] I English not speak.
[21] … because I study English, just more study English.
[22] My husband in USC study.
(Chinese L1; Wei 1995)
[23] Outside cold, inside warm.
[24] (on the phone) Hello … she not in home. She at outside at playground playing. You
come? You not come? I tell her. Bye.
[25] Go swim? No. Parent no go, you no go swim.
[26] You go too? We have three ticket.
[27] You not go library, I go.
[28] Tomorrow I no go work. I sick.
(Chinese L1; Wei 1996a, p. 421)

Though the Chinese basic word order is SVO, any constituent can be moved to the sentence initial position or before the verb for topicalization or emphasis.

These examples show that, among other things, though early-stage Chinese learners of English use L2 content morphemes to express their intended meanings, they employ their L1 morpheme order (cf. Givón, 1984; Talmy, 1985; Jake, 1998; Fuller, 1999). In [20], the direct object 'English' is placed before the verb. In [21], *more* appears before the verb phrase *study English*. In [22], the prepositional phrase of location *in USC* is placed

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between the subject and the verb. Depending on the context, in Chinese any constituent or element, such as the copula, AGENT or THEME can be left out, as shown in [23], [24] and [25]. In Chinese morphological realization patterns, there are few auxiliary verbs and no system morphemes for 3rd person singular, plural, and tense/aspect marking.

Thus, in Chinese grammatical concepts, such as tense and aspect are not morphologically realized but implicitly expressed, as in [24], [25], [26] and [27], or realized by other means, such as adverbials of time, as in [28]; negation is realized by placing the negative particle ('not/no') immediately before the verb (i.e., no auxiliary is available for the purpose in Chinese), as in [20], [24], [25], [27] and [28]; interrogative is realized by rising intonation, as in [24], 25] and [26]; and plural is realized by specific cardinal numbers, as in [26]. These examples show that learners try to use TL content morphemes, but their IL contains the morphological realization patterns from their L1 (Wei, 1996b, 2000a). Such instances of L1 morphological realization patterns in the composite IL are also observed in Japanese learners' early-stage IL production.

> [29] In Japan student English junior high school start.
> [30] I in Japan my city like.
> (Japanese L1; Wei 1995)
> [31] I from Japan arrive, now live in room … apartment, I, friend and EPI teacher. EPI
> teacher help me English speak … kind, nice teacher.
> [32] Speak English difficult. I English … speak not well.
> [33] Here everything expensive. I everyday use bike. Taxi? No. I live not far.
> [34] I go to party with friend tomorrow. We together cook, interesting.
> (Japanese L1; Wei 1996a, p. 421)

Early-stage Japanese learners of English seem to use TL content morphemes but follow their L1 morphological realization patterns. The Japanese basic word order is SOV, which is used in [29], [30], [31] and [32], where any constituent is placed before the verb; negation is realized by placing the negative element after the verb, as in [32] and [33]. Also, in Japanese morphological realization patterns, there is lack of auxiliary verbs for tense/aspect marking, negation, etc. and other system morphemes as required in the TL, such as certain determiners as in [33] and [34], 3rd person singular as in [31], and plural as in [34]. Like those early-stage Chinese learners, early-stage Japanese learners tend to produce 'bare forms' in which TL content morphemes are inserted into L1-based IL frames or frames not found in the TL (Wei, 1996b; Jake, 1998).

The composite IL model assumes that lemmas in the bilingual mental lexicon are language-specific and contain all the information necessary to project actually occurring surface forms. Like lexical-conceptual structure and predicate-argument structure, L1 lexical structure at the level of morphological realization patterns may be employed by early-stage leaners to fill the 'gaps' in the incompletely acquired TL lexical structures. Thus, language transfer at any level of abstract lexical structure in IL development is assumed to be language-specific lemma transfer.

5. Conclusion

The central assumption underlying the BLA Model is that lemmas in the bilingual mental lexicon are language-specific and are in contact in SLA. It defines the nature of learner errors in terms of the composite nature of the bilingual mental lexicon. It describes and explains sources of learner errors in terms of language transfer caused by activation of language-specific lemmas in the bilingual mental lexicon at a particular level of the speech production process. It explores sources of language transfer at an abstract level, that is, at the lemma level of speech production. The BLA Model assumes that the L1 plays a role in the early IL by influencing the TL as several levels of abstract lexical structure in relation to the nature and activity of the bilingual mental lexicon. This model has several implications for language transfer.

(1) The BLA Model claims that SLA involves several linguistics systems in contact and that in early L2 learninglearners' L1 may play a role in influencing the developing IL. The central argument of this model is that learners' production of a given L2 may be affected by both their L1 and their current IL. Thus, it becomes necessary to investigate the role of language transfer in terms of its synchronic procedure in speech production and its diachronic procedure in IL development. This model recognizes that learners' production or formalization of a given L2 may be affected not only by their L1 but also by the current state of their IL.

This follows the cognitive paradigm that characterizes language transfer as learners' problem-solving procedure or learning strategy by activating certain L1 lemmas in the bilingual mental lexicon for L2 lexical-conceptual structure and predicate-argument structure or using L1 grammatical devices for L2 morphological realization patterns.

(2) The BLA Model views language transfer as the creative activation of L1 knowledge at different levels of abstract lexical structure. This is because learners' incomplete knowledge of the L2 includes their incomplete knowledge of lemma specifications for the abstract lexical structure of the TL. As assumed in this model, lemmas in the bilingual mental lexicon are language-specific and contain information about language-specific lexical-conceptual structure, predicate-argument structure and morphological realization patterns. Thus, without acquiring or only partially acquiring language-specific lemma specifications for particular TL lexical items, learners may transfer certain lemmas underlying similar lexical items in their L1 to the L2.

(3) The BLA Model integrates the language transfer phenomena into cognitive learning and retains the term 'language transfer' as a description of the interrelatedness between old knowledge and new knowledge. Sufficient acquisition of the TL abstract lexical structure in terms of language-specific lemma specifications will eventually replace the previously learned abstract lexical structure for particular lexemes. Thus, language transfer is viewed as a result of mutual influence: L1 may influence L2 to different degrees in different stages of IL development, and L2 may influence L1 in a later stage of learning. In other words, language-specific lemmas in the bilingual mental lexicon need to be clearly delineated and separated. This is because lexicalization and grammaticalization patterns are language-specific and must be learned as such.

(4) The BLA Model emphasizes the nature and activity of the bilingual mental lexicon in the process of L2 learning. As assumed in this model, language transfer does not work independently but accommodates to IL development and such an accommodation is indispensable for successful SLA. Under this assumption, L1 plays a specific but rather transitional or limited role in IL development as learners' IL system moves closer to the TL system. Since the role of L1 in filling gaps in the abstract lexical structure underlying the developing IL system is rather restricted, some unfilled gaps in the intended TL are predicted to occur along the IL continuum. However, the 'target' in L2 learning is always the TL. As predicted, as more and more TL abstract lexical structure becomes available to learners, the intended TL will gradually replace the composite IL system. SLA is a progressive process and is mainly driven by the acquisition of the TL abstract lexical structure, without which, any IL system will remain as a composite.

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