7 Lexical Questions: What Do You Learn When You Learn a Word?

The theory presented here is a theory of linguistic competence – a theory of the formal properties of humans' I-languages. Psycholinguists are more concerned with processing, production, and acquisition than the underlying system. Although the goals of both leagues of scholars often do not intersect, there is some psycholinguistic work that seems to have some bearing on the ideas proposed in this monograph. The purpose of Chapters 7 and 8 is to explore this work and, hopefully, enlarge its scope as well as the possible audience for the ideas presented here.

I understand that, by entering a field that I am not a specialist in, I can fall into the trap of amateurism – and its concomitant professional ridicule. But it seems to me that the potential benefits of building the bridge between linguists and psycholinguists outweigh the disadvantages. I am willing to take a first step here, assuming that I probably misunderstand basic questions, hoping to initiate a dialogue rather than providing convincing solutions.

In Section 7.1, I present an overview of the MDM model with some extensions regarding the Encyclopedia, which was left undeveloped in previous chapters. With this development in place, I explore what happens when someone learns a word in Section 7.2 from the perspective of the MDM. In Section 7.3, I present a brief discussion of current psycholinguistic models of bilingual lexicons and argue that the MDM is a useful tool to approach some of the problems that those models try to account for. Section 7.4 switches gears and discusses lexical co-activation briefly. Finally, I present some conclusions. The result of this tentative exploration is that the 1Lex MDM model proposed in these pages will come out reinforced.

7.1 The MDM: The Role of the Encyclopedia

The model that I have been developing can be represented in compressed form in (1):

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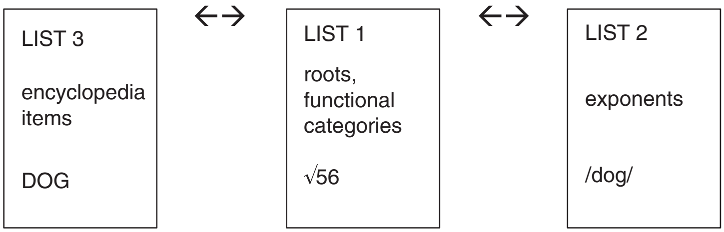
(1)

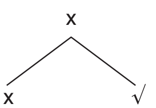


To summarize some of its outstanding features: There is no theoretical primitive corresponding to the Saussurian notion of word, a mapping of a *signifiant* with a *signifié*. Instead, we have three separate lists linked by the computational system of human language, C_{HL}. List 1 consists of a set of roots and functional categories. The roots in this system are nothing but formal indices that help us link the items in List 3 and in List 2. These indices are devoid of any grammatical information; since they do not have a label, they cannot project onto fully fledged phrases.

I also adopt the wide-spread assumption that functional categories are listed in List 1 (although, as far as I can tell, for my purposes they could also be listed as indices). Functional categories are drawn from a Universal Features Inventory (Embick 2015). The idea is that a subset of items from the UFI are activated in a particular I-language and consequently are able to select roots or other functional categories and have an exponent. List 2 consists of a list of rules of exponence – called VIRs in DM -, discussed in detail in Section 3.2.

The meanings of words are listed in List 3, what usually is referred to as the Encyclopedia. I take it that the Encyclopedia is the set of slices of the conceptual structure of the human mind that find an indexed structure in List 1. Recall that I argued that the items in List 3 map onto syntactic structures that minimally include a root (=an index) and a categorizing morpheme:

(2)



(where x={a,v,n})

Other than this, I don't have much to say about the conceptual structure in this monograph but a few comments might be in order. First, I understand that a good chunk of conceptual structure is not indexed by a root – in other words, many concepts in a particular human's mind are not linguistic or at least not expressed in the grammar of his or her language. There is a pervasive idea that this affects abstract concepts but it seems to me that it affects even the most concrete and mundane ones. For instance, the concept "drinking receptacle with a handle" exists in the minds of everyone in the western world, but not

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every language may have a specific term for this concept: In Spanish we have the words *taza* and *jarra*, both of which designate drinking receptacles with a handle but a *jarra* is as wide at the top as at the bottom and can be full of beer or wine but not coffee while *taza* cannot be used to drink beer or wine and the bottom can be narrower than the top. There is no word in Spanish that denotes "drinking receptacle with a handle" *tout court*. The English word 'mug' denotes a receptacle with a handle but a 'cup' may also have a handle (but does not have to have a handle) and the small drinking receptacle that I use to drink my morning espresso has a handle but can never be called a 'mug', and so on (see Malt et al. 2015 for a summary discussion of cross-linguistic differences on how languages parse the conceptual structure).

Finally, I do not have much to say about the structure of what I call conceptual structure itself. There are some intriguing recent proposals, including the possibility that there are two levels of conceptual structure for analogic concepts and parametric concepts, as in Evans (2015). Fortunately, I don't need to go into this.

Under the assumption that the Universal Feature Inventory is a subset of conceptual structure, in this model, conceptual structure feeds List 1 and List 2. I am not sure if this is a bug or a feature of the system – in any case, functional categories could easily be reanalyzed as indices too.

The main conclusion of this chapter is that learning vocabulary in a second language is not qualitatively distinct from learning vocabulary in a first language – from the point of view of the competence system, learning new words involves the same sorts of adjustments to the linguistic system: learning new ways to structure a set of concepts into an encyclopedia item that maps onto an index and an exponent, finding new exponents for old encyclopedia items, restructuring some portion of the conceptual system, or adding grammatical information to old words. Before I start the discussion in Section 7.2, I would like to highlight that I am not attempting to account for the *process* of word learning, how the *gavagai* problem is resolved and so on. Rather, the discussion is focused on a much narrower question: what do you learn when you learn a word? That is, I am focusing on the impact that a new word has in the linguistic system.

7.2 Learning New Words

Let's say this writer, a mechanical ignoramus, is shown a strange object and told that it is a *carburetor*, a word he has never heard of. Neither had he ever seen the object before. Moreover, he is taught what the carburetor is for and – surprise! – he understands the explanation. He has acquired a new word, *carburetor*. What exactly has he acquired?

In the traditional, Saussurian view of word, a word consists of a *signifiant* and a *signifié*. Learning the new word consists of learning this new meaning/form mapping. In my terms, the process looks more complex: the learner has to acquire a new exponent in List 2 and an encyclopedia item in List 3, develop a new index in List 1 to link the two and set the morphosyntactic environment in which the index can be used. Is this complexity warranted? Obviously yes. For instance, consider that the Spanish equivalent of *carburetor* is masculine but neuter in German: this is a simple example that learning the new word involves more than the meaning/form mapping. This is captured in the MDM system quite nicely because the MDM system integrates the new information into the C_{HL} – learning a new word entails learning the index as well as the grammatical environment in which it may occur: a masculine *n* in Spanish, a neuter *n* in German.

Let's say the writer knew the word *carburetor* but all he knew is that it is a piece of an engine but had no idea what its shape is or what it is for. Let's now say that someone explains everything about carburetors to the writer and – surprise again! – he actually understands it. What has he learned? Before the patient mechanic's explanation, the writer already had an index – say, √99 – and a vocabulary item for 'carburetor', as well as some very fuzzy List 3 representation. After the explanation, two things have happened simultaneously: (i) the writer's Encyclopedia has been enriched with a new, more precise, representation and (ii) the indexed structure now links to the new richer representation in the conceptual set.

Finally, let's assume that this writer goes to the garage and overhears someone say, "the carb in this car is not mixing well." The writer has never heard the word *carb* but in this particular context, he realizes that 'carb' refers to the same thing as 'carburetor'. What has he learned? A new vocabulary item for an old List 1 and List 3 item:

(3)	Before learning:	CARBURETOR ←→ √99 ←→ /karburetor/
	After learning:	CARBURETOR ←→ √99 ←→ {/karburetor/,/karb/}

I assume my carburetor examples represent generally what is learnt when we learn vocabulary in a first language: a lot of it involves learning the whole word from scratch: new index, new morphosyntax, new encyclopedia item, new exponent. Sometimes, it is about tinkering with things that are already there in sketch: the learner expands and slices the conceptual structure, creates new vocabulary items, and fixes the indexed structure that connects them.

Let's see now what happens when you learn words in a second language. We are now supposing that the writer, a Spanish speaker, learns the English word *planet* as well as the Chinese word *xíng xing*. He realizes that they all refer to the same concept, which we may represent as PLANET. What has he learned? The extension of *planet, planeta*, and *xíng xing* is the same: whenever the

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proposition ‘x is a planet’ is true, the propositions ‘x is a planeta’ and ‘x is a xíng xing’ are also true. We can then take it that what this person has learned is new phonetic forms for an encyclopedia item (but see fn 3, chapter 4):

(4)	Before learning:	PLANET ⟵⟶ √89 ⟵⟶ /planeta/
	After learning:	PLANET ⟵⟶ √89 ⟵⟶ {/planeta/, /planet/, /xíng xing/}

Additionally, this person will also have to learn that *planet* and *xíng xing* are selected by a bare *n* in a language in which *n* bears no gender features. We can further assume that becoming more and more proficient in English and Chinese won’t lead to changing this relation between the List 3 and the List 1 items. That is, there is no need to create a redundant meaning/form representation for each of ‘planet’ and *xíng xing*. Is this substantially different from the way we learn words in a first language? When we learn a first language, we typically learn a matching of index, encyclopedia item, and exponent, while in a second language, at least at the beginning, we seem to match old concepts to new exponents. But we do this when we learn our first language too, as shown with the ‘carb’ example.

Let’s now assume that an English speaker learns the German word *gefallen*. It means exactly the same as English ‘like’, so that if it is true that ‘y likes x’ it is also true that ‘x *gefällt* y’ and vice-versa. Notice that the positioning of x and y has been changed, purposefully, between the English and German examples. This is because the German word requires that the person who likes appears as a complement in dative case while the thing liked appears as a subject in nominative case. According to fairly standard analyses, (see Arad 2003, among many others) this difference in the distribution of case and grammatical function is directed by the flavor of *v* that selects the root. Thus, in this example, learning a new word requires acquiring a new exponent and a new grammatical structure for the index. The Encyclopedia, on the other hand, does not need to change:

(5)	List 3	List 1	List 2
	LIKE	[√56] $v_{[ger]}$	/gəfalən/
		[√56] $v_{[eng]}$	/laɪk/

Is this something that we do only when we learn our L2? Again, I don’t think so. The German child has to learn the verb *mögen* together with *gefallen* – both mean the same but they are inserted in different morpho-syntactic structures – *mögen* works like English ‘like’ with the liker in nominative case and the likee in accusative case. Thus, the German child learning *gefallen* is not in a different place than the English-speaking adult learning the same word.

One more mini-story. The writer, a Spanish speaker, learns the English word *jealousy*. Now, it so happens that the word *jealousy* denotes two very different emotions: it denotes what I feel when someone flirts with my spouse and it denotes what I feel when someone gets a promotion that I desired for myself. In Spanish, two different words are used for the two emotions: *celos* and *envidia* (the latter a cognate of the English word *envy*). The I-language of this Spanish speaker looks like (6a), with distinct roots and vocabulary items for the two List 3 items. As he begins to learn English, this Spanish speaker initially takes *jealousy* to mean the same thing as *celos*. His I-language now looks like (6b), with both /θelos/ and /dʒɛləsi/ as possible spell-outs for CELOS. Later he realizes the two words are not equivalent and /dʒɛləsi/ is also used with the meaning of ENVIDIA: he has learned how to use *jealousy* in the same contexts as an English speaker. What has he learned? The conceptual structure has not changed, the two emotions CELOS and ENVIDIA are List 3 items. But now there is a new phonetic form that can be applied to two old concepts. In our terms: the root √99 can spell out as /embidja/ or /dʒɛləsi/ and the root √98 can spell out as /θelos/ or /dʒɛləsi/:

(6)	a.	Before learning:	CELOS ⟷ √98 ⟷ /θelos/ ENVIDIA ⟷ √99 ⟷ /embidja/
	b.	After learning (1):	CELOS ⟷ √98 ⟷ {/θelos/, / dʒɛləsi/} ENVIDIA ⟷ √99 ⟷ /embidja/
	c.	After learning (2):	CELOS ⟷ √98 ⟷ {/θelos/, /dʒɛləsi/} ENVIDIA ⟷ √99 ⟷ {/embidja/, /dʒɛləsi/}

Again, one could ask if this process is something that we do as we learn our first language. We certainly do. As we acquire our first language, we are constantly reshaping the connections between List 3 and List 2. A child learning English as a L1 might think that 'high school' and 'college' are synonymous words and only later realize that their conceptual scope is somewhat different – which involves a process strictly parallel to what we see in (6).

This is the last of the flash short stories. Let's say the writer, a Spanish speaker, learns the Quechua word *supay.* It is the name of a deity that does not exist in the Christian theology, which is the only one the writer is familiar with. Initially, he may try to assimilate it to a familiar concept, say the DEMON concept of Christian tradition. This is shown in (7a), where the word /supai/ is just another spell out for DEMON. Eventually, the writer may construct a new concept (possibly built out of previous conceptual primitives) in his Encyclopedia and link it to a new index and the new phonetic representation, as in (7b). In fact, the learning of what this word means will not be completed until the whole mythological structure – a new conceptual structure – has been put in place:

(7)	a.	Before learning:	DEMON ⟷ √2 ⟷ {/demonio/, /supai/}
	b.	After learning:	DEMON ⟷ √2 ⟷ /demonio/ SUPAI ⟷ √3 ⟷ /supai/

I think these examples suffice to make two points:

(i) the MDM model allows us to understand more clearly what is involved in learning a new word: sometimes what appears superficially to be "learning a new word in the L2" is just learning a new exponent; sometimes the learning does embrace a new concept; sometimes it entails only a new morphosyntactic structure for old concepts; sometimes it involves expanding the range of grammatical environments in which an index can be merged. Of all these processes, adding new exponents seems to be the easiest one, since it requires no alteration of grammar or conceptual structure. This expectation is confirmed by anecdotal evidence – Spaniards who colonized Peru initially identified *supay* with the Christian devil and seemed unable to create a new conceptual structure for the new exponent. It is also confirmed by experimental evidence, as I explain in a minute.

(ii) The acquisition of an L2 vocabulary is not fundamentally different from learning the L1 vocabulary: there will be processes like the ones I just described of creating or altering exponents, conceptual structures, and grammatical frameworks. It follows that one should create a single model to represent our lexical knowledge and learning, in particular, we should avoid positing dedicated models to represent our L2 knowledge or our L2 learning of new words. This conclusion follows directly from the integrationist framework that I propose in this monograph.

7.3 Psycholinguistic Models of the Bilingual Lexicon

Psycholinguistic research has uncovered a number of properties of bilingual lexicons, which have led to proposing a series of models that seek to capture them. In particular, the models of the bilingual lexicon that I have consulted are mostly concerned with understanding the sort of errors that L2 learners make (see in particular the informative overviews in Pavlenko 2009, Williams 2015). There seem to be two distinct approaches to the problem, the terms of the debate neatly summarized in Brysbaert and Duyk (2010) and Kroll, van Hell, Tokowicz, and Green (2010). The first one proposes that the L1 and the L2 lexicons are stored separately, they are asymmetrically connected and they are, likewise, asymmetrically bound to the conceptual structure (see Kroll and Stewart 1994 for the classic proposal). On the other side, connectionist models propose that bilingual speakers have only one lexicon. It would seem that the latter approach is more germane to my own proposals; however, the theoretical assumptions are so different that it looks as if we have reached conclusions that only look similar at the most superficial level. In essence, as a linguist, I am interested in the lexicon as a component of the I-language of a speaker and I try to figure out how it interacts with the computational system and the interface systems: The word "lexicon" means things like transitivity, events, noun classifications, and so on. The co-activation work inspired by connectionism seems to be mostly interested in how words are stored in our long-term memory. If an English word that begins with the syllable 'can' as in 'candle' activates a Spanish word that begins with the same syllable, this tells us something about how information is stored but not something about how our linguistic competence – the connections between our List 1, List 2, and List 3 – works.

A good model of the bilingual lexicon should be able to account for properties of the bilingual lexicons that have been uncovered in recent years, in particular, that bilingualism affects the organization of the L1 lexicon. In the terms of my framework we could summarize it as follows: let's assume that a monolingual person of Language x has a List 1 root *r* that maps onto an item *i* of List 3. For this individual, continuous contact with Language y will affect this relationship so that *r* will map onto an item *i'*, which covers a slightly different area of the Encyclopedia from *i*. Here are some examples: Athanasopoulos (2009) shows that the semantic space for blue color in Greek, which is divided into different roots (*ble* and *ghalazio*), is *shifted*, maintaining a proportional distance, among those who have lived extensively in an English-speaking country. There is also *reverse transfer*: as documented in Pavlenko and Malt (2011), bilingual L1 Russian/ L2 English speakers tend to classify containers ('cup', 'glass', etc.) in their L1 more like English speakers than like monolingual Russian speakers (this effect was more noticeable among early bilinguals). Finally, there is also *attrition*, when a conceptual distinction in your native language disappears in an intense contact situation (Athanasopoulos et al. 2010). It seems that these findings are fully consistent with the MDM 1Lex framework; they are in fact built into this grammar organization: if the new vocabulary has to negotiate the real estate with the old, it is to be expected that there will be readjustments in both directions. On the other hand, a theory that assumes that a bilingual has two compartmentalized lexicons does not predict shifting, reverse transfer, or attrition.

Some research on priming points to the conclusion that the lexicons of bilinguals are set in a *compound* organization: the words in each language are connected to a common conceptual structure. For instance, it can be shown that an Italian-English bilingual will recognize the Italian word *sedia* faster if it has been primed by the English 'chair' (Basnight-Brown and Altarribia 2007, Williams 2015). If we look at this result from the MDM perspective, it is consistent with the assumption that both *sedia* and 'chair' are exponents of the same List 3 and List 1 items.

Some other research points to a *subordinate* organization: the words in the L2 seem to take a detour through the L1 before reaching the conceptual structure, at least among low proficient learners. In the present context, let me introduce the most cited model of bilingual lexicons: The Revised Hierarchical Model (RHM; Kroll and Steward 1994). The proponents of this model want to capture the

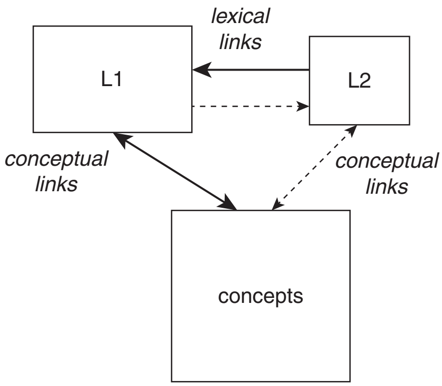

Figure 7.1 The Revised Hierarchical Model
Kroll and Stewart 1994

insight that in the early stages of L2 acquisition "L2 words are more strongly connected to their L1 translation equivalents than to concepts … as L2 proficiency increases, the links between L2 words and concepts become stronger" (Pavlenko 2009: 143; see Kroll and Stewart 1994, Kroll and Tokowicz 2005, and Kroll et al. 2010, among many others.) The RHM, represented in Figure 7.1, captures this idea. As you can see in Figure 7.1, the words in L2 pass through the L1 before reaching the conceptual structure. The connections between L2 and conceptual structure do exist but are weaker, as shown by the thinner line. Once the L2 learner becomes more proficient, more direct connections between L2 and conceptual structure are possible.

The intuition underlying the RHM is captured nicely in the MDM, as shown in the 'planet' example (see (4)). As experienced by language learners the world over and witnessed by generations of language teachers, the initial learning of L2 "words" is really the addition of new exponents/vocabulary items to the List 2, while the rest is left unchanged. The English speaker who learns Spanish learns that *perro* means 'dog', *pájaro* means 'bird' and so on. Notice that this strategy does not have to be discarded, as many words in different languages do denote the same thing (planet, dog, cat, mouse, horse, tree …), as previously argued. For many other new words this equivalence breaks down: *celos* is not the same as 'jealousy'. When the non-equivalence is detected, a new mapping of items in List 3 and in List 1 must be developed: in this particular context, 'jealousy' may be a possible spell out for two distinct List 3 and List 1 items (see (6)). The original RHM claims that the figure in (8) only reflects the beginning of learning a second language and it is later abandoned. But Thierry and Wu (2007) show that even among advanced learners there is evidence that the strategy is used to some extent while other works show that even at the beginning level, access to conceptual access is possible (see Brysbaert and Duyk 2010).

There is more to the RHM than the initial intuition. The main empirical motivation for the RHM is the experimental finding that translation from the L2 to the L1 is significantly faster than translation from the L1 to the L2. The RHM accounts for this by assuming that L2 words are directly connected to L1 words whereas the latter can only reach the L2 words through conceptual structure.

However, Athanasopoulos (2015) shows that the RHM cannot account for conceptual shift or reverse transfer because of its compartmentalized structure. Additionally, as Brysbaert and Duyk (2010: 365) point out, the RHM would lead to expect a high priming effect of L2 to L1 and a much weaker priming effect in the opposite direction, a hypothesis that has been tested using masked priming paradigm (Schoonbaert et al. 2009). In fact, priming effects from L2 to L1 seem to be very hard to find. Proponents of the RHM can counterargue that theirs is a model of language production, not language processing. One could wonder if there is a model that can account for both.

Schoonbaert et al. (2009) propose an account of their priming results within a connectionist framework. The starting point is that the L1 word has a richer semantic representation than the equivalent L2 word which, in their model, is shown by the activation of more nodes in the semantic level. This is shown in Figure 7.2.

The L1 word activates a higher percentage of semantic features than the L2 word: in this model, semantic features are represented as nodes in the semantics level. An L1 prime activates a high percentage of nodes connected to an L2 target but an L2 prime only activates a smaller percentage of nodes connected to the L1 target. This results in stronger priming of L2 by L1 and very little priming of L1 by L2.

Unfortunately, Schoonbaert et al. (2009) do not explain what they mean by "semantic features" and they do not provide an example. They obviously do not mean semantic features in the sense in which linguists use the term (see my discussion of furniture and drinking receptacles in Chapter 4). As far as I can tell, both 'taste' and *smaak* should evoke the same semantic features in an English/Dutch bilingual. Figure 7.2 seems to suggest that *smaak* has some semantic features in the minds of Dutch L1 bilinguals that 'taste' does not have, but the authors of the model don't tell us what these features are. Thus, it seems to me that semantic features is the wrong way of looking at it. I would argue that the priming effects that Schoonbaert et al. (2019) discuss are not a consequence of weaker L2 semantics: it is the L2 exponent – the vocabulary item in the List 2 – that is weaker due to less usage, fewer contexts, etc.

Additionally, it is not clear to me that this model has anything to say of the translation experiments that are the focus of Kroll and Stewart (1994). Recall that Kroll and Stewart found that it takes longer to translate from L1 to L2. It seems to

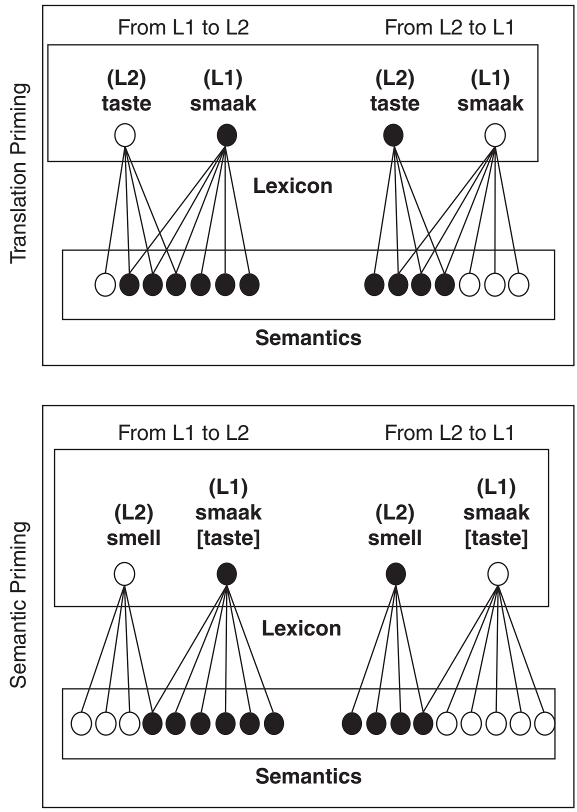

Figure 7.2 A connectionist model of the bilingual lexicon (Schoonbaert et al. 2009:581)

me that the Schoonbaert et al.'s (2009) model predicts that translation from L1 to L2 should be faster than vice-versa, precisely because the overlap in semantic features should favor it. So, it seems that the translation and priming experiments yield results that appear paradoxical at first sight. It looks like a good area where we can check the usefulness of the MDM.[1]

The starting point of my proposal is that the translation and masked priming experiments elicit alternative exponents to the same List 1 and List 3 element. Further, let me suggest that the L1 exponents are more strongly activated than the L2 exponents. This can in fact be incorporated into the MDM by adding probabilistic weights to the different exponents (see Adger and Smith 2010 for an analysis of dialectal variation based on probabilistic weights). These probabilistic weights are certainly necessary independently. Consider our favorite example, how *birra* displaced *cervesia*. In order for this displacement to take place, there has to be an increasing probability among speakers to choose the new exponent over the old until the point that the old exponent's probability is 0. So, let's assume that the Dutch person who has English as L2 has both 'taste' and *smaak* as vocabulary items but the former has lower probability. I represent probability with a **shadow** representation:

(8) List 3 ←→ List 1 ←→ List 2
TASTE √566 {**smaak**, **taste**}

As mentioned, Kroll and Stewart (1994) found that translation from the L2 to the L1 was faster than the opposite direction. Translation from L2 to L1 is faster because the subjects were given the weaker exponent as input and had to return the stronger one. The stronger and more likely exponent is easier to find in long-term memory than the weaker one and therefore it is easier to access in a translation task. Translation from L1 to L2 is slower because the subjects were given the stronger exponent as input and were asked to retrieve the weaker one. Consider now the masked priming experiments, which yielded a stronger priming effect going from L1 to L2. I surmise this is also because the L1 representation is stronger and therefore it has a stronger evocative power.

A question raised by the RHM is the following. In the model in Figure 7.1, both the L1 and the L2 are linked to a module called concepts. I am not certain that I know what these concepts are: are they the meanings of words or are they part of a language of mind? Other questions that can be raised by this: Are those concepts "there" beforehand? Is learning a new language just finding new links to these concepts? What happens when the new language distributes the conceptual space differently (i.e., seats, drinking receptacles)? These issues are discussed at length in Pavlenko (2009), as well as Jarvis and Pavlenko (2008).

Consider Pavlenko's Modified Hierarchical Model (MHM), shown in Figure 7.3. It retains the triangular shape of the RHM but adds complexity in the conceptual space, with a box for L1 concepts, another one for L2 concepts, and an overlapping area.

Notice some characteristics of this model. First, the concept box is divided in three sub-categories: L1-specific categories, L2-specific categories, and shared categories. As a consequence, the arrows linking one box to another have also become more complex. We have the lexical link from L2 to L1 that we saw in the Kroll and Stewart (1994) model. Quite naturally, we have conceptual links between L1 words and L1 categories as well as L2 words and L2 categories. But we also see that there are instances of transfer: L2 transfer (using L1 words for L2 categories) and L1 transfer (using L2 words for L1 categories). On the downside, as Athanasopoulos (2015) points out, the MHM does not quite address the empirical problem of reverse transfer.

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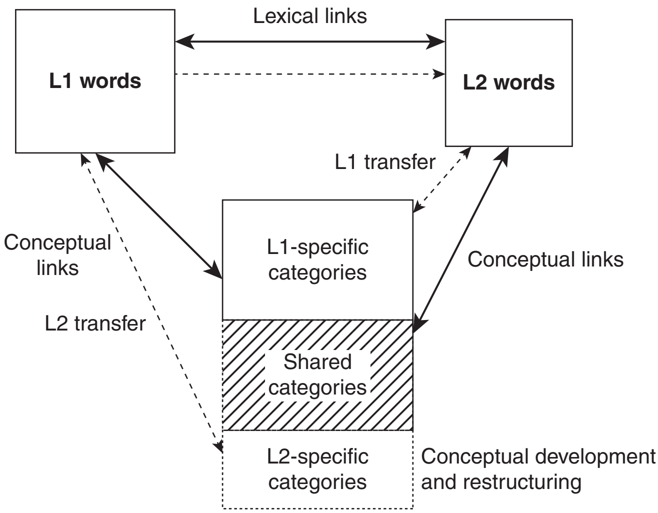

Figure 7.3 The Modified Hierarchical Model
Pavlenko 2009: 147

What does the MHM do for us? Pavlenko (2009) offers a couple of examples and a distinction between *semantic transfer* and *conceptual transfer*. Let's say a Finnish speaker says *he bit himself in the language*, where *language* is pronounced instead of *tongue*. In Finnish, the word *kieli* has the same semantic scope as *tongue*, referring to the body part and to *langue*. According to Pavlenko, this error is an example of *semantic transfer*, which occurs at the point when a word is mapped onto a concept. But it seems to me that the error does not involve the conceptual structure itself because Finnish and English have the same (or similar) categories.

An example of an error in *conceptual structure* is the usage of an English speaker who uses the Russian word *chashka* ('cup') to refer to a paper cup, which in Russian is denoted with a different word. Pavlenko describes this error as a mistake in understanding the conceptual range of *chashka*. This would be an example of *conceptual transfer*.

The sort of model that MDM exemplifies is perfectly suited to handle Pavlenko's examples, although the solution provides quite a different insight. Consider the Finnish example first. Recall that, as reported, the Finnish speaker says 'language' when he means 'tongue'. According to Pavlenko, this is a problem of semantic transfer, the word 'language' has mapped to the wrong meaning. Within MDM, this is conceptualized as follows: The "error" would come about as the assignation of the wrong exponent to a particular index and encyclopedia item:

https://doi.org/10.1017/9781108756181.007 Published online by Cambridge University Press

(9)

	List 3 ←→	List 1 ←→	List 2
Before learning	TONGUE	√44	{/kieli/, /læŋguɪdʒ/}
	LANGUE	√45	{/kieli/, / læŋguɪdʒ/}
After learning:	TONGUE	√44	{/kieli/, /tʌŋ/}
	LANGUE	√45	{/kieli/, /læŋguɪdʒ/}

For this speaker, the root √44, which maps onto an item in the Encyclopedia that could be defined as "TONGUE "or "MUSCLE IN THE MOUTH" has the exponents {/kieli/, /language/}. The root √45, which maps onto a List 3 item that we may call LANGUE, has exactly the same exponents. After learning the actual usage of the English words, the Finnish speaker has 'tongue' as the exponent of √44 and 'language' as the exponent of √45. Learning to use 'tongue' for 'language' with the meaning of TONGUE simply entails a change in the VIRs – and therefore it is not in fact a semantic error.

As for the English person learning Russian, the error is of the same type as the initial misunderstanding of *supay* (see example (7)): approaching the learning of words in a second language as learning new vocabulary items for old concepts. Eventually, learning the correct semantic range of the word *chashka* involves an alteration in the Encyclopedia: the learner will eventually have to figure out that *chashka* does not link with the old concept CUP (with exponent /kʌp/), but will have to develop a new concept, call it CUP2, with the extension of Russian *chashka*, as well as a new index:

(10)

	List 3 ←→	List 1 ←→	List 2
Before learning	CUP	√57	{/kʌp /, /tʃaʃka/}
After learning:	CUP	√57	{/kʌp/}
	CUP2	√58	{/tʃaʃka/}

With this I finish my discussion of the models of bilingual lexicons. I am fully aware that I have barely scratched the surface of the problem. However, I hope to have shown that the MDM 1Lex framework can provide excellent tools for analysis. I also hope to have aroused the curiosity of scholars with expertise in this field.

One more note before I move on. As mentioned, the RHM is explicitly designed as a production model (particularly emphasized by Kroll and Tokowicz 2005) – in other words, it is a model of L2 speakers' performance (although Williams 2015 classifies it as a comprehension model). This raises another issue. The RHM leads to the conclusion that if an English speaker learning Spanish uses the word *celos* where he should use *envidia,* this is a performance error. I think this is misguided: this usage reflects an aspect of this person's knowledge of their L2 (i.e., the meaning that *celos* and *envidia* have in their mental lexicon). Generally, systematic errors reveal something about the competence system while occasional, sporadic errors are due to performance. In particular, the assumption that the L2 words are equivalent to L1 words is a fairly systematic strategy in learning an L2 vocabulary, a fact that is not captured in a model that seeks to be a performance model. On the other hand, the MDM is a competence model: it seeks to understand how our knowledge of language is structured. Systematic errors must be caused by properties of the competence system. The inappropriate usage of the English word ‘jealousy’ by a Spanish speaker reflects something about the organization of the lexicon of that person, as shown previously.

7.4 Co-activation

There is now a wealth of studies on lexical *co-activation*, embracing almost every aspect of the phenomenon (see Williams 2015 for a useful overview). For instance, take the following experiment (Nas 1983, cited in Dijkstra 2005). Nas asked Dutch-English bilinguals to decide if words from a list were English words or not. Some of the non-English words sounded like Dutch words, others did not. The ones that sounded Dutch were rejected more slowly, suggesting that the Dutch vocabulary is also active for subjects who are accomplishing a task dealing with the English lexicon. Assuming that a bilingual has two “languages,” lexical co-activation studies argue that bilinguals do not entirely shut off the lexicon of one language when using the other – rather, it seems clear that both lexicons are fully awake when a speaker processes or produces one of them. This has been shown with many different methods and tasks (see Kroll et al. 2015, Dijkstra 2005).

There is, of course, an alternative interpretation of these results. One could simply assume, as I do in these pages, that the effect of a person having “two languages” is an illusion since all normal humans are in possession of a unified linguistic competence. A direct consequence is that there is no such thing as “co-activation” because there are no separate lexicons in the bilingual’s mind. Kroll et al. (2015: 377) seem to approximate this idea when they reach the conclusion that “all the languages that are known and used become part of the same language system” (although I would question the idea that *lexical* co-activation data can provide generalizations concerning the whole linguistic system.) This is also, of course, the conclusion reached by all the scholars who approach the lexicon from a connectionist perspective.

A lot of the research on co-activation involves orthography, partial phonological identity, and a number of other notions. For instance, using the English word ‘steak’ activates the Dutch word *sterk* ‘strong’ (see the overview in Dijkstra 2005). This suggests that co-activation is involved with every feature of how words are stored in long-term memory, including connections among these lexical items that do not normally enter the linguist’s assumptions concerning the structure of the speaker’s I-language. As I said at the introduction, when linguists thinks of the “lexicon” of a language, they normally think of the meaning of words, the phonological exponent, their morphosyntactic environment. This entails that the issue of lexical co-activation goes way beyond the sort of phenomena that linguists try to describe – including the MDM argued for in these pages. There is, it seems to me, some room for collaboration for scholars from different perspectives.

7.5 Conclusions

Let me now summarize what we have learned in this chapter. I have elaborated on the List 3 side of the grammar in Section 7.1 in preparation for a discussion on word learning in Section 7.2. The conclusion that I reached at the end of Section 7.2 is that the outcome of first and second language vocabulary acquisition in an individual's I-language are not that different because vocabulary acquisition always involves the same outcomes: creation of new List 1 items and/or new morphosyntactic frameworks for them, creation of new List 2 items, and shaping and reshaping List 3 items.

In Section 7.3, I discussed some psycholinguistic approaches to second language vocabulary acquisition. All of these models take for granted that acquiring vocabulary in a second language is fundamentally different from acquisition of the first and, as a consequence, acquisition of bilingual vocabulary requires models specifically designed for it distinct from models of monolingual vocabulary. I have shown that the integrated MDM model can provide insight into the research questions that occupy psycholinguistics scholars and suggested that the distinct-models approach is not necessary. Finally, in Section 7.4, I have very briefly discussed the by-now-abundant literature on co-activation and claimed that it largely confirms the 1Lex hypothesis.