
> Dictionaries and Second Language Acquisition

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1 Introduction

For a number of reasons dictionaries and second or foreign language acquisition can be thought of as forming a fine pair. Language learners all over the world have dictionaries and use them regularly. Whenever they travel to the country where the other language is spoken, they tend to take a dictionary with them, not a grammar book (cf. Bogaards 1996). And this is understandable because finding your way to the railway station without knowing how such a place is called in the other language is nearly impossible whereas not knowing the grammatical structures of the correct sentences that would be needed in such a situation only makes the communication a bit harder. Besides, even those non-native speakers who have an almost perfect command of the grammar of the language continue to be at a loss for words on many occasions. Especially collocations are a constant challenge for all those who were not raised in the foreign language.

The nineteenth century philosopher Wilhelm von Humboldt (1797 – 1835) distinguished a number of levels on which language can be approached: the ‘äussere Form’ and the ‘innere Form’. The most external aspect of language is, according to him, pronunciation, followed by vocabulary and morphology, whereas the more internal aspects are, in descending order: surface syntax, deep syntax, and semantics (cf. Muysken 2004). Now, what seems to be just a superficial feature, pronunciation, happens to be at the same time the aspect that first of all strikes the native speaker when he encounters a foreigner. Advanced learners of a second language are easily recognized as such because of their foreign accent. But in many cases it is also their choice of words that betrays them, more so than the errors they make in morphology or (surface) syntax. As is well known, people are very sensitive when it comes to variation in pronunciation (cf. Guiora 1972) and learners often feel quite embarrassed when they don’t find the words they need, whereas both native speakers and language learners are more tolerant when morphological or syntactic errors are made.

In this paper I will concentrate on the place the lexicon occupies in second or foreign language acquisition (hereafter SLA) and on the place dictionaries occupy in that process. In section 2 I will try to make clear how the lexicon functions in the act of speaking. I will comment on the model that was proposed by Levelt (1989) and that has been adapted to

the specific context of SLA by several scholars. In section 3 I intend to give an overview of how lexical aspects of SLA are studied in the field of applied linguistics. In section 4 the perspective will change and the field of (meta)lexicography will be examined in order to see to what extent the second language learner is taken into account. The last section will be devoted to what is known about vocabulary acquisition and about the role dictionaries can play in that context.

2 The lexicon in language use

In his groundbreaking book *Speaking. From Intention to Articulation* Pim Levelt (1989) presents the speaker as an information processor. When we speak we try to get something, a message, an emotion or anything else, through to someone else (or to ourselves for that matter). In order to understand what is happening, Levelt elaborated the model that is presented in figure 1. In the words of Levelt (1989:9)

Talking as an intentional activity involves conceiving of an intention, selecting the relevant information to be expressed for the realization of this purpose, ordering this information for expression, keeping track of what was said before, and so on.

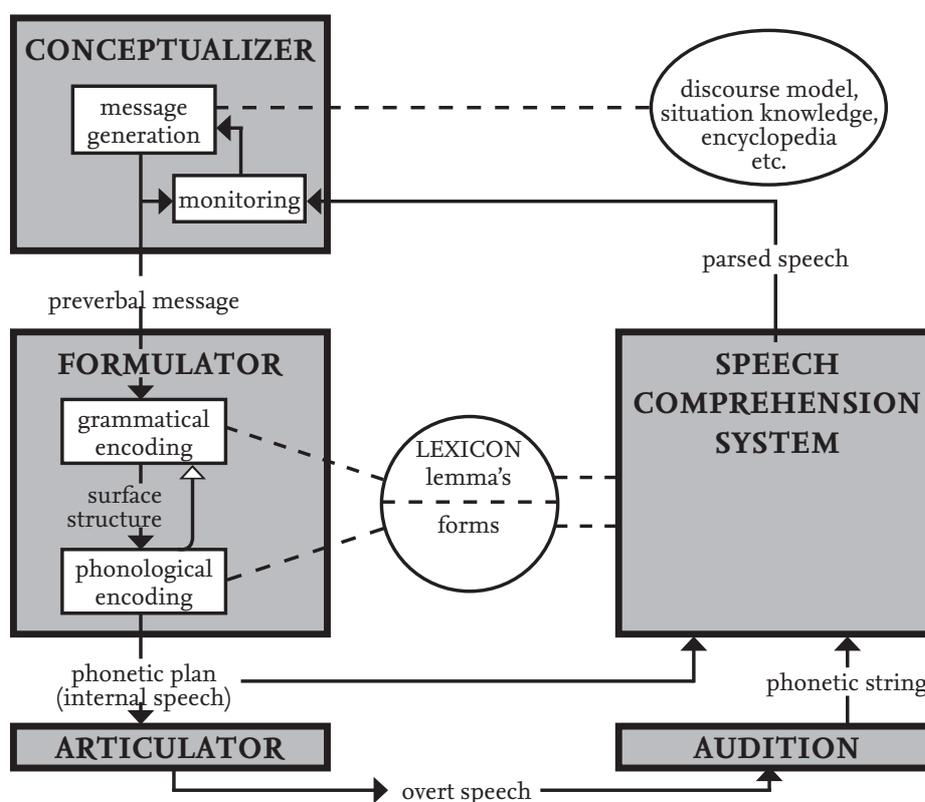


Figure 1. Levelt's model of the speaker as information processor (Levelt 1989:9)

The first stage of the act of speaking is that of the intention, the conceptual stage, where a message is generated and monitored. At this stage the discourse model plans the kind of message to be conveyed; the knowledge one has of the actual situation will influence the form in which the message will be presented, and encyclopaedic knowledge will determine the content of what will be expressed. The preverbal message that is the result of this conceptual stage is then, piecemeal, sent to the formulator. The formulator is heavily dependent on the lexicon, which is represented in the model as the central linguistic module. Once the right words have been chosen, the grammatical form can be determined and the morphological form will follow. These linguistic elements are then, again piecemeal, sent to the articulator which creates an audible form. In the whole process, feedback is crucial: not only do we monitor the content of what we intend to say, adapting our intervention to the supposed knowledge of the interlocutors as well as to their reactions, but the interaction between the conceptual level and the linguistic level, between syntax and morphology, between the linguistic level and the locomotor systems is constantly in action.

An example may make this very intricate procedure clearer. Let us take a simple event we want to talk about: an object 'BOOK' passes from one person, Albert, to another, Bernard. Depending on the state of the discourse so far, we can choose to say something about the book, about Albert, about Bernard, or about the action. This may result in sentences like 'The book was given by Albert to Bernard', 'It was Albert who gave the book to Bernard', or 'By the way, did you know that Bernard received it only yesterday?'. It is obvious that in the last case, there had already been spoken about the book; as to the sender of the book, either this aspect had been part of the conversation so far, or it is shared knowledge between the two participants, or else the speaker does not deem it necessary to mention it.

What is essential in the model is that at the conceptual stage, a virtual message like

'BOOK' – A -> B

has first of all to be put into words. So, if on the level of the preverbal message, it has been decided that the 'BOOK' is the topic of the speech act, the word that is needed will have to be retrieved in the lexicon. As Levelt (1989:11) puts it:

A lemma will be activated when its meaning matches part of the

preverbal message. This will make its syntax available, which in turn will call or activate certain syntactic building procedures.

In the lexicon each entry is represented as having two sides: a *lemma*, which contains the meaning and the syntactical specifications, and a *form*, which includes all the information that is needed on the levels of morphology and phonology (see figure 2). What is central to this approach, that Levelt presents as the ‘lexical hypothesis’, is that conceptual meanings trigger lexical elements which in turn trigger grammatical elements (Levelt 1989:181). In our example this becomes clear when we realize that the choice of the topic ‘BOOK’ leads to the selection of the lexical item *book* which in turn makes it necessary to begin the sentence with an article, ‘a’ or ‘the’ depending on whether the book has already been mentioned or not.

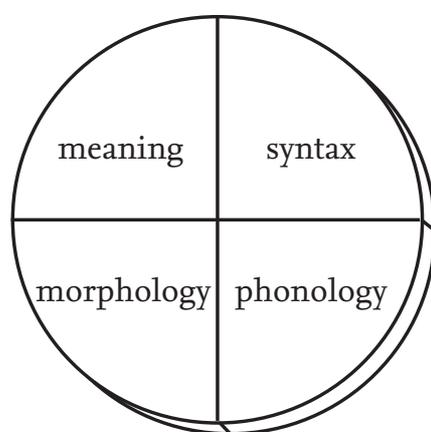


Figure 2. Internal structure of an item in the mental lexicon (Levelt 1989:182)

This procedure, that is presented in a very sketchy way here, is executed in an astonishing speed and with an incredibly high degree of correctness. It is well known that a speaker with a normal speech rate produces some 150 words per minute, but that this pace can go up to about 300 occasionally, which means that from 400 to only 200 milliseconds are needed per word. These choices are made from the total stock that constitutes the mental lexicon, which counts tenths of thousands of elements. Nevertheless, the number of wrong choices or slips of the tongue is less than about 0,1 percent (cf. Levelt 1989:199). That is what we call a skill or, in the context of language use, fluency (cf. Dörnyei 2009:286 – 293). And that is what adult native speakers of a language typically have acquired.

Although not much is known in detail about this fascinating process of lexical choices, it suggests that there must be a close link between the total knowledge that is contained in the human memory, especially all the subjects we are able to talk about, and the means we put to use during

communication with others, i.e. the lexical units. The native language we are raised in offers words and expressions to name and categorize the outside world and structures to a large extent the whole of our knowledge, impressions and feelings.

Learners of a second language already have such an intimate link between their understanding of the world and the specific linguistic elements and means of their mother tongue. What they have to acquire in the other language is the skill, the more or less automatic link that permits them to pass swiftly from the one to the other. And they have to discover that the new language is not just a new set of labels for the same outside reality, but that at points the other language creates a different world (cf. Dagut 1977, Jiang 2002).

In order to understand what is going on when a second language is learnt, De Bot (1992) and Jiang (2000) have adapted Levelt's model to this particular situation. Further expanding on that Ma (2009:54-57) presents the following description. As was already said, each item in the mental lexicon consists of two parts: the *lemma* and the *form*, where the lemma consists of the semantic and syntactic information and the form (or lexeme) includes the morphophonological information (see figure 2). Now, what the second language learner is first of all confronted with, in most cases, is the form, written or spoken. At this stage the lexical item is still almost totally void (see figure 3). The only thing the learner can do is interpret that form in terms of what is available in his long term memory and which is very closely linked to his mother tongue, as we have seen. So, in a second stage the lexical item will correspond to something like the model in figure 4, where the L2 form is linked to L1 semantics and L1 syntax. Ideally the item has to develop into an element that is integrated in the second language on the levels of semantics and syntax as well as on the level of morphology (see figure 5).

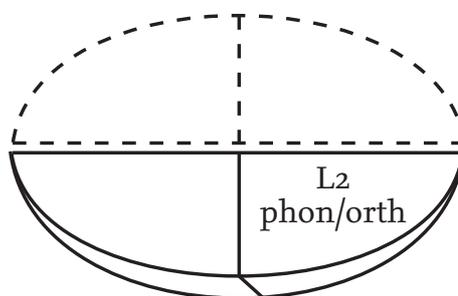


Figure 3. Lexical representation at the initial stage of lexical development in L2 (Jiang 2000:51)

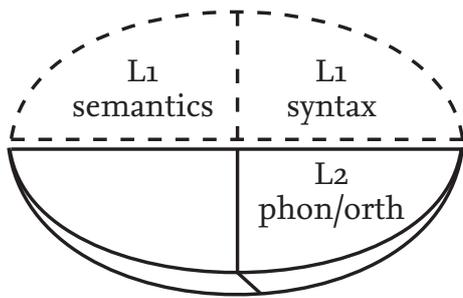


Figure 4. Lexical representation in L2 at the second stage (Jiang 2000:53)

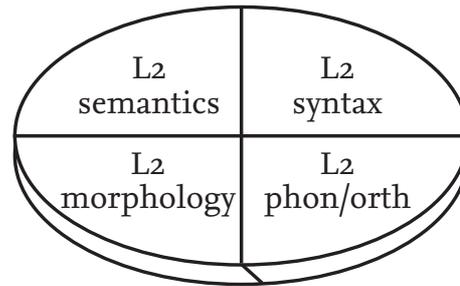


Figure 5. Lexical representation in L2 at the third stage (Jiang 2000:53)

It will be clear that this learning process will not always lead to this ideal situation and that in no way the mental lexicon of the L2 of a bilingual person will be identical to that of a monolingual person. In most cases, even for very advanced learners of a second language (also see section 3), the end state of lexical items in the mental lexicon will be much more complicated, leading to a far less orderly picture, maybe something like figure 6. In the case of the very advanced learner, morphology and syntax may be rather native like, and knowledge about the written form may well be perfect. In many cases, however, the phonetic form will be quite different from the L2 standard. The meaning will be highly influenced by the L1 and will only seldom be as rich and as easily accessible in speech as is the case for the native speaker (e.g. cognates or international items). Ma (2009:58), rightly I think, presents this description not only as a feasible model to account for L2 lexical development, but also as an insightful explanation of lexical errors and lexical stalemate or fossilization.

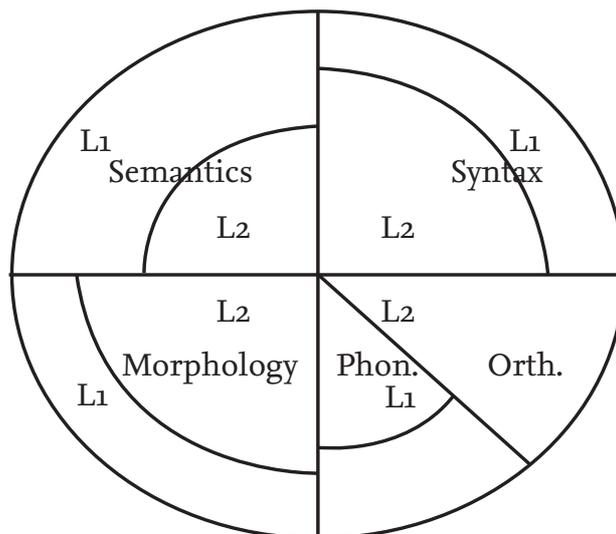


Figure 6. Lexical representation in L2 with influence of the L1.

3 The lexicon in second language research

In contrast with the central role of the lexicon that is claimed in Levelt's model and in its adaptations for SLA, most of the research done in the field of applied linguistics and second language learning is devoted not to the lexical side of the L2 but to grammatical subjects. Looking for the term 'dictionary' in more than ten handbooks and introductions in applied linguistics, bilingualism, and second language acquisition that have been published since 2000, I was struck by its almost complete absence. The term was not mentioned in the subject indexes of seven out of eleven such overviews of the field (see table 1). In three cases the term 'dictionary' was present in the subject index, but in the text itself not much was said about it. For instance, in Kaplan (2002) one is just reminded that dictionary making is one of the branches of applied linguistics, a statement that, rightly or wrongly, will certainly not please all lexicographers (cf. Wiegand 1984). In two other handbooks (Hinkel 2005 and Gass and Selinker 2008), there were only some quite obvious statements about the importance of dictionaries for SLA, and only one (Davies and Elder 2004) contained a chapter on dictionaries (by Alan Kirkness), an honest overview of the state of the art especially in pedagogical lexicography.

	'dictionary'	'lexicon'	'vocabulary acquisition'
Bhatia & Ritchie (2004)	-	+	-
Davies & Elder (2004)	+	+	-
De Bot & al. (2005)	-	+	-
Dörnyei (2009)	-	-	+
Doughty & Long (2003)	-	+	+
Gass & Selinker (2008)	+	+	+
Hinkel (2005)	+	+	+
Kaplan (2002)	+	+	-
Kroll & De Groot (2005)	-	+	+
Mitchell & Myles (2004)	-	+	-
VanPatten & Williams (2007)	-	+	-

Table 1. Presence of terms in eleven handbooks and introductions to SLA

When looking for the term 'lexicon' in these handbooks and introductions, one is better served. It is mentioned in all but one of the handbooks, the exception being Dörnyei (2009). In most cases lexical access or other aspects of the functioning of the mental lexicon are discussed in the context of psycholinguistic experiments, or else theories about the mental

lexicon of balanced bilinguals are presented. In one handbook (Mitchell and Myles 2004:54), which is conceived within the Chomskyan Minimalist Program, it is stated that ‘the core of human language is the lexicon (the word store)’ which consists of two kinds of items:

lexical categories, which include ‘content’ words such as verbs and nouns, and functional categories, which include ‘grammatical’ words such as determiners or auxiliaries, as well as abstract grammatical features such as Tense or Agreement, which may be realized morphologically.

The rest of the book is exclusively devoted to the grammatical side, leaving out any consideration about the acquisition of vocabulary.

The most interesting contribution is a chapter by Kroll and Sunderman (2003), who set out to describe the cognitive processes that support SLA. They discuss a number of models and theories that suggest that in proficient bilinguals

lexical and semantic information in L₁ is activated during both comprehension and production in L₂ (p. 122).

One of these models is the revised hierarchical model (RHM, first proposed in Kroll and Stewart 1994), which is illustrated in figure 7 (Kroll and Sunderman 2003:114; for a discussion about this model see Brysbaert and Duyck (in press) and Kroll et al. (in press)). As can be seen, in a first stage there are stable links between the concepts and the lexical items of the L₁ as well as between the lexical items of the L₂ and those of the L₁. In the latter case we speak of translation equivalents. Note that the lexicon of the L₂ is much smaller than that of the L₁. This picture reminds us of the early stage we have seen in the model presented by Jiang (2000). What have to be developed are direct links between concepts and the corresponding lexical items of the L₂, now given as a dotted line. Kroll and Sunderman (2003:115) underline that

the RHM is explicitly a developmental model. It assumes that the connections between words and concepts in bilingual memory change with increasing proficiency in the L₂. ... A clear prediction of the RHM is that translation from L₂ to L₁ ... should be in place early in acquisition, whereas L₁ to L₂ translation ... will be more difficult for learners to perform.

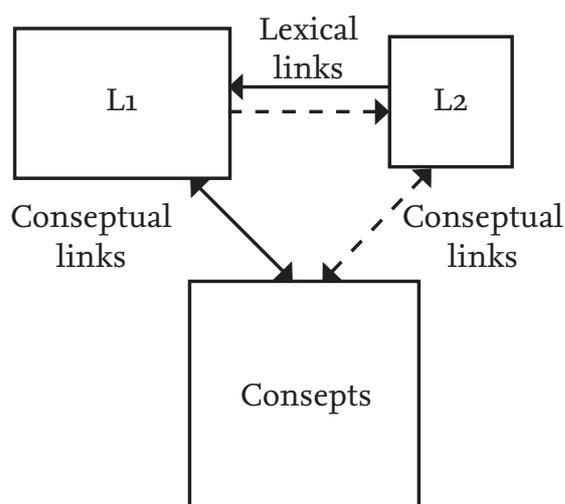


Figure 7. Revised hierarchical model (Kroll and Sunderman 2003:114)

Although this might sound like a truism, it is important to realize that now a scientific explanation is available for this well known fact. And this theoretical point permits the authors to criticize L2 teaching methods that are based on notions of inhibiting L1 activation, such as the Direct method (the Berlitz method), Total Physical Response (TPR), or the Natural Approach, as well as many modern practices in the movement of communicative second language learning (p. 122 – 123). All these methods try to exclude the L1 from the L2 learning scene, not taking into account the fact that this is impossible as even proficient bilinguals experience the influence of their mother tongue.

Returning to the handbooks and introductions in applied linguistics, one can look, on a more concrete level, for the importance of the lexicon as a subject matter in language courses. In other words: what is said about vocabulary learning? Again, one is struck by the paucity of the results: on eleven such books, only five devote some space to the concrete study of the lexical aspect of SLA (see Table 1). Fortunately, there are also a number of more specialized books that treat vocabulary learning (e.g. Schmitt 2000, Nation 2001, Bogaards and Laufer 2004, Ma 2009, to mention only the most recent ones). In the second part of this section I will try to give an outline of the main topics and findings.

Gass and Selinker (2008:449) state that

In SLA research to date, there has been much less attention paid to the lexicon than to other parts of language, although this picture is quickly changing (see Nation, 2001; Singleton, 1999; Bogaards and Laufer, 2004). However, there are numerous

reasons for believing that lexis is important in second language acquisition. In fact, the lexicon may be the most important language component for learners.

De Groot and Van Hell (2005:10), however, remind us that the lexical items to be learned are

far too many to teach and learn via a method of direct teaching ... it can easily be imagined that the teaching and learning of a full-fledged F[oreign] L[anguage] vocabulary is an impossible task that may discourage both teachers and learners of FL and direct their efforts to more manageable components of FL knowledge instead.

This explains why grammatical issues are more central to most language courses than lexical aspects. And as many applied linguists are linguists in the first place it is understandable that syntax is studied far more often than lexis. However this may be, it is the responsibility of the learner to come to terms with the lexicon: no course is long enough and no teacher has enough time to guide the learner through the whole vocabulary of the other language. But teachers and researchers should make clear suggestions as to how this tremendous task can be best approached and which avenues are the most successful.

One of the debates in L2 vocabulary acquisition concerns the differences between *incidental and intentional vocabulary learning*. In a very insightful paper Hulstijn (2003) first more exactly defines the terms incidental and intentional learning, which are often mistakenly used as synonyms of implicit and explicit learning. I will not go into terminological details here. What is essential is that in intentional learning

attention is deliberately directed to committing new information to memory, whereas the involvement of attention is not deliberately geared toward an articulated learning goal in the case of incidental learning (Hulstijn 2003:361).

In incidental learning the most frequently used method is extensive reading in a situation where the learners do not explicitly have the intention to learn (new) vocabulary. They just 'pick up' elements of the language during the performance of a communicative task. Intentional learning can be done in the same way, but there are also other techniques, mainly in the form of some kind of paired-associate learning (translation

pairs, illustrations and words, etc.) or of form focused activities. Laufer (2003) discusses the main assumptions underlying the ‘vocabulary through reading hypothesis’ and then reports three experiments in which she compares reading and several types of vocabulary focused activities (writing sentences or compositions). She arrives at the conclusion that

if a word is practiced in a productive word focused task, its meaning has a better chance to be remembered than if a word is encountered in a text, even when it is noticed and looked up in a dictionary. (Laufer 2003:578)

Nevertheless, what is clear is that

- (1) incidental learning does have an effect on the growth of the L2 lexicon;
- (2) words are better learned when they occur more frequently in the input;
- (3) learners with larger vocabulary sizes tend to profit more from this approach than those with small vocabularies;
- (4) when learning words from context, it is not only the meaning that is learned, but collocational and grammatical aspects are taken in as well (see also Schmitt 2008:346 – 352).

On the other hand, when using some form of paired associates learning, the significance of the results may be overestimated because the learning materials and the test form are very much alike, but do not guarantee that what is learned really functions in language use. Even if many items can be learned in relatively little time in this way, they are not always easily used in language production because their grammatical and collocational properties have not been acquired at the same time.

A point that is uncontroversial is that *vocabulary learning is an incremental process*: only seldom does one learn a lexical unit in one single moment (e.g. some cognates). This is true for vocabulary acquisition through reading as well as when using a form of paired-associate learning. In the latter case, the link between a form and a meaning can sometimes be established in a direct way, but aspects of morphological, grammatical or collocational behaviour are not taken in at the same time. In the case of reading, the growth of knowledge about particular lexical items is normally very slow. In a longitudinal small scale study of three learners of English (Schmitt 1998) it turned out that after one year none of the learners had more than a partial mastery of the meaning, the associations and the grammar of the eleven target words. Only spelling was not a problem for any of the learners. In a well designed experiment with 121 Japanese learners

of English Webb (2007) shows that pseudo words in different contexts are better learned after three, seven, and ten presentations respectively. And this is true of receptive as well as productive knowledge, and of orthographic, semantic, syntactic, and other aspects of that knowledge. But even after ten encounters, the knowledge is far from complete, going from 66% (syntax) to 80% (grammatical functions) on the receptive measures used, and from 29% (meaning and form) to 77% (orthography) on the productive tests (see also Brown et al. 2008).

But not only frequency of exposure determines the learning results in L2 vocabulary acquisition. There are word type effects too. Aspects that have been fairly well researched include concreteness and cognate status. According to De Groot and Van Hell (2005:16)

the recall scores are from 11% to 27% higher for concrete words than for abstract words

and

the effect of cognate status varies between 15% and 19% when highly experienced FL learners were the participants in the vocabulary learning studies.

As lexicographers we know very well that these aspects are not the only ones in which words can differ. As is well known:

- nouns are different from verbs,
- adjectives behave in other ways than nouns,
- some words are highly polysemous, whereas others are strictly monosemous,
- prepositions may have a definable meaning in some of their uses, but have only a grammatical function in others (compare *The book was **on** the kitchen table*, i.e. not under it or behind it; and *The salary depends **on** the kind of job*),
- some words are complex, having clearly recognizable parts, others are opaque,
- some lexical units consist of one word, others are multi word items, and
- all lexical units have complex and unforeseeable particularities at the level of collocation.

In other words, *the lexicon is not a homogeneous mass*, as is often presupposed in vocabulary acquisition research. It is a highly complex crisscross of

strictly individual elements and particular relationships in which it is difficult to see a clear structure.

All these differences and intertwining relationships that constitute the mental lexicon make me sometimes think of a wet cave with stalagmites and stalactites as in figure 8. The water is dripping at unequal paces and at different places, leaving each time some of the calcium that is in it and so building, slowly but steadily, the pillars and the ‘curtains’ that constitute the cave. As can be seen, sometimes solid structures are the result of a longstanding contact; in other cases the beginning structures on the floor are very far from the corresponding elements in the ceiling and it is not even very clear which drip will fall on what beginning stalagmite. This image is quite far from that of the dictionary with its typical two column pages where all words are treated like citizens in a democracy: equal, in spite of their big variation in almost all respects.



Figure 8. Artist's impression of the mental lexicon of the L2 learner.

To make the image even more complex, it is necessary to acknowledge that *vocabulary acquisition is also driven by individual aspects of the learner*. It is indeed due to the wide variety of factors involved in L2 vocabulary acquisition that the best means of mastering this crucial aspect of the second language is still unclear (cf. Schmitt 2008). Some people tend to ‘pick up’ new words or expressions much more easily than others. Some learners heavily rely on their L1 and on translation, others use the knowledge of their L1 or other languages and combine it with what they have acquired in the L2, inventing their own words, which sometimes happen to be correct or almost correct items of the other language. Some

are very handy in deriving new forms from existing ones, whereas others do not see the structural elements of the L2.

All this has to do with what have been called *lexical skills, strategies, or techniques*. Nation (2005:589 – 593) groups them into four categories. The first is guessing or *inferring from context*, a technique everyone uses in his native language and that can be applied to the L2 as well, albeit that the ratio between what is well understood in a text and what causes problems is often so unfavourable in the L2 situation that success is far from guaranteed. The second strategy, *learning from word cards*, which is a form of paired-associate learning (for instance, words and their meanings are written down on the two sides of a card), can lead to specific learning outcomes, especially because the cards can be shuffled presenting the words in various orders. The third approach is through the *use of word parts*. Depending on the nature of the L2, it may be possible to analyse word forms into morphological elements, like ‘*pro-* (forward), *-gress-* (to move), *-ion* (noun)’ which constitute *progression* meaning something like ‘a movement forward’ (Nation 2005:592). For a language like English and many others, this strategy should be applied with the utmost care, however, as is evident from words like *professor*, *profile* or *profit*, where the first syllable is not always a prefix and does not have a meaning like ‘forward’. The last skill mentioned by Nation is *using a dictionary*. According to this author the dictionary can be used to check the guess that had been made while reading a text, or it can help in acquiring new vocabulary. Coady (1997:287), however, takes the view that dictionary use is not always positive as

many adult L2 learners systematically misinterpret dictionary entries and take much more time on reading tasks as compared to nondictionary users.

On the other hand, Scholfield (1997:295 – 296) suggests that dictionary use may be better than just guessing, not only because the dictionary may provide more accurate information, but because it is more demanding and may therefore lead to a more elaborate mental treatment and, consequently, to better learning results. I will come back on this issue in section 5. Before that, in the next section, I want to examine the way the L2 learner is taken into account in (pedagogical) lexicography.

4 Dictionaries and the language learner

Fifty years ago, at the end of a first conference devoted to dictionaries

that was held in Bloomington (Indiana), a list of recommendations was established and it was generally accepted that

dictionaries should be designed with a special set of users in mind and for their specific needs (Householder 1962:279)

Since then a growing body of studies have been done concerning the dictionary user (see for a good overview Lew 2004). In most cases L2 learners have been the subjects and especially monolingual learner's dictionaries have been examined. So, this 'special set of users' should be fairly well known by now. However, it remains to be seen to what extent the L2 learner and especially the acquisition of L2 vocabulary play an important role in the study of dictionary use.

In overviews of the field of lexicography, the learner as learner is not really present. What most subject indexes of introductions and text books about lexicography do have are references to learner's dictionaries (e.g. Béjoint 2000, Hartmann 2001, Landau 2001, Atkins and Rundell 2008). References to the L2 learner, however, are quite rare, and this applies even more to the learning of vocabulary in a foreign language. Cowie (1999:49 – 51) speaks of the 'development of vocabulary' when presenting Hornby's ideas about the importance of relations between lexical items on the level of synonymy and antonymy, and he claims that, in order to foster L2 vocabulary acquisition, connections between senses should be reflected in the layout of an entry (Cowie 1999:148, 162). Svensén (2009) has an entry 'vocabulary learning' but the four references we find there all discuss presentation features of dictionaries: according to this author frequency indications are helpful to make clear which items are to be learned, whereas sense ordering, strict alphabetic ordering, and nesting are all claimed to have their positive or negative impact on the L2 vocabulary acquisition process.

But how do we know? What research outcomes are there to support such claims? Or to make this question more general: Is there any scientific evidence about the relationship between dictionary use and L2 vocabulary growth? Only a very limited number of studies have been done in this specific area. In order to frame the discussion it is important to make a fundamental distinction between what Galisson (1987) has called 'la lexicographie de dépannage' and 'la lexicographie d'apprentissage'. In the first case the dictionary is seen as a sort of breakdown truck which helps you out in a difficult situation. And this is the aspect that has been taken into account in most dictionary user studies. But what interests us here

is the question whether the dictionary can be considered as a learning tool and to what extent dictionary use is conducive to vocabulary growth, especially on the long run.

About twenty years ago, I did a quite informal study to clear the ground in this particular respect (Bogaards 1991). I asked a group of university students of French (N = 44) to translate a Dutch text into French. The text contained 17 words that were expected to be mostly unknown to the subjects. Of the 44 students 12 had a bilingual dictionary at their disposal, 10 others could use the French learner's dictionary *Dictionnaire du français langue étrangère niveau 2* (DFLE, Larousse 1978), 12 students worked with the monolingual *Petit Robert*, and 10 had no dictionary. The results showed that the bilingual group had looked up the most words (about 12 of the 17 target words) and had given the most correct translations (about 13.5); the DFLE group followed with about 7.6 words looked up and 7.6 correct translations; the group that used the *Petit Robert* looked up about 6 words and found about 8.0 correct translations. The group without dictionary could not look up any of the target words but nevertheless produced a mean of 5.6 correct translations. (It is clear from these figures that, contrary to the expectation, each subject already knew about five of the 17 target words.) Two weeks later a test that had not been announced was given to the students as well as to a group of 14 students who had not participated in the first part of the 'experiment'. The results of this test, that aimed at establishing the numbers of words that had been learned during the translation stage and through the use of different types of dictionaries, showed that the group that had learned the most words (about 4) was the DFLE group, followed by the two other groups that had dictionaries at their disposal (bilingual and *Petit Robert*, gain of about 3 words), whereas the students who had not used any dictionary had learned less than 2 new words. Because of the low numbers of students and the informal setting, no real conclusions can be drawn from this study, but it seems nevertheless that dictionary use can lead to more vocabulary learning than when no dictionary is used. This suggestion is confirmed by Cho and Krashen (2003) who found that two of their subjects, the ones who consistently used dictionaries while reading a book, acquired much more words than those who did not look up words in a dictionary.

Only recently some other studies have been conducted that can shed some light on the relationship between dictionary use and long term gains in L2 vocabulary knowledge. Aizawa (1999 described in Ronald 2003b:87 – 90), Laufer 2000, Ronald (2001), Yuzhen (forthcoming), and Dziemianko (in press) have studied the use of different types of dictionaries, paper

or electronic, and have measured the knowledge the subjects, Japanese, Israeli, Chinese or Polish learners of English, had acquired after a delay of one to three weeks.

In Aizawa's study 308 high school students had to read a passage in English with or without a bilingual dictionary. Immediately after the comprehension test a surprise test was conducted in which the knowledge of 24 target words was tested; this test was repeated two weeks later. The results show that the dictionary group outperformed the no-dictionary group with almost 50% (15.60 as against 10.88 correct answers) on the first vocabulary test. On the delayed test this difference shrank but was still significantly higher (13.01 as against 11.42; note that the score of the no-dictionary group rose as was the case in my own study).

Laufer (2000) compared the acquisition of ten target words in a reading text where one group (N = 31) had the words glossed on the margin of the text, while the other group (N = 24) could click on the words and have access to dictionary information providing translations, definitions, and examples of usage. The two unexpected vocabulary tests, one immediately after the experimental session, the other two weeks later, both showed significantly higher scores for the 'dictionary' group than for the 'gloss' group.

Ronald (2001) asked 24 Japanese learners of English to study either a set of dictionary definitions or a set of authentic examples for 20 English adjectives. To measure vocabulary retention three weeks later, Ronald presented the subjects with the same materials in which the target words had been replaced with blanks; the subjects had to select the one correct word from four alternatives presented. Although the definition group had outperformed the example group in writing more correct sentences and in giving more correct translations during the first part of the procedure, all differences disappeared at the moment of the vocabulary retention test. The author suggests (p. 245) that the form of the test was the cause of this unexpected result, as the test did not really measure vocabulary retention but sensitivity to the contexts in which the target words had first been presented. My guess is that both (dictionary) definitions and (dictionary or authentic) examples may lead to vocabulary learning and that definitions are not necessarily superior to examples. The main point is that information that is typically found in dictionaries, definitions or examples, is favourable to L2 vocabulary acquisition.

Yuzhen (forthcoming) compares the use of palm top electronic dictionaries (PEDs) and paper dictionaries (PDs) in a task where 101

Chinese learners of English had to verify the meaning of ten target words and to write sentences including these words. After the experimental treatment the students filled in the Vocabulary Knowledge Scale (VKS, Paribakht and Wesche 1997) in which they could indicate to what extent they knew the target words. This test was repeated two weeks later without further announcement. The results show that there were no significant differences between the two groups as to immediate or long term word retention. But both groups had made some progress: they had retained about 26% of the words immediately after the treatment and about 17% two weeks later.

In a similar vein Dziemianko (in press) tries to find an answer to the question which form of a monolingual learner's dictionary (Cobuild6), the paper dictionary or its electronic format, is a better learning tool in L2 vocabulary acquisition. The subjects, 64 Polish learners of English, had to perform a receptive as well as a productive task: they were asked to explain or translate nine content words and to complete nine sentences in which prepositions had been left out. Two weeks later the same test (but with the items in a different order) was administered without any announcement and without the support of a dictionary. In this case the results show a statistically highly significant difference between the scores of the users of the electronic dictionary and those who had used the paper form of exactly the same dictionary. Whereas the former had acquired about 64% of the test items, the latter had obtained a score of only some 46%.

What can be concluded from these studies? In the first place it is clear from all of them that dictionary use can lead to gains in L2 vocabulary knowledge. In addition, both Aizawa's study and the study by Laufer confirm that the use of a dictionary leads to more vocabulary growth than no dictionary. Whereas the use of different types of bilingual dictionaries in electronic or paper form does not seem to lead to statistically significant differences in long term vocabulary growth in Yuzhen's study, in the more precise comparison of two forms of the same information in paper and electronic form in Dziemianko's research, the electronic presentation leads to far better retention of receptive as well as productive knowledge in L2.

5 The dictionary as learning tool

One of the basic aspects of knowing a language is, as we have seen, skill. This skill corresponds to one of two fundamental types of knowledge that is contained in the human brain: *procedural knowledge*. As opposed

to *declarative knowledge*, which is the knowledge of facts, procedural knowledge answers the question of how things are done. We know that Paris is the capital of France, but we also know how to ride a bike. This difference between *knowing that* and *knowing how* also applies to vocabulary knowledge. We may know that a certain flower is called a *daisy* in English, a *pâquerette* in French, or a *madeliefje* in Dutch. But this knowledge is different from that about the ways these words can be properly used in a context. In the case of such concrete nouns as names of flowers the latter knowledge may be simple and easy to acquire for the L2 learner, but even then the native speaker of a language does know much more about them than most learners will ever do. Names of flowers may be associated to songs, be part of set phrases, or have symbolic values that do not exist in the same way in the native language of the L2 learner.

In a seminal paper the American psycholinguist George A. Miller (1999) tries to define what it means to know a word. He gives an overview of research that has been done by psychologists in order to explore the lexical network in native speakers and comes to the conclusion that no single theory is able to explain all the differences in verification times that are produced by subjects who are confronted with statements like 'A canary is a bird' or 'A canary is an animal'. And he underlines the importance of types of relationships between meanings other than hyponymy: i.e. synonymy, meronymy, troponymy, and various verbal entailments, which are now all contained in WordNet (see Fellbaum 1998). But even WordNet does not give a complete picture of the mental lexicon as it does not provide a topical organization: it does not give a handy overview of the words needed to discuss e.g. baseball. Another crucial feature that has not been incorporated in WordNet is a way to recognize the alternative meanings of a polysemous word. And this brings Miller to the important issue of context.

Polysemous words have been used by psycholinguists in order to find an explanation for the speed with which a particular meaning of a word can be identified and treated. From the results of this type of research Miller and his colleagues have gained the insight that,

associated with each word meaning, there must be a contextual representation

and that

a polysemous word must have different contextual representations [...]. A contextual representation is not in itself a linguistic context,

but is an abstract cognitive structure that accumulates from encounters with a word in various linguistic contexts and that enables the recognition of similar contexts as they occur. (Miller 1999).

One could compare this to the 'knowledge' one has of faces which one readily recognizes in one type of social event, a family gathering or a business meeting, but that one would have difficulty in bringing home outside of a given context.

Miller (1999) then adds something that is important to lexicographers:

Note that contextual representations are precisely what is missing from most dictionary definitions. But it is not easy to explain to lexicographers what more they should provide. Unfortunately, 'contextual representation' is not an explanation; it is merely a name for the thing to be explained.

This contextual representation limits the number of alternative meanings of polysemous words and so speeds up the process of comprehension. It is a sort of 'missing link' between declarative knowledge and procedural knowledge or skill. It could also be responsible for the fact that people are often able to finish the sentences of their interlocutor, to understand in spite of not really hearing part of what was said, and of reacting before the interlocutor has finished.

For the moment one can only speculate on the exact roles that are played by different types of context: situational context, topical context, and local or direct linguistic context. What is clear, however, is that computers are up to now fairly bad in picking the right sense of polysemous words and, what is more relevant in this context, that learners of a second or foreign language are not much better at that. Dictionaries, and especially monolingual learner's dictionaries have become much better over the years in providing information about what words mean and how they are used. As will be clear from the foregoing, however, they do not manage to tell the whole story and users will not yet find there these 'contextual representations' that native speakers seem to have and that explain their fabulous speed and correctness in handling lexical materials.

When language learners consult a dictionary, they may add something to their declarative knowledge. As the development of 'contextual representations' asks for multiple encounters of the same lexical unit in

various contexts, one cannot easily overstate the importance of reading and listening in the process of L2 acquisition. Well chosen examples in dictionaries may certainly be assumed to help as well. We should, however, be unpretentious as to the role dictionaries can play in the total process of vocabulary acquisition. A dictionary cannot give as many and as varied contexts as are offered in extensive language use. And as dictionary consultation takes time, even in the electronic era, one should be reserved when advising learners about dictionary use. Although, as we have seen, dictionary consultation can be effective when L2 vocabulary acquisition is concerned, it may not always be the most efficient way. To summarize in a somewhat apodictic manner: dictionaries have their role to play when it comes to establishing declarative knowledge, but maybe not when procedural knowledge is strived for.

One other point needs to be made at the end of this paper. As we have seen in section 3, the L2 lexicon even of advanced bilinguals is influenced by the content of their L1 lexicon. So, some degree of bilingualism is always present. And the question arises if completely monolingual dictionaries are the best learning tools for L2 learners. It is not possible to give any firm answer to that question. It is in order, however, to note that the monolingual learners' dictionary came into existence in the context of direct methods that tried to avoid as much as possible the use of the native language of the learners (cf. Cowie 1999:1 – 13). Now that we know that this is impossible, we should try to take this point into account. As we have seen that bilingual dictionaries are not the ultimate answer to this situation because they do not seem to lead to better L2 vocabulary retention (see section 4), it is time to think about other, more effective and efficient lexical learning tools. At least two interesting proposals have been made in recent years. I think the avenues opened up by Laufer (1995, also see Laufer and Levitzky-Aviad 2006) as well as by Bogaards and Hannay (2004) deserve to be further explored. Both proposals try to combine the best of two worlds: the extensive knowledge that is condensed in modern monolingual learner's dictionaries and the exploitation of bilingual equivalences that are so well established in the learner's mental lexicon. In this context it is worthwhile to quote Schmitt (2008:337) who says:

Although it is unfashionable in many quarters to use the L1 in second language learning, given the ubiquitous nature of L1 influence, it seems perfectly sensible to exploit it when it is to our advantage.

In the same vein Laufer and Girsai (2008:7) speak of the 'pervasive influence

that L1 has on the learner lexis' and, after presenting an experiment the results of which give full support to a contrastive approach in L2 vocabulary acquisition, they conclude that

there is indeed a place for contrastive analysis and translation activities in L2 teaching. Meaningful communication has been the goal of communicative language teaching, but the best method for achieving this goal may not be identical to the goal itself (Laufer and Girsai 2008:19).

Albert Sydney Hornby, who was one of the founding fathers of the English monolingual learner's dictionary, is described by Cowie (1999:12) as

a man of broad sympathies and practical instincts who believed that the knowledge of the expert should be put to the service of the ordinary learner and teacher.

I am convinced that if he had known what is available as scientific evidence now, he would have been enthusiastic to adapt the dictionary to it. I think that we owe it to him to make every effort we can to better serve the ordinary learner and teacher. In order to improve the dictionary a closer collaboration between lexicographers, SLA experts and psycholinguist is more necessary than ever.

> **References**

Atkins, B.T. Sue and M. Rundell (2008). *The Oxford Guide to Practical Lexicography*. Oxford: Oxford University Press.

Béjoint, H. (2000). *Modern Lexicography. An Introduction*. Oxford: Oxford University Press.

Bhatia, T.K. and W.C. Ritchie (eds.). (2004). *The handbook of bilingualism*. Oxford: Blackwell.

Bogaards, P. (1991). 'Dictionnaires pédagogiques et apprentissage du vocabulaire.' In *Cahiers de Lexicologie* 59:93 – 107.

Bogaards, P. (1996). 'Lexicon and Grammar in Second Language Learning.' In P. Jordens, J. Lalleman (eds.). *Investigating Second Language Acquisition*. Berlin/New York: Mouton de Gruyter, 1996, 357 – 379.

Bogaards, P. and B. Laufer (eds.). (2004). *Vocabulary in a second language. Selection, acquisition, and testing*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

Bogaards, P. and M. Hannay (2004). 'Towards a New Type of Bilingual Dictionary.' In G. Williams and S. Vessier (eds.). In *Proceedings of the 11th EURALEX International Conference*. Lorient: Université de Bretagne Sud. 463 – 474.

- Brown, R., R. Waring, and S. Donkaewbua (2008). 'Incidental Vocabulary Acquisition from Reading, Reading-while-Listening, and Listening.' In *Reading in a Foreign Language* 20:136 – 163.
- Brybaert, M. and W. Duyck (in press). 'Is it Time to Leave behind the Revised Hierarchical Model of Bilingual Language Processing after 15 Years of Service?' In *Bilingualism: Language and Cognition*.
- Cho, K-S. and S. Krashen (1994). 'Acquisition of Vocabulary from the Sweet Valley Kids Series: Adult ESL Acquisition.' In *Journal of Reading* 37, 662 – 667.
- Coady, J. (1997). 'L2 Vocabulary Acquisition: A Synthesis of the Research.' In J. Coady and T. Huckin (eds.). *Second Language Vocabulary Acquisition*, Cambridge: Cambridge University Press, 273 – 290.
- Cowie, A.P. (1999). *English Dictionaries for Foreign Learners. A History*. Oxford: Clarendon Press.
- Dagut, M.B. (1977). 'Incongruencies in Lexical 'Gridding' – an Application of Contrastive Semantic Analysis to Language Teaching.' In *IRAL* 15:221 – 229.
- Davies, A. and C. Elder (eds.). (2004). *The handbook of applied linguistics*. Oxford: Blackwell.
- De Bot, K. (1992). 'Bilingual Production Model: Levelt's Speaking Model Adapted.' In *Applied Linguistics* 13:1 – 25.
- De Bot, K., W. Lowie, and M. Verspoor (2005). *Second language acquisition. An advanced resource book*. London: Routledge.
- De Groot, A.M.B. and J.G. Van Hell (2005). 'The learning of foreign language vocabulary. In Kroll and De Groot 2005:9 – 29.
- Dörnyei, Z. (2009). *The Psychology of Second Language Acquisition*. Oxford: OUP.
- Doughty, C. and M. Long (eds.). (2003). *The handbook of second language acquisition*. Oxford: Blackwell.
- Dziemianko, A. (in press). 'Paper or Electronic? The Role of Dictionary Form in Language Reception, Production, and the Retention of Meanings and Collocations.' In *International Journal of Lexicography* 23/3.
- Fellbaum, C. (ed.) (1998). *WordNet: An Electronic Lexical Database*. Cambridge, Mass. And London: MIT Press.
- Galisson, R. (1987). 'De la lexicographie de dépannage à la lexicographie d'apprentissage : pour une politique de rénovation des dictionnaires monolingues de FLE à l'école.' *Cahiers de Lexicologie* 51:95 – 118.
- Gass, S.M. and L. Selinker (2008). *Second language acquisition: An introductory course*. Mahwah, New Jersey: Erlbaum.
- Guiora, A.Z. (1972). 'Construct Validity and Transpositional Research: Toward an Empirical Study of Psychoanalytic Concepts.' *Comprehensive Psychiatry* 13:139 – 150.
- Hartmann, R.R.K. (2001). *Teaching and Researching Lexicography*. (Applied Linguistics in Action), Harlow: Longman-Pearson Education.
- Hinkel, E. (ed.) (2005). *Handbook of research in second language teaching and learning*. Mahwah, New Jersey: Erlbaum.

- Householder, F.W. (1972). 'Summary Report.' In F.W. Householder and S. Saporta (eds.). *Problems in Lexicography: Report of the Conference on Lexicography Held at Indiana University November 11 – 12, 1960*. Bloomington, Ind.: Indiana University. 279 – 282.
- Hulstijn, J.H. (2003). 'Incidental and intentional learning.' In Doughty and Long 2003:349 – 381.
- Jiang, N. (2000). 'Lexical representation and development in a second language.' In *Applied Linguistics* 21:47 – 77.
- Jiang, N. (2002). 'Form-Meaning Mapping in Vocabulary Acquisition in a Second Language.' In *Studies in second Language Acquisition* 24:617 – 637.
- Kaplan, R.B. (ed.) (2002). *The Oxford handbook of applied linguistics*. Oxford: OUP.
- Kirkness, A. (2004). 'Lexicography.' In Davies and Elder 2004:54 – 81.
- Kroll, J.F. and E. Stewart (1994). 'Category Interference in Translation and Picture Naming: Evidence for Asymmetric Connections between Bilingual Memory Representations.' In *Journal of Memory and Language* 33:149 – 174.
- Kroll, J.F. and G. Sunderman (2003). 'Cognitive processes in second language learners and bilinguals: the development of lexical conceptual representations.' In Doughty and Long 2003:104 – 129.
- Kroll, J.F. and A.M.B. De Groot (eds.). (2005). *Handbook of bilingualism: Psycholinguistic approaches*. Oxford: OUP.
- Kroll, J.F., J.G. van Hell, N. Tokowicz, and D.W. Green (in press). 'The Revised Hierarchical Model: A Critical Review and Assessment.' *Bilingualism: Language and Cognition*.
- Landau, S. I. (2001). *Dictionaries : The Art and Craft of Lexicography*. Cambridge: Cambridge University Press.
- Laufer, B. (1995). 'A Case for Semi-bilingual Dictionary for Production Purposes.' In *Kernerman Dictionary News* 3.
- Laufer, B. (2000). 'Electronic Dictionaries and Incidental Vocabulary Acquisition: does Technology make a Difference?' In U. Heid et al. (eds.). *EURALEX*. Stuttgart University: 849 – 854.
- Laufer, B. (2003). 'Vocabulary Acquisition in a Second Language: Do Learners Really Acquire most Vocabulary by Reading? Some Empirical Evidence.' In *Canadian Modern Language Review* 59:565 – 585.
- Laufer, B. and N. Girsai (2008). 'Form-focused Instruction in Second Language Vocabulary Learning: A Case for Contrastive Analysis and Translation.' In *Applied Linguistics* 29:1 – 23.
- Laufer, B. and T. Levitzky-Aviad (2006). 'Examining the Effectiveness of 'Bilingual Dictionary Plus' – A Dictionary for Production in a Foreign Language.' *International Journal of Lexicography* 19:135 – 155.
- Levelt, W.J.M. (1989). *Speaking. From Intention to Articulation*. Cambridge, Mass: The MIT Press.
- Lew, R. (2004). *Which Dictionary for Whom? Receptive Use of Bilingual, Monolingual and Semi-Bilingual Dictionaries by Polish Learners of English*. Poznan: Motivex.
- Ma, Q. (2009). *Second Language Vocabulary Acquisition*. Bern : Peter Lang.

- Miller, G.A. (1999). 'On Knowing a Word.' In *Annual Review of Psychology* 50:1 – 19.
- Mitchell, R. and Myles, F. (2004²). *Second language learning theories*. London: Arnold.
- Muysken, P. (2004). 'Two linguistic systems in contact: grammar, phonology and lexicon'. In Bhatia and Ritchie 2004:147 – 168.
- Nation, I.S.P. (2001). *Learning vocabulary in another language*. Cambridge, UK: Cambridge University Press.
- Nation, I.S.P. (2005). 'Teaching and learning vocabulary'. In Hinkel 2005. 581 – 595.
- Qing Ma (2009). *Second language vocabulary acquisition*. Bern: Peter Lang.
- Ronald, J. (2003a). 'A Review of Research into Vocabulary Acquisition through Dictionary Use. Part 1: Intentional Vocabulary Learning through Dictionary Use.' In *Studies in the Humanities and Sciences* 44/1:285 – 307.
- Ronald, J. (2003b). 'A Review of Research into Vocabulary Acquisition through Dictionary Use. Part 2: Incidental Vocabulary Acquisition through Dictionary Use.' In *Studies in the Humanities and Sciences* 44/2:67 – 97.
- Schmitt, N. (1998). 'Tracking the incremental acquisition of second language vocabulary: A longitudinal study'. In *Language Learning* 48:281 – 317.
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge, UK: Cambridge University Press.
- Schmitt, N. (2008). 'Instructed Second Language Vocabulary Learning.' In *Language teaching Research* 12: 329 – 363.
- Scholfield, P. (1997). 'Vocabulary Reference Works in Foreign Language Learning.' In N. Schmitt and M. McCarthy (eds.). *Vocabulary. Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press. 279 – 302.
- Singleton, D. (1999). *Exploring the second language mental lexicon*. Cambridge, UK: Cambridge University Press.
- Svensén, B. (2009). *A Handbook of Lexicography. The Theory and Practice of Dictionary-Making*. Cambridge: Cambridge University Press.
- Tarp, S. (2008). *Lexicography in the Borderland between Knowledge and Non-Knowledge. General Lexicographical Theory with Particular Focus on Learner's Lexicography*. Tübingen: Niemeyer (Lexicographica Series Maior 134).
- VanPatten, B. and J. Williams (eds.). (2007). *Theories in second language acquisition: An introduction*. Mahwah, New Jersey: Erlbaum.
- Webb, S. (2007). 'The effects of repetition on vocabulary knowledge.' In *Applied Linguistics* 28:46 – 65.
- Wiegand, H.E. (1984). 'On the Structure and Contents of a General Theory of Lexicography.' In R.R.K. Hartmann (ed.). *LEXeter '83 Proceedings. Papers from the International Conference on Lexicography at Exeter, 9-12 September 1983*. Lexicographica. Series Maior 1, Tübingen: Max Niemeyer, 13 – 30.
- Yuzhen (forthcoming). 'Dictionary Use and EFL Learning. A Contrastive Study of PEDs and PDs.' Paper submitted to the *International Journal of Lexicography*.