Current Perspectives on Vocabulary Teaching and Learning

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Abstract

This chapter reviews key vocabulary research and draws a number of conclusions regarding teaching and learning. Areas addressed include the amount of vocabulary required to use English; what it means to know and learn a word; the incremental nature of vocabulary acquisition; the role of memory in vocabulary

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learning, incidental, and intentional vocabulary learning; and the implementation of a systematic approach to vocabulary teaching and learning. This chapter also introduces principles by which activities can be developed for vocabulary teaching and instruments that will help teachers choose effective tasks. The insights and techniques discussed in this chapter can help teachers develop principled vocabulary programs for their students.

Keywords
Vocabulary size, Vocabulary depth, Incidental learning, Intentional learning, Retrieval

Introduction

Vocabulary learning is a critical part of developing second-language competency. Vocabulary knowledge has been shown to play a significant role in language comprehension and production. It has also been shown to affect scores on general proficiency measures. It is no wonder then that vocabulary development is considered by researchers, teachers, and students alike, to be among the most important tasks of the language learner. Reflecting this importance, there has been a wealth of research in this area in recent years, leading to a robust set of research-led pedagogical principles. This chapter highlights these insights and provides tangible advice on how to teach vocabulary in an effective manner.

The Vocabulary Challenge Facing L2 English Learners

Before pedagogical stakeholders can design principled vocabulary programs, they first need to understand the vocabulary challenge facing learners of English. There are a considerable number of word families in English (a word family consists of a headword [play], its inflections [played, playing], as well as its derivations [playful, playfulness, playfully]). The average dictionary lists many tens of thousands of word families, for example. However, even educated native speakers will know only a fraction of these, perhaps around 17,000 (Goulden et al. 1990). Although this figure is probably unrealistic for all but the most motivated learners, the good news is that it is possible to function in English with vocabularies far smaller than this, the reason being that learners do not need to understand all the running words in a text to comprehend it. A key consideration here, and one of the main areas of vocabulary research, is just how many words are necessary to perform various tasks in English. However, before discussion of that area is possible, it is first important to answer a related question.

What Percentage of the Vocabulary in a Text Is It Necessary to Know?

The percentage of known words in a text is referred to as *lexical coverage*. Some researchers have suggested that coverage of 95% of the lexical items in a text

predicts adequate reading comprehension (Laufer 1989), while others (e.g., Hu and Nation 2000) have suggested a higher figure, 98%. It is probably best to think of these numbers as points on an approximately linear scale, with comprehension improving as lexical coverage increases (Schmitt et al. 2011). Therefore, 95% lexical coverage might be considered a minimal and ≥ 98% an optimal figure (Laufer and Ravenhorst-Kalovski 2010). This equates to 1 unknown word per 20 and per 50 words of text, respectively.

While less research has focused on coverage figures for listening, studies in this area have also found that better comprehension comes with greater lexical coverage. They have also suggested that adequate comprehension is possible with lower lexical coverage than reading. Van Zeeland and Schmitt (2013), for example, found that a great deal can be comprehended with 95% coverage of narrative texts.

It is important to remember that these figures are probabilistic; meeting the coverage targets is no guarantee of successful comprehension. In addition, there will inevitably be individual differences with some learners able to comprehend more with less coverage and some able to understand little with more coverage. Finally, it is also important to remember that discourse comprehension is a multi-faceted construct; there are many other factors that affect the extent to which a learner comprehends a text (see Schmitt et al. 2011). However, with an understanding of lexical coverage requirements, it is now possible to determine the extent of the lexical challenge facing L2 learners.

How Many Words Is It Necessary to Know to Reach the Coverage Figures?

The above showed that to read an authentic text independently, 95% coverage can be taken as a minimal requirement, while ≥98% coverage can be considered optimal. Studies have shown that the latter equates to approximately 8000–9000 word families, while the former can be realized with knowledge of 4000–5000 word families (Laufer and Ravenhorst-Kalovski 2010; Nation 2006). For listening, it seems that comprehension is possible with comparatively less coverage. Thus, 95% coverage can be attained with knowledge of 2,000–3,000 word families. This latter figure is supported by Webb and Rodger (2009), who found that 95% coverage of a corpus of 318 movie scripts could be achieved with knowledge of the most frequent 3,000 word families. All these figures include proper nouns, as it is assumed that these do not pose a great deal of difficulty for learners (i.e., they will be familiar to most or guessable from context). Laufer and Ravenhorst-Kalovski (2010) calculated that proper nouns account for approximately 2.1% of words in a text. Of course, even with understanding of all proper nouns, many words will still be unknown, but with vocabulary sizes of 8,000–9,000 words for reading and 2,000–3,000 words for listening, learners should be able to infer the meaning of novel words from context and understand most of the communicative content of the text.

While the learning goals described in this section may seem prohibitively large, it is useful to remember that many are successful in reaching such levels. These

statistics should provide stakeholders with size targets that need to be attained in order to function well in English in various ways; however, they do not tell us which words students need to know.

Which Words Should Learners Study?

In some situations, the particular words to teach are obvious. For example, beginners in a classroom need, among other things, the words required to operate in a classroom setting, e.g., *book* and *pencil*. ESP learners focusing on a specific field of study, e.g., medicine, will need to learn the technical vocabulary required in that field (*scalpel*, *femur*). This situationally based vocabulary and technical vocabulary are obvious targets for teaching, but it is less obvious what to teach if the goal is a general increase in vocabulary size. In this case, the best criterion to guide target word selection is frequency of occurrence. Words occurring frequently in English are typically the most useful and the first acquired by students. The usefulness of frequent words has much to do with text coverage. That is, knowing a small number of words in English allows coverage of a large proportion of a text. Readers can perform a coverage analysis by copying a text and pasting it into a vocabulary profiler (e.g., *Lextutor*: https://lextutor.ca/). The results will, depending on the intended audience of the text, resemble the findings of Nation (2006). For example, he reports that 82.93% of the words in *Lady Chatterley's Lover* are from the most frequent 1,000 word families of English, which includes function words like *that*, *a*, and *to*. The next 1,000 word families account for 7.21% of the running words in the text. However, another 1,000 word families, the tenth most frequent, account for only 0.24% of the same text (Table 1). This frequency order reflects the order of importance to the average learner, with highly frequent words important and low-frequency words less so. Spoken discourse generally has less diversity when it comes to vocabulary, and so 3,000 word families will cover around 95% of typical

Table 1 Percentage coverage figures for *Lady Chatterley's Lover*

Frequency band (in thousands)	Percentage contribution to total coverage (excluding proper nouns)	Cumulative coverage (including proper nouns)
1	80.88	82.93
2	7.21	90.14
3	3.14	93.28
4	1.78	95.06
5	1.07	96.13
6	0.69	96.88
7	0.61	97.43
8	0.47	97.90
9	0.32	98.22
10	0.24	98.46

Adapted from Nation (2006)

speech (Webb and Rodgers 2009). However, for academic spoken English, the number of word families needed to reach necessary coverage is larger, 4,000 in addition to proper nouns (Dang and Webb 2014). Clearly, the most frequent words in English are an essential foundation to all language users and need to be learned regardless of the effort.

In addition to learning a wide and varied vocabulary of individual words, English learners must also cope with formulaic language. English has a large number of these multi-word lexemes, many of which are opaque (e.g., *pass away*, *bite the dust*, *kick the bucket*, all meaning *to die*). Although it is certainly possible to be communicative without using these, they are a large part of what makes proficient English speakers sound natural and their lexical choices appropriate. In addition, recognizing formulaic language is associated with a processing advantage (Pawley and Syder 1983). Also, as such formulaic language seems to be ubiquitous in English, learners need to be able to fluently decode the meaning of these lexical phrases if they are to read and listen to authentic discourse efficiently (Martinez and Murphy 2011). It is clear then that the lexical challenge facing learners, both in terms of single items and formulaic sequences, is considerable.

Word lists offer a partial solution to this problem. These allow stakeholders to determine which words or sequences should be included in instruction. List selection is important as many are currently available and the most appropriate list will depend on learner needs. For example, the Essential Word List (Dang and Webb 2016) would suit beginners, while the Academic Vocabulary List (Gardner and Davies 2014) could be used with EAP students. Lists of formulaic sequences, common phrasal verbs, for example (Garnier and Schmitt 2015), are also useful tools for materials writers and teachers. These tools, if correctly deployed, offer valuable research-driven evidence around which syllabi can be designed.

The Construct of Vocabulary Knowledge

Perhaps the first step to understanding vocabulary learning is to specify what it means to know a word. The average layperson would probably assume a word known if learners can demonstrate knowledge of its meaning and form (written and/or spoken). While learners may be able to use a word with this level of understanding, such shallow knowledge might be considered as, to borrow terminology employed earlier, minimal. In contrast, optimal knowledge consists of a great deal more. The most frequently used componential taxonomy of lexical knowledge is Nation (2013). The following represents the most extensive description of vocabulary knowledge produced to date (Table 2).

As can be seen by this listing, true mastery involves knowing a variety of word-knowledge aspects. The more aspects of word knowledge known, the more likely it is that it will be used in the right contexts in an appropriate manner. However, Nation's conceptualization should be seen as aspirational rather than prescriptive. It describes all potential aspects of knowledge, rather than those aspects necessary for appropriate use. Indeed, native speakers would not be expected to have knowledge of every dimension at both receptive and productive levels for all words known to them. As such, it would be unwise to expect language learners to develop maximal

Table 2 Dimensions of word knowledge

Form	Spoken	R	What does the word sound like?
		P	How is the word pronounced?
	Written	R	What does the word look like?
		P	How is the word written and spelled?
	Word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express this meaning?
Meaning	Form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	Concepts and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	Associations	R	What other words does this make us think of?
		P	What other words could we use instead of this one?
Use	Grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	Collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this
	Constraints on use (register, frequency, etc.)	R	Where, when, and how often would we expect to meet this word?
		P	Where, when, and how often can we use this word?

Taken from Nation (2013)
Note: *R* receptive knowledge, *P* productive knowledge

knowledge. Furthermore, although the taxonomy represents a componential description of the vocabulary construct, the various dimensions should not be taken as inherently discrete but as contributing to one predominant construct, that of foreign language vocabulary knowledge (González Fernández and Schmitt under review). Perhaps the most beneficial use of such a listing is as a pedagogical tool for analyzing and/or specifying the goals of a classroom activity or assessment. Additionally, it reminds students that revisiting words known only to the form-meaning level is important, as enhancement of shallow knowledge is just as critical to appropriate use as establishing form-meaning knowledge of unknown lexical items.

The Incremental Nature of Vocabulary Learning

Gaining full mastery of each knowledge type listed above simultaneously is clearly unrealistic. Although currently there is a limited understanding of how some are acquired (e.g., register), it seems clear that certain types are learned before others. For example, Bahns and Eldaw (1993) found that collocational knowledge lagged behind general vocabulary knowledge (cf. Webb and Kagimoto 2009). Advanced learners studied by Schmitt (1998) had little problem with spelling regardless of what else they knew about the words, suggesting that this is one of the first aspects of lexical

knowledge to be mastered by students. These findings were supported by González-Fernández and Schmitt (under review), who found an implicational relationship between different types of knowledge. They report that a learner who has derivational knowledge of a word and knowledge of its different meaning senses will also have knowledge of its collocations and written form-meaning link. Their research showed that the four types of knowledge investigated can be placed in the following order of difficulty: form meaning and collocation < polysemy and derivation. Furthermore, they considered knowledge at both the recognition and recall levels and found recall knowledge indicated the presence of recognition knowledge, but the opposite was not true. This latter finding is supported by Laufer and Goldstein (2004) who found that productive knowledge of both form and meaning is more challenging than receptive knowledge of the same two word-knowledge types.

The above research also suggests that just because some word-knowledge aspects are known does not necessarily mean that others will be. Schmitt and Zimmerman (2002) found that even advanced learners who knew one form of a word (e.g., *philosophy*) did not necessary know all members of its word family (*philosophize*, *philosophical*, *philosophically*). Also, learners might know the core meaning sense of a word, but they are unlikely to know all possible meaning senses (Schmitt 1998). Thus, learning a word must be an incremental process, with the various word-knowledge aspects being mastered at different rates. It follows from this that each of the word-knowledge types will be known at different degrees of mastery at any one time. This is illustrated by Fig. 1, which shows what knowledge of a word might look like.

Just as it is possible to say that a word is known to a greater or lesser extent by the level of mastery of each word-knowledge aspect, so can mastery of each aspect be placed on a continuum between the dichotomous poles *known* and *unknown*, with various levels of knowledge between those two extremes. Even an aspect as seemingly basic as productive knowledge of the written form is learned incrementally, along a cline like the following (Fig. 2).

From this, we see that vocabulary acquisition is not only incremental but also incremental in a variety of ways. First, lexical knowledge consists of different kinds

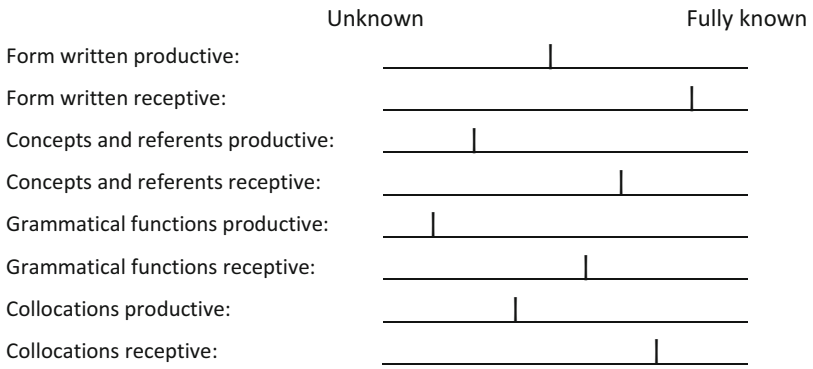

Fig. 1 A graphic representation of potential word mastery by word-type aspect

No knowledge of spelling Some letters correct Mostly correct Fully correct spelling

|---------- |

Fig. 2 A graphic representation of cline of mastery for written form knowledge

of word knowledge that cannot be learned fully simultaneously. Instead, learners develop knowledge of different aspects at different times. Second, each word-knowledge type develops along a cline, which means that not only is word learning in general incremental but learning of the individual word-knowledge aspects is also incremental. Taken together, these conclusions indicate that word learning is a complicated but gradual process.

However, it would be wrong to assume that the journey from no knowledge, through partial mastery, to full mastery is one of only incremental progression. It would be pleasing to believe that learners' lexical development is one of linear growth, but teachers and leaners have long known this not to be the case, recognizing that lexical knowledge can also decay (e.g., Fitzpatrick 2012). At present, little is known about this process, other than that it is a common occurrence, presumably happens due to lack of interaction with target vocabulary, and can likely affect each of the word-knowledge aspects. However, although it is possible to theorize that some aspects of word knowledge may be more severely affected than others by a period of reduced input, currently we know very little about the relative speed with which different types of word knowledge degrade. One robust finding from studies in this area is that productive vocabulary knowledge of the form-meaning link is more vulnerable to decay than equivalent receptive knowledge (e.g., Chen and Truscott 2010). However, studies also report some productive knowledge remains on delayed posttests. This suggests that some words are more resilient to decay than others. Research findings are contradictory as to the causes of such comparative resilience, with some suggesting that variables such as word class impact retention (Ellis and Beaton 1993) and others finding no difference between the retention of nouns and verbs (Barclay 2017). In addition to part of speech, there are numerous factors that could potentially influence this process; however, it is unlikely that any one of these is entirely responsible for knowledge maintenance. Therefore, more research is needed in this area before conclusions can be drawn and pedagogical strategies developed to help the mitigation of lexical decay. For the time being, perhaps the best advice for educators is the importance of retrieval and sustained interaction with target vocabulary. Additionally, as once-acquired vocabulary is never truly lost (de Bot and Stoessel 2000), learners should not despair at the natural "ebb and flow of [lexical] knowledge" (Fitzpatrick 2012).

Recycling and Retrieval

The fact that vocabulary is learned incrementally inevitably leads to the implication that, to be truly learned, words must be met and used multiple times. The number of exposures/usages necessary depends on a number of factors, including

how salient the word is, how necessary the word is for a learner's present needs, and whether the word is met incidentally while pursuing some other purpose or studied explicitly with the goal of learning it. This latter distinction is the focus of the next section.

Incidental and Intentional Vocabulary Learning

An important distinction is that of incidental and intentional learning. Although somewhat of a simplification, it is generally true that the former refers to learning that occurs when students are engaged in some other task and the learning of vocabulary is not one of the overt goals. In contrast, the latter refers to learning when (one of) the specified goal(s) is vocabulary acquisition itself. Incidental learning then does not involve an explicit focus on vocabulary, unlike intentional learning that often comprises tasks focusing on target words (Schmitt 2008). Some word-knowledge aspects are best learned intentionally. For example, the use of word cards or flash card software is particularly suited to foundational aspects of knowledge, such as the form-meaning link. This is because such learning leads to high pickup rates (Crothers and Suppes 1967), and the declarative knowledge it produces is especially appropriate for this aspect of word knowledge (Schmitt 2014). In contrast, deeper aspects of word knowledge (e.g., collocation, derivation, etc.) might best be learned through extensive incidental exposure. This is because such exposure aids the development of intuitions regarding appropriacy of use (ibid.). These two learning types should not be seen as conflicting therefore but as complementary pieces of the vocabulary-learning puzzle.

Frequency of Exposure and Retrieval

Frequency of exposure (the number of times an item is encountered) has been found to correlate with acquisition for both incidental and intentional learning. Based on the discussion in the previous section, it should be unsurprising to learn that the number of exposures necessary for acquisition varies greatly depending on the type of learning. Incidental learning typically requires more exposures, while intentional learning requires fewer to reach a learning threshold. Although it would be pedagogically convenient if research could specify a number of exposures after which acquisition will occur, this does not seem to be possible.

Recent research into incidental learning has found that the probability of developing word knowledge from reading does improve with an increase in frequency of occurrence but that there is no threshold past which all unknown words seem to be learned for the various aspects of word knowledge (Pellicer-Sanchez and Schmitt 2010). Furthermore, reading has been found to benefit more than just the form-meaning link. For example, exposure to novel words can lead to the development of multiple aspects of word knowledge. Moreover, the probability of each aspect developing improves with greater frequency of occurrence (Webb 2007a). A similar correlation has also been demonstrated when the stimulus is audiovisual material

(Rodgers 2013). Therefore, greater frequency of exposure can have a positive effect on multiple aspects of vocabulary, but it is not possible to specify an exact number of exposures necessary for such improvement.

Similarly, studies investigating intentional learning have shown that rather than stipulating a requisite number of exposures, more exposures increase the probability of learning (e.g., Peters 2014). One reason why it is not possible to provide a threshold number is that other factors besides frequency of exposure are important for vocabulary learning. In fact, Schmitt (2008, p. 339) concludes that "virtually anything that leads to more exposure, attention, manipulation, or time spent on lexical items adds to their learning." Another reason is that each word varies in terms of the learning burden it poses for a student. The learning burden of a word is the amount of effort needed to learn it (Webb and Nation 2017). This is affected by a number of factors. Some factors are learner-dependent, describing variables relating to the language learner (e.g., motivation, language-learning aptitude, proficiency). Other factors are interlexical and relate to the relationship between known language and the L2 item (e.g., L1, known L2 words). For example, Willis and Ohashi (2012) investigated the learning burden that cognates pose Japanese learners of English. Using the vocabulary size test (Nation and Beglar 2007), they found that cognates were more likely to be known by the participants than noncognates even after other potentially conflating factors were controlled. This shows that cognates have a lower learning burden than noncognates, at least for Japanese learners of English. Other factors can be grouped as intralexical and relate to the intrinsic difficulty some words pose (see Laufer 1997). One final category relates to the learning context and includes variables such as task design and the level of engagement with an item. All of these factors can potentially affect the learning burden, which in turn can impact the number of exposures required to learn a lexical item.

Within this discussion, an important distinction needs to be recognized, that of exposures and retrievals. The former relates to the number of times a participant sees a target item, both before a learner has encoded a word and afterward. The latter, retrieval, refers to the act of recalling a (partially) learned form. Numerous researchers have argued that retrieval facilitates learning and retention to a greater extent than mere presentation of an item (e.g., Baddeley 1990). That is, the number of retrievals is a better predictor of learning and long-term retention than the frequency of exposure. For example, Nakata (2016) found that items retrieved five and seven times are better retained than items retrieved once or three times. However, Nakata also found that considerable knowledge was retained by the one-retrieval group 4 weeks after learning. There are two important points that need to be stressed: first, more retrievals lead to more robust knowledge, and, second, any retrieval of information will benefit retention.

Finally, as the number of encounters necessary to reach the learning threshold likely depends on the factors introduced above, it follows that a teacher cannot predict when Learner A will learn Word B. Therefore, it is pertinent to encourage learners to interact with lexical items (both single words and formulaic sequences) as often as it takes for acquisition to occur, rather than mandating a specific number of encounters.

The Timing of Retrieval

The above section showed that vocabulary needs to be recycled if learners are to retain it. One of the great mistakes many teachers make is to focus on a new word only once, leading to a high probability of that word being forgotten and the time spent on learning it wasted. Nation (1990) suggests that to avoid this waste, it is as important to recycle partially known words as it is to teach new ones. However, there are more efficient and less efficient schedules for recycling and revision. To understand the best timing for this recurring exposure to words, it is necessary to understand how the mind forgets new information. Typically, most forgetting occurs soon after the end of the learning session. After that major loss, the rate of forgetting decreases (Fig. 3).

The forgetting curve in Fig. 3 indicates that it is critical to have a review session in which learners retrieve the words they learned soon after the learning session but less essential as time goes on. This finding suggests that learners should rehearse new material soon after the initial meeting and then at gradually increasing intervals, as illustrated in Fig. 4 (e.g., Ebbinghaus 1885).

This pattern of learning is referred to as spaced repetition or expanding rehearsal. Nakata (2015) provides an empirical example of the benefits of this procedure,

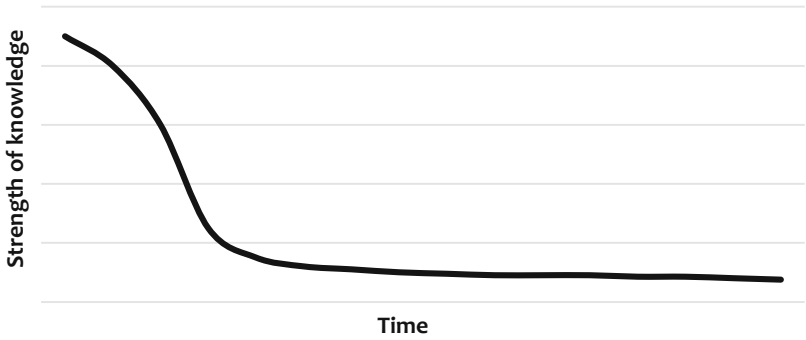

Fig. 3 The typical pattern of forgetting

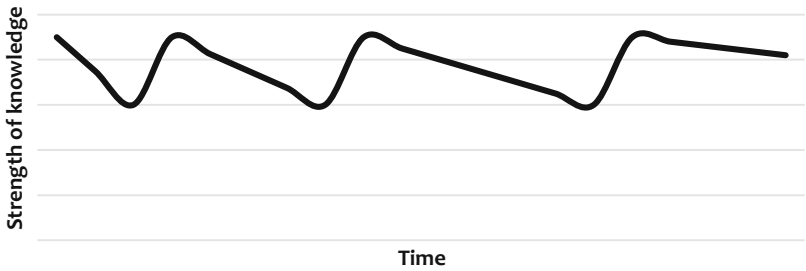

Fig. 4 Forgetting pattern with spaced repetition

showing that learning through short, medium, and long expanding intervals is more robust than learning through massed-retrieval procedures. With the prominence of communicative language teaching and inductive task design, such learning is not currently in vogue; however, the use of lists and flash cards for vocabulary learning, especially if learners employ expanded rehearsal, can greatly facilitate both acquisition and retention of vocabulary (e.g., Nation 2013). Numerous flash card applications are freely available that incorporate spaced repetition algorithms. These automatically program learning so that it is both efficient and effective and take the responsibility for determining the timing of recycling away from the learner, allowing him/her to concentrate on acquiring vocabulary.

A Principled Approach to Vocabulary Teaching and Learning

The background in the above sections leads to several observations that are important for vocabulary pedagogy. First, a learner is unlikely to be able to acquire a sufficiently wide vocabulary through explicit learning alone; there are simply too many words to learn. Second, learning an achievable number of word families (3,000–9,000) can provide considerable rewards in the linguistic abilities they support. A significant percentage of this can be realistically addressed in an explicit manner over time. Third, the most important words to target for explicit attention are generally the most frequent words in English.

Combining these points, one can make a cost/benefit calculation (Nation 1995) concerning what vocabulary to teach. All teaching carries cost, mainly in classroom time but also in teaching and learning effort. The most frequent 3,000 word families are worth this cost, because they are the essential foundation to any language use. If learners need to develop topic-specific vocabulary, then technical words are also likely to be met sufficiently frequently to justify intentional learning (appropriate word lists can help determine this discipline-specific lexis for ESP provision). In addition, the most frequent formulaic sequences are good candidates for explicit attention (e.g., Garnier and Schmitt 2015). Finally, learners who hope to be able to efficiently read authentic English texts would need knowledge of mid-frequency vocabulary (i.e., between 3,000 and 9,000; see Schmitt and Schmitt 2014) which could also be learned intentionally. Beyond this band, however, words occur so infrequently that time is better spent on developing strategies that enable learners to determine the meaning of unknown lower-frequency vocabulary on their own (see Nation 2008).

In addition to this cost/benefit consideration, any single method of vocabulary learning will not address all the word-knowledge aspects that are required for full vocabulary use. We can explicitly address some aspects, like meaning and grammatical characteristics, but aspects like collocation, polysemy, and register are likely to require extensive exposure in many different contexts. Thus, Nation (2007) identifies four areas on which teachers need to focus: meaning-focused input,

meaning-focused output, form-focused input, and fluency development. These will be discussed in relation to vocabulary learning below.

Meaning-Focused Input

This strand involves vocabulary development from listening, reading, or reading while listening. The focus here is on comprehension and enjoyment rather than language learning per se. Importantly, this strand requires that learners are familiar with most items in a text. In practical terms, this means students should have minimal or optimal lexical coverage of the texts that are used. This strand is important because it enables learners to recycle previously learned vocabulary, develop partially known aspects of word knowledge, and practice lexical determination strategies such as guessing meaning from context.

One key to facilitating this strand is maximizing learners' language exposure. Although no guarantee of development, one of the most effective ways to learn English is to live in an English-speaking country. Fitzpatrick and Clenton (2010) showed that study-abroad programs can stimulate lexical development, while research has also shown that longer sojourns can lead to substantial gains. However, spending short periods in an L1 context is probably not a sustainable solution to the lexical acquisition challenge, nor is it a realistic possibility for all learners.

Reading has traditionally been promoted to increase a learner's exposure to English. Typically, this means the use of graded readers or graded online content (see www.erfoundation.org). The provision of comprehensible input via graded reading programs has been found to lead to vocabulary learning (e.g., Al-Homoud and Schmitt 2009). As proficiency increases, learners will naturally wish to move on to more lexically challenging readers and eventually authentic texts. Such texts have also been shown to facilitate learning of individual words (Pellicer-Sanchez and Schmitt 2010) as well as formulaic sequences (Macis 2018). Another possibility is *narrow reading*. This entails reading numerous texts on the same topic. Reading on one subject leads to the increased frequency of topic-specific vocabulary and, therefore, a greater likelihood of acquisition. This latter strategy is a natural choice for ESP courses.

Other sources of exposure are audiovisual content and computer games. TV, film, and online content are good options for providing extensive language exposure as they are abundant and tend to be popular activities. They have also been shown to promote acquisition and knowledge maintenance, particularly if captions are used (Peters et al. 2016). Similarly, computer games are a good source of language exposure and can lead to vocabulary learning (Peters 2017). However, learners with larger vocabulary sizes tend to profit more from these sources of incidental exposure (Montero-Perez et al. 2017). Indeed, although audiovisual material and video games can be useful sources of input, many learners will not have sufficient coverage of authentic audiovisual texts to allow fluent processing. Therefore, to fulfill the requirements of this strand, teachers need to consider the vocabulary level of a learner before recommending activities.

Meaning-Focused Output

This strand involves learning through writing and speaking. This means learners using known (or partially known) language while also compensating for lexical gaps through communication and lexical determination strategies (e.g., using monolingual or bilingual dictionaries). Meaning-focused output can aid lexical development in a number of ways: Encouraging the use of newly acquired vocabulary, promoting the negotiation of various aspects of word knowledge, and contributing to the incremental development of partially known items (Nation and Meara 2002). Including target lexical items for learners to use is one way to ensure that learners are pushed to use items that are only partially known, rather than relying on compensation or avoidance strategies.

Language-Focused Learning

This strand involves the intentional learning of vocabulary. Deliberate learning is an efficient method for gaining a large amount of robust lexical knowledge expeditiously. The word-knowledge aspects covered in this strand tend to be limited to the form and/or the meaning. That is why teachers need to encourage the development of word-knowledge aspects of greater depth during the meaning-focused input and meaning-focused output strands. To encourage effective form-focused learning, the following points need to be considered.

The Choice of Activity

One reasonable way to start is by focusing on the meaning and word form aspects first. Numerous tasks focus on the form-meaning link, for example, using word cards, writing the form of the target word, gap fills, matching, odd one out, and sentence writing. However, research has shown that the type of activity used, and the knowledge type it aims to engender, can affect the extent and strength of acquisition. As we have finite processing capacity, a focus on one word-knowledge aspect will necessarily reduce focus on other aspects. For example, concentrating on meaning and encouraging meaning elaboration through mind maps or sentence writing will, while promoting the learning of semantic properties of the target word, inhibit learning of structural properties (i.e., form) (Barcroft 2002). This is illustrated by Barcroft's (2015) type of processing – resource allocation (TOPRA) model below (Fig. 5).

The thick outer lines represent the finite processing resources of each learner at any one time; these do not move. The inner lines do move and reflect the type of processing required by a task. Thus, a task such as sentence writing, which requires semantic processing, will reduce the proportion of processing capacity devoted to form and mapping. This model therefore predicts that such a task would promote more semantic learning than form learning or mapping. Obviously, an activity cannot focus on all aspects of word knowledge, so it is important for teachers to analyze activities to determine the type of processing it requires and then select tasks

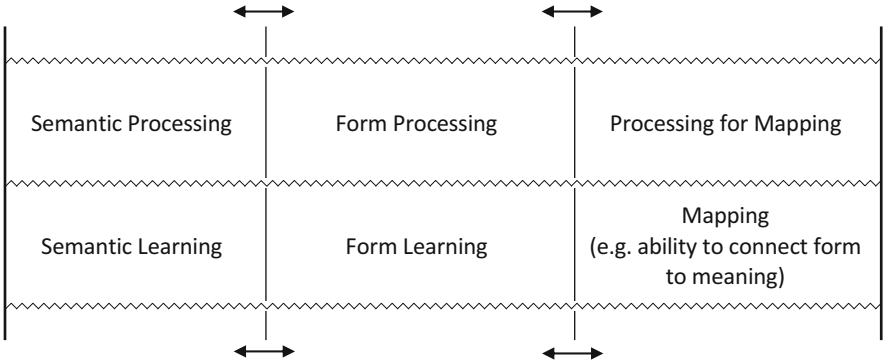

Fig. 5 The TOPRA model. (Barcroft 2015)

based on the type of knowledge most necessary to learners. This conclusion holds for both individual words and formulaic language; research has shown that the focus of a task affects which aspects of idioms are learned, with meaning-focused learning tasks (i.e., L2-L1) leading to better knowledge of meaning and form-focused learning tasks (i.e., L2-L1) fostering better knowledge of form (Steinel et al. 2007).

Another useful tool to help teachers choose learning tasks is the Involvement Load Hypothesis (Laufer & Hulstijn 2001). This holds that vocabulary learning and retention are dependent on the extent of involvement facilitated by a task. Involvement consists of three components:

- *Search* relates to whether learners need to look for the required word-knowledge aspect: Is the meaning of an item provided, or do learners need to attend to it themselves?
- *Need* is how necessary a linguistic item is to the success of a task: Is there a need to engage with the target word to complete a task, is the need for meaning disambiguation imposed by an external source (e.g., the teacher), or is it up to the learner (e.g., by looking in a dictionary)?
- *Evaluation* is the extent to which a task requires the comparison of a lexical item with a context to check appropriacy: Is there a requirement to check words against known words and/or context, and is that requirement provided by an external source (e.g., gap fill) or initiated by the learner?

The total involvement load of an activity is calculated by combining each element. Laufer and Hulstijn (2001) suggest tasks that have greater involvement load lead to more robust learning. A more fine-grained, but similarly user-friendly, approach to task assessment is Technique Feature Analysis (Nation and Webb 2011). This analytical tool contains dichotomous scales relating to research findings on conditions facilitative of vocabulary learning. The instrument contains 18 questions separated into 5 sections (motivation, noticing, retrieval, generation, and retention), with a higher total score associated with a more impactful learning task. Although the validity arguments are yet to be fully explored for either tool, for teachers and

materials writers, they offer a quick method of checking the likelihood of a given task fostering robust knowledge. Thus, they should be used in combination with other tools (e.g., observation) to ensure that pedagogical activities are meaningful.

The Presentation of the Word and Meaning

Research has also considered the effect of different methods of meaning presentation and found some to be more helpful than others. These research findings often differ from common pedagogical practices and accepted EFL orthodoxy, and so it is important for educators and materials writers to consider their own practice in light of the following.

There are numerous ways of presenting the meaning of the target language: L2 definitions, L1 definitions, L2 synonyms, L1 equivalents, and pictures (Nation and Webb 2011). Additionally, combinations of the above are also common (the use of L2 definitions with accompanying pictures, the use of an L2 synonym and an L2 definition). Teachers are often reticent to use L1 equivalents; however, research has shown that they are a highly effective method of meaning presentation. For example, in a study with Israeli learners of English, Laufer and Shmueli (1997) found that words accompanied with an L1 equivalent were learned and retained better than those explained in L2. In spite of the widespread notion that L1 should not be used in the classroom, teachers and materials writers need to recognize that using the L1 for learning the meaning aspects of target vocabulary is efficient and should be considered, especially for lower-level learners.

Research has also explored the presentation of words in and out of context. It is a common assumption that unknown words should be presented in a context that disambiguates the target meaning. However, research has shown that for the initial acquisition of the form-meaning link, discrete presentation of target items is as effective, if not more effective, than presentation in a disambiguating sentential context. For example, in an investigation of Japanese EFL students, Webb (2007b) found no difference between word-pair and word-pair + sentence conditions in terms of acquisition of form-meaning aspects of word knowledge. This finding has been extended to formulaic language. Le-Thi et al. (2017) found no difference between the intentional learning of formulaic sequences in sentential and decontextualized conditions. Context is of course important to the learning of foreign language vocabulary but is particularly meaningful after the initial acquisition of shallow aspects of knowledge. After the learning of form-meaning aspects, single words and formulaic language need to be encountered numerous times in diverse contexts to facilitate the development of knowledge aspects that allow situationally appropriate language use.

A related issue is the number of items that can be learned in any one session. Nation (2008) suggests that for beginner learners, 20 words is a realistic figure but that for proficient learners, this number is as high as 50. Again, there seems to be no number that is applicable to all learners, even those with similar proficiency. This is because the number of words that can be studied and retained will likely depend on learner variables (such as language-learning aptitude and working memory) and task design. Perhaps therefore, best practice might involve setting a realistic minimum that all learners can attain, but not a maximum number of items for study.

Many words are polysemous (have more than one meaning sense) in English, and often some of their different meaning senses have a common underlying trait. *Fork*, as an example, can mean a *fork* to eat with, a *fork* in a road or river, a *tuning fork* for use with music, a *pitch fork* that farmers use to throw hay, or several other things. The *General Service List* (West 1953) indicates that the meaning sense of *implement used for eating or in gardening* makes up 86% of the occurrences, while *anything so shaped*, like *a fork in the road*, makes up 12%. This would suggest that *eating fork* is the most important meaning sense, but in this case, we can capture all of the meaning senses by drawing learners' attention to the similarities between them. By defining the core concept, in this case the shape shared by each of the meaning senses, we maximize the efficacy of the teaching by enabling students to understand the word in a much wider variety of contexts. Analysis similar to West's has also been conducted on the most frequent phrasal verbs in English. This showed that they too can be polysemous. For example, *work out* can mean to plan, exercise, happen, or prove to be successful (Garnier and Schmitt 2015); however, it is not yet clear the extent to which there are core concepts that allow multiple meaning senses to be addressed simultaneously. The best advice, therefore, is for practitioners to address the notion central to multiple meaning senses of phrasal verbs whenever possible.

Teachers can also maximize vocabulary learning by teaching word families instead of individual word forms. Instructors can make it a habit when introducing a new word to mention the other members of its word family. In this way, learners form the habit of considering a word's derivations. To reinforce this habit, teachers may eventually ask students to guess a new word's derivatives at the time of introduction. Including a derivation section as part of an assessment also promotes the idea that learning the complete word family is important.

The Target Words

In addition to the type of learning activity and the manner of item presentation, the choice of the target words themselves can also affect the extent of learning that occurs. Research shows that learning semantically related words (e.g., synonyms, antonyms, co-hyponyms) is less efficient (Tinkham 1997) and less effective (Ishii 2014). Recent studies have also shown that teaching words that have visually similar referents (e.g., spherical objects such as globe, watermelon, football) at the same time can inhibit vocabulary learning (Ishii 2014).

It is key that teachers consider all these points when selecting words for learners to study and when preparing vocabulary-focused activities. Additionally, it is equally important that students are made aware of these principles so that they can effectively organize their own vocabulary study.

Fluency Development

Fluent lexical production is vital for competent speaking and writing (Snellings et al. 2002), while automaticity of lexical decoding is critical to understanding both spoken and written discourse efficiently. Automaticity in lexical production and

recognition can be influenced through pedagogical interventions. For example, continued use of flash card software can shorten the time necessary to recognize a word (ibid., 2002). Furthermore, Nation (2008) suggests that tasks such as 4-3-2, in which learners produce the same oral content in progressively shorter periods, positively influence fluent production of lexis. A further method of affecting lexical fluency is through implementation of an extensive reading program. Longitudinal research has shown that such an intervention can lead to the development of reading speed, which is presumably associated with fluent lexical processing (McLean and Rouault 2017).

Conclusion

Pulling together the areas covered in this chapter, the following principles of vocabulary learning and teaching can be extracted:

- It is essential that learners develop knowledge of the most frequent words in English. Word selection should be made with the needs of the learners in mind. The learning targets presented in this chapter provide realistic objectives that should be communicated to learners.
- The construct of vocabulary knowledge comprises multiple components. It also includes both single words and formulaic sequences. A principled approach to vocabulary teaching and learning needs to take this into consideration.
- Vocabulary learning is incremental. Therefore, it is important for teachers to promote sustained interaction with vocabulary, rather than simply teaching novel words.
- Intentional and incidental learning are complimentary. A systematic approach to vocabulary teaching necessarily includes provision for both.
- The findings of memory research should be used to determine the manner and timing of recycling. One of the most important roles of the vocabulary teacher, therefore, might be recommending and introducing effective vocabulary-learning software.
- The choice of learning task impacts the type of knowledge produced; therefore, the needs of the learners should be used as a criterion for task selection.
- A principled vocabulary curriculum needs a balance of meaning-focused input, meaning-focused output, form-focused input, and fluency development.
- Research has shown that there are more efficient and less efficient tasks for vocabulary learning. These findings should be considered when designing or choosing activities.

This chapter has highlighted insights into the nature of vocabulary and vocabulary learning and discussed ways that research-led practice can be developed. Teachers, learners, materials writers, and researchers all agree that vocabulary is an essential component of competent foreign language use. Considering the number of word families needed to engage with ungraded authentic texts, the ubiquity of

formulaic language needed for natural production and fluent decoding, and the various aspects of the vocabulary-knowledge construct needed for appropriate use, learners face a difficult challenge. The good news is that teachers and materials writers can positively influence the acquisition and retention of foreign language lexical knowledge. However, for this to occur, it is vital that a principled approach is adopted.

Cross-References

▶ A Relevant Pedagogic Grammar for Today's Classrooms
▶ Applications of Usage-Based Approaches to Language Teaching
▶ Pronunciation in English as Lingua Franca

References

Al-Homoud F, Schmitt N (2009) Extensive reading in a challenging environment: a comparison of extensive and intensive reading approaches in Saudi Arabia. Lang Teach Res 13(4):383–401

Baddeley AD (1990) Human memory and theory and practice. Lawrence Erlbaum Associates, Hove

Bahns J, Eldaw M (1993) Should we teach EFL students collocations? System 21(1):101–114

Barclay S (2017) The effect of word class and word length on the decay of lexical knowledge. In: Paper presented at the AAAL, Portland

Barcroft J (2002) Semantic and structural elaboration in L2 lexical acquisition. Lang Learn 52(2):323–363

Barcroft J (2015) Lexical input processing and vocabulary learning. John Benjamins, Amsterdam

Bot K d, Stoessel S (2000) In search of yesterday's words: reactivating a long-forgotten language. Appl Linguis 21(3):333–353

Chen C, Truscott J (2010) The effects of repetition and L1 lexicalization on incidental vocabulary acquisition. Appl Linguis 31(5):693–713. https://doi.org/10.1093/applin/amq031

Crothers E, Suppes P (1967) Experiments in second-language learning. Academic Press, New York

Dang TNY, Webb S (2014) The lexical profile of academic spoken English. Engl Specif Purp 33:66–76

Dang TNY, Webb S (2016) Making an essential word list. In: Nation ISP (ed) Making and using word lists for language learning and testing. John Benjamins, Amsterdam

Ebbinghaus H (1885) Über das Gedchtnis. Untersuchungen zur experimentellen Psychologie. Duncker & Humblot, Leipzig

Ellis NC, Beaton A (1993) Psycholinguistic determinants of foreign language vocabulary learning. Lang Learn 43(4):559–617

Fitzpatrick T (2012) Tracking the changes: vocabulary acquisition in the study abroad context. The Language Learning Journal 40(1):81–98

Fitzpatrick T, Clenton J (2010) The challenge of validation: assessing the performance of a test of productive vocabulary. Lang Test 27(4):537–554

Gardner D, Davies M (2014) A new academic vocabulary list. Appl Linguis 35(3):305–327

Garnier M, Schmitt N (2015) The PHaVE list: a pedagogical list of phrasal verbs and their most frequent meaning senses. Lang Teach Res 19(6):645–666

González-Fernández B, Schmitt N (in press) Word knowledge: exploring the relationships and order of acquisition of vocabulary knowledge components. *Applied Linguistics*

Goulden R, Nation P, Read J (1990) How large can a receptive vocabulary be? Appl Linguis 11(4):341–363
Hu M, Nation ISP (2000) Vocabulary density and reading comprehension. Read Foreign Lang 13(1):403–430
Ishii T (2014) Semantic connection or visual connection: investigating the true source of confusion. Lang Teach Res 19(6):712–722. https://doi.org/10.1177/1362168814559799
Laufer B (1989) What percentage of text lexis is essential for comprehension. In: Lauren C, Nordman M (eds) Special language: from humans thinking to thinking machines. Multilingual Matters, Clevedon, pp 316–323
Laufer B (1997) What's in a word that makes it hard or easy? Intralexical factors affecting the difficult of vocabulary acquisition. In: Schmitt N, McCarthy M (eds) Vocabulary: description, acquisition, and pedagogy. Cambridge University Press, Cambridge, pp 140–155
Laufer B, Goldstein Z (2004) Testing vocabulary knowledge: size, strength, and computer adaptiveness. Lang Learn 54(3):399–436
Laufer B, Hulstijn, J (2001) Incidental vocabulary acquisition in a second language: the construct of task-induced involvement. *Applied Linguistics* 22 (1):1–26
Laufer B, Ravenhorst-Kalovski GC (2010) Lexical threshold revisited: lexical text coverage, learners' vocabulary size and reading comprehension. Read Foreign Lang 22(1):15–30
Laufer B, Shmueli K (1997) Memorizing new words: does teaching have anything to do with it? RELC J 28(1):89–107
Le-Thi D, Rodgers M, Pellicer-Sanchez A (2017) Teaching formulaic sequences in an English-language class: the effects of explicit instruction versus coursebook instruction. TESL Canada J. 34(3): 111–139
Macis M (2018) Incidental learning of figurative language from a semi-authentic novel: three case studies. Read Foreign Lang. 30(1): 48–75
Martinez R, Murphy VA (2011) Effect of frequency and idiomaticity on second language reading comprehension. TESOL Q 45(2):267–290
McLean S, Rouault G (2017) The effectiveness and efficiency of extensive reading at developing reading rates. System 70:92–106
Montero-Perez M, Peters E, Desmet P (2017) Vocabulary learning through viewing video: the effect of two enhancement techniques. Comput Assist Lang Learn 31(1-2): 1–26
Nakata T (2015) Effects of expanding and equal spacing on second language vocabulary learning: does gradually increasing spacing increase vocabulary learning? Stud Second Lang Acquis 37:677–711. https://doi.org/10.1017/S0272263114000825
Nakata T (2016) Does repeated practice make perfect? the effects of within-session repeated retrieval on second language vocabulary learning. Stud Second Lang Acquis 1–27. https://doi.org/10.1017/S0272263116000280
Nation ISP (1990) Teaching and learning vocabulary. Heinle and Heinle, Boston
Nation P (1995) The word on words: an interview with Paul Nation [Interviewed by Norbert Schmitt]. Lang Teach 19(2):5–7
Nation ISP (2006) How large a vocabulary is needed for reading and listening. Can Mod Lang Rev 63(1):59–82
Nation P (2007) The four strands. Innov Lang Learn Teach 1(1):1–12. https://doi.org/10.2167/illt039.0
Nation P (2008) Teaching vocabulary: strategies and techniques. Heinle, Boston
Nation ISP (2013) Learning vocabulary in another language. Cambridge University Press, Cambridge
Nation ISP, Beglar D (2007) A vocabulary size test. Lang Teach 31(7):9–13
Nation P, Meara P (2002) Vocabulary. In: Schmitt N (ed) An introduction to applied linguistics. Arnold, London, pp 35–54
Nation ISP, Webb S (2011) Researching and analyzing vocabulary. Heinle, Cengage Learning, Boston
Pawley A, Syder FH (1983) Two puzzles for linguistic theory: nativelike selection and nativelike fluency. In: Richards J, Schmidt R (eds) Language and communication, pp 191–225

Pellicer-Sanchez A, Schmitt N (2010) Incidental vocabulary acquisition from an authentic novel: do things fall apart? Read Foreign Lang 22(1):31–55
Peters E (2014) The effects of repetition and time of post-test administration on EFL learners' form recall of single words and collocations. Lang Teach Res 18(1):75–94
Peters E (2017) The effect of out-of-class exposure on learners' vocabulary size. In: Paper presented at the AAAL 2017, Portland
Peters E, Heynen E, Puimège E (2016) Learning vocabulary through audiovisual input: the differential effect of L1 subtitles and captions. System 63:134–148. https://doi.org/10.1016/j.system.2016.10.002
Rodgers MPH (2013) English language learning through viewing television: an investigation of comprehension, incidental vocabulary acquisition, lexical coverage, attitudes, and captions. (PhD), Victoria University of Wellington
Schmitt N (1998) Tracking the incremental acquisition of second language vocabulary: a longitudinal study. Lang Learn 48(2):281–317
Schmitt N (2008) Instructed second language vocabulary learning. Lang Teach Res 12(3):329–363
Schmitt N (2014) Size and depth of vocabulary knowledge: what the research shows. Lang Learn 64(4):913–951
Schmitt N, Schmitt D (2014) A reassessment of frequency and vocabulary size in L2 vocabulary teaching. Lang Teach 47(4):484–503
Schmitt N, Zimmerman C (2002) Derivative word forms: what do learners know? TESOL Q 36(2):145–171
Schmitt N, Jiang X, Grabe W (2011) The percentage of words known in a text and reading comprehension. Mod Lang J 95(1):26–43
Snellings P, van Gelderen A, de Glopper K (2002) Lexical retrieval: an aspect of fluent second language production that can be enhanced. Lang Learn 52:723–754
Steinel MP, Hulstijn J, Steinel W (2007) Second language idiom learning in a paired-associate paradigm. Stud Second Lang Acquis 29(3):449–484
Tinkham T (1997) The effects of semantic and thematic clustering on the learning of second language vocabulary. Second Lang Res 13(2):138–163. https://doi.org/10.1191/026765897672376469
van Zeeland H, Schmitt N (2013) Lexical coverage in l1 and l2 listening comprehension: the same or different from reading comprehension? Appl Linguis 34(4):457–479
Webb S (2007a) The effects of repetition on vocabulary knowledge. Appl Linguis 28(1):46–65
Webb S (2007b) Learning word pairs and glossed sentences: the effects of single context on vocabulary knowledge. Lang Teach Res 11(1):63–81
Webb S, Kagimoto E (2009) The effects of vocabulary learning on collocation and meaning. TESOL Q 43(1):55–77
Webb S, Nation P (2017) How vocabulary is learned. Oxford University Press, Oxford
Webb S, Rodgers M (2009) Vocabulary demands of television programmes. Lang Learn 59(2):335–366
West M (1953) A general service list of English words. Longman, Green & Co, London
Willis M, Ohashi Y (2012) A model of L2 vocabulary learning and retention. Lang Learn J 40(1):125–137. https://doi.org/10.1080/09571736.2012.658232