Resources for learning single-word items – 8347 words

1. INTRODUCTION

This chapter begins with a discussion of critical issues in relation to two of the key terms in the title, *single-word items* and *learning*. It first discusses the status of single-word items and their implications for learning resources; then vocabulary learning in relation to three different types of vocabulary knowledge. These components are then brought together in an overview of resources for learning single words. Finally, we suggest ways that teachers and learners can assess particular resources in terms of the type of learning targeted.

2. CRITICAL ISSUES AND TOPICS

2.1 Single-word items

The idea of a single-word vocabulary item may seem transparent, but for applied linguists working in vocabulary the problem of providing an exact definition of what to count as a word is well-established (Hanks, 2013; Kilgarriff, 2015; Nation, 2016; Wray, 2015). The problem is not only theoretical but has practical ramifications for language teachers. In brief, the concept of word is made problematic by inflected and derived forms of words (Are *medicine* and *medicinal* the same word?), polysemy in the highest frequency zones of any language (Do all the meanings of *get* add up to a single word?), homonyms, homographs and homophones (Is *bank* = *money* and *bank* = *river* one word or two?), variation in orthographic or phonological form (Are *color* and *colour* the same word?), and ambiguity over the status of multiword lexical items that can be decomposed into smaller, single-word items (Is *look into* = investigate two words or one? see Wood & Barcroft, this volume). For teachers, the issue involves whether a multiword item can be taught without focusing on each one of its components (*rice krispies* without *rice* and *crisp*), or whether one of the meanings of a homoform can be taught apart from others (*banks* = *money* apart from *banks* = *river*), or to what

degree comprehension of polysemes is generalizable (Is *frosty* in *frosty reception* inferable from a *frosty morning*?). Such issues are compounded by the common second language (L2) learners' assumption that words should present stable correspondences between particular forms and particular meanings, as they typically believe they do in their first languages (L1s). Unfortunately, on examination this assumption frequently fails to hold true, and a number of corpus linguists and lexicographers are now casting doubt on the status of the word as the primary carrier of linguistic meaning, or even a reliable unit of analysis (Hanks, 2013; Sinclair, 2010; Wray, 2015).

But while the discussion above implies there is an unmarked continuum between sub-word, single-word, and multi-word vocabulary units, this does not quite amount to a rejection of the word as a pedagogically useful unit. We propose that the idea of 'word' as a discrete meaning-carrying item be retained on two conditions, that not all single-word items will conform to this prototypical idea of the word, and that the meaning of many words will be *fuzzy*, with their exact semantic import determined by both their semantic contexts and the other words they are used with (Hanks, 2013; Murphy, 2010; Wray, 2015). This position has much in common with the monosemic approach to word meaning proposed by Nation (2016) and Ruhl (1989). From this perspective, the vast majority of single-word items, however polysemous, correspond to basic, unparaphrasable root-meanings, notwithstanding that communication requires their interpretation in both particular contexts of use and the other words they are used with. Empirical support for monosemism comes from Beretta, Fiorentino and Poeppel (2005) who show that polysemous items are processed through computation from a single entry in the mental lexicon. That is, 'look up,' 'look into,' 'good looking' and 'have a look' are all processed via the underlying monoseme 'look,' such that there is one basic learning act behind the acquisition of at least recognition knowledge of these several manifestations.

The precise status of single words may be debatable, but the pedagogical value of placing a high importance on single-word learning is not. First, the vast majority of learners assume that words are

the basic units of a language and the main thing to be learned. There is probably no reason to try and convince learners of the problems with this assumption; teachers are better advised to work with it. Second, despite the undoubted importance in language of units other than single words, such as multiword units, research by Bogaards (2002) has shown that knowledge of the single words that make up such units strongly facilitates their acquisition, even when the multiword unit is metaphorical or idiomatic. He had two groups of learners process idiomatic multiword units, one of whom had previously learned the single-word meanings composing the units and one that had not. Those who knew the constituent words were significantly better able to comprehend and retain the multiword units (while incidentally the inverse is not the case). In other words, knowing *look* facilitates using and learning *look into*, lending support to both monoseme theory and the typical learners' attitude to learning single-word items.

Another important issue in learning single-word items is the extent to which cognate word-forms between the L1 and L2 allow single-word items to transfer fairly reliably between languages. Although learners rarely assume that multiword units such as *eye for an eye* or *look forward to* will have direct translations (Kellerman, 1986), virtually all learners view cognate word-forms as an essential bridge to creating the second lexicon, if they are available. Many linguists, on the other hand, are sceptical of naïve transfer theories (e.g., Granger, 1993) in view of the likelihood of faux-amis in some of the pairings. However, the failure to recognize cognates is almost certainly a greater danger for learners than faux-amis (White & Horst, 2011). For instance, Ringbom (2007) notes that virtually all Swedes learn English successfully while most Finns struggle, the main difference between them being the degree of lexical similarity between their L1s and English, despite the usual number of faux-amis. Hence, teachers are probably best advised to exploit the available cognate forms at least as a starting strategy.

In relation to learning languages that share few cognate forms with the L1, the situation is more complex. Swan (1997) argues that virtually all learners assume that single-word items in their L1 will

have translation equivalents in their target language, and to the greater extent such an assumption provides another bridge to the second lexicon. Hence, pedagogically oriented researchers such as Nation (2013) see L1 vocabulary knowledge as having the potential to reduce the learning burden of L2 vocabulary items. However, when learners are confronted with vocabulary in use, they will encounter places where the L2 translation equivalent diverges in use from the L1 word-form, and the learners will need to adjust their L2 lexicons appropriately (Swan, 1997). Still, the most radical of these adjustments will not involve wholesale departure from the form-meaning link established via the translation equivalent, but rather the addition or removal of particular senses of a word, the other words that words are commonly used with (collocations), the grammatical patterns they typically occur in (colligation), the frequency with which they are used, or the contexts they are typically employed in, including such notions such as register, connotation and the semantic space a word occupies vis-à-vis other words within the same language (synonyms, antonyms, hypernyms, and hyponyms).

A final reason to learn single words is the value of such knowledge. When a frequent, single word is learned it will be seen often and unlock a good deal of related meaning, but this cannot normally be said of multiword units. *Look* is used frequently both as a single word and in numerous multiword units, so knowledge of this word is highly valuable. For example, the core sense of the single-word item *look* contributes to the overall meaning of the multiword expression *look forward to.* However, although the multiword expression *look forward to* also carries with it the sense of *pleasurable anticipation*, this sense of pleasurable anticipation is not activated in otherwise comparable verb+forward items such as *think forward to*, *bring forward*, or especially *push (oneself) forward.* In this way, single-word items are more productive than multiword items which tend to be one-offs. While single-word items frequently contribute their senses to the overall sense activated by larger multiword items, multiword items are rarely productive in this way. In fact, what productivity multiword items possess appears to depend on knowledge of single-word lexical sets

that can be substituted for others within the structure – e.g. *pour/throw cold water on* something (see Hanks, 2013, for an in-depth discussion).

In sum, there are at least three important reasons to value the learning of single-word items and be interested in the resources available for doing so. Learners expect to be learning single-word items; they expect their knowledge of single words to transfer between related languages; and knowledge of single words is highly productive compared to knowledge of multiword items. While the role of multiword items was undoubtedly neglected in many traditional linguistic analyses, recognising their importance does not negate the value of single-word items.

2.2 Types of vocabulary learning

The materials available to teachers and learners for learning single-word items can be categorised in relation to the types of vocabulary learning they target. It is common in applied linguistics research to distinguish three types of vocabulary knowledge (cf. Henriksen, 1999): Type 1) knowledge of form-meaning relationships; Type 2) knowledge of how words are used in sentences and texts, including considerations of connotation, register, pragmatics, and collocational and colligational preferences and restrictions; and Type 3) the skill of accessing ~~Type 1~~ knowledge of single-word items quickly, with automatized access the ultimate goal (Meara, 1996; Schmitt, 2010).

Traditionally, single-word learning involves mainly Types 1 and 3 knowledge in a mainly receptive context, in other words form-meaning links, with regard to both spoken and written form, and the speed or fluidity of accessing one from the other (meaning from form, but also form from meaning). This framework allows us to be quite precise about whether a particular resource introduces or practices spoken word recognition, written word recognition, or how either of these links to meaning, and allows us to temporarily set aside resources for interpretation and production of words in combination. In the early stages of language learning at least, the learner has enough to

do in each of these three areas without mixing them together, despite the fact they will eventually come together in language use.

2.3 Examples of resources for single word learning

This section discusses word lists, dictionaries, flashcards, textbooks, written and audio texts whether paper or computer based, and resources that are only computer based, focusing primarily on Type 1 and Type 3 learning, but suggesting implications for Type 2 learning where these are not fully separable.

2.3.1 Word Lists

The most common resource for anyone wishing to learn a set of words is almost certainly a simple word list, whether made by learners themselves or by someone else on their behalf. The obvious benefits of a word list are ease of construction, portability, equality of focus on each word, and decontextualization. The latter refers to words being treated qua words where they can receive specific attention apart from the partial attention they receive when met in natural contexts and where learning can be reduced (Mondria & Wit-de Boer, 1991). Hence, word lists can be seen as facilitating Type 1 learning through decontextualization, although from the perspective of Type 2 learning decontextualization could also be seen as a drawback. Two further drawbacks of word lists from the perspective of Type 1 learning are the fixed order of the words and the limitations of a written, and so non-audible, representation.

Computer lists offer several additional benefits over paper lists. One is randomization, so that words need not be learned in a fixed order such that each primes the next. Another is potential completeness. If the list has been generated from a text or corpus, as is increasingly the case, every word of the text will be equally represented and none will get lost. Another is morphological grouping, which can be achieved through simple alphabetization of the words in a text or corpus (e.g., ‘cat’ and ‘cats’ will appear together), or through software that is able to groups words in

relation to lists of word families, lemmas or the like. Another is utility grouping; if the words are ranked by frequency of occurrence in a text, then their importance for handling that text is made clear, such as when software pitches list against texts or other learning resources (as in Range, Antprofiler, or Vocabprofile). Alternatively, if the words are ranked by range and frequency in a large reference corpus, then their importance in the language as a whole is clear. Indeed, list building projects by West (1953; the General Service List of 2000 headwords) Nation (unpublished, the British National Corpus, BNC, list of 14,000 word families, and 2016, the BNC-Contemporary Corpus of American English, BNC-COCA, of 20,000 families), and many others, are major contributions to the resource stock available for learning the lexicon of English. These corpus-based lists combine the advantages of completeness, grouping, randomization, and utility, and Nation (2016) has set down guidelines for developing further word lists based on his own extensive experience. Such lists let us expand utility to a broader category, something like curriculum design, where whole programs of study can be sequenced in part or in whole according to which words are needed at which stages of learning. This curriculum-shaping role can apply to a language as a whole (frequency lists) or specific parts of it (examples are Coxhead's, 2000, Academic Word List that supplements the GSL, or Browne et al's, 2013, list of business English that supplements their New GSL). Importantly, in their role as curriculum shapers, corpus-based word lists help us to identify which single-word items are of most value to learners.

Further affordances of computer-based word lists can no doubt be supplied by readers in their interest areas, but a final general one worth mentioning is linkability: the ease of linking computer word lists to other digital and non-digital resources. Text-to-speech (TTS) links, where a clicked word will say its name with reasonable accuracy, strongly reduces one negative affordance of traditional word lists, but the possibilities are endless (pictures, example sentences, L1 glosses, L2 glosses, and others). Pedagogy can even be incorporated into lists. Learners have always written little definitions beside, over, or under the items on their lists and found ways to fold and bend them to quiz themselves or each other, and technology multiplies this dimension.

2.3.2 Flashcards

Another variant of the word list is flashcards, which can incorporate all the benefits of other lists but integrates further pedagogical advantages in relation to Type 3 learning. (See Nakata, this volume, for a fuller account of flashcards.) Importantly, Elgort (2011) found that learning new words with paper word cards could create lasting word knowledge that could be accessed so quickly that it attained the psycholinguistic criteria of automaticity, and so met Krashen's, 1989, criteria for 'acquired learning' as distinct from mere 'learned learning'. Hence, flashcards are an extremely important resource for learning single-word items.

It was mentioned in the context of word lists that learners often make a list of parallel glosses or synonyms and quiz themselves or each other by folding the paper in half—look at the word, produce the meaning, or vice-versa, and check. This practice fosters both Type 1 and Type 3 learning because it involves form-meaning retrieval. The flashcard basically focuses and formalizes this particular use of the word list. Flash cards divide a word list into a set of word cards each with a word on one side of the card and a meaning clue on the other, so that retrieval can be practiced.

An extensive body of psychological research has demonstrated that the practice of retrieving word information from memory, as compared to simple recognition, leads to improved retention (for an overview see Nation, 2013). Admittedly retrieval from word to meaning is practiced every time a word is encountered in a text etc., but the extra advantage of flashcards is the option of retrieving word from meaning. Meaning-to-word retrieval is essentially what happens in production (we have a meaning and we look for a word to express it), and flashcards make it possible to engage extensively in this more complex lexical operation at a learning stage when production is limited. (This is more accurately termed active recognition practice in Laufer & Goldstein's, 2004, framework.) It is important to practice retrieval in both directions because, as research by Webb (2009) has shown, the way words are known reflects the way they were learned. Words that were only retrieved word-to-meaning may be slow to go into productive use. Productive lexicons in L2 are

almost always some fraction of the size of their receptive counterparts (Laufer, 1998), and regular practice in meaning-to-word retrieval could only reduce this difference.

Flashcards deploy all the original benefits of word lists (completeness, decontextualization, presentational equality, etc.) and further facilitate randomization (cards can be shuffled, as words on a list cannot) and retrieval (either the word or the meaning is out of sight when the other is visible). In turn, phone/computer flashcards deploy all the benefits of paper ones, improve on some of them (more perfect randomization, tighter record keeping) as well as introducing some new ones. For example, many of the flashcard downloads on the World Wide Web allow multimedia meaning clues like pictures or speech, and in addition have a quiz option (either in the productive direction, from meaning clue to a list of candidate words, or recognition, from word to list of candidate definitions). The quiz dimension opens up a whole new vista in the pedagogical design of flashcards. When learners use the quiz option, they will get every word either right or wrong, which the program can record, and this allows the program to engage in some on-the-fly instructional design. With this information, the program can focus more on the words learners need to work on, vastly increasing the efficiency of the learning operation.

And finally when the dimension of timing is added to flashcard retrievals, and speed of retrieval is encouraged in a game or competitive setting, flashcards are intensified as a Type 3 learning resource. Single-word lexical access (or word recognition speed) has often been shown (first by Perfetti, 1985) to be the strongest predictor of L1 reading ability, sometimes in interaction with listening comprehension ability (Gough & Tumner, 1986). Meara (1996) made the pioneer argument for bringing this line of enquiry into L2 research, emphasizing the importance of word handling as a dimension of L2 lexical knowledge. Twenty years later, however, few studies in applied linguistics have looked at ways this type of knowledge could be pedagogically facilitated or created. Timed, record-keeping flashcards would appear to be an excellent candidate.

One recent study that has looked at the possibility of working with word recognition speed pedagogically is Cobb & Horst's (2011) study of the Nintendo game *My Word Coach,* which is a set of video games which are mainly variations on the flashcard theme and incorporate timing and record keeping. Francophone learners of English who practiced retrieving meaning from form and form from meaning over an extended period with speed motivation not only significantly improved their word recognition speed but also their general ability in English on a series of broader measures including production.

Whether high-tech or paper, the flashcard format can be adapted into a number of other game like resources for building single-word fluency. The form side of a flashcard can be used to play a game called 'Snap' where learners draw cards from a stack of cards containing duplicates and quickly decide if they are the same or different, with a competitive element as appropriate. This simple game may be able to develop receptive fluency for simple word-form recognition. Alternatively, the meaning side of a flashcard can be replaced with other lexical information and learners can play Word Ping-Pong, "batting" a word to an opponent who must return relevant lexical information such as a synonym, antonym, a word in the same word class, etc. as determined by a teacher. This not only gives practice in productive fluency, but can also extend flashcard learning to Type 2 vocabulary knowledge.

2.3.3 Dictionaries

A dictionary is fundamentally a type of word list, a list of forms and associated meanings presented as definitions or glosses. It is not, however, primarily intended as a resource for word learning. Owing to its typical size, it is primarily a resource to offer a form-meaning link for words encountered elsewhere (e.g., in a text), or in the case of the bilingual dictionary, a resource for making links between meanings, L1-forms and target language forms. Many researchers view dictionaries as the most used resource by language learners (Nesi, 2014; Scholfield, 1997) and how

they use them and to what effect is an interesting question that we do not know enough about. Consequently, amidst fears that dictionaries could lead to the development of superficial form-meaning connections, a good deal of effort was invested in the 1980s-90s into improving the quality of dictionaries from the language learner's perspective.

Cobuild (1989) developed the 'sentence definition' where, e.g., the everyday meaning of *drive* was defined not as 'propel a four-wheeled vehicle forward in a controlled manner,' in the classic genus and distinguishers format, but in a comprehensible, mini-scenario like, 'When you drive a car, truck, or bus, you use it to carry you and your passengers to another location').

Longman's *Learners Dictionary of Contemporary English* (LDOCE, 1987) wrote all its definitions in a constrained defining vocabulary of 3,000 common words, whereby most look-up words would be defined in words more frequent than the look-up word itself. Dictionaries of this type also provided explicit information of interest to learners rather than native speakers, such as extensive unpacking of polysemes and plentiful grammatical information (exemplification, countability, frequency in speech v. writing, and register). Much of this information aims at supporting productive use of words in speaking or writing, pushing the resource towards Type 2 learning, with at least one variant of the genre designated a 'production dictionary' (the Longman *Activator*).

The effect of these modifications however remains unknown. Looking into this was a thin but important strand of applied linguistics research in the 1990s (e.g., Hulsteijn, Hollander & Greidanus, 1996; Knight, 1994) but since then it has fallen off. A search for 'language learners use of dictionary' on Google Scholar yields few studies more recent than 1999 beyond those discussed in Nesi's (2014) timeline of research in this area.

Some reasons for waning interest in dictionaries are not difficult to discover. One is the sustained assault on dictionary use by researchers (including Cobb, 2012), or glosses in general (Webb, 2007), because information in a gloss or definition is incomplete, can result in superficial learning, and so may need further supplementation from exposure to language in use or other Type

2 focused resources. However, the potential benefits of dictionaries for Type 1 learning are considerable, and when added to those of mobile technologies, they are more so.

Willingness-to-use on the part of learners is in itself a major affordance of dictionaries. Lewis (1993, p. 25) attributes to Krashen the famous observation that, “When students travel, they don’t carry grammar books, they carry dictionaries,’’ and indeed a major affordance of dictionaries is their portability, and this has only increased with the ubiquitous smart phone with look-up links to every word they contain.

Figure 1. Bilingualized and made for small screen

Where the look-up takes the learner to on his/her small screen is of course another matter. In fact the phone-sized dictionary is an interesting study in conflicting pedagogical benefits: the portability of a such dictionaries are often purchased at the cost of comprehensibility. Small screen print and numerous abbreviations are typical, like "n. (noun), subst. (substantive), S1W3 (frequency level 1 in speech and 3 in writing)," that assume a trained user. Early online dictionaries continued to pack the small print around their headwords, as if print versions had merely been broken into pieces and attached to menus rather than fully reconceived for small screens.

The issue of screen size is further problematised by the old question of whether learners should use bilingual or monolingual dictionaries. Nesi (2014) reports that the bilingual dictionary is the resource of preference for the vast majority of learners, despite the fact that monolingual dictionaries are generally believed to be superior. Hence, one promising format for learner dictionaries that attempts to bridge this gap is the bilingual*ized* dictionary, where some amount of L1 is used in the definition but also enough target-language exemplification and explanation to increase the completeness of the account. One of the several dictionary options available from the New York Times online is the bilingualized Oxford-Hachette English-French Dictionary shown in Fig. 1, in which the well-spaced entry is clearly designed with the small screen in mind, not just a paper dictionary squeezed down, and is bilingualized for English readers learning French. The word in question *gum* is translated into several, not one, French equivalents (*gencive, gomme, colle)*, and the distinctions between them are explained in English (*for gluing* and *from tree*). ESL and EFL instructors are probably well advised to encourage bilingual dictionary use early in the learning process, and then later give their learners the training they will need to use a monolingual of bilingualized learner dictionary.

2.3.4 Textbooks

From a vocabulary learning perspective there are two types of textbooks. One is dedicated specifically to vocabulary learning, and the other is a more general course book with a focus on vocabulary as one of its parts. Dedicated vocabulary expansion textbooks focus directly on word learning and can often fairly be called expanded word lists. The best known of these remains Bernard's (1972) four-workbook set of *Advanced English Vocabulary*, which was designed for three months of self-study in the aim of preparing learners for academic work in English, and basically derived its content from West's GSL. Each volume put about 400 high frequency GSL word families through the same set of five exercises (introduction, dictation, word study, encounter in a text, word completion exercise) in each unit. This type of treatment was eminently suitable for computer adaptation, and indeed the second author's *List_Learn* suite (http://lextutuor.ca/list_learn) is based on Barnard's treatment: Several lists in addition to the GSL can be called up, and each word in each list is linked to a dictionary, a dictionary-building routine, a dictation routine, a word recognition routine and meaning inference routine, all employing randomization.

The other type of course book is a multi-skills book with some focus on vocabulary. To be noted is that not all language course books have always had any significant focus on vocabulary at all, but just assumed that any unknown words would be looked up in a dictionary. Most textbooks in the lexically aware post-1980s era claim a specific focus on vocabulary, since learners and teachers expect it, though these claims are of variable accuracy. Once again the word list is key to how vocabulary is treated in modern course books. Typically, novel lexical items for a reading passage or grammar exercise are pulled out (decontextualized) and given focus in the form of a list, often with in-context glossing, thereby addressing Type 1 learning. These same words are often then met again later in the unit in either a matching activity or cloze passage related to the original reading passage for retrieval practice (or occasionally for further exploration of meaning in morphology table, semantic map, or transfer/application of meaning in comprehension questions that require use of the target words, and thus expanding learning to Type 2). Some course books also offer vocabulary strategy training, such as advice to keep a vocabulary notebook (i.e. word list) or ways to devise

mnemonics for hard-to-remember words. A less obvious way that word lists can feature in course books is as a source of selection and limitation for the words the book is written in and targeted for learning (described above as a curriculum structuring role for lists). The *Collins Cobuild English Course* (Willis & Willis, 1988) focused on the 700 most frequent word families in Book 1 and a further 850 in Book 2, computers having checked that words on these lists were represented a sufficient number of times for learning, and words outside the lists held to a certain limit. The benefit provided by word lists in this case was to assure a sufficient number of encounters with particular words for learning to occur. No other language course book in the meantime has attempted so detailed an accounting of its lexis as Willis and Willis did.

2.3.5 Texts

Texts other than course books in the target language are also potential resources for single-word learning (see Webb, this volume, on incidental vocabulary learning). Research has shown that while the Type 1 learning rate in an L2 is quite slow (Horst, Cobb & Meara, 1998), it is nonetheless possible for learners to acquire vocabulary simply from repeated encounters with a new word in comprehensible contexts (Webb & Chang, 2015). In fact, the Type 1 learning rate from reading is quite slow whether in L1 or L2, but in L1 the longer time span (decades rather than years) means that in that context reading can play a significant role in the building of a lexicon, especially regarding the many words that appear mainly in text but rarely in speech. It is not clear that reading can play the same role in an L2 (Cobb, 2016), at least in the early stages of learning. Problems with lexical growth from reading include the relatively infrequent appearance of all but the most frequent words (in the amount of text that learners are able to read); the dispersion of the encounters, such that words are forgotten by the time they are re-encountered; the lack of opportunities for using learned words after reading; and the general density of unknown words in texts written for native speakers. Some of these problems can be solved by having learners read graded readers, which are

native texts written within a frequency level (or, to a word list). However, another problem with learning new words from reading that applies equally to graded and ungraded texts is that reading involves interpreting larger groups of words than just single words, such that unknown and partially known single words may not receive attention when learners are reading for meaning (discussed above).

We thus conclude that reading is not particularly rich in affordances for initial Type 1 single word learning, for which word lists and flashcards are almost certainly at least faster and maybe better. However, initial word learning is not the whole of word learning, and reading has strengths at two other points in the process. First, many of the weaknesses of list-based word learning can be addressed by subsequently meeting words in a variety of novel contexts, and so reading has some promise as a means of addressing Type 2 vocabulary knowledge. Second, it allows even beginning learners to build fluency and rapid access for words they already know (Type 3 learning). Nation (e.g., 2013) has argued strongly for extensive reading within learners' known-word level as a means to building fluency, and Horst (2009) specifically finds an effect for extensive reading on lexical access. Third, in the later stages of learning, reading is almost certainly the only way to expand the lexicon into zones where commercially produced lists, flashcards or textbooks are no longer of much use, especially since so much of any language's lexicon appears exclusively in text.

Audio texts as a learning resource for early learning almost certainly suffer from the same drawbacks as other texts but in a more extreme form. The real-time aspect of listening (although this can be controlled with technology), as well as variations in pronunciation, present significant barriers to learning new words in an L2 (Stahl, 1990, offers evidence in L1 but few studies investigate this issue in L2). Listening to audio texts, however, almost certainly affords fluency building for words once known. Conversation with native speakers or other learners, on the other hand, while possibly not a resource as traditionally understood, provides several benefits for single word

learning. The other words in the context are normally known, new words if important are typically focused through emphasis, and ample opportunities exist for clarification and repetition requests.

Teachers are well advised to encourage their learners to read and listen a good deal, and provide opportunities and incentives to do so, but not to expect large amounts of new, Type 1 word learning to occur as a result. Rather, the vocabulary benefits of extensive reading and listening relate to consolidation of learning that has occurred using other resources and development of Type 2 and Type 3 knowledge.

2.3.6 Concordancers

Information technology to this point has been considered for what it can add to existing learning resources (randomization of word lists, timing and scoring of flashcards, and others). It seems fair to say that the computational version of many of the resources we have looked at have effectively replaced the original resource in most learners' and teachers' thinking and have become the principal resource for vocabulary study (Ballance, 2017; Cobb, 2012). Few learners use paper word lists or flashcards any more. But there also exist computational vocabulary learning resources with only remote precedents in the pre-computational era that deserve discussion in their own right. One of these is a concordancer, a piece of software that taps into a text or corpus to generate all the examples that exist for any word or phrase present. In terms of learning single-word items, a concordancer can present a target single-word item in relation to other words in a context, and so it primarily used for promoting Type 2 learning, but it also has value as a resource for Type 1 learning. Indeed single-word vocabulary learning is one of the principle and most successful uses concordancers were shown to have in Boulton and Cobb's (2017) meta-analysis of data-driven learning (mainly concordancing) studies.

Figure 2 is a concordance output for the word family *struggle* from Lextutor's English concordancer drawn from the typical school text *Call of the Wild*. The concordance shows various inflections of the item *struggle* being used in context, and reports the frequency of each. It can also report the words that typically come before and after it in the novel. Also, what cannot be seen is that the program invites several types of collocation search (for example, *struggle* with any form of *desperate* on either side).

An important word-learning advantage that a concordance provides is the elimination of lexical dispersion. As mentioned in the discussion of learning words from texts, the time between occurrences of unknown words is a negative factor for learning from reading, but the concordance brings all the occurrences of a whole book into a single physical space and time frame. A related advantage is that a concordance creates an opportunity for constructing a complex meaning representation. It was mentioned above that while learners are entitled to start building their lexicons through L1 translation equivalents, this strategy will rarely suffice as learning proceeds.

Figure 2: Concordancer for family *struggle* from a typical school text

A more complex, L2-based meaning will be required for any complex task or communication in the L2, such as academic study or intellectual work. Dictionaries can play some role in helping learners create such meanings, but research by Cobb (1997) showed that concordance lines are more comprehensible to learners than dictionary definitions and that the meanings inferred from multiple examples more durable, flexible, and transferable to novel contexts than meanings inferred from single contexts or gleaned from bilingual dictionaries. A possible reason for this could be that of the several examples offered by a concordance program, one or two will perchance be comprehensible so that an informed inference can be made. Another is that several examples are partially comprehensible such that some sense of a word's range of meanings becomes apparent. Yet another is that the concordancer provides a kind of automatized simplification of the ambient contexts that words are being inferred from. Research by Ballance and Coxhead (under review) has shown that the average lexical difficulty of the examples assembled by a concordance is considerably lower than the average level of the corpus or texts it is drawn from, such that learners may be able to work with texts that are beyond their current vocabulary level. And further, technology can amplify this apparent natural property of concordances: *Sketch Engine for Language Learning* (SKEL; at https://skell.sketchengine.co.uk/run.cgi/skell) uses frequency algorithms to select the easiest example sentences in its host text or corpus and present these at the top of the output (Kilgarriff, Marcowitz, Smith, & Thomas, 2015).

Thus for single-word learning of the Type 1 variety, the concordancer may function as a kind of reading assistant, making up for some of the drawbacks of natural text: the elimination of natural amounts of lexical dispersion and the provision of good conditions for inferring complex word meanings. It is thus natural that concordance programs have been teamed with texts through click-on interfaces. Of course, by providing ready access to concentrated exemplification, it can also provide a wealth of information about how a word is used, facilitating Type 2 learning via inductive analysis in a technique generally known as data-driven learning (see Boulton and Cobb, 2017 for more on this topic).

3. **FUTURE DIRECTIONS**

To this point we have argued for the importance of single-word learning; situated this type of learning within three standard types of vocabulary knowledge (form-meaning relationships, knowledge of how words are used in context, and speed of access to both these types of knowledge) and argued that resources for single-word learning traditionally focus on the first and third of these in terms of creating and accessing form-meaning links. A number of what-to-use-when suggestions for language teachers seeking single-word learning resources for their students can be taken away from the foregoing discussion.

The first takeaway from this chapter is that we should be aware which of the three general types of vocabulary resource we are looking at, what it can be expected to do, and which stage of the learning process it mainly applies to. Single-word resources for building form-meaning links will help learners amass a supply of receptive vocabulary to get started with, but are unlikely in themselves to do much for production. (We have all seen or been the teacher that introduces learners to a list of words and then asks them to use the words in sentences.) Resources focused on knowledge of how words are used will help learners with aspects of production, like collocation and word order, but may assume form-meaning knowledge is already in place when it may not be. (We have all seen or been the teacher that introduces learners to grammar patterns composed of words they have never seen before.) Fluency resources will give practice in accessing form-meaning links but are unlikely to do much to create these links in the first place. (We have all seen or been the teacher that launches a fluency game such as Word-Snap using words that learners have never seen.) Thinking about resources in terms of the three types framework can help us to be aware of the assumptions in our choices.

A complementary set of suggestions can be built from what was said above about the typical benefits of particular single-word resources. If laying an initial lexical base is the goal (as Meara

1995 convincingly argued that it should be), then some sort of list-based approach (like L1-L2 flashcards, whether high- or low-tech) with the strong affordances of coverage and completeness are more suitable than reading or fluency building activities, which are better for other purposes. Similarly, instruction in the use of a concordancer as a means of deepening knowledge of L2 meanings would not be appropriate for this goal. On the other hand, for learners who already have basic form-meaning links for 5,000 word families, resources that build fluency (reading), deepen word meanings (monolingual or bilingualized dictionary), or provide opportunities for contextual inference (reading or concordancer) are more appropriate than bilingual flashcards or word lists.

It should be remembered that any what-to-use-when suggestions are about proportions not absolutes. Learners should not be asked to study flashcards for six months before they are allowed to read a text! As Nation (2007) has convincingly argued, every language course at any level should have some representation from all the 'four strands.' These are meaning focused input (reading, listening), meaning focused output (speaking, writing), language focused learning (grammar, vocabulary, multiword units), and fluency development (lexical access, reading speed, fluent production). While our concern in this chapter is not an entire language course but just resources for one part of one part of it, we endorse the point that the four strands should all be addressed. So for example when learners have practiced form-meaning recognition links for a list of 20 well-chosen words with say flashcards or another game, this can be followed up with activities that work in the other direction to practice active recognition/production (meaningful output); or to turn up the speed and work on access for the same words (fluency); or to have learners listen to words and circle the one they hear (meaningful input); or listen to glosses from the back of their flashcards and write down the word that is indicated (meaningful output); or read and listen to sentences and paragraphs that employ the words (integrated meaningful input); or write sentence employing the words from dictation (integrated meaningful output).

FURTHER READING

Ballance, O. J. (2017). Technology to teach vocabulary. In J. I. Liontas (Ed.), *The TESOL Encyclopedia of English Language Teaching*: Wiley.

This article has a main focus on how techonology can support vocabulary study, whether it be the study of single-word items or mutli-word items. It explores the affordances of technology in relation to vocabulary learning mechanisms such as recall, noticing and generative use.

Cobb, T. (2012). Technology and learning vocabulary. In C. A. Chapelle (Ed.), *The Encyclopedia of Applied Linguistics*: Blackwell.

This article also discusses technology and vocabulary study, but it illustrates general vocabaulry learning principles and the affordances of technology in relation to a particualr suite of vocbaualry learning resources: Compleat Lexical Tutor (https://www.lextutor.ca/).

Nation, I. S. P. (2013). *Learning Vocabulary in another Language* (2nd ed.). Cambridge, UK: Cambridge University Press.

This authorative book length treatment of L2 vocabulary acquisiton not only provides an insightful review of the main findings in the field but also provides links to and summaries of many resources for learning single-word items.

Nesi, H. (2014). Dictionary use by English language learners. Language Teaching, 47(01), 38-55.

Because of the status of dictionaries as resources for learning single-word items, this summary of the main research findings on second language dictionary use is a valuable starting point for considering some fundamental pedagogical issues in resources for learning single-word items.

RELATED TOPICS

factors affecting the learning of single-word items, learning single-word items vs multiword items, strategies for learning single-word items, word lists, learning words through flashcards and wordcards, evaluating exercises for learning vocabulary, key issues in teaching single-word items

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