

Wordlists in Language Teaching and Learning Research

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Received: Nov. 24, 2011 Accepted: December 14, 2011 Published: December 30, 2011

doi:10.5296/ijl.v3i1.1205

URL: <http://dx.doi.org/10.5296/ijl.v3i1.1205>

Abstract

Words comprise a great part of learners' knowledge of a second language (L2). In fact, vocabulary expansion is one of the very important ways for learners to gain proficiency in the L2. To this end, they try many different vocabulary learning strategies and seek help from many different sources. The strategies may range from mere oral repetition of the words and their native language equivalents to keeping some personalized vocabulary notebooks. The sources may also range from the entries of dictionary to the words found in the advice column of a monthly magazine. However, by taking a brief look at the literature we easily see the abundance of research on vocabulary learning strategies and its paucity on sources of

learning vocabulary. In other words, we can claim that the researchers have mostly focused on how rather than what to teach and learn as far as vocabulary is concerned. Though comparatively small in its quantity, the research on the gradation of words is by no means a newborn topic. SLA researchers in this area have tried to use the existing corpora to squeeze out highly efficient and at the same time manageable wordlists which can capture the most frequent vocabularies encountered by learners in different genres. The purpose of this paper is to present a review of different wordlists that have been proposed in the field of applied linguistics. Wherever possible, the applications of these wordlists for the teaching and learning of an L2 are highlighted.

Keywords: Vocabulary learning, Word gradation, Wordlists, Corpora

1. Introduction

The importance of vocabulary learning has been highlighted intermittently during the history of English language teaching from the Grammar-Translation Method (GTM), which considered verbal memorization as a major technique in learning a second language, to lexical approach, which believed learning a language to be mainly relying on vocabulary expansion, and later to English for Specific Purposes (ESP) and English for Academic Purposes (EAP) methodology, where economy in learning and catering for learner needs has called for compiling wordlists in different academic disciplines. As the main building blocks of language, words comprise a great part of learners' knowledge of a second language (L2). In fact, Vocabulary expansion is one of the very important ways for learners to gain proficiency in the L2. To this end, they try many different vocabulary learning strategies and seek help from many different sources. The strategies may range from mere oral repetition of the words and their native language equivalents to keeping some personalized vocabulary notebooks. The sources may also range from the entries of dictionary to the words found in the advice column of a monthly magazine. However, by taking a brief look at the literature we easily see the abundance of research on vocabulary learning strategies and its paucity on sources of learning vocabulary. In other words, we can claim that the researchers have mostly focused on how rather than what to teach and learn as far as vocabulary is concerned. Though comparatively small in its quantity, the research on the gradation of words is by no means a newborn topic. SLA researchers in this area have tried to use the existing corpora to squeeze out highly efficient and at the same time manageable wordlists which can capture the most frequent vocabularies encountered by learners in different genres. The impact as Gardner (2007, p. 1) asserted is "profound on English language teaching, and there is abundant evidence that this will remain the case for the foreseeable future".

Wordlists are widely utilized for applying in language classrooms, developing language tests, and analyzing texts (Coxhead, 2000). According to Nation (2001) the purpose in making wordlists is to design syllabuses and particularly it is an attempt towards needs analysis: "There are other applications of the methodology for identifying terms, such as dictionary construction, the preparation of glossaries, indexes, and databases, and the preparation of teaching materials." (Chung & Nation 2004, p. 262).

The range of activities in corpus vocabulary research as classified by Nation (2001) focuses on three different kinds of vocabulary classes:

1. High frequency words such as those included in West's (1953) General Service List (GSL) of the most widely useful 2000 word families in English, covering about 80 percent of most texts.
2. An academic vocabulary of words, which are reasonably frequent in academic writing and comprise some 8 to 10 percent of running words in academic texts.
3. A technical vocabulary, which differs by subject area and covers up to 5 percent of texts.

2. General Vocabulary World Lists

The first systematic attempts in designing wordlists were taken by Thorndike and Lorge (1944) who counted 18,000,000 running written words manually. Their "The Teacher Word Book" consisted of 30,000 words. As it is evident, the value of the work lies in its size. Later, it was used as a source of frequency data for the most well known and probably the most outstanding wordlist, the General Wordlist, designed by Michael West in 1953. According to Hirsh & Nation (1992) the reason for choosing this name was that the words were supposed to cover a wide range of genres, situations and uses. This list has been the basis of many series of graded readers (Nation & Kyongho, 1995). It is composed of 2000 word families and is based on a corpus of 5 five million words of English. Family or *lemma* as clearly defined by (Francis and Kucera, 1982 cited in Coxhead 2000) refers to a set of lexical forms which the same stem and which belong to the same major word class, differing from each other only in inflection and/or spelling. Though frequency was the main criterion in the procedure of choosing these words, West considered some other criteria as well, namely, ease of learning, coverage of useful concepts and their stylistic level (pp. ix-x).

GSL has been evaluated and criticized for a number of reasons. Engels (1968) criticized it for its size. He also expressed doubts over the necessity for the inclusion of the second 1000 word families since it covers about 4.7% of the running words in non-fiction texts which is to a great extent trivial compared to the approximately 70% coverage of its first 1000 word families. He considers them "fallacious... [since] they can't be called general service words."

The list has been also criticized by Richards (1974) for its age. He believes since many changes have occurred in language and also in views about the appropriate content for an ESL course, the list contains many archaic and nonessential words (e.g. mannerism) and does not contain words of current high frequency (e.g. computer). In another study carried out by Hirsh & Nation (1992) on three short novels, it was found out that the 2000 words provided by GSL are not adequate to read unsimplified texts for pleasure. To gain 97-98% coverage of the running words (tokens), supposed to be necessary for pleasurable reading, they believe learners need a vocabulary of about 5000 words.

However, GSL with the coverage potential of up to 90 percent of fiction texts as claimed by (Hirsh, 1993), up to 75 percent of non-fiction texts (Hwang, 1989) and up to 76 percent of the academic corpus (Coxhead, 1998), has resisted the test of time and many researchers have benefited from it as a stop list. The amount of coverage reported by different researchers as stated above seems to be a justified reason for insistence on the part of Hwang and Nation (1995) who claimed that:

Whatever the criticisms of the General Service List, a general service vocabulary is essential for all learners no matter whether they are using English as a foreign or second language, for spoken or written use, or for general or special purposes. (p.36)

3. Academic and University wordlists

These wordlists are designed to meet the needs of learners who intend to continue their studies in different fields of science. The words covered by these wordlists are found in academic texts at the university level and they try to cover a wide range of words with high frequencies common among different fields of science. In fact, academic vocabulary, variously known as sub-technical vocabulary (Anderson, 1980; Yang, 1986), specialized nontechnical lexis (Cohen, Glasman, Rosenbaum-Cohen, Ferrara, & Fine, 1988) or semi-technical vocabulary (Farrel, 1990), is used to refer to items which are reasonably frequent in a wide range of academic genres but are relatively uncommon in other kinds of texts (Coxhead & Nation, 2001).

As it is rather obvious, academic vocabularies are of great difficulty for the learners (Cohen, *et al.* 1988) because, on the one hand, they occur with lower frequency than general service vocabulary items do and, on the other hand, they are not familiar for learners just so much as their technical vocabularies are.

However, many attempts have been made and a number of such wordlists have been developed to help the undergraduate students develop an acceptable command of academic vocabulary. To develop a theoretically safe and practically manageable academic wordlist many researchers have tried different methods and thus have prepared different lists. By taking a glance at these lists one can immediately recognize that although different assumptions and approaches of compilation have been adopted, there is a considerable deal of overlap in their content.

Among those who tried to compile these lists two distinct methods are completely evident which have cited in Coxhead (2000). In the first method, researchers use corpora and identify words that occur across a range of texts. Champion and Elley (1971) explored a corpus of 301,800 running words including 234,000 words in textbooks, 57,000 words from journal articles and 10,800 words in a wide range of examination papers. Excluding General Service list items, Praninskas (1972) also investigated a corpus of approximately 27,000 running words and decided to extract words which occur reasonably frequently in them. Lynn and Ghadessy benefited from students annotations above words in textbooks. Lynn (1973) examined 52 books and 4 classroom handouts by looking at the words above which English learners wrote translation in their academic texts. Ghadessy (1979) also based his work on learners' written signals in their books and examined a corpus of 478,700 running words for this purpose. It is clear enough that the last two studies were based on the assumption that the learners will mark difficult and at the same time important words in the texts they read so the researchers approached the task of compilation based on the learners' written signals such as annotation, highlighting and translation.

As there was a great deal of overlap between these four lists, Xue and Nation (1984), in their joint attempt, combined them into a single list, the University Wordlist (UWL). The list is classified into 11 levels based on the frequency and range of the items with the first level

containing words of great frequency and the last level containing words with the least frequency.

According to Nation (1990) this academic wordlist which contains 836 word families, excluding the 2000 words of GSL, accounts for 8% of the words in a typical academic text. Sutarsyah (1993) reported 8.7% coverage of UWL. In a broader study, Hwang (1989) reported a similar ability of coverage of 8.5% for academic texts. It was 3.9% for newspapers and 1.7% for fiction. When we add this 8-9% with the 80 percent coverage of the 2000 highly frequent word families the resulting 89 percent coverage of academic texts makes an invaluable contribution to the comprehension of these texts (Worthington & Nation, 1996).

Though greatly welcomed by many learners, teachers and course designers, UWL carried some shortcomings of the previous works. It was Coxhead (1998) who found the necessity to make another comprehensive endeavor for compiling a more efficient wordlist, called Academic Word List (AWL). The reason as succinctly described by Coxhead (2000) lies in the fact that UWL

...as an amalgam of the four different studies lacked consistent selection principles and had many of the weaknesses of the prior work. The corpora on which the studies were based were small and did not contain a wide and balanced range of topics. (p. 214)

Benefiting from other researchers' experiences to improve the outcome, she developed a corpus of 3,513,330 tokens and 70,377 types collected from 414 academic texts by more than 400 authors in approximately 11,666 pages of text. In order to be a good representative of academic texts, she considered multiple factors such as the length of the texts, variety of texts, and variety of writers in a way acknowledged by previous researchers. In every part of the procedure adopted, she compared her work with previous ones and tried to alleviate their weaknesses. The corpus was divided into four sub-corpora: arts, commerce, law and science.

To select the words she based her selection on three main criteria; namely, specialized occurrence, range and frequency. The first criterion, specialized occurrence, simply means that the word families have to be outside the 2000 word families of GSL. The range criterion requires a member of a word family to occur at least 10 times in each of the four main sections of the corpus and in 15 or more of the 28 subject areas. Moreover, the last criterion, frequency, requires the word family to occur at least 100 times in the corpus. However, to have a safer yardstick, the researcher prioritizes range to frequency because frequency depends on the text length and topic. At last, 570 word families were found to meet the criteria. The dispersion of words, however, across the sub-corpora was not even. For science it was 9.1%, 9.3% for arts, 9.4% for law & 12% for commerce. So commerce covered approximately 3% more than the other three sub corpora, making the list more advantageous for students under this category. Table 1 provides information about the corpora used to design the AWL with respect to the four disciplines examined.

Table 1. The composition of the academic corpus, taken from Coxhead (2000, p. 220)

	Discipline				Total
	Arts	Commerce	Law	Science	
Running words	883,214	879,547	874,723	875,846	351,333
Texts	122	107	72	113	414
Subject areas	Education	Accounting	Constitutional	Biology	
	History	Economics	Criminal	Chemistry	
	Linguistics	Finance	Family and	Computer science	
	Philosophy	Industrial	medicolegal	Geography	
	Politics	relations	International	Geology	
	Psychology	Management	Pure commercial	Mathematics	
	Sociology	Marketing	Quasi-commercial	Physics	
		Public policy	Rights and remedies		

It was found that the AWL covered 10 percent of the words in academic corpus but only 1.4 percent of a similar sized corpus of fiction showing that the list is much more appropriate for learners with academic purposes rather than those with general purposes. The very trivial amount of coverage in the fiction collection, which was composed of 3,763,733 running words, is a good indication of significance for this work.

4. Critique of AWL

Despite all the considerations taken by Coxhead (1998), the AWL has been criticized from different perspectives. Even Coxhead (2000) herself frankly locates some of the limitations of her study such as smaller corpus in comparison to those commonly used for dictionary designing, lack of balance in the number of running words per discipline and fewer numbers of short texts in the law sub-corpora, which may all reduce the reliability of this research to some extent. Chen and Ge (2007) criticized the wordlist, claiming that it does not account for medical texts. Their research disclosed that although the AWL items accounted for around 10.07% of English medical research articles, only 292 out of 570 AWL word families were frequently used in English medical research articles.

Some scholars contend that many items of the AWL (as well as those of all the preceding word lists) should not have been included in the list, had we taken differences in meanings of members of a headword into account. This is thoroughly explained in subsequent parts. In a study, Ming-Tzu and Nation (2004) tried to see if the existence of unrelated meanings for the same word form has resulted in the inclusion of words in the list which would not be there if their clearly different meanings were distinguished. In this attempt they first examined different meanings of each member of each word family to see which families contained homographs or in fact were two separate families as far as meaning is concerned. They then tried to find out how widely distributed each homograph is to find out if it still meets the criteria to be included on the list. A dictionary and a rating scale were used to discover the relatedness of word meanings and a concordance program was used to count the rate of the

distribution of homographs. The result of the study was reported as follows:

It was found that 60 families contained potential homographs. Only 21 of these actually contained homographs which occurred in the Academic Corpus, and only six of these would require additional entries in the AWL. These word families [intelligence, offset and panel] would need to be removed from the AWL. These are reassuringly small changes, indicating that homography is not a major concern affecting the words in the AWL (p. 309).

More recently, Hyland and Tse (2007) in their critical article “Is There an “Academic Vocabulary”?” called into question the whole idea of academic vocabulary. They used a corpus of 3,292,600 running words collected from research articles, textbooks, book reviews, scientific letters, Master’s theses, doctoral dissertations, final year project theses and divided them into three sub-corpora; namely, sciences, engineering and social sciences. The research findings suggest that though the AWL covers 10.6% of the words in the corpus and an accumulative coverage of 85% combined with the West’s GSL, it couldn’t account for 22% of the words in the science corpus. This suggested that in spite of 10.6% coverage of the AWL, individual lexical items usually act differently across disciplines in terms of range, frequency, collocation and meaning. Table 2 provides more detail on the coverage power of the AWL.

Table 2. Coverage of AWL in Academic Corpus, taken from Hyland & Tse (2007, p. 240)

	Frequency words	AWL items	Mean	Coverage %		Overall
				AWL	GSL	
Engineering	551,891	61,408	108	11.1	73.3	84.4
Social Sciences	1,822,660	200,393	352	11.0	77.0	88.0
Sciences	838,926	78,234	137	9.3	69.0	78.3
Overall	3,213,477	340,035	597	10.6	74.0	84.7

Note. GSL = General Service List (West, 1953).

They believe one reason for this weakness of the AWL is the criteria considered by Coxhead in selecting words; that is, she set to accept a word with at least 10 occurrences in each of the four fields but it was really low compared to the large corpora. So they warned EAP teachers to use the list with more caution:

In fact, a major difficulty of such lists, and not just the AWL, is the assumption that a single inventory can represent the vocabulary of academic discourse and so be valuable to all students irrespective of their field of study (Hyland & Tse, 2007, p. 238).

5. Technical wordlists

The need for a technical wordlist has been felt greatly on the part of ESP and EST students and teachers because they have found a major part of their course content to be comprised of these vocabularies. However, little contribution has been made so far. Many technical word

collections have been compiled only by the intuition of the experts and some others by using statistical measures and have mostly manifested themselves in the form of technical dictionaries or textbooks' glossaries. Such compilations, in majority of the cases, also include terms, which are not purely technical and thus cannot be called technical word lists. The main problem lies in the fact that there is no well-established approach for deciding which words are technical terms and which are not. Multiple approaches for compiling have been adopted for designing academic wordlists.

Farrell (1990) used a rating scale that classified words according to how closely related they are to a particular subject area. He also considered frequency of occurrence a criterion. Nation (2001) believed in using a technical dictionary compiled by specialists of that specific field. Williams (1981) used clues provided by the writer of the text to mark the words urgent for comprehending the message of the text. In an attempt, using an anatomy text, Chung and Nation (2004) compared the four approaches adopted by the previous researchers. They used a four step rating scale at first and because of its high reliability they compared the other three ones with it. The details of their efficiency are reported in table 3 below:

Table 3. Effectiveness of the four ways of identifying technical terms, taken from Chung and Nation (2004, p. 261).

Approach	Percentage of terms and non-terms correctly identified	Percentage and number of terms correctly identified	Percentage and number of non-terms correctly identified	Average percentage of terms and non-terms correctly identified
Rating scale	100% (876 lemmas)	100% (227 lemmas)	100% (649 lemmas)	100%
Clues	83.1%	59.5% (135 lemmas)	91.4% (593 lemmas)	75.5%
Dictionary	73.9% (Dorland's) 86.2% (Oxford)	98.2% (223 lemmas) 66.5% (151 lemmas)	64.7% (420 lemmas) 93.1% (604 lemmas)	81.5% 79.8%
Computer	87% 91.9% (with collocates)	73.6% (167 lemmas) 77.8% (with collocates)	91.7% (595 lemmas) 98.2% (with collocates)	82.7% 88%

In another attempt to bring more uniformity and consensus as to which approach is better for different word extraction purposes, Chujo and Utiyama (2006) applied nine statistical measures to the 7.3 million words in the commerce and finance component of British National Corpus. The resulting word lists showed that each statistical measure extracted level-specific words. Beginning level basic business words were identified using *Cosine* and *the complimentary similarity measure*; intermediate level business words were extracted using *log-likelihood*, the *chi-square test*, and the *chi square test with Yate's correction*; and advanced level business word lists were created using *mutual information* and *Mc Nemar's test*.

However, in keeping with the advancement of technology, Kwary (2006) set out to provide a technical Vocabulary Wordlist by using three computer programs; namely, RANGE of Paul Nation to create the wordlist, HOT POTATOES from Half-Baked Software Inc. to create vocabulary quizzes and Front Page of Microsoft Corporation to create a Web-based technical dictionary. In doing so he used GSL and AWL as stop lists to determine the technical vocabularies.

6. Merits and Demerits of Wordlists

No matter general or academic type, wordlists have been criticized for a number of reasons by different researchers. In a recent critical survey by Gardner (2007), the researcher locates the most challenging issue in developing wordlists and establishes its broad significance:

Perhaps the greatest challenge of such research is the determination of what constitutes a *word* for counting and analysis purposes. Decisions in this regard have important ramifications not only for lexical findings themselves; but also for the pedagogical theories and practices that derive from them. (p. 241)

In this study, he focuses on three problematic areas; namely, morphological relationships between words, homonymy and polysemy, and multiword items, which are even intensified due to some inabilities in machine-based corpora analysis. Homonyms which are words with the same spelling but different meanings have been always considered as problematic because these are included under the same word family in machine processing of the electronic corpora. It is very important to note that these differences in meanings can manifest themselves both in different meanings of a single word and in differences between the meanings of different members of the same headword. To clarify the point we can think of two different meanings of the verb *contain* (to include and to stop a disease) and of differences of meaning between *consist* and *consistency* as two members of the same headword.

Words which have different meanings in different contexts are also problematic because these are hard to be distinguished by computers especially in isolation. These problems have been notified by Sinclair (1991) who, after the COBUILD project, found out that different forms of a word behave in different ways, take their own set of collocates and express different shades of meaning.

Multiword items are also ignored in the processing because of the low frequency, though most of them are very much rewarding to be learnt. As Cook (2003, p. 109) rightly mentioned "an item may be frequent but limited in range, or infrequent but useful in a wide range of contexts." Gardner (2007) also recommended wordlist developers and users to consider variables such as "age, English language skills, English literacy skills, and extent of morphological training", which are known to be critical in recognizing and utilizing morphological relationships between words, when determining the constituents of a word for counting and analysis. Calling these problems into question, these researchers hope that improved versions of wordlists which can best serve pedagogy can be created.

As far as pedagogy is concerned wordlists have proved to be highly beneficial for learners and also teachers. They can help toward an economical efficient teaching because they provide curriculum developers, syllabus designers, test developers, teachers and learners with a reference list to decide which words deserve attention and whether a text is suitable for a certain group of learners or not. Also some researchers (e.g., Ellis, 1990; Long 1988) acknowledge that courses with direct attention to language features result in better learning.

7. Concluding Remarks

Wilkins (1972, cited in Kwary 2006) argues that without grammar very little can be conveyed, while without vocabulary nothing can be conveyed. As explained in different parts of the study, the contributions of wordlists are now greatly evident in the field of applied linguistics. So it is quite rewarding to pay much more attention to this domain of research. In spite of the long history, the subject has been mostly isolated and little attention has been directed to it. The most challenging part of the task of compiling a word list, as it seems, goes to its theoretical dimension and thus there is increasing need to bring about more valid and agreed upon theories as to what to count and how to count. Perhaps the greatest challenge of such research is the determination of what constitutes a *word* for counting and analysis purposes (Gardner, 2007). It will therefore be much help to the field if future researchers try to bring about a valid theoretical framework on which we can confidently build our task of compiling lists and by which we can fairly evaluate the lists compiled so far. The development is also to a large extent dependent on the development of computer softwares which can meet the demands of researchers. One cannot ignore the advancement hitherto obtained in this area. Moreover, the experiences of the researchers involved can make the path shorter for subsequent studies.

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