

Graded Readers and Vocabulary

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This study looks at the potential for vocabulary learning using a corpus of forty-two graded readers from one series of graded readers (seven at each of the six levels in the series). It was found that in order to have 95% coverage of the running words at a level in the series, it was necessary to already know the vocabulary of the current level in the scheme. Most of the words in the scheme would be met often, particularly if learners systematically read several readers at each of the various levels in the scheme. Words which were introduced in the early levels of the scheme occur often in books written for the later levels of the scheme. Learners need to read about one graded reader per week in order to meet repetitions of the new words soon enough to reinforce the previous meeting. Graded reader schemes need to go up to the 5,000 word level in order to make the transition from graded readers to unsimplified texts easier.

THE SCOPE OF THE STUDY

This study examines the vocabulary learning possibilities and vocabulary load of graded readers. It is a corpus based study and looks at a collection of graded readers at various levels from the same graded reader scheme. Because the study looks at what actually happens when learners read graded readers, it can be seen as the first step of a program of research that looks at the role of graded readers in vocabulary development. In essence, this study examines the coverage, density, and repetitions of vocabulary at each level of a graded reading scheme. It also looks at the vocabulary of reading schemes in terms of the high frequency vocabulary of English. It tries to answer questions like the following.

- Do learners need to know the new vocabulary of a level in the graded reading scheme before they begin reading at that level?
- How much do learners have to read in order to meet all the vocabulary in the scheme?
- How much do learners have to read in order to learn the new vocabulary?
- How much graded reading should learners be doing?
- Are graded reading schemes well designed?
- Do they cover the most important high frequency words of English?

These questions are approached from a vocabulary perspective. Although vocabulary knowledge is very important for reading, it is only one of a range of important factors affecting reading and learning from reading. These other factors include

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the learners' interest in the book being read, the background knowledge that the learner brings to the book, the learners' skill in reading in the first and second languages, and the quality of writing in the book being read. This study puts these factors and others to one side to look at the vocabulary load. This will lead to some unfairness and distortion. At the end, however, the findings of this study need to be balanced against these other very important factors and put in their perspective when teachers and learners make decisions about reading programmes. Hill and Thomas's reviews of graded readers (see below) help to restore the balance.

GRADED READERS

Graded readers are books which are specially written or adapted for second language learners. This involves severely restricting the vocabulary that can occur, controlling the grammatical structures that can occur, and matching the length of text to the vocabulary and grammar controls. There are excellent reviews of graded reading schemes and graded readers largely coming from the Edinburgh Project on Extensive Reading (Hill 1997, Thomas and Hill 1993, Hill and Thomas 1988, 1988, 1989, Bamford 1984). In this article, the term reader will only be used to refer to a book. The people reading the books will be called learners.

Typically a graded reading scheme consists of a series of vocabulary and grammar levels with several readers available at each level of the scheme. A low proficiency learner would begin reading books at the lowest level of the scheme, and when reading at that level was comfortable, would move on to books at the next level. Table 1 (page 358) outlines the levels and vocabulary size of the graded reader scheme studied here. Table 2 (page 359) shows the range of book lengths.

Reading graded readers can have several learning goals. These include gaining skill and fluency in reading, establishing previously learned vocabulary and grammar, learning new vocabulary and grammar, and gaining pleasure from reading.

There are some writers who see no place for simplified reading material of the kind that is found in graded readers. They consider that the simplification results in distorted language that is not suitable for learners. Although there is no research to support this position, it is unfortunately true that some graded readers are very poorly written indeed. However, it is also true that there are many very well written graded readers. David Hill in Day and Bamford (1998) provides a very useful list of these, so that teachers and learners can choose the best. The strongest argument in favour of graded readers is that without them learners would not be able to experience reading in a second language at a level of comfort and fluency approaching first language reading. As we shall see, the vocabulary load of unsimplified material is so high that learners would have to study for several years before they could read a book where they knew most of the vocabulary. Graded

reading schemes allow learners to have early contact with easy material in the second language.

Michael West designed his graded readers as supplementary readers. That is, they were not intended to teach previously unmet vocabulary, but to help establish previously met vocabulary and to help learners to gain pleasure and skill from reading material containing familiar vocabulary.

The Supplementary Reader (also called the "Plateau" Reader) serves four purposes. It gives extra practice in reading; it reviews and fixes the vocabulary already learned; it "stretches" that vocabulary so that the learner is enabled to give a greater width of meaning to the words already learned; and lastly, by showing the learner that what he has learned so far really enables him to do something, it encourages him to press on with his study of the language. (West, 1955: 69).

One of the goals of the present study however is to see if graded readers have the potential to play a major part in vocabulary learning. The book flood studies (Elley 1991) show that extensive reading can be the basis for a language course, and well written graded readers are obvious candidates for such a course.

Graded reading schemes can thus have a variety of goals. The present study is taking the rather narrow view of seeing what role graded readers could play in helping learn new vocabulary. This is not the main goal that graded readers were designed for and is clearly not their only goal. This must be borne in mind when interpreting the results of this study.

Virtually no published research has appeared on the design and effectiveness of graded reading schemes. This is surprising when we consider the number of graded reading schemes available and the importance of these to publishers, teachers and learners. The aim of this study is to start to fill this gap.

PREPARATION OF THE MATERIAL

The graded reader scheme chosen for this study is the Oxford Bookworms. This is considered to be a very well produced scheme containing a wide range of interesting and creatively edited titles (Hill 1997). In this study, this series is taken to be representative of the best of graded readers. As Table 1 shows, it contains six levels and covers a vocabulary of 2,410 word families. There are over 100 readers in this and closely related series.

A graded reading scheme usually has a word and structure list divided into levels that are used to guide the production of the books. Before the analysis of the graded readers was carried out, the word list was carefully checked to make sure that all word families and family members were included. The original list did not include numbers, days of the week, months of the year, and letters of the alphabet. As these

were freely used in the graded readers at all levels, they were added to the list. The numbers included cardinal (three, four), ordinal (third, fourth), and plural forms (threes, thirds) and abbreviations (rd, st, th). The original list gave no guidelines about the use of derivational affixes, so Bauer and Nation's (1993) list was consulted and the most common regular, and productive derivational affixes (largely up to Level 3 of Bauer and Nation) were included. The inclusion was justified by the use of the affixes in most of the graded readers analysed.

Where the original list included the same word form but with a different part of speech at different levels, the appropriate affixed forms were included at the appropriate level. So, for example, bow and bows for the noun bow appear in Level 5. The verb bow appears at Level 6 so bowed and bowing appear there.

Table 1 shows the number of word families at each level of the scheme. A word family consists of a head word, usually the stem form, and its closely related inflected, derived, and abbreviated forms. So, the word family accident includes the headword accident and the family members accidents, accidental, and accidentally. Notice that Level 1 assumes a knowledge of 530 words. Level 2 introduces another 341 words making a total Level 2 vocabulary of 871 words.

Level	Word families introduced at each level	Cumulative total of word families at each level
1	530	530
2	341	871
3	320	1,191
4	296	1,487
5	459	1,946
6	464	2,410

Table 1: Number of word families at each graded reader level

A list was made of all the proper nouns used in the graded readers. These were isolated from the other words because it was considered that most of these words did not require prior vocabulary learning. That is, the proper nouns could be easily understood from context and should not be counted as unknown vocabulary. Most of the proper nouns were first names (John, Colin, Julie, Carol), family names (Bligh, Jones) and places (Staines, Hollywood, London).

THE COMPUTER PROGRAMS

Most of the analysis done in this study involved the use of two programs written for MS-DOS compatible PCs. VocabProfile analyses one input text at a time

comparing the word forms it contains with three baseword lists and indicating, through marking up the input text and through creating word lists, which words in the text occur in which baseword list and which do not occur in any list. This program has been used in other text based research (Hirsh and Nation 1992, Worthington and Nation, 1996, Laufer and Nation 1995). A more recently developed program, RANGE, can examine up to 32 texts at the same time. It can use baseword lists and its output gives the frequency and range of occurrence of the word forms in the input texts. The baseword lists allow the words to be classified into word families. RANGE has been used to create an academic word list (Coxhead 1998). Copies of these programs are available at <http://www.vuw.ac.nz/lals/software.htm>. A weakness of these programs is that the analysis of vocabulary is based solely on form. The programs cannot distinguish bank (a place to deposit money) from bank (of a river). Similarly the programs cannot distinguish the stem bank (as a verb) from the stem bank (as a noun). Although this is a serious problem, it is not so serious in this study as the use of the important homographs in the texts is controlled by the grading scheme. For example, the use of bank (a place to deposit money) is allowed at Level 2. The use of bank (of a river) is not allowed until Level 5. The programs have self-checking routines to ensure that the same word form does not occur in more than one of the baseword lists.

CHOOSING THE READERS

Seven books at each level were chosen for analysis, making a total of forty two books. The choice was based primarily on the number of words outside the list, with books with the smallest number of words outside the list being chosen (Proper nouns were not counted as words outside the lists). These books were chosen because from a vocabulary load perspective, they are the best simplifications. That is, they keep as much as possible within the permitted vocabulary.

Level	Number of texts	Total tokens	Range of text length
1	7	38,186	4,743 - 5,890
2	7	45,579	5,511 - 7,960
3	7	75,571	8,819 - 12,194
4	7	111,214	14,342 - 20,142
5	7	158,370	20,379 - 25,272
6	7	198,509	24,840 - 31,501
Total	42	627,429	4,743 - 31,501

Table 2: Number of texts and number of tokens at each level in the corpus

Table 2 shows that the seven readers at level 1 ranged in length from 4,743 words in the shortest reader to 5,890 in the longest reader. The seven readers contained a total of 38,186 running words.

DO GRADED READERS PROVIDE GOOD CONDITIONS FOR INCIDENTAL VOCABULARY LEARNING?

The answer to this question initially involves looking at whether the known vocabulary at each level provides enough coverage of the tokens in the book to make reading comprehensible. Framing the question in this way is based on the idea that learners should be able to read a graded reader and easily deal with the new words introduced at that level. Incidental is taken to mean that the learners' main focus is on the story, not vocabulary learning, and the attention given to vocabulary does not interfere too much with reading the story.

Research (Laufer 1992, Liu Na and Nation 1985, Hu and Nation 1999) suggests that at least 95% of the running words in the text should be known to the learner. In this study known words are considered to be a) the words that are in the previous levels of the graded reading scheme, and b) proper nouns. This viewpoint sees readers as a means by which learners expand their vocabulary size by learning the words that are introduced at that level of the grading scheme. Table 3 provides data on the coverage of the six levels of the scheme.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Average coverage	93.3%	87.6%	91.8%	94.5%	95.7%	96.4%
Range of coverage	88.3 - 95.9%	86.1 - 90.1%	90.6 - 93.3%	93.8 - 96.7%	94.8 - 96.9%	95.0 - 97.5%

Table 3: Total coverage and range of coverages of running words at each level by words from the previous levels and proper nouns in seven books at each level.

Table 3 shows that on average the Level 1 words and proper nouns cover only 87.6% of the running words at Level 2. The Level 1 and 2 words cover only 91.8% of the running words in the Level 3 books, and so on. 95% or more coverage is only reached for Levels 4, 5 and 6 of the scheme. It is not easy to determine on the basis of these figures whether inadequate coverage of Levels 1, 2 and 3 is the result of the design of the lists (the number of words in the lists and the actual words in the lists) or control of the words appearing in the books (the quality of the simplification). However, the presence of some books at the level which have very good coverage by the words at that level suggests that the quality or degree of control in the simplification is a major factor.

It is probably not important that the words in Level 1 do not provide 95% coverage of the Level 1 books, because learners will come to these books with widely differing vocabulary knowledge both in terms of size and particular words known.

Table 4 shows the coverage of text by words at the previous levels plus words allowed at the current level plus proper nouns. That is, Table 4 shows for Level 2, for example, the coverage by proper nouns and the words from Level 1 and Level 2. These three sources provide 96.6% coverage of the running words in the Level 2 readers. 3.4% of the running words (roughly one word in every thirty running words) are unknown. The assumption behind these figures is that learners need to know the words at the current level before they begin reading at that level.

Level	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Previous levels	0	81.8%	87.3%	91.0%	91.0%	92.1%
Current level	87.4%	9.0%	4.8%	2.4%	1.9%	1.9%
Proper nouns	5.9%	5.8%	4.5%	3.5%	4.7%	3.9%
Total	93.3%	96.6%	96.6%	96.9%	97.6%	97.9%
Range	88.3 - 95.9%	93.3 - 98.4%	95.5 - 97.5%	96.7 - 98.7%	96.8 - 98.5%	97.3 - 98.9%

Table 4: Text coverage in seven books at each level by previous levels, current level, and proper nouns.

Table 4 shows that the coverage at Level 1 is not sufficient being below 95%, but is sufficient at all the other levels. Saying the coverage is sufficient however involves seeing graded readers as a way of establishing previously met vocabulary rather than as a means of planned vocabulary expansion.

It seems possible to produce graded readers at each level where the proper nouns and the vocabulary allowed at that level cover more than or close to 97% of the running words in the text. This would provide very comfortable reading. If the vocabulary introduced at each level is not known beforehand however, reading particularly in the lower levels of the scheme is likely to be laborious, as there will be a high proportion of unknown words. Direct study of this vocabulary would be a useful way of helping reading when first entering a new level of the scheme.

This study probably overestimates the vocabulary difficulty facing learners. Graded readers provide some support for unknown vocabulary through the use of pictures and through the rich contexts provided to support guessing from context. However, in general, guessing from context will be very difficult without knowledge of 95% of the running words in the text (Liu Na and Nation 1985).

At the early levels of graded readers, learners might find the vocabulary load of the texts a little heavy and may need to make use of a dictionary

Before learners begin a graded reading program, some direct study of the vocabulary at the early levels could make reading easier

At the higher levels of graded readers, the conditions for incidental vocabulary learning are very good

WILL READING SEVEN READERS AT EACH LEVEL BE ENOUGH TO MEET AND LEARN THE NEW WORDS AT EACH LEVEL?

MEETING THE WORDS

Table 5 shows that at the six levels 12.5% - 20.0% of the word families in the lists do not occur at all at the level where they could be introduced. Even when all forty two books are combined 4.2% (101) of the word families in the 2,410 word list do not occur at all. It is thus unlikely that learners will learn all the words in the list by reading a substantial number of graded readers. However, over 95% of the word families may be met and this provides opportunities for learning to occur.

Frequency of occurrence	Level 1 words in Level 1 books	Level 2 words in Level 2 books	Level 3 words in Level 3 books	Level 4 words in Level 4 books	Level 5 words in Level 5 books	Level 6 words in Level 6 books
Not occurring	66 (12.5%)	51 (15.5%)	46 (14.4%)	53 (17.9%)	92 (20.0%)	58 (12.5%)
1 time or more	464 (87.6%)	290 (85.0%)	274 (85.6%)	243 (82.1%)	367 (80.0%)	406 (87.5%)
3 times or more	424 (80.0%)	234 (68.6%)	224 (70.0%)	175 (58.9%)	262 (57.1%)	314 (67.7%)
5 times or more	397 (74.9%)	211 (61.9%)	186 (58.1%)	147 (49.7%)	193 (42.1%)	247 (53.2%)
10 times or more	333 (62.8%)	150 (44.0%)	133 (41.6%)	90 (30.3%)	108 (23.5%)	132 (28.4%)
20 times or more	269 (50.8%)	71 (20.8%)	62 (19.4%)	39 (13.1%)	32 (7.0%)	39 (8.4%)
Total families at this level	530	341	320	296	459	464

Table 5: Occurrences and repetitions of word families in the seven books at the levels where the words are introduced.

Table 5 shows that 424 of the 530 available word families from Level 1 occur three times or more in those seven books at Level 1. 269 (50.8%) of the 530 words occur twenty times or more. 66 of the 530 words in the list do not occur at all in the seven Level 1 books.

MEETING THE WORDS AGAIN

One of a range of factors influencing learning is the number of meetings with each word. Table 5 shows the number of words occurring 1 or more times, 3 or more times, 5 or more times, 10 or more times, and 20 or more times at each level. Because so many factors influence vocabulary learning from written text, there is no set number of repetitions that will ensure learning. What research there is (Nation 1999: Chapter 4) suggests that around 10 repetitions is desirable, but the more the better. Table 5 shows that around two thirds of the words occur three times or more at the level at which they are introduced in the seven readers at that level. Almost 40% of them occur ten times or more. This indicates that by reading seven readers at a level, learners would have a good chance of learning a lot of words.

Occurrences	Level 1 words in Level 2 books	Levels 1 & 2 words in Level 3 books	Levels 1, 2 & 3 words in Level 4 books	Levels 1 - 4 words in Level 5 books	Levels 1 - 5 words in Level 6 books
Not occurring	64 (12.1%)	94 (10.8%)	114 (9.6%)	89 (6.0%)	119 (6.1%)
1 time or more	466 (87.9%)	777 (89.2%)	1,077 (90.4%)	1,399 (94.1%)	1,828 (93.9%)
3 times or more	417 (78.7%)	700 (80.4%)	979 (82.2%)	1,290 (86.7%)	1,622 (85.4%)
5 times or more	386 (72.8%)	658 (75.6%)	905 (76.0%)	1,198 (80.5%)	1,525 (78.3%)
10 times or more	320 (60.4%)	575 (66.0%)	759 (63.7%)	1,002 (67.3%)	1,242 (63.8%)
20 times or more	249 (47%)	448 (51.4%)	591 (49.6%)	753 (50.6%)	903 (46.4%)
total families at this level	530	871	1,191	1,487	1,946

Table 6: Occurrences and repetitions of word families at levels subsequent to their introduction.

These chances are substantially increased when repetitions in readers at subsequent levels are considered. That is, if a learner reads a book at Level 1, she will meet Level 1 words. When she reads a book at Level 2, she will meet Level 2 words and Level 1 words. These Level 1 words can strengthen and build on the learning from Level 1 reading. Table 6 shows the repetitions of words in the books in the next levels up in the series. So, in the seven Level 2 books, there are 466 Level 1 words. 417 of these Level 1 words occur three times or more in the seven books at Level 2, 386 occur five times or more and so on. Many of these Level 1 words also occur in books at Levels 3, 4, 5, and 6. Table 6 shows that the words from the previous levels occur often in the readers. In almost every case, they occur much more often in the subsequent levels than in the level at which they were first introduced. This is not too surprising as the books are longer at subsequent levels. Because the words occur most often at the following levels, teachers and learners must see

vocabulary learning from graded readers as being a cumulative step by step process. Moving through the levels is an essential way of establishing the learning of previously introduced words.

We have seen that there are more repetitions of words at subsequent levels than there are at the levels where they are first introduced. This suggests that learners should not read so many books at the early levels but should read more at the later levels providing the vocabulary load is not so heavy. That is, it is not likely to be the level at which the word is introduced that establishes knowledge of that word, it is likely to be the later levels that establish the knowledge. This reinforces a point made earlier when we looked at percentage coverage of text. Graded readers are not designed to teach words when they first appear.

Tables 5 and 6 underestimate the repetitions because they separate repetitions at the level where the words are first met from repetitions at subsequent levels. These need to be combined. Some words also are used before the level where they should be introduced. Table 7 gives total occurrences for all six levels.

Occurrences	Level 1 words	Level 2 words	Level 3 words	Level 4 words	Level 5 words	Level 6 words	Total words
Not occurring	15 (2.8%)	8 (2.3%)	2 (0.6%)	2 (0.7%)	30 (6.5%)	44 (9.5%)	101 (4.2%)
1 time or more	515 (97.2%)	333 (97.7%)	318 (99.4%)	294 (99.3%)	429 (93.5%)	420 (90.5%)	2,309 (95.8%)
3 times or more	508 (95.9%)	332 (976.4%)	316 (98.8%)	282 (95.3%)	389 (84.8%)	342 (73.7%)	2,169 (90.0%)
5 times or more	499 (94.2%)	329 (96.5%)	307 (95.9%)	274 (92.6%)	350 (76.3%)	274 (59.1%)	2,033 (84.4%)
10 times or more	481 (90.8%)	318 (93.3%)	286 (89.4%)	251 (84.8%)	274 (59.7%)	183 (39.4%)	1,793 (74.4%)
20 times or more	453 (85.5%)	307 (90.0%)	256 (80.0%)	192 (64.9%)	164 (35.7%)	78 (16.8%)	1,450 (60.2%)
Total available	530	341	320	296	459	464	2,410

Table 7: Total occurrences and repetitions of words at each level in all forty-two books.

Table 7 shows that over all the forty two books, most of the vocabulary in the various levels gets plenty of repetition. So, for example, 453 of the 530 level 1 words occur 20 times or more in the 42 books in the corpus. For levels 1 to 3 around 90% of the available 1,191 words occur at least ten times with a large proportion occurring twenty times or more. 74.4% of the 2,410 words occur ten times or more in the forty two readers. To get these repetitions, learners would

need to read all forty two books. Graded readers have the best effect for vocabulary learning when a substantial number of books at each level are read.

Very few words in Levels 1 to 4 do not occur in the 42 books. Most of the fifteen words not occurring from Level 1 are numbers and a few letters of the alphabet which did not occur as isolated letters. A greater number of words from Levels 5 and 6 do not occur at all in any of the 42 books. This is to be expected as they are less frequent words in the language as a whole and they are unlikely to occur at previous levels because of the grading scheme.

Tables 5, 6, and 7 show that if learners work their way through a set of graded readers, they not only meet most of the words but meet them many times. Simply on the basis of repetition, graded readers provide a very good opportunity for vocabulary learning. However, this opportunity occurs most favourably if several books are read at each level (particularly at the higher levels) and if learners move sequentially through the levels in the scheme.

Reading several books at the same level could result in many but not all of the new words at that level being met and learned

Words from the earlier levels get more repetitions at later levels, so it is important that learners work their way through the levels of the scheme

If a choice must be made, read more books at the later levels than at the earlier levels

Reading through all the levels of a graded reader scheme provides excellent conditions for incidental vocabulary learning

HOW LONG SHOULD A GRADED READER BE, AND HOW MANY BOOKS SHOULD BE READ AT EACH LEVEL?

One way of roughly calculating how long a graded reader should be is to look at the average coverage of, say, Level 2 words in Level 2 books of a certain length to see how long a book would need to be to have a certain number of repetitions per book. Level 1 figures are not provided because the high number of function words at that level distorts the picture.

The average percentage coverage of each new word at each level was calculated by dividing the text coverage of the new words by the number of word families actually providing that coverage. For example, in the seven Level 2 books, 290 Level 2 word families account for 9% of the running words in the books. On average each Level 2 family accounted for .031% of the running words in the Level 2 books (9% divided by 290 = .031%). For each word on average to occur ten times in a single book, each book would need to be 32,258 words long (100 divided by .031 and then multiplied by ten = 32,258).

Level	Average % coverage by each word family	Number of running words to get an average of 10 repetitions per word	Actual average text length at that level	Number of texts to get an average of 10 repetitions
2	0.031%	32,258	6,512	5 books
3	0.018%	55,555	10,798	5 books
4	0.009%	111,111	15,888	7 books
5	0.005%	200,000	22,627	9 books
6	0.005%	200,000	28,360	7 books

Table 8: Length of text and number of texts needed to get an average of ten repetitions per word of the vocabulary introduced at that level.

Table 8 shows that a considerable length of text is needed to get sufficient repetitions of the new words introduced at each level. These lengths are much greater than the lengths of the individual books. If repetition is a factor favouring learning, learners will need to read around 5 to 9 texts at each level. It is not realistic to make individual texts the required length.

Another way of looking at the repetitions at each level is to see how many books at each level need to be read in order to meet most of the words at that level, and in order to gain sufficient repetitions for learning.

Number of books	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
1 book	62.5%	57.5%	52.8%	34.5%	32.0%	43.5%
2 books	74.0%	64.2%	65.6%	55.7%	46.4%	61.4%
3 books	80.8%	72.4%	75.9%	68.6%	58.8%	67.7%
4 books	82.1%	76.0%	80.0%	72.7%	67.8%	76.5%
5 books	84.7%	79.5%	83.1%	77.1%	72.1%	81.7%
6 books	85.8%	82.1%	84.1%	80.1%	75.6%	85.6%
7 books	87.5%	85.0%	85.6%	82.1%	80.0%	87.5%

Table 9: Cumulative percentage of the available word families encountered at least once at each level over an increasing number of books.

Table 9 shows that by reading one book at Level 1, 62.5% (331) of the available 530 words will be met. By reading two books at Level 1, 74.0% of the 530 words

will be met. For most levels the returns drop significantly (there is less than a 5% increase in new words met) after reading three books at the same level at the lower levels and four books at the higher levels. This means two things. First, if learners learn every new word that they meet in the first books that they read at a particular level, the number of unknown words will quickly drop and they will be able to read the other books at that level with much more comfort. Second, in terms of learning words introduced at the current level, it is better to move fairly quickly to a higher level rather than staying at the same level. (A 2% increase in words met at Level 1 equals about ten words.) This advice however is not true if the goal is to develop fluency.

Number of books	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
1 book	16.8%	1.5%	4.1%	4.1%	2.4%	1.1%
2 books	32.3%	10.3%	10.3%	7.8%	3.9%	5.6%
3 books	43.0%	20.2%	20.3%	12.8%	6.8%	9.9%
4 books	50.4%	26.7%	26.6%	18.6%	9.8%	13.6%
5 books	57.9%	35.8%	32.8%	22.9%	14.4%	19.4%
6 books	61.7%	39.9%	36.6%	25.9%	18.7%	25.6%
7 books	62.8%	44.0%	41.6%	30.3%	23.5%	28.4%

Table 10: Cumulative percentage of the available word families encountered at least ten times at each level over an increasing number of books.

Table 10 shows that by reading one book at Level 1, 16.8% (89) of the available 530 words at Level 1 will be met ten times or more. By reading two books at Level 1, 32.3% of the available 530 words will be met ten times or more. The increase drops to less than 5% after reading five books at Levels 1 to 3. It takes more books at the higher levels to get a good number of repetitions.

So, after reading five to seven books at a level, around 80% of the words available at that level will be met at least once, and around 20% to 50% of the words will be met ten times or more.

Graded readers need to be quite long in order to get repetitions of vocabulary

To get a useful number of repetitions, at least three books need to be read at each level, and preferably more at the later levels

HOW MUCH SHOULD LEARNERS BE READING IN A SET TIME AT EACH LEVEL?

The idea behind this question is that learners need to get repetitions of vocabulary in order to help learning. But a repetition is not a repetition for learning if the learner has no memory of the previous meeting with the word. There is a rough way of providing a guideline for deciding how much extensive reading learners at a particular level should be doing. The two factors determining the necessary amount of reading are (a) the frequency level of the learners' vocabulary, and (b) the length of time that the memory of a meeting with a word is retained. For example, if a learner is reading at Level 3 of the graded reader series, then as Table 8 shows, there will be around 5,000 - 6,000 running words between each repetition. If the memory for a meeting with a word lasts for one week, then the learner will need to read about 5,000 - 6,000 words per week to ensure that there is another meeting before the memory of it is lost. At Level 3, this means about one graded reader every week (Table 8 shows the average length of graded readers at each level). Table 11 indicates how many books would need to be read per week in order for a repetition to reinforce a previous meeting with a word.

There are a lot of assumptions in this calculation, including how long a memory of a meeting with a word lasts, the evenness of the spacing of these meetings, the evenness of the impact of these meetings, the chances of meeting words outside the readers, and so on. However, the data is presented because it is the best we have at present, and because teachers and learners should be making judgements of the desired quantity of reading on some rational basis rather than making them blindly.

Table 11 shows that the idea of reading at least one graded reader a week is a sensible thing to do. Where English is taught as a foreign language, this would mean that over a two year period, allowing for holidays, learners would read around fifty graded readers from all levels of a scheme and thus have a very good chance of gaining strong receptive knowledge of the 2,000 high frequency words of English. Fifty graded readers would make up a total of about 750,000 running words of text.

	Level 2	Level 3	Level 4	Level 5	Level 6
Average number of repetitions per book	2.0	1.9	1.6	1.2	1.3
Average number of running words between repetitions	3,255	5,682	9,929	18,853	21,814
Amount of reading per week to meet the same words from that level again in that week	One Level 2 book per week	One Level 3 book per week	One and a half Level 4 books per week	Two Level 5 books per week	Two Level 6 books per week

Table 11: Average number of repetitions per book, average number of running words between repetitions, and average books to read per week to gain a repetition of each word introduced at that level at each level of the graded reader scheme.

The figures in Table 11 were calculated by looking at each group of seven books at the same level and dividing the number of tokens of the words introduced at that level by the number of word families introduced at that level, all divided by seven to get average repetitions of new words per book. The average total number of tokens per book at that level (i.e. the average length of a book) was then divided by the average number of repetitions to get the number of running words between repetitions. The average length of books at that level was divided by the average number of running words between repetitions to get the number of books needed to get a repetition.

This is of course a very rough guide indeed because repetitions of particular words are not evenly spaced, but it is enough to allow us to get an indication of how much learners need to read in order to meet words again.

Learners need to read at least one graded reader a week to meet words often enough to have a good effect on their vocabulary growth

WHAT IS THE HIGHEST VOCABULARY LEVEL THAT GRADED READING SCHEMES SHOULD REACH?

Ideally, after working their way through a scheme of graded reading, learners should be able to read unsimplified texts without meeting too many unfamiliar words. We will try to determine the kind of vocabulary preparation for reading unsimplified texts given by graded readers in two ways, first, by seeing how well the 2,000 high frequency words of English (West 1953) and 570 high frequency and wide range academic words of English (Coxhead 1998) are covered by the graded reader levels, and second, by seeing how well the vocabulary of the graded reader levels covers a variety of different kinds of text.

THE HIGH FREQUENCY WORDS OF ENGLISH

The classic list of high frequency words is West's (1953) A General Service List of English Words. This contains around 2,000 word families (depending on how a word family is defined), which is about 400 words less than the graded reader list. The General Service List (GSL) is old and was designed to be more than a high frequency word list. Like the graded readers list, it was designed to be complete in itself in that it could be used to write about most non-technical topics without going far beyond the words in the list.

84.7% of the words in the GSL are in the graded reader list. There is thus quite a big overlap between the two lists, showing that the graded readers provide a good way of meeting the high frequency words of English.

THE ACADEMIC VOCABULARY

The Academic Word List (Coxhead 1998) is a list of 570 word families which are frequent in academic writing across a range of disciplines. These words are very

important in academic writing and make up 8.5 - 10% of the running words in most academic texts. That is, about one word in every ten is from this list. 126 of the 570 academic word families (22.1%) occur in the graded reader list. Most are in Levels 5 and 6 of the graded reader levels. 14 of the 126 however did not appear in the forty two graded readers studied. These figures show that for learners who need to deal with academic texts there is still a lot of vocabulary learning to do before they can comfortably cope with the vocabulary in academic texts. It must be noted however that academic texts have the heaviest vocabulary load of all types of texts.

Let us now look at a range of types of texts to see how well the graded readers prepare learners for unsimplified texts.

UNSIMPLIFIED TEXTS

Table 12 shows that the graded reader list used in this study covers 85.6% of the fiction section of the Wellington Corpus of Written New Zealand English (WCWNZE) (a corpus paralleling the LOB and Brown corpora). The graded reader list provides fractionally better coverage than the GSL. This can be accounted for by the greater number of words in the graded reader list, some of these being words that are in the Academic Word List. These findings support the previous findings. The graded readers deal well with the high frequency words and provide the beginnings of knowledge of other vocabulary including academic vocabulary.

Lists	Fiction	Popular	Newspapers	Academic
Readers	85.6%	81.9%	80.1%	76.3%
GSL	85.5%	81.5%	79.7%	76.4%
GSL + AWL	86.4%	86.4%	84.9%	85.1%

Table 12: Coverage of various types of text in the WCWNZE by the GSL, AWL, and graded reader list.

Even if around 5% coverage is allowed for proper nouns, the coverage figures by the graded reader list and the GSL are still a long way from the minimum 95% coverage needed for reading with not too heavy a vocabulary load.

This indicates that with a top limit of 2,400 words and even 3,000 words, most graded reader schemes do not come close enough to the vocabulary size needed for comfortable reading of unsimplified text.

Should there be graded readers around the 4,000 and 5,000 word levels? The answer to this question is clearly yes. If there are no graded readers around these levels, then learners will not be able to read with comfort and pick up vocabulary without interfering too much with the reading. They will also have difficulty in reaching a good degree of fluency with the vocabulary they already know.

However, after the 2,000 word level, learners need to start specialising in their vocabulary learning to suit their language use goals. If learners carry on learning generally useful vocabulary, this will help with reading fiction but will not be an effective way to help with reading academic texts. Table 12 shows that the 570 words of the Academic Word List are a useful goal for learners wanting to read newspapers (5.2% coverage) and academic text (8.7% coverage). In comparison, the third one thousand most frequent words in the Brown corpus provide less than 4.3% coverage. Graded readers should specialise after the 2,000 word level.

The Bridge Series of graded readers, now out of print, provide a useful model of how graded readers focusing on lower frequency words could be designed. The introduction to the series describes them as being "moderately simplified".

"... words outside the commonest 7,000 (in Thorndike and Lorge: *A Teacher's Handbook of 30,000 Words*. Columbia University 1944) have usually been replaced by commoner and more generally useful words. Words used which are outside the first 3,000 of the list are explained in a glossary and are so distributed throughout the book that they do not occur at a greater density than 25 per running 1,000 words."

This type of simplification needs to be researched to examine the opportunities that such readers provide for vocabulary learning. It may be necessary to use some way of ensuring that the words at the target levels are repeated or highlighted in the text to help learning.

There need to be graded readers up to the 5000 word level

After the 2000 word level, there should be graded readers focusing on fiction and there should be academic non-fiction readers providing coverage of the Academic Word List

WHAT SHOULD THE SIZE OF THE LEVELS BE IN A GRADED READING SCHEME?

In general, the words in a graded reading scheme are arranged into groups largely on the basis of their frequency, with the most frequent words occurring at Level 1 and the least frequent words in Level 6. This can be seen in Table 8 in column 2 (Average coverage by each word family), and in Table 9 in row 2 (Average number of repetitions per book). The average percentage coverage and average number of repetitions for each word decreases from one level to the next. Even if the words in the list have not been deliberately graded using a frequency list, like the General Service List (West 1953), putting the most useful words first has the same effect. Frequency and usefulness are two ways of viewing the same phenomenon.

Ideally, in terms of percentage coverage of text, the levels in a graded reading scheme should be roughly equal. That is, when a learner moves from Level 2 readers to Level 3 readers, the new words at Level 3 should cover the same percentage of

running words as the words at Level 2 did when the learner moved from Level 1 to Level 2. If this was so, then the vocabulary burden of each level would be equal in terms of assisting comprehension. Ideally, the percentage coverage of text by the newly introduced words should be 4% or less, because then the words from the previous levels and the proper nouns could cover 95% or more of the text, making comprehension and guessing from context easier (Laufer 1992, Liu Na and Nation 1985).

Words	Percentage coverage	Cumulative % coverage
Previous levels	90.5%	90.5%
Proper nouns	4.5%	95.0%
Current Level	4.0%	99.0%
Others	1.0%	100%

Table 13: The ideal text coverage by different types of words in a graded reader.

By using the average percentage coverage figures from Table 8, it is possible to calculate how many words should be at each level in order to have 4.0% coverage at the level when the words first appear (4.0% divided by the average percentage coverage by each word family, e.g. for Level 2, 4% divided by .031% = 129 words). Table 14 presents this information for each level.

Level	Average % coverage per word	Word families	Cumulative families
1	-	530	530
2	0.031	129	659
3	0.018	222	881
4	0.009	444	1325
5	0.005	800	2125
6	0.005	800	2925

Table 14: Number of word families needed at each level to get 4% coverage by the words introduced at that level.

The levels in Table 14 differ considerably from those used in most graded reading schemes, although some come very close to it (see Table 15). The stages are small at the earlier levels, and become very large at the later levels. As we have seen, it would be useful to add further levels, perhaps with 1,000 word steps.

Another way of spacing the levels is to base the levels on a manageable set of words that could be learned within a set time. It is likely that the size of the levels is not as important as controlling the vocabulary in the readers so that no more than a small percentage are not covered by previous levels.

The number of new words in each level of a graded reading scheme should become bigger from the earlier to the later levels

HOW TYPICAL IS THE GRADED READER SCHEME EXAMINED HERE?

This study has focused on one series of graded readers. In order to be able to generalise the results of this study, we need to show that the lists and readers studied here are similar to those in other schemes. There are several ways of doing this. One way is to show that the word lists used are similar. Another way is to show that the scope of the levels in the various schemes is roughly the same.

There are some difficulties in making these comparisons. Publishers are often not willing to make their word lists available, and the advertised words per level do not accurately represent the actual number of words used. With these difficulties in mind let us now look at some comparisons.

COMPARING WORD LISTS

Some early graded reader lists were actually published and were available for teachers, learners and course designers to use. These included the Longman Structural Readers Handbook (second edition 1976) and A Guide to Collins English Library (1978). Unfortunately publishers' attitudes to their lists have changed and they are no longer readily available and in some cases jealously guarded.

Because the lists are basically lists of high frequency words, we would expect a reasonable degree of similarity between the lists. 85% of the 2,300 words in the Longman Structural Readers list appear in the list used in this study, as do 84.7% of the 2,000 words in the General Service List. This is a substantial degree of overlap.

COMPARING LEVELS

Hill (1997) says that there are currently 69 series of graded readers in English with 1,621 titles in print. Series often reappear under different names as they are repackaged or taken over by another publisher. The levels range from 300 words to 5,000 words. Table 15 provides information about the levels taken from publishers' catalogues.

Series	Number of levels	300-400	500-600	700-750	900	1000-1100	1200-1400	1600-1650	1800	2000-2300	2500	3000-3100	3700	5000
Longman originals	four	*	*		*		*							
Longman classics	four		*		*		*		*					
Longman fiction	five						*	*		*		*		
Heinemann	five	*	*			*		*		*				
Penguin	six	*	*			*		*		*		*		
Oxford storylines	four	*		*		*	*							
Oxford bookworms	six	*		*		*	*		*		*			
OPER	five						*			*		*	*	*

Table 15: The levels in several schemes of graded readers.

Level 5 of Longman fiction is unsimplified text.

The Oxford Bookworms graded reader series used in this study has six levels ranging from an advertised 400 to 2,500 head words. This series covers most of the range of levels and includes a substantial number of levels.

Graded reading schemes use roughly the same vocabulary. It does not matter if a mixture of books from various schemes are read by learners

It is more important to choose well written, interesting graded readers than to stick to one particular scheme

LEARNING VOCABULARY NOT IN THE LIST

An examination of words occurring frequently in a text but which are not in the list reveals that they are overwhelmingly proper nouns. A few topic related words which are not proper nouns occur frequently. They include words like lottery in the book The Lottery Winner, and breadfruit in Mutiny on the Bounty. There are very few words that were not in the list and that occurred across the six levels of the readers examined here. This indicates that there are not glaring gaps in the list. This is reinforced by the high overlap with the carefully controlled and tested General Service List.

CONCLUSION

FOR TEACHERS USING GRADED READERS

This study has shown that a carefully designed scheme of graded readers is a very effective means of ensuring that learners meet the high frequency words of a

language with plenty of repeated opportunities so that learners have a chance to learn them and to enrich their knowledge of them.

Learners need to read a minimum of five books at each level, and need to work their way through the levels. The main reason for this is that most words occur more often in subsequent levels than they do at the level at which they are first introduced.

This reading needs to be done at a fairly intensive rate of around a book per week. This will ensure that learners meet words again before they have forgotten their previous meeting with the words.

When learners move to a new level in their graded reading, it is likely that they will meet quite a high proportion of unknown words. At this point it would be wise to supplement the learning through reading with direct study of the new vocabulary, using word cards. This is best done as an individual activity with learners making their own cards and choosing the words from the books to put on the cards. Teachers can give useful advice and training in how to go about this learning. This may need to be done for only the first one or two books at a level. After that the density of unknown words will be light enough to allow more fluent reading.

From a vocabulary learning perspective, it is best to move fairly quickly to the higher levels of the graded reading scheme and to read more books at those higher levels.

As well as providing opportunities for vocabulary growth, graded readers also allow learners to develop fluency with the words they already know. If the degree of vocabulary control in a graded reader is well applied, then by reading books at levels that they have already passed through, learners will meet few unknown words and will be able to concentrate on reading faster.

FOR PUBLISHERS DESIGNING A SCHEME

Graded readers differ from other reading material in that the language in them is controlled so that most or all of it is within the proficiency level of the learners reading them. Graded readers should not differ in other ways. That is, they should be readable, interesting and well-written. Just because the vocabulary and grammar are controlled, the quality of the writing should not suffer. A graded reader should tell a good story well.

Let the technique of simplification be as perfect as possible, if abridgement is not interesting, it is useless ...

Simplification and abridgement have brought to life not a few books which, for the foreign reader and the English schoolchild, would otherwise be completely dead:

they have also murdered not a few whose lives might have been saved. (West 1955: 74-75)

Primarily, however, it is the control that makes graded readers unique, and a good graded reader is both well-written and well controlled. To see how important control is, it is only necessary to look at the frequency of occurrence of vocabulary in uncontrolled (unsimplified) texts, where almost half of the different words occur only once or twice (Carroll, Davies and Richman 1971, Sutarsyah, Nation and Kennedy 1994: 39) (contrast this with Table 7), and where the most frequent 2,000 words of English cover less than 86% of the running words in the text (see Table 12).

This study has several important findings for the designers of graded reading schemes.

Graded reading schemes need to take learners closer to unsimplified text in the higher levels of the scheme. We have seen that after learners have reached the highest level of a graded reader scheme, they would still face at least one unknown word in every ten running words (90% coverage) when they read unsimplified text. This is equivalent to one unknown word in every line of the book. This is too heavy a vocabulary load for comfortable reading and for incidental learning to occur. Graded readers should take learners up to 5,000 word families with some specialisation of focus for learners wishing to read non-academic text (novels, magazines), and those wishing to read academic text and newspapers.

The spacing and size of the levels need to be worked out so that each successive level contains a greater number of words. The principle that should lie behind the setting up of the levels of a graded reader scheme is that when learners move from one level to another, they will not be overburdened by new vocabulary. This new vocabulary should not occur at a density greater than one new word in every twenty running words (95% coverage) and preferably should not occur at a density greater than one new word in every fifty running words (98% coverage).

The cumulative vocabulary levels of a scheme might look like this.

Level 1	500 word families
Level 2	700 word families
Level 3	1,000 word families
Level 4	1,500 word families
Level 5	2,000 word families
Level 6	3,000 word families
Level 7	5,000 word families

Some Level 6 and 7 graded readers in this scheme should be non-fiction and should focus on academic vocabulary as exemplified by the Academic Word List (Coxhead 1998).

The control of vocabulary needs to be taken seriously. There has been a tendency in some schemes to be very flexible in the vocabulary allowed. There needs to be the freedom to use words outside the list if they are essential to the story or if they make the writing less awkward. The quality of the text is a very important factor in producing good graded readers. However, these extra words should be monitored to ensure that where possible they occur several times in the reader. For example, many words outside the list like amputated, alibi, ail, blisters, bog occurred only once in the forty two readers examined in this study. Such words are likely to be unknown by the learners and thus add unnecessarily to the vocabulary burden of the text. Careful editing could easily get rid of these. This is not a laborious editing job as computer programs like VocabProfile can quickly locate these words. If some of these words are essential then they should be used in the interests of the quality of the telling of the story, but there should not be too many of them.

The vocabulary control needs to be done so that the conditions for incidental learning are more favourable. That is, the words from the previous levels and the proper nouns need to cover over 95% of the running words. This desirable coverage is most likely to occur if (1) the levels in the scheme are properly designed as suggested above, and (2) the control of the words outside the list is carefully done. It may not be necessary to check on the text coverage of the previous levels of the list, but this can easily be done if the texts are in computer readable form.

Vocabulary control does not ensure an interesting story and an enjoyable read and graded readers must be interesting. Lack of vocabulary control however increases the vocabulary load of the text and makes reading a much more difficult process. We have to see interest and control not as alternatives but as complementary goals in producing graded readers.

The effects of all these changes in graded reading schemes should be to increase learners' satisfaction with graded readers and thus encourage them to read more. Graded readers are such a tremendous resource for language learners that they need to be designed and used for the best possible effect. This study has tried to show how this could be done.

This study has worked within a very narrow focus. It has looked only at graded readers as a means of vocabulary learning. As mentioned at the beginning of this article, most graded reader schemes are deliberately not set up as a way of presenting new vocabulary, but are seen as being supplementary readers that help establish

vocabulary already met in language courses as well as helping reach a range of other reading goals. This study has attempted to look at their potential for vocabulary learning and has concluded that they are an excellent resource from this point of view.

This study has also not considered the quality of writing in graded readers. This is a grave omission but is beyond the scope of this study. Poorly written graded readers have done a grave disservice to the cause of graded reading (see for example the criticisms of Yano, Long and Ross (1994) on the stilted language of simplified texts). It is essential that graded readers be well written because learners will be quickly turned off this important source of learning if they read poorly written stories. Hill and Thomas's reviews of graded readers provide some encouragement to writers and editors to keep quality of writing to the forefront. It would be an excellent idea, I think first suggested by David Hill, to have an equivalent of the Oscars for graded readers. Each year the best graded readers (in terms of quality of writing, presentation and control) are given an award. Publishers would be entitled to publish this on the cover of each reader ("Voted best graded reader for 1999") which should boost sales, but more importantly boost the quality of production of graded readers. Such a valuable resource deserves all the support it can get.

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