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RESEARCH TIMELINE

Lexical coverage and profiling

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Introduction

Technological innovations in computer software and advancements in corpus linguistics have made it easier to analyse the vocabulary in a text. Corpus-driven analysis of multi-million-word corpora has enabled researchers to create word frequency lists and these have been used together with software to profile the distribution of words at different frequency levels within texts. This analysis of vocabulary provides an indication of the difficulty level of a text, the potential for vocabulary learning through reading or listening to the text, as well as the vocabulary knowledge required to understand different types of spoken and written discourse. This area of research, known as LEXICAL COVERAGE or LEXICAL PROFILING, tends to fall into a number of different categories. The following themes highlight some of the major areas of lexical coverage research.

A. How does lexical coverage affect comprehension?
B. How many words do you need to know to understand written or spoken discourse?
C. To what extent do different text types provide opportunities for incidental vocabulary learning through reading and listening?
D. Which tools and methods can be used to investigate lexical coverage?

Studies in Theme A are experimental in nature and findings are typically based on the percentage of words that learners know in reading or listening passages and their comprehension scores for that passage. This area investigates the amount of lexical coverage needed to reach 'adequate' discourse comprehension. It is important to note that 'adequate comprehension' is not a clearly defined construct and what is considered adequate in one study might be quite different in another. This line of research indicates that 95% to 98% coverage is needed to establish adequate comprehension of different types of discourse. For reading comprehension, minimal (95%) and optimal (98%) thresholds have been suggested (Laufer & Ravenhorst-Kalovski, 2010*) while for listening comprehension, 95% lexical coverage is recommended for good comprehension (e.g. van Zeeland & Schmitt, 2013*). These findings indicate that a reasonable comprehension level may be achieved at a density of lexical coverage above 90%, suggesting that learners need to know a very high percentage of words in a text in order to understand it.

Building on the findings in Theme A, the second area of lexical coverage research (Theme B) uses word frequency lists and a representative corpus of a domain to examine the number of words necessary to reach the coverage figures associated with adequate comprehension. For example, 3,000 word families plus proper nouns (e.g. 'Harry', 'London') and interjections (e.g. 'oh', 'hey'), are sufficient to reach 95% coverage of movies (Webb & Rodgers, 2009a*), TV programs (Webb & Rodgers, 2009b*), and conversation (Nation, 2006*). Findings from this line of research give an indication of the coverage of high-, mid-, and low-frequency words, as well as academic vocabulary in different types of discourse. This is particularly useful in distinguishing the relative values of words in different types of discourse. For example,

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West's (1953)* General Service List (GSL) was developed to represent the most useful 2,000 words in the English language and provides around 70–90% coverage of discourse with the amount of coverage dependent on the type of text. Coxhead's (2000)* Academic Word List (AWL) covers around 10% of academic written texts and around 4% of academic spoken discourse (Dang & Webb, 2014*).

Studies in Theme C examine the number of encounters with words to determine the potential for incidental vocabulary learning through reading, listening, or viewing the text. These studies draw on the lexical profiling research in Theme B by investigating the potential for learning words incidentally that are deemed to be unknown due to their word frequency level. For example, Webb and Rodgers (2009b*) looked at repetition of vocabulary that was less frequent than the 3,000 word level to determine the potential to incidentally learn lower frequency words through watching television programs. Cobb (2007)* examined the potential for readers to learn the most frequent 3,000 word families through reading different types of text. Studies investigating incidental vocabulary learning have shown that the more often words are encountered, the more likely they are to be learned (e.g. Horst, Cobb, & Meara, 1998; Rott, 1999; Waring & Takaki, 2003; Webb, 2007). By examining the extent to which text types such as graded readers, listening passages, and classroom-based teacher talk create the opportunity for incidental vocabulary acquisition, we can better understand where vocabulary learning is more likely to occur.

Studies under Theme D relate to lexical profiling methodology. These include discussions of issues that should be considered when designing and evaluating studies of lexical coverage. For example, Reynolds (2013*) questions whether the unit of counting in lexical profiling studies should be the 'word family'. Word families are made up of a headword (e.g. 'access'), its inflections ('access', 'accesses', 'accessing', 'accessed'), and derivations ('accessible', 'accessibility', 'inaccessible', 'inaccessibility') and are the typical unit of counting in the studies found in this timeline (e.g. Nation 2006*; Webb & Paribakht 2015*). The rationale behind using word families is that if a learner knows the headword, he or she may understand the meaning of the inflections and derivations when they are encountered in context. Currently, there is a debate in lexical profiling studies – whether to use word families or lemmas as a unit of counting. Although there are some proponents of the lemma-based approach (e.g. Gardner & Davies, 2014), there is little research investigating this issue and an answer for this question remains to be determined. Thus, further research needs to be done in this area (see Nation, 2016 for discussion*). Another issue is the vocabulary size at which proper nouns (e.g. Baltimore, Harry) should be considered to be understood by learners. Research under this theme also discusses tools (e.g. software, frequency lists) that are commonly used to perform the coverage analysis.

In addition to the four themes discussed in this manuscript, we were tempted to include studies of the lexical frequency profiles of learner language use (e.g. Laufer & Nation, 1995; Meara, 2005). Although these studies do have a similar methodology to those of Theme B, their focus on productive knowledge contrasts the research in this timeline which is all focused on receptive vocabulary knowledge. Lexical frequency profiling of learner language measures the extent of lexical sophistication and thus might be better incorporated in timelines that are devoted to lexical richness. Another theme not included in this timeline is word lists (e.g. high-/low-frequency lists, academic and technical word lists). There has been ample research on word frequency lists since the early 1950s that has resulted in the creation of lists such as West's (1953) GSL and Brezina and Gablasova's (2015) New GSL. Similarly, there are several lists of academic vocabulary such as Coxhead's (2000*) AWL and Gardner and Davies' (2014) Academic Vocabulary List. In addition, there are lists of academic collocations (Ackermann & Chen 2013), phrasal expressions (Martinez & Schmitt, 2012), and lexical frames common in academic and spoken English (Gray & Biber, 2013). In this timeline, frequency lists such as the GSL (West 1953*) and Nation's (2012*) British National Corpus (BNC) are included, together with the British National Corpus/Corpus of Contemporary American (COCA) word lists that have been used in analyses within the articles summarized in the timeline. However, there was not sufficient space to include all of the available word lists, and ideally these studies would be detailed in a separate timeline.

Overall, our timeline reveals a relatively steady number of studies published on lexical coverage from the 1980s. Research might have been spurred by the introduction of technological tools that

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reduce the challenges of corpus-driven studies. The availability of the RANGE program (Heatley, Nation, & Coxhead 2002*) and the development of the BNC word lists (Nation, 2006*) have likely led to an increase in the number of studies conducted in recent years. With a relatively small number of studies investigating the relationship between lexical coverage and comprehension, further research is still warranted. However, there is value in researching each of these themes in more depth (Schmitt et al., 2017*). Moreover, as advances in lexical profiling tools occur there will likely be additional innovation regarding how these lines of research are conducted.

Endnotes

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Year	References	Annotations	Theme
1953	West, M. (1953). *A general service list of English words*. London: Longmans, Green & Co.	**West**'s widely used GSL contains 2,000 word families and provides high lexical coverage (~70–90%) of English. The words in the list were selected using both objective criteria (frequency of occurrence and range) as well as subjective criteria (usefulness of words for English learners), thus some words were manually identified and added to the list. The GSL has been a great resource for material writers and vocabulary researchers, and has contributed to research in vocabulary profiling partly because of its integration into vocabulary tools such as RANGE and VocabProfile. Despite its popularity, the GSL was put together almost 60 years ago, thus researchers question whether it is representative of current English. A recent attempt was made to update the list to reflect more current English. Gilner (2011)[1] provides an excellent historical and methodological overview of the GSL.	**D**
1956	Schonell, F., Meddleton, I., & Shaw, B. (1956). *A study of the oral vocabulary of adults: An investigation into the spoken vocabulary of the Australian worker*. Brisbane: University of Queensland Press.	In this pioneering study of lexical coverage, **Schonell et al**. examined the number of words necessary to engage in conversation. To do so, they recorded interviews and spontaneous conversation of about 2,800 unskilled and semi-skilled workers in Australia. The analysis showed that around 2,000 headwords would cover 99% of informal conversation. This work is significant because it was carried out when electronic corpora were not available.	**B**
1985	Liu, N., & Nation, I. S. P. (1985). Factors affecting guessing vocabulary in context. *RELC Journal*, *16*(1), 33–42.	**Liu & Nation** investigated the effect of lexical coverage on the ability to guess the meanings of unknown words. Participants were presented with a low-density (one unknown word in 25) and a high-density text (one unknown word in ten). More accurate guesses were made with the low-density texts compared to the high-density texts indicating that lexical coverage affects successful guessing. This is the only study examining how coverage affects vocabulary learning. More research in this area is warranted.	**C**
1988	Wodinsky, M., & Nation, I. S. P. (1988). Learning from graded readers. *Reading in a Foreign Language*, *5*(1), 155–161.	**Wodinsky & Nation** analysed the recurrence of words in two different graded readers and the potential for incidental vocabulary learning in each text. The number of encounters necessary for incidental vocabulary learning to occur was set at ten. They found that learners would encounter 498 out of the 1,100 word families ten or more times if both graded readers were read. Based on the finding, the authors suggest that learners need to read a large number of graded readers to learn all of the new words encountered in a level.	**C**
1989	Laufer, B. (1989). What percentage of text lexis is essential for comprehension? In C. Lauren & M. Nordman (Eds.), *Special language: From humans thinking to thinking machines* (pp. 316–323). Clevedon: Multilingual Matters.	This important study was the first to examine the effect of lexical coverage on L2 reading comprehension. **Laufer** operationalized 'adequate' reading comprehension as scores of 55% or higher because this was a passing grade at the institution where the participants were recruited. Learners who achieved a reading comprehension score of 55% or above were found to have a minimum of 95% lexical coverage. Based on this finding, she suggested that the lexical threshold for reasonable reading comprehension is at around 95% coverage of a text and recommended that this lexical coverage could be achieved with knowledge of 5,000 words.	**A**

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Note. Authors' names are shown in small capitals when the study referred to appears in this timeline.

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1991	Meara, P. M. (1991). *BBC English Core Curriculum: The lexicon.* London: BBC English.	**Meara** investigated the lexical profiles of BBC radio broadcasts as a means to determine whether they might be understood by L2 learners. He found that knowledge of the most frequent 2,500 word families provided around 90% coverage of the broadcasts.	**B**
1992	Hirsh, D., & Nation, I. S. P. (1992). What vocabulary size is needed to read unsimplified texts for pleasure? *Reading in a Foreign Language*, *8*(2), 689–696.	**Hirsh & Nation** attempted to find the number of words needed for pleasurable reading in English. They found that the most frequent 5,000 word families provided 97–98% lexical coverage of unsimplified texts designed for teenagers who are native speakers of English. They suggested that L2 learners target this vocabulary size as a goal to provide comprehension of these texts.	**B**
1993	Bauer, L., & Nation, I. S. P. (1993). Word families. *International Journal of Lexicography*, *6*(4), 253–279.	**Bauer & Nation**'s discussion and categorization of word families has had an impact on most studies of lexical coverage because word families are the most commonly used unit of counting in lexical coverage research. Because there is empirical support for the use of word families as the unit of counting in first language (L1) studies (e.g. Nagy et al., 1989)[2] but there is little L2 research validating its use, some scholars question the validity of using word families as the unit of counting in L2 studies (e.g. Brown, 2013; Reynolds, 2013).	**D**
1994	Carver, R. P. (1994). Percentage of unknown vocabulary words in text as a function of the relative difficulty of the text: Implications for instruction. *Journal of Reading Behavior*, *26*(4), 413–433.	This study indirectly examined the lexical coverage of a text by investigating the relationship between comprehension of relatively difficult reading passages and the number of unknown words in the same passages. In this two-part study, schoolchildren in grades 3–6 and graduate-level students were asked to read passages of varying levels of difficulty and draw a line under each unknown word. **Carver** suggested that the relative difficulty of a text increases, as the number of unknown words in the text increases. He claimed that around 98–99% coverage would make texts suitable for readers.	**A**
1994	Sutarsyah, C., Nation, I. S. P., & Kennedy, G. (1994). How useful is EAP vocabulary for ESP? A corpus based case study. *RELC Journal*, *25*(2), 34–50.	This study compared the vocabulary in small corpora made up of related and unrelated texts. An ESP corpus included a single long economics text while an EAP corpus included short texts comprising diverse academic disciplines (e.g. education, engineering). The analysis showed that the number of words in the unrelated academic texts was much higher than in the single economics text (12,744 vs. 5,438) indicating that reading materials made up of narrowly focused (related) topics require readers to know less vocabulary than those from a variety of different (unrelated) topics.	**B**
1999	Nation, I. S. P., & Wang, K. (1999). Graded readers and vocabulary. *Reading in a Foreign Language*, *12*(2), 355–380.	This study examined the lexical coverage of graded readers and the amount of reading required to learn the high-frequency words found in a graded reader series. The findings indicated that 40% of the new words in a level would be encountered ten or more times (and potentially learned) when learners read seven books.	**C**
1999	Ward, J. (1999). How large a vocabulary do EAP Engineering students need? *Reading in a Foreign Language*, *12*(2), 309–324.	**Ward** identified the most frequent 2,000 word families (EngList) from an engineering corpus and then compared its coverage with other frequency lists such as the GSL (West, 1953) and the UWL (Xu & Nation, 1984).[3] The results showed that the most frequent 2,000 words (EngList) provided over 95% coverage of the engineering texts, which was better coverage than the GSL and GSL plus the UWL. He suggested that knowing EngList would provide students with sufficient vocabulary knowledge to read university-level engineering texts.	**B**

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2000	Bonk, W. (2000). Second language lexical knowledge and listening comprehension. *International Journal of Listening*, *14*(1), 14–31.	**Bonk** (2000) was the first to study the relationship between vocabulary knowledge and L2 listening comprehension. Bonk used a dictation task to measure EFL students' vocabulary knowledge and a free-recall test to assess their listening comprehension. He found that the relationship between coverage and listening comprehension was complex as there was a great deal of variation in the comprehension scores at the same levels of coverage. He suggested that with good coping strategies learners may achieve good listening comprehension when coverage is less than 95%. VAN ZEELAND & SCHMITT (2013) followed up this study but recommended that 95% coverage should be the target for good listening comprehension of informal texts.	**A**
2000	Coxhead, A. (2000). A new academic word list. *TESOL Quarterly*, *34*(2), 213–238.	Using a 3.5-million-word corpus of written academic English, **Coxhead** created the AWL, comprising 570 word families that account for ~10% coverage of written academic texts. AWL has been common in lexical profiling studies because researchers explored the AWL's coverage in different types of academic discourse and in specialized/technical vocabulary lists. It is important to note that AWL was put together in response to shortcomings of an earlier academic word list: the UWL (Xu & Nation, 1984). More recently, used a 120-million-word corpus to create a new Academic Vocabulary List, which has not been widely used in lexical profiling research yet.	**D**
2000	Hu, M., & Nation, I. S. P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language*, *13*(1), 403–430.	This study follows up LAUFER'S (1989) investigation of the relationship between reading comprehension and lexical coverage. In contrast to the findings of the earlier study, **Hu & Nation** found that L2 readers needed to know 98% of the words in a text to have adequate reading comprehension of a relatively easy text.	**A**
2002	Heatley, A., Nation, I. S. P., & Coxhead, A. (2002). Range: A program for the analysis of vocabulary in texts. Retrieved from http://www.victoria.ac.nz/lals/about/staff/paul-nation	The RANGE software has been the most commonly used computer program in studies of lexical profiling. It lists all the words that occur in a text according to where they are found in word lists, and shows how many times they were used. Currently, RANGE can be downloaded freely together with three sets of lists: the GSL/AWL lists (2,000, plus 570 word families), the BNC lists (14,000), and the BNC/COCA lists (25,000). RANGE also allows researchers to use their own word frequency lists instead of those that come with the program.	**D**
2003	Adolphs, S., & Schmitt, N. (2003). Lexical coverage of spoken discourse. *Applied Linguistics*, *24*(4), 425–438.	Building on the work of SHONELL ET AL. (1956), **Adolphs & Schmitt** examined the vocabulary size necessary for everyday (informal spoken) communication. In contrast to the earlier study, they reported that 2,000 word families was insufficient to cover 95% of informal everyday conversation, and that 3,000 word families was a more appropriate target as the vocabulary size necessary to understand spoken discourse.	**B**
2004	Gardner, D. (2004). Vocabulary input through extensive reading: A comparison of words found in children's narrative and expository reading materials. *Applied Linguistics*, *25*(1), 1–37.	This study investigated the vocabulary in expository and narrative texts written for 10- and 11-year-olds. **Gardner** analysed the proportion of general high-frequency words from WEST'S (1953) GSL list and academic words from Xu & Nation's (1984) UWL that were in the texts. Gardner found that these lists covered about 89% of his corpus. Because there was greater repetition of words in expository texts, he reported that expository texts might contribute to greater incidental vocabulary learning than narrative texts.	**B, C**

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2004	Adolphs, S., & Schmitt, N. (2004). Vocabulary coverage according to spoken discourse context. In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language* (pp. 39–49). Amsterdam: John Benjamins.	Building on their earlier work (see Adolphs & Schmitt 2003), **Adolphs & Schmitt** examined a number of factors such as the purpose of interaction or the degree of familiarity between two interlocutors in spoken discourse and their influence on lexical coverage. The findings indicated that spoken interaction requires a larger vocabulary than was previously reported (Adolphs & Schmitt, 2003). They also found that a larger number of word forms was necessary for friendship-based (intimate) interactions compared to professional/business-based (transactional) conversations.	**B**
2006	Nation, I. S. P. (2006). How large a vocabulary is needed to reading and listening? *The Canadian Modern Language Review*, *63*(1), 59–82.	In this influential paper, **Nation** investigated the number of words necessary to understand different types of spoken and written text. Nation focused on the vocabulary size necessary to reach 98% lexical coverage of written and spoken texts. He found that knowledge of the most frequent 8,000–9,000 word families was necessary to reach 98% coverage of written discourse while knowing the most frequent 6,000–7,000 word families was necessary to reach 98% coverage of spoken discourse. One of the most important contributions of this study is that it introduced the 14 BNC 1,000-word lists that were used in much of the subsequent research examining lexical coverage. Nation's BNC word lists are made up of the 14,000 most frequent word families and also include additional lists of proper nouns and marginal words.	**B, D**
2007	Cobb, T. (2007). Computing the vocabulary demands of L2 reading. *Language Learning and Technology*, *11*(3), 38–63.	This study was conceived in response to Krashen's (1989)[4] claim that reading alone may provide L2 learners with sufficient lexical input necessary for unassisted reading. **Cobb** analysed the vocabulary found in three subcorpora: press, academic and fiction. He found that not all words at the 3,000-word level were encountered a sufficient number of times (six or more) in the subcorpora to master that level. Based on this finding, Cobb suggested that reading alone may not be sufficient to improve L2 learners' vocabulary knowledge for reading.	**C**
2008	Stæhr, L. S. (2008). Vocabulary size and the skills of listening, reading and writing. *Language Learning Journal*, *36*(2), 139–152.	This study examined the relationship between EFL learners' vocabulary size and their reading, listening and writing skills. The participants' vocabulary size was calculated based on their scores on the Vocabulary Levels Test (Schmitt, Schmitt, & Clapham 2001).[5] **Stæhr** reported that the learners' vocabulary size showed fairly high correlations with reading comprehension (.83), writing production (.73) and listening comprehension (.69). The results corroborate findings on the importance of lexical coverage for L2 comprehension (Laufer, 1989; Bonk, 2000; Schmitt et al., 2011).	**A**
2008	Webb, S., & Nation, I. S. P. (2008). Evaluating the vocabulary load of written text. *TESOLANZ*, *16*, 1–10.	**Webb & Nation** explain how two tools, (1) RANGE (Heatley et al., 2002) and (2) the Vocabulary Size Test (Nation & Beglar, 2007),[6] can be used to help English language teachers identify level appropriate texts for their students. Identifying suitable texts for students was based on the degree to which students have sufficient lexical coverage of texts.	**B, D**
2009	Webb, S., & Rodgers, M. P. H. (2009). The lexical coverage of movies. *Applied Linguistics*, *30*(3), 407–427.	**Webb & Rodgers** analysed a corpus comprising 2,841,887 words that was made up of 314 American and British movies. Their findings showed that a vocabulary of 3,000 word families plus knowledge of proper nouns and marginal words provided 95% coverage of the corpus. They suggested that this vocabulary size may be sufficient for comprehension of movies. van Zeeland & Schmitt's (2013) study of the lexical coverage necessary to understand spoken discourse supported this recommendation.	**B**

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2009	Webb, S., & Rodgers, M. P. H. (2009). Vocabulary demands of television programs. *Language Learning*, *59*(2), 235–366.	**Webb & Rodgers** analysed the vocabulary in 88 English language TV programs. They found that knowledge of the most frequent 3,000 word families and proper nouns and marginal words provided 95% coverage of TV programs. These results were similar to the findings of Webb & Rodgers' (2009) study of the lexical coverage of movies. Together, the results of the two studies suggest that 95% coverage of video may usually be achieved when viewers know the most frequent 3,000 word families. They also examined the reoccurrence of lower frequency words and suggested that regular TV viewing had the potential to contribute to considerable incidental vocabulary learning.	**B, C**
2009	Stæhr, L. S. (2009). Vocabulary knowledge and advanced listening comprehension in English as a foreign language. *Studies in Second Language Acquisition*, *31*(4), 577–607.	This study examined the relationship between vocabulary size and depth on listening comprehension. Based on learners' scores on the Vocabulary Levels Test **Stæhr** indirectly calculated the degree of lexical coverage of the audio passages. His findings suggested that 98% coverage provided adequate L2 listening comprehension. This is partially supported by van Zeeland & Schmitt (2013) who found that 98% coverage provided high-level listening comprehension.	**A**
2010	Brown, D. (2010). An improper assumption? The treatment of proper nouns in text coverage counts. *Reading in a Foreign Language*, *22*(2), 355–361.	In many studies of lexical coverage, there is an assumption that proper nouns have a minimal learning burden and are easily understood (e.g. Nation, 2006; Webb & Rodgers, 2009). **Brown** questions this hypothesis. He suggests that research is needed to determine the extent to which learners of different vocabulary sizes can understand the proper nouns encountered in text.	**B, D**
2010	Horst, M. (2010). How well does teacher talk support incidental vocabulary acquisition? *Reading in a Foreign Language*, *22*(1), 161–180.	**Horst** investigated the lexical coverage of in-class teacher talk addressed to English as a second language (ESL) learners and examined the extent to which it may contribute to the incidental acquisition of newly encountered words. The findings indicated that 4,000 word families were necessary to reach 98% coverage of teacher talk, suggesting that it does not require as much vocabulary as needed to comprehend other spoken materials such as TV shows (Webb & Rodgers, 2009b), movies (Nation, 2006), and academic lectures (Dang & Webb 2014). The findings showed that ESL teacher talk in a classroom setting offers minimal opportunities for incidental vocabulary acquisition.	**B, C**
2010	Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learner's vocabulary size and reading comprehension. *Reading in a Foreign Language*, *22*(1), 15–30.	**Laufer & Ravenhorst-Kalovski** examined the relationship between learners' vocabulary size, lexical coverage of academic texts and reading comprehension scores of academic English. They found that 4,000–5,000 word families plus proper nouns was sufficient to reach 95% lexical coverage and 6,000–8,000 word families plus proper nouns would enable learners to reach 98% coverage of the texts. They suggested that 95% coverage may provide minimum comprehension while 98% coverage may provide optimal reading comprehension. Their calculation of the target vocabulary size necessary to reach 98% coverage of written text supports Nation's (2006) earlier findings.	**A, B**
2010	Matsuoka, W., & Hirsh, D. (2010). Vocabulary learning through reading: Does an ELT course book provide good opportunities? *Reading in a Foreign Language*, *22*(1), 56–70.	**Matsuoka & Hirsh** examined the lexical profile of an English language teaching (ELT) course book and the potential for vocabulary learning through completing the text. They found that knowledge of the most frequent 2,000 words and the AWL would provide around 95% coverage. They also reported that few lower frequency and academic words were likely to be learned in the ELT course book and suggested that knowledge of the low-frequency words should be strengthened through studying additional suitable ELT texts.	**B, C**

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Year	References	Annotations	Theme
2010	Webb, S. (2010). Using glossaries to increase the lexical coverage of television programs. *Reading in a Foreign Language*, *22*(1), 201–221.	This study examined the lexical coverage of glossaries made up of low-frequency words found in television programs. **Webb** created glossaries comprising low-frequency words (beyond the most frequent 3,000 words) that occurred ten or more times in television programs. The findings indicated that the lexical coverage of the glossaries was 1.31% and 2.26%. In both cases, the amount of coverage was greater than that of the most frequent 3,001–4,000 word families, indicating that coverage provided by glossaries may be an efficient way to increase lexical coverage, and in turn comprehension.	**B, C**
2010	Webb, S. (2010). A corpus driven study of the potential for vocabulary learning through watching movies. *International Journal of Corpus Linguistics*, *15*(1), 497–519.	**Webb** examined the number of encounters with low-frequency words in single movies and sets of movies. In this study, low-frequency words were operationalized as word families belonging to the 4,000–14,000 word family lists from Nation's (2006) BNC lists. **Webb** found that the number of low-frequency words occurring ten or more times increased as the number of analysed movies increased. This suggested that watching movies regularly may create many opportunities for incidental learning of low-frequency words.	**B, C**
2010	Webb, S. (2010). Pre-learning low-frequency vocabulary in second language television programmes. *Language Teaching Research*, *14*(4), 501–515.	Based on the finding that 3,000 word families plus proper nouns and marginal words would provide 95% coverage of TV programs (see Webb & Rodgers, 2009b), **Webb** examined the extent to which knowledge of low-frequency topic- related words encountered in TV programs would boost lexical coverage. The coverage of ten word families ranged from 0.70% to 3.91% in different programs. This tended to provide greater coverage than learning 1,000 word families at the next level (e.g. 3,000–3,999 or 4,000–4,999).	**B, C**
2011	Hsu, W. (2011). The vocabulary thresholds of business textbooks and business research articles for EFL learners. *English for Specific Purposes*, *30*(4), 247–257.	This study examined the vocabulary sizes necessary to reach 95% and 98% coverage of Business English in two corpora: business textbooks and business research articles. **Hsu** found that knowledge of 5,000 and 8,000 word families plus proper nouns were necessary to reach 98% coverage of business textbooks and business research articles, respectively. Further analyses revealed that the vocabulary demands of business textbooks and research articles varied according to subject (e.g. business policy, marketing, accounting).	**B**
2011	Rodgers, M. P. H., & Webb, S. (2011). Narrow viewing: The vocabulary in related television programs. *TESOL Quarterly*, *45*(4), 689–717.	This study looked at the potential for vocabulary learning through related and unrelated television programs. The results indicate that there are fewer different words in related programs and the words within these programs reoccur more often than in unrelated programs. These findings support the results of Sutarsyah, Nation, & Kennedy's (1994) earlier study of academic text.	**C**
2011	Schmitt, N., Jiang, X., & Grabe, W. (2011). The percentage of words known in a text and reading comprehension. *Modern Language Journal*, *95*(1), 26–43.	**Schmitt et al**. examined the relationship between lexical coverage and reading comprehension. This comprehensive study of lexical coverage addressed the methodological limitations of Laufer (1989) and Hu & Nation (2000) and included representative samples of English language learners ($N = 661$) from eight different countries. Schmitt et al. found a linear relationship between coverage and comprehension when coverage was 90% and higher. At these levels of coverage, more words that are known in a text led to greater reading comprehension. The results support the findings of Hu & Nation (2000).	**A**

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2012	Coxhead, A., & Walls, R. (2012). TED Talks, vocabulary, and listening for EAP. *TESOL ANZ Journal*, *20*, 55–65.	This study examined the vocabulary coverage of TED Talks, an online platform which contains recordings of short academic spoken presentations given by experts at annual TED conferences, and explored whether the coverage of the AWL in TED Talks was similar to written academic texts. **Coxhead** & **Walls** found that that knowledge of 8,000–9,000 word families plus proper nouns were necessary to reach 98% coverage of TED Talks. This is similar to Nation's (2006) findings for written discourse at 98% coverage. Their analysis also revealed that the AWL accounted for 3.90% of TED Talks, similar to the AWL's coverage (4.41%) of academic spoken English (Dang & Webb, 2014), indicating that the AWL's coverage of academic spoken lectures is around half that of written academic texts (10%).	**B**
2012	Nation, I. S. P. (2012). The BNC/COCA word family lists. Retrieved from http://www.victoria.ac.nz/lals/about/staff/paul-nation	**Nation**'s 25 BNC/COCA 1,000-word lists are the most recently created lists being used in lexical profiling studies. They were created to better represent general service vocabulary at the 1,000- and 2,000- word-frequency levels, and were sourced primarily from spoken discourse at these levels. The rest of the lists were also designed to more accurately reflect international English and were therefore sourced from American and British supercorpora. There are four additional lists that include (1) a list of proper names, (2) a list of marginal words, (3) a list of abbreviations, and (4) a list of transparent compounds. Both sets of lists are freely available at Paul Nation's website. Information about the evaluation of the BNC/COCA word lists can be found in Nation & Webb (2011: chapter 8)[7] and Nation (2016: chapter 13).[8]	**D**
2012	O'Loughlin, R. (2012). Tuning in to vocabulary frequency in coursebooks. *RELC Journal*, *43*(2), 255–269.	This study provides a second evaluation of the vocabulary learning potential of English language course books (see Matsuoka & Hirsh, 2010). **O'Loughlin** evaluated three levels of a course book series that contained reading as well as listening passages in addition to supplementary texts. He found that only about 1,500 of the 2,000 most frequent words were encountered in the combined texts (reading, listening, supplementary). He suggests that other sources of meaning-focused input are likely necessary to learn high-frequency vocabulary.	**C**
2013	Brown, D. (2013). Types of words identified as unknown by L2 learners when reading. *System*, *41*, 1043–1055.	This study examined the types of words that might cause problems for learners in reading. After the participants marked inflected and derived forms of high-frequency words as unknown, **Brown** concluded that even L2 learners with a larger vocabulary size might have limited knowledge of derivational affixes at the higher frequency levels. Based on the finding, Brown suggests that lemma may be an appropriate unit of counting (alternative to word families) for lexical profiling studies.	**D**
2013	Laufer, B. (2013). Lexical thresholds for reading comprehension: What they are and how they can be used for teaching purposes. *TESOL Quarterly*, *47*(4), 867–872.	Because of contrasting recommendations of lexical thresholds for reading comprehension (see Laufer, 1989; Nation, 2006; Schmitt et al., 2011 etc.), **Laufer** suggests an optimal threshold that requires knowledge of 8,000 word families plus proper nouns to reach 98% coverage and a *minimum* threshold that requires around 5,000 word families including proper nouns to reach 95% coverage. She then describes a number of tools (complementary to those recommended in Webb & Nation, 2008) that can help teachers identify a text's lexical coverage and learners' vocabulary size. Laufer suggests that measuring learners' vocabulary size and their readiness for a text early on will enable teachers to identify potentially unknown words that might then be addressed via explicit word-focused instruction.	**B, D**

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2013	Reynolds, B. L. (2013). Comments on Stuart Webb and John Macalister's Is text written for children useful for L2 extensive reading? *TESOL Quarterly*, *47*(4), 849–852.	**Reynolds** questioned the validity of the word family as the unit of counting in studies of lexical coverage. He argued that it was L1 rather than L2 research that provided support for using word families as the unit of counting. In their response, Macalister & Webb (2013)[9] agreed on the need for L2 research to investigate the extent to which different units of counting are appropriate for learners at different proficiency levels.	**B, D**
2013	Webb, S., & Nation, I. S. P. (2013). Computer-assisted vocabulary load analysis. In C. Chappelle (Ed.), *The encyclopaedia of applied linguistics* (pp. 1–10). London: Wiley-Blackwell.	**Webb & Nation** provided an overview of lexical profiling studies. They also discussed how the RANGE program can be used to carry out lexical profiling studies and offered suggestions on how to interpret RANGE-based output for lexical analysis.	**B, D**
2013	van Zeeland, H., & Schmitt, N. (2013). Lexical coverage in L1 and L2 listening comprehension: The same or different from reading comprehension? *Applied Linguistics*, *34*(4), 457–479.	**van Zeeland & Schmitt**'s study is the most comprehensive research examining the relationship between lexical coverage and listening comprehension. They investigated L1 and L2 learners' listening comprehension of informal narratives. They found that listening comprehension may largely depend on the level of lexical coverage, and suggested that although 98% coverage may provide a high level of comprehension, 95% may be sufficient for good comprehension of informal narratives.	**A**
2013	Webb, S., & Macalister, J. (2013). Is text written for children useful for L2 extensive reading? *TESOL Quarterly*, *47*(2), 300–322.	This study examined the vocabulary size necessary to comprehend texts written for L1 children, L1 adults and L2 learners, and aimed to determine the numbers of words needed to reach the 98% coverage point that is associated with adequate reading comprehension (see Hu & Nation, 1990 and Schmitt et al. 2011). **Webb & Macalister** found that 10,000 word families plus knowledge of proper nouns and marginal words were necessary to reach 98% coverage of texts written for L1 children and L1 adults, while 3,000 word families plus knowledge of proper nouns and marginal words were necessary to reach 98% coverage of texts written for L2 learners. They suggested that texts published for L1 children (and L1 adults) may be challenging for L2 learners to understand and might not be suitable for L2 extensive reading programs.	**B**
2014	Anthony, L. (2014). AntWordProfiler (Version 1.4.1) [Computer Software]. Tokyo: Waseda University. Retrieved from http://www.laurenceanthony.net/	AntWordProfiler is freely available software created by Laurence Anthony as an alternative to the RANGE (Heatley et al., 2002) and Vocabprofile (Cobb n.d.) lexical profilers. Unlike RANGE, which is only compatible with Windows operating systems, **AntWordProfiler** is compatible with Windows, Macintosh and Linux.	**D**
2014	Dang, T., & Webb, S. (2014). The lexical profile of academic spoken English. *English for Specific Purposes*, *33*, 66–76.	This study examined the lexical profile of academic spoken English. The British Academic Spoken English corpus was analysed in the study. **Dang & Webb** found that learners need a vocabulary of around 4,000 word families plus proper nouns and marginal words to reach 95% coverage of academic spoken text. Their analysis also revealed that Coxhead's (2000) AWL accounted for 4.41% of academic spoken English. Knowledge of the AWL reduced the lexical burden of academic spoken English; learners who knew the AWL would only need a vocabulary of 3,000 word families plus proper nouns and marginal words to reach 95% coverage of academic spoken English.	**B**

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2014	Kaneko, M. (2014). Is the vocabulary level of the reading section of the TOEFL Internet-based test beyond the lexical level of Japanese senior high school students? *Vocabulary Learning and Instruction*. doi: http://dx.doi.org/10.7820/vli.v03.1.kaneko	This study analysed the vocabulary coverage of the reading section of the TOEFL iBT test by the Educational Testing Service. It was found that between 12,000 and 13,000 word families, including proper nouns, were necessary to reach 98% coverage. It is supported by the findings of Webb & Paribakht (2015) showing that more vocabulary is required to reach 98% coverage of the reading sections of proficiency tests compared to other written texts.	**B**
2014	Nation, P. (2014). How much input do you need to learn the most frequent 9,000 words? *Reading in a Foreign Language*, *26*(2), 1–16.	**Nation** investigated the amount of authentic text required to encounter words a sufficient number of times to potentially acquire certain vocabulary sizes. He found that if learners read 200,000 words, they could potentially learn the most frequent 2,000 words incidentally, and if they read 3 million words, they may be able to learn the most frequent 9,000 words.	**C**
2015	Kaneko, M. (2015). Vocabulary size required for the TOEFL iBT Listening Section. *The Language Teacher*, *39*(1), 9–14.	This study examined the vocabulary size necessary for comprehension of the listening section of the TOEFL iBT test. Using Nation's (2006) BNC lists, **Kaneko** reported that 3,000 and 6,000 word families (plus proper nouns and interjections) were necessary to reach 95% and 98% coverage, respectively. Kaneko suggests that Nation's (2012) BNC/COCA lists might yield more accurate text-coverage results because TOEFL iBT contains some words common in American English.	**B**
2015	Webb, S., & Paribakht, T. S. (2015). What is the relationship between the lexical profile of test items and performance on a standardized English proficiency test? *English for Specific Purposes*, *38*, 34–43.	This study examined the lexical profiles of listening, reading, and cloze test passages from an English proficiency test (CanTEST) used for university admission purposes in Canada. The findings revealed that for reading comprehension passages, 6,000 and 14,000 word families (plus proper nouns and interjections) were necessary to reach 95% and 98% coverage, respectively. Listening comprehension passages required 4,000 and 10,000 word families (plus proper nouns and interjections) to reach 95% and 98% coverage, respectively. **Webb & Paribakht** found either no correlation or small correlations between the amounts of lexical coverage of the test passages and scores on those passages. This led them to suggest that larger vocabulary sizes rather than lexical coverage may be most important for comprehension.	**A, B**
2016	Nation, P. (2016). Types, lemmas, and word families. In P. Nation (Ed.), *Making and using word lists for language learning and testing* (pp. 23–39). Amsterdam: John Benjamins.	In response to considerable debate about the choice between lemmas, types and word families when deciding on the unit of counting (e.g. Brown, 2013; Reynolds, 2013), **Nation** suggests that researchers 'need to look at the reasons why the counting is being done and who the lists will be used with' (p. 23).	**D**
2017	Schmitt, N., Cobb, T., Horst, M., & Schmitt, D. (2017). How much vocabulary is needed to use English? Replication of van Zeeland & Schmitt (2012), Nation (2006) and Cobb (2007). *Language Teaching*, *50*(2), 212–226.	**Schmitt et al.** reviewed three influential studies of lexical coverage by Cobb (2007), Nation (2006), and van zeeland & Schmitt (2013). Schmitt et al. recommended that further research on lexical coverage was needed and proposed that approximate replications of the studies are completed to establish more accurate lexical coverage figures.	**A, B, D**

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2017	Tegge, F. (2017). The lexical coverage of popular songs in English language teaching. *System*, *67*, 87–98.	**Tegge** examined the vocabulary demands of pop songs found in Billboard charts as well as teacher-selected songs for language teaching purposes. She found that teacher-selected songs had a lower lexical demand than regular pop songs.	**B**
n.d.	Cobb, T. Web Vocabprofile [accessed June 18, 2016 from http://www.lextutor.ca/vp/], an adaptation of Heatley, Nation & Coxhead's (2002) RANGE.	The Compleat Lexical Tutor is a free online website created and maintained by Tom **Cobb**. It offers a number of useful resources to language teachers and researchers. One of them is VocabProfile – a web-based version of RANGE (Heatley et al., 2002). Similar to RANGE, VocabProfile classifies words in a text by their frequency. VocabProfile allows users to analyse texts with several different word lists including West's (1953) GSL lists plus Coxhead's (2000) AWL, Nation's (2006) BNC lists, and Nation's (2012) BNC/COCA lists.	**D**