Do English Language Teaching materials offer the vocabulary that students need? A content-based analysis of three textbooks

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Abstract

The two-faceted nature of lexical frequency as the overarching factor in determining communicative usefulness and in contributing to vocabulary learning should be taken into account in language teaching textbooks. These constitute a basic tool of the teachers' repertoire in Foreign Language Teaching (FLT) contexts. However, the number of textbooks' lexical content analyses is not abundant and most of them yield non-positive results. The aim of the present study is to analyse the lexical profile of three well-known English as a Foreign Language (EFL) textbooks which belong to the same series and which are targeted at adult learners. The analysis examines which words are presented and how frequently they are included to verify whether such textbooks comply with the aforementioned two-faceted nature of lexical frequency. For that purpose, the amount of the lemmas, types and tokens and the frequency levels of the types of each textbook were computed by means of the computer programme RANGE (Nation, Heatley & Coxhead, 2002). Afterwards, the number of the lemmas of the three textbooks was a) matched with the number of lemmas assumed by The Common European Framework of Reference for Languages (CEFR) (2001, 2017) in accordance with each textbook's level and b) compared with the vocabulary growth rates (students' lexical learning capacity) as determined by the specialised literature. Results showed that each textbook's distribution of words per range was not entirely adequate in relation to their targeted levels of proficiency. Likewise, the textbooks exceeded the number of lemmas to be learnt from the perspective of both the quantitative requirements of the CEFR and learning rates. These results point to a certain authors' pedagogical manipulation of the lexicon to comply with editorial space restrictions, which entails distorting the normal patterns of lexical distribution of texts.

Keywords: textbooks; content analysis; EFL; vocabulary; frequency; range

Introduction

Vocabulary has always been at the forefront of Language Teaching throughout history (Howatt with Widdowson, 2004; Sánchez, 2009). It has generally been assumed that the more words one knows, the higher his/her communicative efficiency will be. As Meara and Jones (1988: 80) stated, "[…] speakers with a large vocabulary perform better than speakers with a more limited vocabulary".

Traditionally in Language Teaching, the most frequently occurring words have been considered those that should be learnt first (e.g. West, 1953; Gougenheim, Michéa, Rivenc & Sauvageot, 1954; Schmitt, 2000; Nation, 2013). Indeed, learning the most frequent words becomes a high priority in Language Teaching, since effectiveness in communication and lexical richness are intrinsically related to each other. However, information-processing based studies emphasise the limited capacity of the human brain in the acquisition of knowledge and the essential role of practice to consolidate it. Besides, in the case of vocabulary knowledge, as Ellis (2002: 152) maintains, "the recognition and production of words is a

function of their frequency of occurrence in the language" and that "each time we process [a word] there is a reduction in processing time". Therefore, if we can only learn a limited amount of the input that is accessed by our mind, it is of paramount importance to select the right input—the most frequent words as a paramount criterion—and how we learn it—by means of frequent encounters with the targeted words.

This two-faceted nature of lexical frequency as the overarching factor in determining communicative usefulness (e.g. Dang & Webb, 2016) and in contributing to learning (e.g. Norlund, 2015), should be taken into account in language teaching textbooks. These constitute the key tool in the teachers' repertoire, especially in FLT contexts (Tomlinson, 2012; Guerrettaz & Johnston, 2013), where the amount and quality of input is meager in comparison with Second Language (SL) settings. However, the amount of textbook content analyses focused on studying their lexical profile (see Harwood, 2014, for a review) is not abundant and most of them report non-positive results.

The aim of the present study is to analyse the lexical profile of three EFL/English Language Teaching (ELT) textbooks targeted at adult learners and which belong to the same well-known series (for the purposes of this study, 'EFL' and 'ELT' will be used interchangeably). The analysis will centre on which words are included and how frequent they are to verify whether such textbooks comply with the aforementioned two-faceted nature of lexical frequency.

In order to accomplish our aim, we compiled a corpus with the words in the three textbooks and classified them into types, tokens, lemmas and word families. A word family is a headword or lemma plus all its derivatives; for instance, 'learn', 'learning', 'learner', 'learners'. Types are different forms (spellings) of the same word; for example, 'learn', 'learning', 'learner', and 'learners' constitute four different types. Tokens are all the words that appear in a text (whether spoken or written), that is, the occurrences of the types. Then, the vocabulary of each textbook was correlated with the British National Corpus (BNC)-based frequency ranges provided by the computer programme RANGE (Nation, Heatley & Coxhead, 2002). Afterwards, the vocabulary of the three textbooks was matched with the quantitative requirements of lexical learning as derived from the CEFR (2001, 2017), taking into account each textbook's level. Finally, the results were compared with the vocabulary growth rates determined by the specialised literature.

This work is structured in seven sections. After this Introduction, the second section includes a brief literature review. The third section details the rationale of this study, after which the research questions (RQ) are stated in the fourth section. The fifth one explains the method followed, that is, the materials that were analysed and the computer programme used to measure lexical frequency (RANGE. Nation et al., 2002). The sixth section jointly reports the results and discusses them. Several concluding remarks are offered in the final section.

Background
This literature review addresses the nature of frequency as a key criterion to determine the vocabulary to be learnt by students and to facilitate their learning, the students' lexical learning capacity or vocabulary growth rates and studies dealing with textbook content analyses on vocabulary.

Frequency lists and communicative usefulness

Establishing the exact number of words students should learn per level remains a true challenge for linguists, teachers or textbook authors. The amount of factors implied in determining communicative needs (frequency, relevance, easiness of learning, etc.) makes it impossible to reach fully reliable conclusions. Nevertheless, frequency emerges as the prime criterion, as is the case with West's (1953) landmark work A General Service List of English Words, which contained 2,000 word families.

Traditionally, the most frequent words in a language are considered to be the most useful ones for communicative purposes, which accounts for the appearance of frequency lists targeted at specifying which words students should learn per level. In this respect, traditional teaching materials and praxis have conventionally relied on a three-level classification: elementary, intermediate and advanced levels, which were enlarged by the CEFR (2001, 2017) as A1+A2 (Basic User), B1+B2 (Independent User) and C1+C2 (Proficient User) levels. The Situational Language Teaching Method from the 1950s helped to consolidate the principle that, in the first level, students were expected to learn from 800 to 1,000 words, followed by up to 2,000 words in the second level and up to 3,000 words in the third level (Howatt with Widdowson, 2004; Sánchez, 2009).

Other larger and more sophisticated corpora-based studies indicate that the amount of vocabulary that people are exposed to in daily communication seems to be large in number of tokens (words) but reduced in types (different word forms). This implies that the amount of different words we use in daily communication is lower than often assumed (Nation, 2011; Aitchison, 2012). The Brown Corpus (Kučera & Francis, 1967), a one million-word corpus of American English, revealed that the first one thousand most frequent lemmas cover 72% of an average general American English text. The first six thousand lemmas account for up to 90% of it. A study based on the BNC (Leech, Rayson & Wilson, 2001) showed similar results. Furthermore, according to Nation and Waring (1997), if we were to consider word families instead of lemmas or word forms, three to five thousand word families would be required to cover an average written text. Nation (2006) concludes that reading a novel requires the knowledge of 8,000 word families approximately, which would cover up to 98% of text.

In all, basic language communicative needs are considered to be covered with the first one thousand words of a service list (Dang & Webb, 2016), two to three thousand (Schonell, Meddleton & Shaw, 1956; Schmitt, 2000) and three thousand (McCarthy, 1998; Adolphs & Schmitt, 2003).

Frequency and vocabulary acquisition

Frequency affects not just which words are to be learned, but also how to help students maximise the consolidation of such words.

In terms of general learning, information-processing theories (Atkinson & Schiffrin, 1968; Baddeley & Hitch, 1974; McLaughin & Heredia, 1996) highlight the limited capacity of human attention for learning skills, language mastery being considered one of them. For the full attainment of skills, controlled processes, which are very tight in capacity and require time to be activated, must be solidly acquired so that attention can be directed at further stages of skill learning requiring higher-level processing or at the learning of other more complex skills. The key factor in the process to automatise a skill is practice or overlearning, as it is empirically revealed in other cognitively based studies such as Rundus (1971) and

Kapur, Craik, Tulving, Wilson & Brown (1994). As to language learning specifically, usage-based theories also emphasise the importance of frequent exposure to linguistic items and constructions in order to consolidate their knowledge (Ellis & Wulff, 2015).

Thus, from a cognitive viewpoint, repetition or frequency is essential to learn both the form and meaning of vocabulary (Waring & Takaki, 2003; Norlund, 2015; Dang & Webb, 2016, etc.). Nevertheless, although researchers concur on the fact that frequency of encounters is a crucial factor in L2 vocabulary learning, they disagree as to the exact number of encounters needed: 5-6 (Cameron, 2001), 6-7 (Morin & Goebel, 2001; Gardner, 2008), 7 or more (Kachroo, 1962); 8 (Horst, Cobb & Meara, 1998), 8-10 times (Schmitt, 2008; Webb, 2007), 10 (Nation & Wang, 1999), 10-12 (Coady, 1997; Nation, 2014),

16 or more (Saragi, Nation & Meister, 1978), 20 or more (Waring & Takaki, 2003; Pigada & Schmitt, 2006). As Webb and Nation (2013: 4) summarise, there should be at least between 7 and 16 encounters with each word and repetition should be spaced rather than massed (or concentrated).

Students' quantitative capacity of L2 vocabulary learning

Besides considering which words to learn and how to learn them, a very important issue in L2 vocabulary learning is the growth rates or how many words the students are able to learn throughout time.

Ito and Bauman (1995), in their empirical study with Japanese college students during an intensive six-week-period classroom setting involving 4 hours a day and 5 days a week, reached the conclusion that these subjects learnt one word per teaching hour. Similarly, research carried out by Waring and Takaki (2003: 148) on graded readers concluded that on average "the subjects learned one new word from an hour of reading". Alcaraz's (2011) results regarding the learning potential of Spanish elementary school children during a term with 4 weekly hours of instruction showed that children learnt 3.6 words per teaching hour during a three-month period. Other studies have revealed that, per year, L2 learners can acquire 500 lemmas (Milton, 2009) or 400 word families approximately (Webb & Chang, 2012). 500 lemmas entail learning almost 3.5 lemmas per teaching hour if considering an academic year as composed of 30 weeks, 5 EFL weekly hours.

Lexical textbook content analyses
There exist several corpus-based studies targeted at analysing the lexical content of EFL textbooks for General English. Their number is not abundant regardless of the importance of both the textbook as a core teaching instrument in FLT (Tomlinson, 2012; Guerrettaz & Johnston, 2013), and the issues reviewed above in terms of the vocabulary the students should learn and how.
In one of the earliest, pioneering studies, Miranda (1990) analysed the lexical core of sixteen three-level course books published in the 1980s, which were targeted at Spanish Secondary Education. His results showed that different and unsystematic selection criteria were used, the consequence being that the textbooks did not share a minimum lexical core. Similar conclusions were reached by Rixon (1999), who

found that there seemed to be a striking lack of agreement in terms of vocabulary selection in seven beginner textbooks for young learners; likewise, the opportunities for recycling words were deemed to be insufficient. This last result coincides with Matsuoka and Hirsh's (2010) study of the lexical items of an upper-intermediate EFL textbook. They reported that "the text was found to offer few opportunities to expand vocabulary knowledge beyond the first 2,000 words and academic words" (Matsuoka & Hirsh, 2010: 67).

Koprowski (2005) obtained analogous results in his analysis of three intermediate and upper-intermediate textbooks for young adults and adults. He compared the frequency and range of the multi-word items in the three textbooks against the Cobuild Corpus. He found that more than 14% of such items were not present in the corpus, that no multi-word element was shared by any of the three textbooks and that the lexical selection criteria seemed to favour the general topic or concept underlying the lexical multi-word items, in the same line as Miranda (1990). This meant the inclusion of many non-frequent multi-word items for the sake of illustrating the general topic with as many lexical phrases as possible—regardless of their frequency and range, which are "both considered fundamental criteria for pedagogic usefulness" (Koprowski, 2005: 328).

Parallel conclusions to Koprowski's (2005) were reached by Gouverneur (2008) and Jiménez and Mancebo

(2008). The first one studied the phrases containing the verbs "make" and "take" in three intermediate and advanced textbooks. The patterns with "make" made up only 7% in the intermediate course books and 15% in the advanced textbooks, while the patterns with "take" were not present in any of the advanced course books. Jiménez and Mancebo (2008) compared the appearance and frequency of the first most frequent fifty function and content words in four textbooks from Spanish Primary and Secondary Education (two course books per educational stage). They found that the Primary Education textbooks differed more than the Secondary Education course books in terms of the words included. More specifically, the amount of the non-shared words between the two course books of the first educational stage was slightly higher than that of the textbooks pertaining to the second educational stage. The authors reached the unsatisfactory conclusion that the lexical items to be learnt by students who belong to the same educational stage may vary depending on the course book chosen. The Secondary Education textbooks also offered a higher difference in terms of the types and tokens included. In the Swedish context, Norlund (2015) studied the vocabulary from three EFL materials for students aged between 10 and 12. Her findings indicated that the amount of high-frequency words was scarce as compared with the total number of types in the word classes of noun, adjective and verb, thus diminishing the opportunities for recycling such words, like Rixon (1999) and Matsuoka and Hirsh (2010). As in Koprowski (2005), the choice of vocabulary did not seem to be driven by frequency criteria but by affinity with the topics.

Besides the vocabulary choice and frequency of words plus the opportunities for recycling, other studies have also examined up to what extent EFL textbooks comply with the vocabulary acquisition rates indicated in the specialised literature (see above). Criado (2009) analysed the full lexical content of a textbook targeted at the last year of Spanish Upper Secondary Education, that is, mostly a B1 level (CEFR, 2001, 2017). Similarly to many of the previous works, the results showed that the material included too many words above the three first ranges or the three thousand most frequent words, which entailed that the textbook forced the students to learn words not pertinent to their level; there were not enough multiple instances of the same lexical types to ensure deeply-rooted learning and the amount of lemmas presented to the students was too high in relation to their assumed rates of learning. However, the

textbook did include a reasonable amount of explicit vocabulary-based activities—one third of all the activities. Besides, the conscious pedagogical manipulation of the lexical items in one of them was more evident since it displayed a higher amount of types and a lower amount of tokens, which distorts the normality of lexical distribution (Zipf, 1949).

Finally, from a different perspective from the previous studies, and based on Nation's (2001) aspects of word knowledge, Brown (2011) examined the vocabulary activities of nine General English textbooks from beginner to intermediate levels. He found that the textbooks "give most attention to form and meaning, then grammatical functions, then spoken form" (Brown, 2011: 94), but the remaining six aspects (written form, word parts, concept and referents, associations, collocations and constraints on use such as register and frequency) were hardly attended to.

As can be seen, regardless of age groups and levels, the general findings from all the previous studies, which used EFL textbooks from the 1980s until the late 2000s, can be summarised as follows: a common lack of systematic criteria for the selection of vocabulary (Miranda, 1990; Rixon, 1999; Koprowski, 2005; Gouverneur, 2008; Jiménez & Mancebo, 2008; Norlund, 2015) and a scarce number of the opportunities for repetition and recycling of the words included (Rixon, 1999; Criado, 2009; Matsuoka & Hirsh, 2010; Norlund, 2015).

Rationale

The previous textbooks' content analyses have yielded valuable insights as to the profile of such textbooks, both in terms of their lexical content and their underlying pattern of lexical repetition. Nevertheless, there is still an imperative need to conduct more related textbook content analyses due to several reasons: the non-high number of such works and the extreme importance of textbooks as the containers of the L2 input and practice opportunities in FLT settings. Moreover, FLT scenarios at a local or a national level require specific targeted studies to verify whether the officially prescribed textbooks comply with the requirements of the specialised literature as regards the two-faceted nature of lexical frequency—communicative usefulness and facilitation of learning. In this way, possible mismatches can be detected and attempted to be solved by the teacher.

Accordingly, in this study we will focus on one of these local FLT scenarios: Spanish state-run Official Schools of Languages, an institution where foreign languages have been taught to adults and young adults for more than thirty-five years.

Research questions

The research questions that this study pursues to answer are the following ones:

RQ1: What is the amount of lemmas, types and tokens in each textbook?

RQ 2: Does the actual amount of the new lemmas provided in each textbook match the amount of the new lemmas expected to be learnt according to the CEFR's (2001, 2017) corresponding level of each textbook?

RQ3: What is the vocabulary distribution of each textbook per range?
This RQ is divided into two sub-RQs:

RQ3.1: To which range do the lemmas, types and tokens of each textbook correspond? RQ3.2: What is the frequency of the types of each textbook within each range?

RQ4: Does the amount of the new lemmas provided in each textbook match the lexical learning rates detected in the specialised literature?

Method

Analysed ELT materials
It should be observed that in order to avoid advertising issues and other conflicts related to the selection of these textbooks, all the information concerning such course books has been kept to a minimum throughout this article.
The textbooks that were analysed belong a very successful seven-title series published by an international editorial house. The CEFR's (2001, 2017) levels covered by the series range from A1 to C1. The series follow the weak version of the Communicative Language Teaching Approach (CLT) (Howatt, 1984) and all their units include a balanced number of skill-based activities and grammar and vocabulary exercises. The three textbooks analysed were the Elementary (2004), Pre-intermediate (2005) and Intermediate (2006) student's book (Textbook 1, Textbook 2 and Textbook 3 hereafter).

Textbook 1 is targeted at the second half of A1 and complete A2, Textbook 2 covers the second half of A2 and the first half of B1, and Textbook 3 is aimed at the second half of B1 and the first half of B2.
Such three textbooks were selected because the series they belong to are widely used in Spanish Official Schools of Languages, whose students' age group, adults and young adults, is the same as that of the series. Specifically, we focused on the Elementary, Pre-intermediate and Intermediate textbooks because they cover from the elementary level to the crucial level from which the students become independent (CEFR, 2001, 2017): the Threshold level (and half Vantage in the case of Textbook 3). Accordingly, the three textbooks represent the Spanish population's most frequent EFL levels.

The computational tool for the performance of the analysis

The analytical instrument of this study was RANGE (http://www.victoria.ac.nz/lals/about/staff/paul-nation), a computational tool designed by Nation et al. (2002). RANGE classifies the words of texts in three categories (tokens, types and word families). It also provides the quantity figures for each category and how often words appear in the texts. Although it does not register any lemma category, lemmas, as well as types, were adopted as the basic units to analyse the three textbooks' vocabulary, given that both are necessary to examine the lexical learning units of the textbooks in an accurate way. For instance, "bake" and "baker" share the same lemma but constitute two different types. Just considering lemmas or types would incompletely reflect the lexical profile of the textbooks. Accordingly, we added a lemma category to Nation et al.'s (2002) categories of token, type and word family. The new lemmas in each textbook were manually calculated. A new lemma is regarded as that which has not occurred in any of the previous course books of those under consideration in this study.
Secondly, RANGE classifies the words into frequency groups or ranges which are derived from BNC-based frequency lists. Each range has one thousand words (at present up to 14). RANGE identifies the

types found in the textbook and checks whether they are present or not in the BNC-based frequency lists and their corresponding ranges. The words in the texts which are not present in any of the ranges are classified as "off range". Taking into account studies which indicate that high-frequency vocabulary should include the first 3,000 word families (Schmitt & Schmitt, 2014) or the first 1,000 most frequent words as a general service list (Dang & Webb, 2016), for the purposes of this study we will only consider the first three ranges, that is, the 1,000, 2,000, and 3,000 most frequent words.

Results and discussion

The results will be reported and discussed for each research question.

RQ 1. What is the amount of lemmas, types and tokens in each textbook?
As can be seen in Fig.1, the three textbooks are very similar regarding the amount of tokens included, particularly Textbook 2 and Textbook 3. However, they vary in the amount of types and lemmas: Textbook 3 includes a higher amount of both types and lemmas than Textbook 1 and Textbook 2. More specifically, the percentage of types out of all the tokens is 10.3% in Textbook 1, 11.7% in Textbook 2 and 14.3% in Textbook 3; the percentage of lemmas out of all the tokens is 7.3% in Textbook 1, 8% in Textbook 2 and 9.7% in Textbook 3.
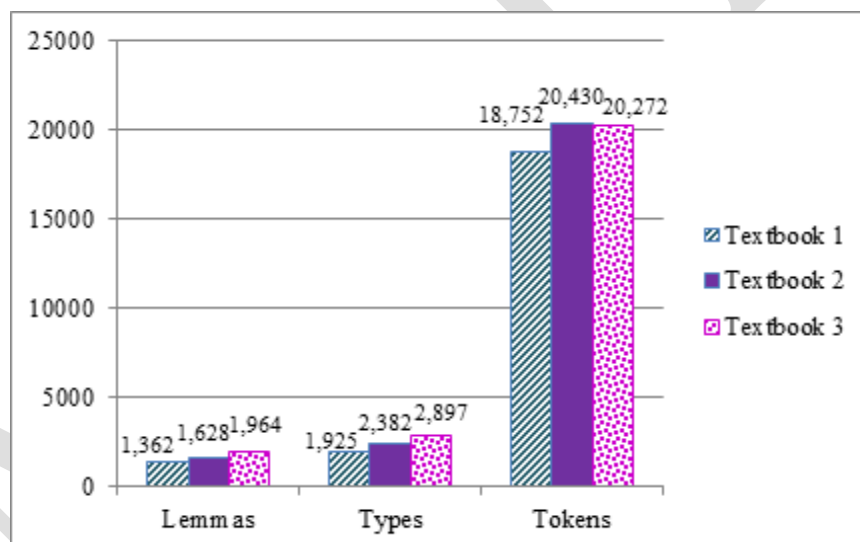

Fig. 1. Lemmas, types and tokens in Textbook 1, Textbook 2 and Textbook 3.

Such numbers mean that the chances for repetition decrease in more advanced levels, which present more new types as well. The amount of types in each textbook increases from 1,925 in Textbook 1 to 2,897 in Textbook 3 (see Fig. 1). This is a sensitive result: the higher the level, the more new types are included. However, the amount of tokens is only moderately higher in Textbook 3 regarding Textbook 1 (20,272 as opposed to 18,752). The progressive increase in types of Textbook 3 does not seem to adjust to Zipf's (1949) law of vocabulary distribution well, according to which more tokens of the same new types should

be required for such an increase. In other words, natural occurrence of lexical items in textbooks is not possible if a balance must be kept between both a moderate amount of very frequent lemmas and a moderate increase in the quantity of new, less common lemmas. This mismatch reveals a serious problem for textbook authors: if they want to augment the number of new types, they must increase the size of the texts included. Increasing the size of texts, however, does imply augmenting the number of common and basic words, in such a way that if less common words are to be presented and sufficiently practised, the size of the sample texts needed would exceed the possibilities offered by textbooks in terms of edition and format. Consequently, establishing a balance between both aspects requires the "pedagogical manipulation" of teaching materials, that is, texts, exercises, etc., which allows for the incorporation of less common and more new lemmas within the limits demanded by publishing houses. This is a standard practice carried out by textbook authors, consciously or not, and these course books' authors certainly comply with such a standard practice. Similar results were obtained by Criado (2009).

RQ 2. Does the amount of the new lemmas provided in each textbook match the amount of the new lemmas expected to be learnt according to the CEFR's (2001, 2017) corresponding level of each textbook?

For the purposes of our analysis, it could be assumed that Range 1 covers the first 500 lemmas in the textbook prior to Textbook 1 (full A1) plus the second 500 most frequent lemmas in Textbook 1 (full A2); that Range 2 includes 250 new lemmas in Textbook 2 (first half of B1) plus 500 new lemmas in Textbook 3 (second half of B1 and first half of B2) and 250 lemmas in the textbook immediately following Textbook 3 (full B2). Table 1 visually summarises these figures:

Table 1. Correspondence of each textbook with its CEFR's level, Nation et al.'s (2002) ranges, the amount of new words to be learnt according to each textbook's CEFR's level and the amount of lemmas included in each textbook.

Textbook	CEFR's (2001, 2017) levels	Nation et al.'s Range (2002)	New (or expected-to-be-learnt) lemmas according to the CEFR's level	Amount of lemmas included in the textbooks
Textbook 0 (Beginners)	A1	RANGE 1: first 1,000 most frequent words	500	
Textbook 1 (Elementary)	A2		500	1,362
Textbook 2 (Pre-intermediate)	B1.1		250	1,628
Textbook 3 (Intermediate)	B1.2	RANGE 2: second 1,000 most frequent words	250	1,964
	B2.1		250	
Textbook 4 (Upper-intermediate)	B2.2		250	

However, as can be observed in Fig. 2, Textbook 1 includes 36.2% more lemmas than students would be expected to learn following the correspondence between Nation et al.'s (2002) ranges and the CEFR's (2001, 2017) linguistic levels. Textbook 2 reduces the surplus to 30.2%, and Textbook 3 further reduces it to 12.2%. This means that the expectations regarding expected vocabulary learning and the actual vocabulary load included in each textbook do not fully match, which coincides with Criado (2009).
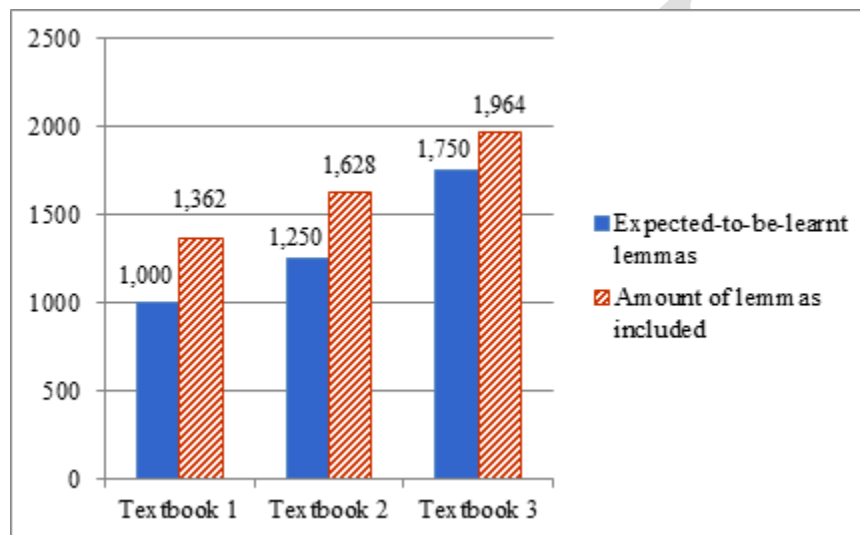

Fig. 2. Expected-to-be-learnt lemmas vs. amount of lemmas in the three textbooks.

RQ 3. What is the vocabulary distribution of each textbook per range?

RQ 3.1. To which range do the lemmas, types and tokens of each textbook correspond?

Table 2 below completes the information about the amount of tokens, types, lemmas and word families in each one of the textbooks analysed as provided by RANGE. Figures refer to content words only, given that function words have been excluded. Also, off-range items in the analysis are not considered, since a review of the off-range lists revealed that most of them are proper names, foreign words or misspellings.

As can be seen, the number of types of the three textbooks belonging to Range 1 is the highest one out of the three ranges, 4,393 versus 1,989 and 822 types in Ranges 2 and 3 respectively. Let us explore in more detail the lexical distribution of types in each range for each textbook.

Table 2. Word counts for Textbook 1, Textbook 2 and Textbook 3.

Textbook 1

RANGE	TOKENS/%	TYPES / %	LEMMAS	WORD FAMILIES
one	15,493/71.6	1,243/41	815	649
two	2,403/11.1	470/15.5	366	347
three	856/4	212/ 7	181	170
Total 3 ranges	18,752	1,925	1,362	1,166
off ranges	2,888/13.3	1,104/36.4	835	?????
Grand Total	21,640	3,029	2,197	1,166

Textbook 2

RANGE	TOKENS/%	TYPES / %	LEMMAS	WORD FAMILIES
one	16,980/73	1,447/43.3	930	737
two	2,585/11.1	657/19.7	481	442
three	865/ 3.7	278/8.3	217	205
Total 3 ranges	20,430	2,382	1,628	1,384
off ranges	2,845/12.2	959/28.7	915	?????
Grand Total	23,275	3,341	2,543	1,384

Textbook 3

RANGE	TOKENS/%	TYPES / %	LEMMAS	WORD FAMILIES
one	16,635/72.2	1,703/41.1	1,061	802
two	2,719/11.8	862/20.8	640	581
three	918/4	332/8	263	270
Total 3 ranges	20,272	2,897	1,964	1,653
off ranges	2,754/12	1,249/30.1	1,181	?????
Grand Total	23,026	4,146	3,145	1,653

RQ 3.2. What is the frequency of the types of each textbook within each range?

For the purposes of our study, three frequency bands were considered: 10 or more for high frequency, 9 to 2 times for middle frequency and 1 time for the absence of frequency. Figs. 3-5 illustrate the number of types per textbook distributed per frequency band in each respective range.

From such Figures it can be detected that the amount of types with the highest frequency band in the textbooks, more than 10 times, is far higher in Range 1 (a mean of 26.9%), while it sharply decreases in Ranges 2 and 3 (a mean of 9% and 6.3% respectively). Therefore, opportunities for repeating the same items within this band are higher in Range 1 than in Ranges 2 and 3. Accordingly, it seems that the words which are likely to be consolidated in the three textbooks are those belonging to Range 1—which constitutes the full target of Textbook 1 and partially that of Textbook 2, but not that of Textbook 3 (see Table 1).

As to the 9-to-2-times frequency band, the figures are more stable and higher than those of the previous and next frequency bands. The results show a mean of 48.9%, 49.2% and 43.6% in Ranges 1, 2 and 3 respectively. These figures imply that, across levels, the textbooks favour lexical enlarging rather than consolidation per se by means of repetition.

Regarding the types with only one occurrence, their number is higher in Range 3 (a mean of 50%). For Range 2, the figures moderately decrease to a mean of 41.9% and the drop is considerably tangible in Range 1 with a mean of 24.2%. This pattern of the 1-time frequency band seems to (at least) partially match the lexical objective of the textbooks (see Table 1). Range 3 is not the target of either textbook and, thus, it reflects the highest mean of types that are found once, the lowest mean of this frequency band being located in Range 1.
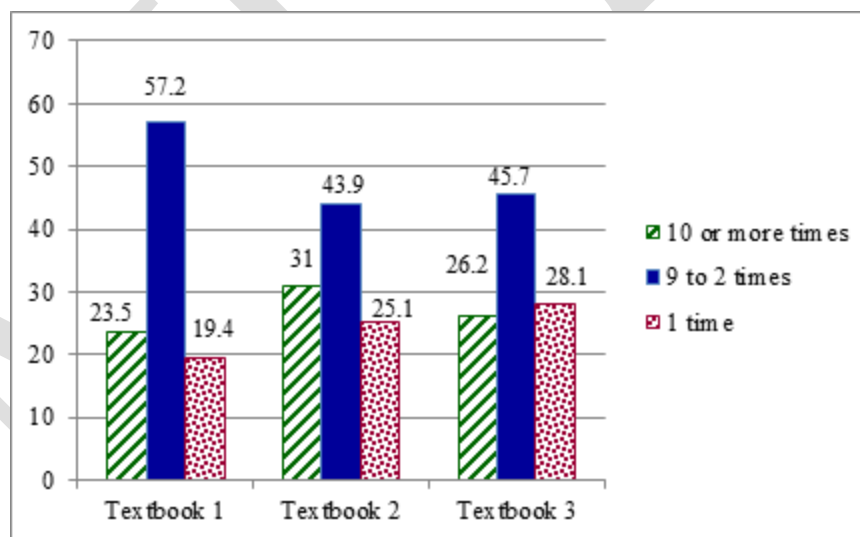

Fig. 3. Frequency of types of Textbooks 1, 2 and 3 in Range 1 (in %).
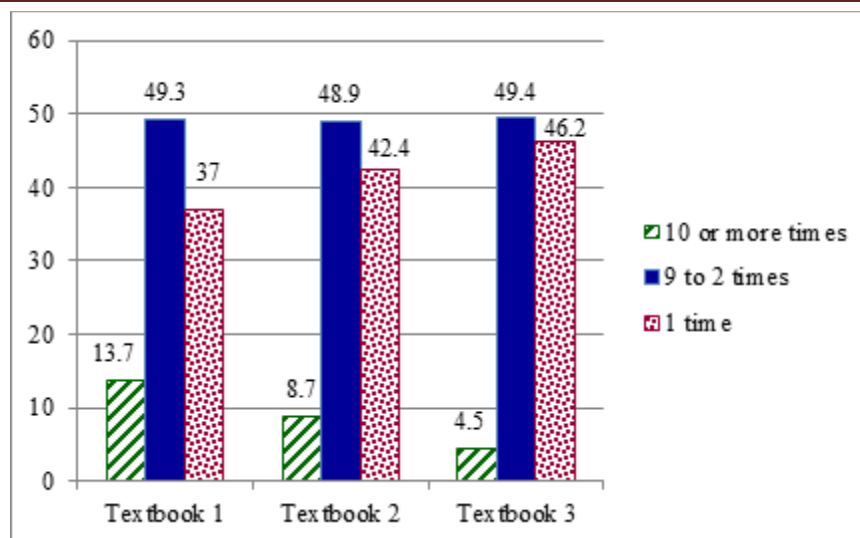
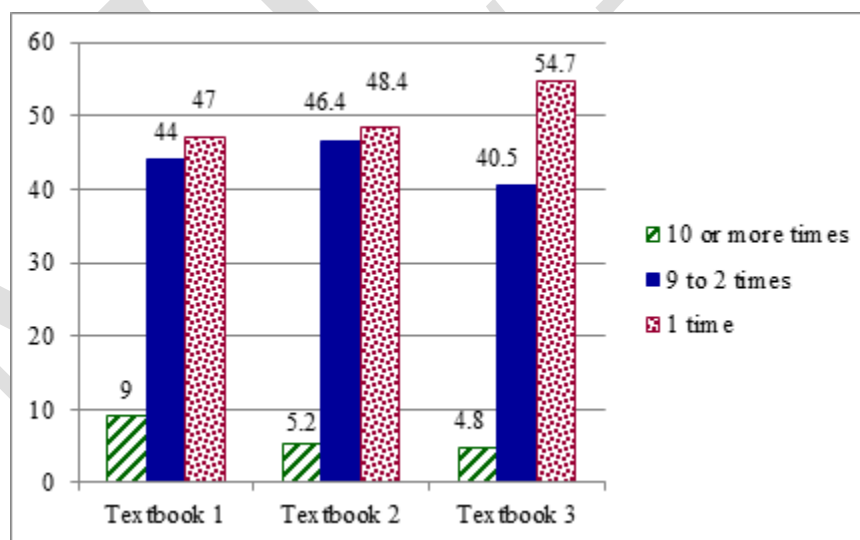Fig. 4. Frequency of types of Textbooks 1, 2 and 3 in Range 2 (in %).

Fig. 5. Frequency of types of Textbooks 1, 2 and 3 in Range 3 (in %).

If we analyse the frequency of types within each range in each textbook, it can be observed that, for Range 1 (Fig. 3), the 10-or-more-times frequency band is higher in Textbook 2 and Textbook 3 than for Textbook 1 (31% and 26.2% versus 23.5% respectively). Thus, the chances for frequent repetition of types from Range 1 augment in more advanced levels. For Textbook 1 in Range 1 the addition of the figures of the 10-or-more-times frequency band and those of the 9-to-2-times reach 80.7% and the 1-time frequency band figure is the lowest one in Textbook 1 (19.4% versus 25.1% and 28.1% in Textbook 2 and Textbook 3 respectively). Regardless of the two previous results, the fact that the 10-or-more-times frequency band in Range 1 is the lowest in Textbook 1 out of the three textbooks seems to be a counter-intuitive fact, given that the lexical target of Textbook 1 is precisely Range 1 (see Table 1). That is, Textbook 1 should ensure the consolidation of Range-1 types by favouring a more abundant repetition of such types. A parallel pattern, that is, lack of opportunities for recycling, was detected in Rixon (1999), Criado (2009), Matsuoka and Hirsh (2010) and Norlund (2015). As indicated in Frequency and vocabulary acquisition, from a cognitive perspective, more frequent words have more chances to be learnt (Waring & Takaki, 2003; Ellis & Wulff, 2015; Norlund, 2015; Dang & Webb, 2016, etc.). Textbook 2 and Textbook 3 should not display a higher percentage of the 10-or-more-times frequency band for Range 1 than Textbook 1 but a higher percentage of the 9-to-2-times frequency band in this range so as to offer more new types to the students and thus favour lexical enlargement. In other words, especially Textbook 3 should display a higher percentage of the 9-to-2-times frequency band to allow for opportunities to widen the students' lexical repertoire, regardless of the fact that the Range-1 types will necessarily be frequently repeated as they make up for basic language following the law of vocabulary distribution in texts (Zipf, 1949).

The fact that Textbook 2 and Textbook 3 present higher percentages of the 10-or-more-times frequency band than Textbook 1 can be accounted for by the explanation in RQ 1 about the apparently insufficient number of tokens of Textbook 3 in comparison with its number of types. That is, higher levels require using longer texts for the inclusion of newer types, and this also inevitably entails increasing the number of Range-1 items.

As to Range 2 (see Fig. 4), the pattern of results is reversed: Textbook 1 has the highest percentage of types in the 10-or-more-times frequency band, 13.7% as opposed to 8.7% and 4.5% in Textbook 2 and Textbook 3 respectively. Moreover, in this range the percentage of Textbook 1 in the 9-to-2-times frequency band is virtually the same as in Textbook 3 (49.3% versus 49.4%) and even slightly higher than that of Textbook 2 (48.9%). In all, the addition of the numbers of the 10-or-more-times frequency band and those of the 9-to-2-times frequency band in Range 2 makes 63% for Textbook 1, 57.6% for Textbook 2 and 53.9% for Textbook 3. It seems reasonable to have expected that Textbook 2 and Textbook 3 displayed a higher percentage than Textbook 1 in Range 2 of the 10-or-more-times frequency band in order to comply with such a range, which is the full lexical objective of Textbook 2 and 3 (see Table 1).

Regarding Range 3 (see Fig. 5), contrary to expectations, Textbook 1 shows the highest percentage of the 10-or-more frequency band (9% against 5.2% and 4.8% in Textbook 2 and Textbook 3 respectively) as well as the lowest once-frequency band (47% versus 48.4% in Textbook 2 and 54.7% in Textbook 3). Given that Range 3 is not the lexical target of Textbook 1, the reversed pattern of results would have been more suitable and sensitive.

The results from RQ 3.1 and RQ 3.2 can be summarised as follows:

a) Globally, Range-1 lexical items are far more frequent in the three textbooks in comparison with Range-2 and Range-3 words. Given that the corresponding new lemmas in Textbooks 2 and 3 pertain to Range 2, the results should have reflected this fact more suitably.

b) Across levels, the three textbooks offer higher opportunities for lexical repetition of words within Range 1, which is the target of Textbook 1. Likewise, the three course books mostly favour lexical expansion rather than consolidation, due to their higher percentages of the 9-to-2 frequency band.

c) Within textbooks, Textbook 1 should have ensured the consolidation of Range-1 words by offering a more abundant repetition of such types; however, its 10-or-more-times frequency band is the lowest one of the three textbooks. Simultaneously, the frequency band of 10-or-more-times for Range 3 in Textbook 1, the highest one in the three course books, should have been much lower.

d) Textbook 2 and Textbook 3 should both have had a higher percentage of Range-2 words in the 10-or-more-times frequency band to comply with their lexical target as well as a higher percentage of the 9-to-2 frequency band in Range 1 to help expand the students' lexical stock.

RQ 4. Does the actual amount of new lemmas provided in each textbook match lexical learning rates detected in the specialised literature?

The amount of new lemmas in each textbook must take into account the students' learning potential or vocabulary growth rates as indicated in the specialised literature (see Lexical textbook content analyses). Let us assume that the average amount of lessons per school year is around 100 hours. Therefore, students are exposed to the following quantities of lexical input in each textbook:

Textbook 1 (1,362 lemmas). The students are supposed to face 13.6 lemmas per hour. Given that 862 lemmas are new (the 500 assigned in the textbook's level plus the additional 362 included, as can be seen in Table 1), the students should learn 8.6 new lemmas per hour.

Textbook 2 (1,628 lemmas). The learners are assumed to handle 16.3 lemmas per hour. 628 are new (the expected-to-be-learnt 250 plus the additional 378), thus the students' learning rate should be 6.3 new lemmas per hour.

Textbook 3 (1,964 lemmas). The students should deal with 19.6 lemmas per hour. 714 are new lemmas (the 500 new lemmas according to the textbook's level plus the additional 214), which amounts to 7.1 per hour that should be learned by the students.

Table 3 below comparatively summarises the results of the research studies mentioned in Student's quantitative capacity of L2 vocabulary learning with those of the three targeted textbooks. As can be seen, overall, the three textbooks analysed here supply the students with an amount of lexical input above their learning capacity, a similar result to Criado (2009).

Table 3. Research findings on student's lexical learning rate and comparison against the amount of lemmas in Textbook 1, Textbook 2, Textbook 3.

	Ito and Bauman (1995)	Waring and Takaki (2003)	Alcaraz (2011)	Textbook 1 (2004), Textbook 2 (2005), Textbook 3 (2006)
Context	Japanese college students	Graded readers	Spanish elementary school children	Young adult / Adult learners
Instruction	An intensive six-week-period	Extensive reading outside the classroom	A term period, 4 hours a week	A 100-hour course

	classroom setting, 4 hours a day, 5 days a week.			
Learning rate	One new word per teaching hour	One new word per reading hour	3.6 new words per teaching hour	New lemmas (mean): 7.3 per hour

Conclusion

This work aimed to study the lexical profile of three textbooks targeted at consecutive levels and pertaining to the same series. Such a profile is not fully positive. Results showed that the lexical component in each one of the textbooks did not quantitatively match the lexical target that each one them should aim at in accordance with their levels as established by the CEFR (2001, 2017), which means that the students are supposed to learn more lemmas than those assumed in their levels. Also, according to the level of proficiency claimed by each one of the textbooks, types per range were not suitably distributed as expected and the frequency of the types within the ranges theoretically targeted at by each textbook was not entirely adequate. Finally, the three textbooks pushed the students to learn at a higher rate than their learning potential as identified in the specialised literature.

On the basis of these findings, the following recommendations are suggested. The textbooks should include a more restricted number of words in accordance with the ranges corresponding to their claimed levels so that students do not get discouraged by an excessive amount of words to be learnt and so that they perceive the usefulness of the lexical items they are supplied with. A high number of non-frequent words or words belonging to Range 3, which is not the lexical target of any of the three textbooks, should be removed so that their learning does not interfere with that of the lexical items the students should learn. The latter should frequently be repeated and recycled in different aural and written texts and in receptive and productive modes.

By no means would I want to downgrade the effort that devising Language Teaching textbooks implies and even less in this case, as the targeted series is very successful worldwide, which certainly indicates that it manages to suit teachers' and learners' tastes. Indeed, choosing the right vocabulary and setting its optimal frequency is a challenging task for textbook authors, especially if they want to use authentic samples as recommended by CLT. It is well known in Corpus Linguistics that the normal patterns of distribution of vocabulary in authentic texts implies that they are made up of a small stock of very frequent words, both of a functional and lexical nature, and a larger amount of non-frequent words. Adding new types of a reasonable frequency of occurrence entails increasing the number of very frequent words as well, thus augmenting the tokens and the overall text, whose limits could fall outside those allowed by the editorial houses. Most probably, the results of this study, especially those referring to the mismatch between the textbooks' levels and its corresponding ranges, could be due to a conscious pedagogical manipulation on the authors' part to comply with the restrictions imposed on text length by the editorial house, which distorts the normal patterns of lexical distribution, or to the need to include certain words as contextually required by the topic of the text.

To conclude, textbook authors should use general frequency lists to choose the lexical items in their textbooks and set their frequency of appearance. At the same time, they should probably acknowledge the need for pedagogical manipulation when combining the criteria of the pedagogical usefulness of frequency, requirements of CLT and the patterns of normal lexical distribution.

Acknowledgements

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