

Article

Exploring the Productive Vocabulary of EFL Learners Through Lexical Availability

Rosa M^a Jiménez-Catalán

University of La Rioja, Spain

Received: 1 October, 2022/Accepted: 14 January, 2023/Published: 29 March, 2023

Abstract

This study has two objectives. The first is to ascertain whether there exists a relationship between the level of productive vocabulary and lexical availability in English as a foreign language. The second is to explore the depth of productive lexical knowledge through qualitative analysis of the level of words generated by upper secondary EFL learners. The measurement instruments were a Productive Vocabulary Levels Test (PVLTL) and a lexical availability task, with eight semantic categories that served as prompts to activate word production. In the present study we analysed two traditional (SCHOOL, ANIMALS) and two non-traditional (TRAIN, FREE) semantic categories. We aimed to determine whether lexical availability and productive vocabulary are two closely related dimensions. The results show a significant positive correlation between the production of words generated in the lexical availability task and the scores obtained in PVLTL. Furthermore, the qualitative analysis of the data indicates that the words generated by two groups of EFL learners correspond predominantly to the level of the 1,000 and 2,000 most frequent words in English.

Keywords

Lexical availability, productive vocabulary level, PVLTL, EFL learners, word level

1 Introduction

Productive vocabulary in second or foreign languages (L2) has been defined in different ways that refer to different aspects of knowledge. Laufer and Nation (1999) distinguished between ‘free productive ability’ or ‘the ability to use a word at one’s free will’ and ‘controlled productive ability’ or ‘the ability to use a word when compelled to do so by a teacher or researcher’ (p. 37). In their view, free productive ability can be measured by the Lexical Frequency Profile, whereas controlled productive ability can be measured by the Productive Vocabulary Levels Test (PVLTL), a word frequency test devised by Laufer and Nation (1999) that “samples 18 items at each of the 2000, 3000, 5000, University Word List (UWL), and 10000-word levels” (p. 37). Another view of productive vocabulary is that underlying the test Lex30 developed by Meara and Fitzpatrick (2000), in which the production of infrequent words in association to cue-words or prompts is measured and out of this production vocabulary size is calculated. In this

respect, lexical availability tasks share some methodological assumptions with Lex30 test, as both are based on the production and association of words in response to prompts that serve to retrieve and recall words from the mental lexicon of second or foreign language learners. Furthermore, as Lex30, lexical availability tasks involve vocabulary breadth and depth as they measure the number of words produced in response to semantic categories, but also provide insights into the structure of learners' lexicon, by means of the patterns of word associations and clusters that can be observed out of learners' lexical availability production. The origin of lexical availability was motivated by the need to identify the common or frequent words used by French native speakers to design pedagogical materials for learning French (Gougenheim et al., 1956), although, as explained below, frequency is not usually the focus of present lexical availability tasks.

Lexical availability is understood as a concept and as a data collection task. As a concept refers to the cognitive processes involved in searching, retrieving, and recalling words from the mental lexicon. As a task it includes semantic categories such as food and drink, clothes, school, or animals which are used as prompts to elicit the words stored in the mental lexicon of language learners. Such prompts provide insights into learners' available lexicon, as observed by the words produced in response to the prompts ranked by the number of learners who retrieve the same word and the position of words in retrieval, for example, first word responses are considered strongly associated to the prompt and the most available in learners' lexicon. The words stored in the mental lexicon are only available when required by the topic or the communicative situation. These words only "...come to mind rapidly when the situation calls for them. They are always at our disposition even though the circumstances for them to be used, spoken, or written, present themselves rarely" (Richards, 1974, p. 76). This is one of the reasons why semantic categories related to daily life, such as food, means of transport or school, amongst others, are included in lexical availability tasks. Research has evinced the potential of these categories in the identification of the available words of learners of Spanish or English as an L2 of different ages, course grades, educational levels, and language profiles. Likewise, lexical availability research has revealed prototypical patterns in the conceptualization of semantic categories (e.g., Hernández, Izura & Ellis, 2006; Jiménez Catalán & Dewaele, 2017; Jiménez Catalán & Montero-SaizAja, 2020). However, their potential to determine vocabulary level or to group learners according to their word production has been overlooked in lexical availability research. The present study contributes to narrowing this gap by exploring the productive vocabulary level and lexical availability of a group of learners of English as a foreign language (EFL). The objectives are twofold. First, it aims to ascertain whether there is a relationship between the productive vocabulary level and word production in a lexical availability task completed by adolescent EFL learners. Second, it examines the nature of the words generated by learners of the same grade but whose word production is different, so as to determine if learners with a higher production also retrieve words of an advanced level.

2 Background

The variable level in lexical availability research has been addressed from different, although interrelated, perspectives, such as educational stage, the target language, vocabulary knowledge, or word level. We move on to address each of these issues.

2.1 Educational stage, and target language level in lexical availability research

The educational stage includes course grades and serves as a reference for the organisation of the instructional system, as well as an indicator of achievement and the quality of the instruction that students are exposed to through the different subjects, foreign languages included. Most lexical availability research has considered grade in this sense, assuming that, as learners move across grades, their lexical production as elicited by lexical availability tasks increases, and that this increase is an indicator of a

higher language level. However, using the course or grade as reference may be problematic; as Graham et al. (2017) and Strand and Hessel (2018) observed, educational level or course grade does not always equate to level in the target language. Regarding English as a target language, some lexical availability studies have used the labels ‘Initial or Basic’, ‘Intermediate’ and ‘Advanced’ to refer to the language level of EFL learners (e.g. Ferreira & Echeverría, 2010; Akbarian et al., 2020), although most research has been based on the levels of the Common European Framework of Reference (CEFR) assigned to course grade by the schools or institutions where the data was collected (e.g. Agustín Llach, 2022; Sandu & Oxbrow, 2020; Ferreira, Garrido, & Guerra, 2019; Jiménez Catalán & Fernández Fontecha, 2019). Regardless of using ‘Initial or Basic’, ‘Intermediate’ and ‘Advanced’ labels or CEFR levels, the results of both groups of studies coincide in reporting a greater production of words amongst EFL learners of upper grades. Few studies have complemented lexical availability tasks with a standardised English language level test. The exceptions are four studies, three of which were conducted, respectively, by Martínez-Adrián and Gallardo-del-Puerto (2016), Agustín Llach (2017), and Fernández Fontecha (2021), where, in the first study, the Oxford Placement Test (OPT) was included to identify the English level of university ESL students in the USA, whilst in the other two studies the English level of high school EFL learners in Spain was identified. Focusing on primary education, Kartsevski and Blanco (2021) made use of the Key English Test (KET) to identify the English level of Chilean primary school children. Although these studies provided relevant data on the English lexical availability output of EFL learners, they used the standardised tests as a reference to identify the English level of the participants, rather than to investigate its relation to vocabulary knowledge. We now turn to dealing with this specific issue.

2.2 Lexical availability and vocabulary knowledge

Research on the relation between lexical availability and vocabulary knowledge level is scarce and differs in terms of the focus and the tasks used. For example, the studies conducted by Akbarian and Farrokhi (2021) and Jiménez Catalán (2010) focused on the effect of gender on receptive vocabulary knowledge and on word production in a composition and a lexical availability task. In contrast, the study by Akbarian et al. (2020) with Iranian university EFL learners evolved around the effect of receptive vocabulary, age, or exposure on lexical availability. Thus, in addition to differences regarding mother tongues and educational stages of the EFL learners, these studies differed concerning the receptive vocabulary test used: respectively, the 2,000 band of the receptive Vocabulary Levels Test (VLT) in the first and second study, and the New Vocabulary Levels Test (NVLT) in the third one. Despite differences in focus and data collection instruments, the above studies presented positive correlations between the VLT, or the NVLT and word production both in the composition task and the lexical availability task. They also showed similarity concerning the most and least productive prompts. These findings are particularly relevant since those studies were conducted independently the one to the other in two different countries.

2.3 Lexical availability and word level

As to word level, the research conducted by Ferreira and Echeverría (2014) in Chile and in Spain by Jiménez Catalán and Fitzpatrick (2014) and Jiménez Catalán and Agustín Llach (2017) provided qualitative data on the level of the words retrieved by high school EFL learners. Ferreira and Echeverría (2014) included two ‘Basic’ and two ‘Advanced’ semantic categories in a lexical availability task and examined the word responses to each category retrieved by English native speakers and Chilean EFL learners. Their results showed a greater production in the performance of native speakers across all the semantic categories, although the effect of the semantic category was similar in both groups; that is, ‘Basic’ semantic categories activated a greater number of word responses than ‘Advanced’ categories in English native speakers and EFL learners. For their part, Jiménez Catalán and Fitzpatrick (2014) looked at the

quality of the words produced by EFL learners at two course levels (grades 6 and 9) in response to nine semantic categories. They used the VocabProfile (VP) (Cobb & Laufer, 2022) to classify the frequency level of the word responses to each semantic category. Their results evinced an increase in the number of words produced in response to each semantic category, but, contrary to expectations, there was an increase in 1k and the Off-list bands, but not in the expected frequency levels (2k, 3k). In a subsequent study, Jiménez Catalán and Agustín Llach (2017) identified the lexical output and the word frequency level of the words produced by EFL learners at grades 8 and 10 in a lexical availability task including ten semantic categories. In addition, they classified the words in terms of CEFR levels (A1, A2, B1, B2, C1 and C2) by means of the Cambridge English Vocabulary Profile (EVP). Their results showed striking similarities concerning the most and least productive semantic categories. Regardless of course level or amount of exposure, EFL learners produced a higher number of words in response to traditional semantic categories than to non-traditional ones. Furthermore, they found that the words retrieved as first responses to each of the ten semantic categories belonged predominantly to the 1k frequency level. Similar results were obtained concerning word level in terms of EVP analysis, since the level of the words retrieved by EFL learners of two different courses and different type and amount of instruction was predominantly A1.

3 Objectives

The present study pursues two main objectives. In the first place, it moves to explore the relation between word production in a lexical availability task and the controlled productive vocabulary knowledge of EFL learners by means of the PVLTL. This is a standardised test of productive vocabulary based on the frequency level of English language (see Methodology section). Given the positive correlations obtained between lexical availability and receptive vocabulary, but, above all, between lexical availability tasks and written compositions (free word production) tasks, we may expect that a positive correlation will be observed between the production of word generated by EFL learners in a lexical availability task (free production/association) and in the PVLTL at the 2,000-frequency band. If this correlation were confirmed, we would obtain some evidence of the potential of lexical availability as an indicator of productive vocabulary level. As Roghani and Milton (2017) observed, "...a good productive test, if it is working well, should correlate with other tests of productive vocabulary size..." (p. 145). Furthermore, the qualitative study of the words generated in response to semantic categories would allow us to gain insights into the depth of productive vocabulary knowledge of adolescent EFL learners at the end of Spanish post-obligatory education. Following Schmitt and Schmitt (2020), we understand vocabulary breadth or size as the number of words known and, depth, as the degree of qualitative knowledge that we have about the words known. The study of these aspects of vocabulary knowledge has pedagogical relevance for the diagnosis of word learning difficulties, for foreseeing possible inequalities in the productive vocabulary knowledge of EFL learners, and for the design of vocabulary teaching programmes. The second objective of the present study is to determine whether EFL learners with a high score in a controlled productive vocabulary test would retrieve a significantly higher number of words in a lexical availability task, and to ascertain whether the words retrieved would be of a higher frequency level than those produced by learners with a low score in a productive vocabulary test. Indeed, there exists the need for an investigation regarding the possible disparities in productive vocabulary of adolescent EFL learners in the same grade and classroom setting and the words they can retrieve in a lexical availability task at the end of secondary education. Most of the research conducted so far has focused on the performance, when taking the PVLTL test, of university EFL learners, rather than on adolescents at secondary education level, and, to our knowledge, no research has been conducted to assess the performance of high school EFL learners when taking the PVLTL and a lexical availability task. In this respect, the semantic generation study conducted by Roghani and Milton (2017) with EFL learners in Iran is of relevance for the present study as lexical availability and semantic generation share association tasks to elicit words

from learners' mental lexicon. In their study they included the semantic categories animals, clothes, body parts and furniture as prompts to elicit word responses from the learners. They also used the productive vocabulary test, version C of Nation (2001), in the 2000, 3000 and 5000 frequency bands. From the word frequencies taken from the BNC/COCA lists, they extracted a total of 56 animal words and distributed them into five bands. Specifically, for the 2000 band, they obtained a total of six words. Taking the total of 56 animal words as a reference, the authors analysed the words that the learners generated for each frequency band and calculated an estimate of vocabulary knowledge. Their results showed that the vocabulary of the Iranian EFL learners was between the 1000 and 2000 most frequent words, and the estimated vocabulary size was around 1000 words. Likewise, their results revealed the existence of most and least productive semantic categories: respectively, Clothes, with an estimated of 1243 words and with a total of 790 words. As to the category Animals, the mean productive vocabulary size was 1155.86 words. Regarding the comparison of PVL and the category generation task for animals they observed a positive correlation between the two (0.494**). They concluded that the generation task had potential to be used as a vocabulary size task.

4 Methodology

4.1 Participants

The sample consisted of an intact group of 29 EFL learners at grade 12 at a northern Spanish high/secondary school. It included all students who were completing their second year of Spanish post-obligatory education (grade 12) at the school. A convenience sample was selected as to warrant homogeneity of language instruction. The institution in question was a state bilingual school at which all the students had studied subjects in English and Spanish throughout all the years of compulsory secondary education and post-obligatory education. In addition, all students had studied French as a second foreign language throughout the four grades of compulsory secondary education and the two grades of post-obligatory education. The language profiles of students were as follows: Spanish as a first language, English as L2, and French as L3 was the profile of 24 students, for five students, Arabic was the first language, Spanish the L2, English the L3, and French the L4. The average age was 17.6 years, and the gender distribution was 15 females and 14 males.

4.2 Data collection and procedures

Permission for data collection was granted by the school director, as well as by the teacher of English at grade 12. The tests were administered in the students' regular classroom in two sessions, each on different days. During the first session, students were informed of the anonymous and voluntary nature of the tests and were asked to complete a lexical availability task and the PVL. In order to collect all information, during a second session an English language proficiency test was administered. In the following sections we provide a description of each test, as well as the distribution of the scores of the placement test equated to the CEFR levels.

4.2.1 Lexical availability task

Each student was given a booklet consisting of two sections. The first included a biographical questionnaire aimed at collecting information on variables such as age, gender, nationality, language profile (first language as well as other known languages), type of high school, English classes received outside school, stays in English-speaking countries, and experience on school language programmes. The second part included eight semantic categories as prompts, each presented in bold capital letters on one side, with spaces numbered vertically (1-60). The order of presentation of the prompts was the same

for all students: ANIMALS, SCHOOL, TRAIN, HAPPINESS, FEAR, COUNTRYSIDE, SURPRISE, FREE. The time allowed for responding was 2 minutes per prompt. Students were given oral and written instructions in Spanish, through which they were asked to write the English words that came to their mind for each prompt. In the present study we focus on the analysis of the responses to four prompts standing for semantic categories: ANIMALS, SCHOOL, TRAIN, FREE. Please note that, when we refer to stimuli or prompts, we use capital letters to indicate the semantic categories and lower-case letters to indicate the lexical items. The first two semantic categories (that is, ANIMALS and SCHOOL) are common in English textbooks designed for the learning of English as an additional language. They are also traditionally included in L2 lexical availability studies either in English (e.g. Jiménez Catalán & Montero-SaizAja, 2020; Canga Alonso, 2017; Jiménez Catalán & Dewaele, 2017) or in Spanish (e.g. Sánchez-Saus Laserna, 2009; Jing, 2012). Likewise, as already mentioned, the semantic category ANIMALS has been explored by Roghani & Milton (2017) in their semantic categorization task study with university EFL learners. The inclusion of those common semantic categories in the present study served to compare our results with data obtained in previous research. The second two categories (TRAIN and FREE) were selected in order to determine whether the responses generated by English learners would be quantitatively and qualitatively different from those generated in response to the two traditional categories.

4.2.2 Productive Vocabulary Levels Test

The Productive Vocabulary Levels Test (PVLТ) (version A+ version C) was designed by Laufer and Nation (1995, 1999) and subsequently adapted by Schmitt, Schmitt, and Clapham (2001) in order to identify the size of controlled productive vocabulary at different frequency levels of English. It is based on four frequency bands of English words distributed from most to least frequent: 2,000 (2k), 3,000 (3k), 5,000 (5k), and 10,000 (10k) words, to which is added the list of academic vocabulary required in university contexts (UWL). The test can be used in full or in frequency bands, the latter of which allow independent administration and measurement of the level and size of vocabulary per frequency band. The PVLТ presents a simple format that allows for the identification of productive vocabulary size in total or by frequency bands through sentences with minimal context, in which the learner is asked to include the appropriate word. Each band includes 30 sentences in which the initial of the word to be inserted is given. For example: He was riding a bic _____ (bicycle). The PVLТ requires knowledge of the meaning, form, spelling and placement of the word. In the present study we administered the 2,000 most frequent band in English in a maximum time of 15 minutes. We focused exclusively on this band for two reasons. The first is that knowledge of words belonging to this frequency is essential for understanding 95% of the content of spoken and written texts in English (Laufer, 1998), as well as for conducting everyday communicative interactions in that language (Nation, 2008; Meara, 2009; Webb & Nation, 2017). The second reason is that, amongst the few existing studies on productive vocabulary of EFL learners, in the research conducted by Tschirner (2004) with German university EFL learners, it was found that 79% of the students did not reach the maximum level in the 2,000 band (30 points). By focusing on one CLIL school and an intact sample of EFL learners, we wanted to control for homogeneity of instruction and warrant a certain productive vocabulary knowledge from the 2,000 level by EFL learners at grade 12.

4.2.3 English language level test

As a placement test, we administered the Quick Placement Test (OPT), version 2. This is a standardised test that measures grammar and vocabulary use and allows us to calculate the correspondence between the scores obtained in the test and the CEFR levels. It was completed by 25 of the 29 students (four did not attend class that day). The average score obtained was 33.57 (Max 60). The distribution of scores and equivalence to CEFR levels was as follows: five students scored between 42 and 44 points (B2), 12

scored between 31 and 41 (B1), seven scored between 22 and 29 points (A2), and one student scored 17 points (A1).

4.3 Data analysis

All tests were coded and processed in Microsoft Excel files according to the following variables: age, gender, family language, knowledge of other languages, number of words evoked by each student in response to each semantic category of the lexical availability task, and PVLТ 2,000 and OPT scores. Beforehand, the total number of words generated in the four semantic categories (1,568 tokens) was edited and lemmatised following protocols used in previous research on lexical availability in English or Spanish as L2 (see Samper Hernández & Jiménez Catalán, 2014), basically, these data editing and processing consisted of the following steps: i) spelling mistakes were corrected, for example, **tortule*, and **pinguin* were corrected to *turtle* and *penguin*; ii) repeated words in the same prompt were counted only once; iii) Spanish words and proper nouns were removed, except for those words that are either cognates in English and Spanish (e.g., *zebra*, *principal*, *carbon*, *animal*), or names of cities or countries that coincide in both languages (e.g., *Paris*, *China*, *Portugal*); iv) plural words were lemmatised to their singular form unless they were plural in English (for example, *trousers*); v) verb forms were changed to bare infinitives; vi) irregular verb forms were counted as different words; vii) abbreviations (such as *mum*) were counted as a different word if they were included as lexical entries in English dictionaries; viii) lexical units of meaning were counted as one word (e.g., *train station*, *high school*). Finally, we shall note that all English words were accepted, regardless of whether they were members of the semantic category or produced in association to it. For example, *world*, *comfortable*, *cheap*, *noisy* in response to TRAIN were accepted and counted as four different word types. Similarly, words such as *happiness*, *independence*, *expensive* or *choice* in response to FREE were also accepted and counted as different types of words as frames or semantic relations could be traced in all of them

WordSmith Tools, Version 6 (Scott, 2012) provided us with word frequency lists of lemmas, from the most frequent to the least frequent amongst the total number of words according to the number of learners who produced each word; likewise, this analyser made possible the identification of the shared and exclusive words in two groups of English learners, namely: those who obtained an equal or higher mean in the lexical availability task, and those who evoked a number of words below the mean. VocabProfile (Cobb & Laufer, 2022) allowed us to identify the frequency level of the word according to large corpora of English: British National Corpus (BNC) and Corpus of Contemporary American English (COCA).

5 Results

The first objective aimed to determine whether there was a correlation amongst the results obtained in a lexical availability task consisting (henceforth in this section PDLEX) of four semantic categories (two traditional and two non-traditional) and the results obtained in the PVLТ 2,000. In order to address this objective, it was first necessary to identify the means obtained by the sample of EFL learners, respectively, in the PDLEX task and in the PVLТ test. Table 1 shows the average number of words (lemmatised) retrieved by the students in response to the four categories all together, with the breakdown by category in the PDLEX and the means for PVLТ 2,000. The minimum, maximum and standard deviations reveal the existence of a large variation in learners' performance in both tasks. Concerning word production, we note a higher word production in response to SCHOOL and ANIMALS than in response to TRAIN and FREE. For the second objective it was important to consider the percentage of learners who were below or above average in both tasks. For the sake of comparison, Table 1 also displays the distribution of students into two groups: those who performed below the mean (Group B), and those who performed above the mean (Group A).

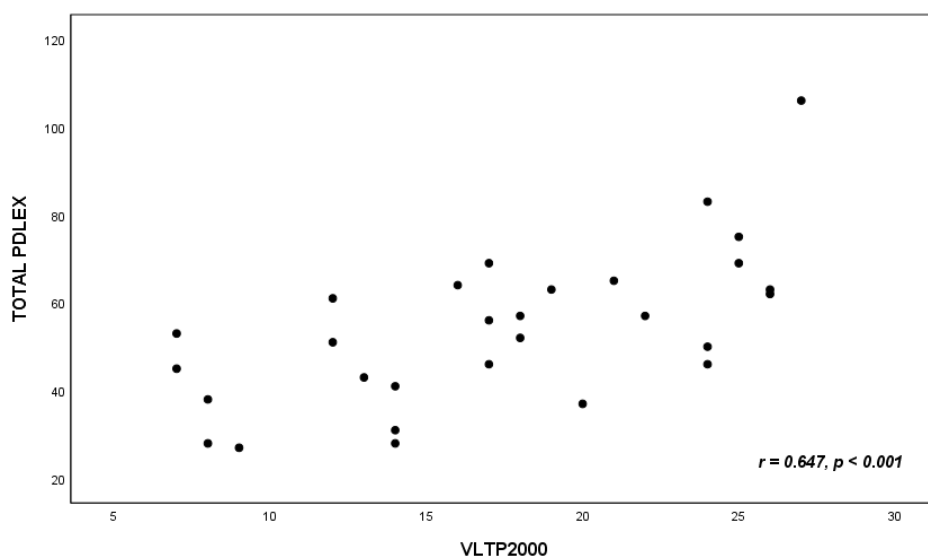
Table 1

Descriptive Statistics for PDLEX and PVL T 2,000

	Min	Max	Mean	ST	< Mean B	%	≥ Mean A	%
PDLEX	27	106	54	17.6	15	51.7	14	48.3
ANIMALS	6	25	16.3	5.1	14	48.3	15	51.7
SCHOOL	8	29	18.6	5.2	12	41.4	17	58.6
TRAIN	3	17	9.9	3.8	12	41.4	17	58.6
FREE	2	44	9.3	7.8	17	58.6	12	41.4
PVLT 2,000	7	27	17.4	6.3	15	51.7	14	48.3

As shown in Figure 1, PDLEX correlates positively with PVL T scores. The data suggest that students who scored higher on the PVL T produced a greater number of words on PDLEX.

Figure 1

Correlation between PDLEX and PVL T 2,000

As far as the relation between the PVL T and PDLEX, Table 2 indicates that PVL T correlates positively in the four categories of the PDLEX and, therefore, it is possible to affirm that the students who scored higher on the PVL T also had a higher word production for each of the PDLEX categories.

Table 2

Correlations between PVL T 2,000 and PDLEX Categories

	r	p-value
ANIMALS	0.558	0.002
SCHOOL	0.512	0.005
TRAIN	0.512	0.005
FREE	0.498	0.006

As to the second objective, we conducted a qualitative analysis of the words generated by the two groups of EFL learners, that is, those who generated a number of words equal to or above the mean (Group A), and those who generated a number of words below the mean (Group B). In the first place, by means of

WordSmith Tools, we identified the ten most frequent words in each group in order to ascertain whether they produced the same or different words in response to each semantic category or stimulus; secondly, by means of VocabProfiler, we identified the frequency level of the words retrieved by each group. The main results for each of these observations are presented in Tables 3 and 4. Regarding the comparison of the ten most frequent words in response to SCHOOL, we note that seven words were shared by both groups, whilst the number of words exclusive to each group stood at three for all groups. As to ANIMALS, the number of words shared was eight, whilst the number of words exclusive to each group was two. TRAIN elicited three shared words, seven exclusive words in group A, and five exclusive words in group B. Finally, in response to the FREE prompt, the number of shared words was four, and the number of exclusive words was six in each group. The comparison of the top ten words in Tables 3 and 4 points to the predominance of nouns regardless of semantic category in the two groups of EFL learners, although in the TRAIN and FREE categories, we observed the presence of abstract nouns, verbs, and adjectives in the word responses to the other two categories.

Table 3

The Top Ten Words in Group A

SCHOOL	ANIMALS	TRAIN	FREE
<i>Teacher</i> (14)	<i>Cat</i> (14)	<i>Fast</i> (6)	<i>Happiness</i> (8)
<i>Chair</i> (12)	<i>Dog</i> (14)	<i>Travel</i> (6)	<i>Countryside</i> (5)
<i>Pen</i> (12)	<i>Snake</i> (11)	<i>Railway</i> (5)	<i>Animal</i> (3)
<i>Maths</i> (11)	<i>Bird</i> (10)	<i>Seat</i> (5)	<i>Family</i> (3)
<i>Pencil</i> (11)	<i>Lion</i> (10)	<i>Speed</i> (5)	<i>Friend</i> (3)
<i>Pencil case</i> (11)	<i>Fish</i> (9)	<i>Train station</i> (5)	<i>Live</i> (3)
<i>Table</i> (11)	<i>Horse</i> (9)	<i>People</i> (4)	<i>Love</i> (3)
<i>Book</i> (10)	<i>Mouse</i> (9)	<i>Rail</i> (4)	<i>Mountain</i> (3)
<i>Student</i> (10)	<i>Tiger</i> (9)	<i>Transport</i> (4)	<i>People</i> (3)
<i>Blackboard</i> (8)	<i>Monkey</i> (8)	<i>Trip</i> (4)	<i>Air</i> (2)

Table 4

The Top Ten Words in Group

SCHOOL	ANIMALS	TRAIN	FREE
<i>Table</i> (12)	<i>Cat</i> (14)	<i>Passenger</i> (9)	<i>Animal</i> (3)
<i>Teacher</i> (12)	<i>Dog</i> (14)	<i>Ticket</i> (6)	<i>Bird</i> (3)
<i>Book</i> (11)	<i>Bird</i> (10)	<i>Railway</i> (5)	<i>Food</i> (3)
<i>Pen</i> (11)	<i>Fish</i> (9)	<i>Travel</i> (5)	<i>Freedom</i> (3)
<i>Pencil</i> (11)	<i>Horse</i> (9)	<i>Fast</i> (4)	<i>Wi-fi</i> (3)
<i>Chair</i> (10)	<i>Lion</i> (9)	<i>Sleep</i> (4)	<i>Countryside</i> (2)
<i>Pencil case</i> (9)	<i>Snake</i> (9)	<i>Station</i> (4)	<i>Friend</i> (2)
<i>Bag</i> (7)	<i>Elephant</i> (8)	<i>Carbon</i> (3)	<i>Love</i> (2)
<i>Computer</i> (7)	<i>Tiger</i> (8)	<i>Chair</i> (3)	<i>Money</i> (2)
<i>Exam</i> (7)	<i>Cow</i> (6)	<i>Transport</i> (3)	<i>Present</i> (2)

The frequency level of the words produced by each group is shown in Table 5. As can be observed, there is a similar distribution of frequencies from the 1,000 to the 3,000 most frequent words in the two

groups. In both cases, a greater number of words from level 1k was retrieved by learners than from less frequent levels. In Group A, the cumulative frequency of words (1k+2k) represents 95.8 % of the words generated by this group, which is a percentage similar to that observed in Group B, where the cumulative frequency represents 95.6% of the words generated by this group. There is also a similar distribution in the 3k band and in the Off-List category. In the two groups, most of the words belonging to these levels refer to the name of the academic subjects or to the content of these subjects learned through the use of English as a vehicular language: *carbon, delay, diversity, explore, geography, independence, landscape, launch, liberty, literature, passenger, philosophy, powder, principal, psychology, rail, relative, sample, sweat, tennis, transport, and tube*. However, as shown in Table 5, the Type-token ratio (TTR) for each semantic category as well as for the total PDLEX in the two groups suggest higher lexical variation in Group B.

Table 5

Frequency Level Distribution of Words Produced in the Lexical Availability Tas

Frequency level	Group A			Group B		
	Lemmas	Tokens	TTR	Lemmas	Tokens	TTR
1K	337	767	43.93	311	606	51.32
2K	63	156	40.38	57	133	42.85
3K	23	37	62.16	22	30	73.33
Off-List	2	3	66.66	3	4	75
Total	425	963	44.13	393	773	50.84

Finally, to get further insights into the relation of PVLТ and PDLEX, we will compare the lexical profiles of the two EFL learners who got the highest scores on the PVLТ, but who differed in their total lexical output in PDLEX, these students were SA14, a boy, and SA1, a girl. Regarding their performance on the two tasks, SA14 scored 27 out of 30 and produced 105 words, whereas SA1 scored 26 and produced 120 words. Table 6 displays the frequency distribution of the words generated in response to each category as well as the number of exclusive words retrieved by the two learners, that is, unique word not produced by any other learner in the sample. As can be observed, SA14 produced more exclusive words than SA1. However, except for SCHOOL, it was SA1 who retrieved more advanced words; put it in another way, although their scores on the PVLТ were very close, SA1 produced a higher number of infrequent words than SA14.

Table 6

Word Frequency Profiles of Two EFL Learners in PDLEX

	Student	1K	2K	3K	OFF-TYPES	Exclusive words
ANIMALS	A1	23.8	28.5	0.0	47.62	0
	A14	21.7	30.4	0.0	47.83	4
SCHOOL	A1	58.3	16.7	8.3	16.6	8
	A14	79.4	5.9	2.9	11.7	5
TRAIN	A1	40.0	40.0	20.0	0.0	9
	A14	53.3	13.3	20.0	13.3	12
FREE	A1	61.5	23.1	7.7	7.6	11
	A14	73.3	13.3	2.2	11.1	24

6 Discussion

The results reveal the existence of a positive correlation between word production in a task of lexical availability and the scores obtained by EFL learners on the PVLТ. The correlation is significant and suggests that both measure similar aspects of lexical knowledge – an issue to which we will return in the discussion of the second objective. At this point it is important to remark that the correlation is not only observed between the total number of words retrieved in the PDLEX task and that achieved in the PVLТ, but also between the former and each of the semantic categories included in the task. Cautiously, it is possible to compare the correlation values shown in previous research amongst lexical availability and other dimensions of lexical competence, such as receptive vocabulary (Jiménez Catalán, 2010; Akbarian et al., 2020) and word use in the letter as a written composition (Jiménez Catalán, 2010; Akbarian & Farrokhi, 2021). Regarding, the prompt ANIMALS, the present study shows a slightly higher correlation (0.558**) than the one observed by Roghani & Milton (2017) between the productive vocabulary and size (as measured by PVLТ) of Iranian EFL learners and their word production in a generation task (0.494**). The comparison yields higher-significance values in the present study, which points to a higher degree of affinity between the lexical availability task and the PVLТ included in the present study, i.e. both measure productive vocabulary knowledge. This result has implications for both lexical availability and productive vocabulary level research, as it provides evidence of the relationship between a task and a test traditionally used in different research areas. Furthermore, although the results refer to the sample analysed, we may predict that similar trends could be obtained for other schools and courses in which English is learnt and taught. One reason for this is that a higher production of words in response to the same prompts was reported in previous research. For example, EFL learners' higher retrieval of words in response to SCHOOL than ANIMALS was reported, respectively, in grade 6 and grade 12 EFL learners (e.g., e.g. Jiménez Catalán & Dewaele, 2017; Canga Alonso, 2017; Jiménez Catalán & Fernández Fontecha, 2019). Another reason is that the means obtained by the informants of the present study concerning SCHOOL and ANIMALS are close to those obtained in previous lexical availability research. Our findings confirm the results compiled by Canga Alonso (2017) with a sample of 265 learners of English in grade 12, who obtained a higher mean for SCHOOL (19.7) than for ANIMALS (16.8). Furthermore, the same tendency is observed in lexical availability research concerning learners of Spanish of the same age and grade. For example, in the study conducted by Sánchez-Saus Laserna (2012), the mean for SCHOOL was higher (17.6) than that for ANIMALS (14.4), whilst in terms of the latter category, Jing (2012) reported an average of 16.3 words produced by learners of Spanish in China. With regards to the results obtained for TRAIN and FREE, to our knowledge these prompts have not been included in past lexical availability research, and thus there is no reference for comparison. However, with caution, we can contrast our results with those obtained by Ferreira and Echeverría (2014) in an English lexical availability task completed by Chilean EFL learners in which two traditional semantic categories and two non-traditional semantic categories were included. The researchers identified a higher lexical production in prompts standing for 'Basic' categories (BODY PARTS and FOOD AND DRINK) than in prompts standing for 'Advanced' categories (TERRORISM AND CRIME and HEALTH AND MEDICINE) both in English L1 and L2.

Regarding the second objective, the qualitative analysis of the words generated by grade 12 EFL learners distributed into two groups shows more similarities than differences in the actual words retrieved. In the case of SCHOOL and ANIMALS, the similarity of responses suggests a prototypical structure in the mental lexicon of EFL learners. We can postulate the existence of prototypes in *teacher*, *cat* and *dog*: the first example was produced by 26 students, and the second and third by 28 out of 29 students. The homogeneity of the ten words generated in response to ANIMALS and SCHOOL compared to the greater dispersion of the responses observed in TRAIN and FREE can be interpreted as an effect of the prompt. Indeed, ANIMALS is a natural and closed semantic category in terms of its constituent members. That is, it would theoretically be possible to count the number of existing animals

and calculate the level and size of vocabulary in this semantic field by identifying the number of words generated in response to the category by learners of any target language. ANIMALS is also an inclusive category characterised by the hierarchical and prototypical relationships of its constituent members (Hernández Muñoz, Izura, & Ellis, 2006). For example, ostrich is a hyponym of the category Birds, and at the same time a peripheral exemplar of the category; this is in contrast with sparrow, which is a prototypical or central exemplar. Furthermore, ANIMALS is a category present in English language textbooks, especially in primary and secondary education, which could point to greater exposure, and consequently to greater familiarity with, animal names. Evidence in favour of this interpretation is found in the research conducted by Ferreira, Garrido, and Guerra (2019), where word familiarity was the determining predictor of the available lexicon of Chilean learners of English. As for SCHOOL, it is a relational category, in which it is possible to identify schemas or scripts of the archetypal objects, actions and agents that make up the concept of school in the mental lexicon of English learners (Jiménez Catalán & Montero-SaizAja, 2020). In the latter study the authors reported that *teacher* was the most frequent response in a stratified sample of 265 pre-university English learners. Their finding is corroborated in the present study with a different sample. In addition to activating *teacher* as a first response to the prompt SCHOOL, the words retrieved by the sample of EFL learners of the present study point to the existence of radial associations amongst words, which in turn points to relationships established at school, and the everyday objects that are usually found in classrooms. EFL learners also produced names of the subjects and themes that formed part of their daily realities at their school – a bilingual school where they had acquired the content of subjects such as history, geography and economics through the use of English as a vehicular language during compulsory secondary education and post-obligatory education.

The lower word production of the two groups in response to non-traditional categories or stimuli corresponds to the qualitative similarity observed in the words generated by the students and is again explained by the characteristics of the prompts. TRAIN is part of a broader category, namely Means of Transport, and in the two groups of EFL learners a common pattern was identified when looking at the ten words retrieved by the largest number of students: TRAIN is related to railway; it is a fast means of transport, and it implies the existence of a station, a journey, people or passengers travelling on the train, which contains seats. To a lesser extent, a common pattern is also present in the category FREE, since it is possible to identify similar associations in both groups: the countryside or nature, animals, friends, and love. However, compared to the other categories, FREE is more diffused and open, as it elicited associations related to adolescents' emotions, such as love, and happiness, evoked by nature, animals, friends, family, or life. Moreover, some of the ten most frequent word responses seem to indicate the effect of common collocations or associations, as observed in the retrieval of food, money, WI-FI or presents in response to FREE. This tendency is observed in both groups when the analysis is extended to the full retrieval of each group. The similarity is also observed at the level of the frequency of the words produced by each group. In both groups, word responses fall at the 1k and 2k level, which corresponds to the score obtained in the PVLTL 2,000 test. Although our focus in this study was NOT on the identification of vocabulary size but on word frequency level, following Nation (1990), it could be possible to calculate vocabulary size from the average score obtained in the PVLTL band by multiplying the number of correct answers by the total number of words in the band, and dividing the result by the number of test items; thus, the score obtained by the sample of English learners in this study yields an approximate vocabulary size of 1,134 words amongst the 2,000 most frequent words.

7. Conclusion

The results of this study provide empirical evidence of the existence of a relationship between a test of English productive vocabulary knowledge in the 2,000 most frequent bands and a task of lexical availability with two traditional and two non-traditional semantic categories. The correlations are

moderate but significant and indicate a relationship between the PVLTL 2,000 and a lexical availability task. Furthermore, the analysis of the frequency level of the words generated in the lexical availability task by the learners indicates the predominance of words corresponding to the 1,000 most frequent words of English, which fits into the average score achieved in the PVLTL 2,000 level test.

The findings are relevant both for research and education. However, although the sample was intact and representative of the school and location where the research was conducted, which allowed us to take it as an in-depth case study, for the generalisation of results it is necessary to conduct further research with larger samples both in terms of the number of informants, but particularly with a greater number of schools. Likewise, future studies should increase the number of traditional and non-traditional semantic categories. Furthermore, although the present study has shown that an intact group of EFL learners at grade 12 (end of Spanish post-obligatory education) do not master the band of the 2,000 most frequent English words, it is important to not overlook the fact that some of the words elicited in response to the FREE stimulus are in the top 3,000 most frequent words in English. Therefore, in addition to including more prompts (traditional and non-traditional), future research should administer other bands of the PVLTL, particularly the 3,000 band alongside the 2,000 band in the test of productive vocabulary level. Finally, in order to achieve more conclusive findings, further lexical availability research should include multi-dimension analyses to ascertain whether specific words or items explain most of the correlations identified.

Acknowledgments

We are grateful to the students and teachers at the school participating in this study. This work was supported by [Ministerio de Ciencia e Innovación, Fondos Feder, and Agencia Estatal de Investigación] under Grant [numberPGC2018-095260-B-100].

References

- Agustín Llach, M.P. (2022). How age and L2 proficiency affect the L2 lexicon. *System*, 104. <https://doi.org/10.1016/j.system.2021.102697>
- Agustín Llach, M.P. (2017). The impact of bilingualism on the acquisition of an additional language: Evidence from lexical knowledge, lexical fluency, and (lexical) cross-linguistic influence. *International Journal of Bilingualism*, 23(5), 888-900.
- Akbarian, I., & J. Farrokhi. (2021). Lexical availability and writing ability of EFL learners. *International Journal of Applied Linguistics*, 31, 48-64.
- Akbarian, I., Farajollahi, F., & Jiménez Catalán, R.M. (2020). EFL learners' lexical availability: Exploring frequency, exposure, and vocabulary level. *System*, 91. <https://doi.org/10.1016/j.system.2020.102261>
- Canga Alonso, A. (2017). Spanish L1 speakers' and EFL learners' available lexicon. *Anuario de Estudios Filológicos*, 11, 5-23.
- Cobb, T., & Laufer, B. (2022). The Compleat Lexical Tutor (BNC-COCA NF L7 V2). Available at <http://www.lex Tutor.ca> [accessed November 2022]
- Fernández Fontecha, A. (2021). The role of learner creativity in L2 semantic fluency. An exploratory study. *System*, 103. <https://doi.org/10.1016/j.system.2021.102658>
- Ferreira, R., Garrido, J., & A. Guerra. (2019). Predictors of lexical availability in English as a second language. *Onomázein*, 46, 18-34.
- Ferreira, R., & M. Echeverría. (2010). Semantic networks of words in lexical availability studies of English L1 and English FL. *Onomázein*, 21, 133-153.

- Ferreira, R., & Echeverría, M. (2014). Lexical Availability of Basic and Advanced Semantic Categories in English L1 and English L2. In Jiménez Catalán, R.M. (Ed.). *Lexical availability in English and Spanish as a second language* (pp. 15-34). Springer.
- Graham, S., Courtney, L., Marinis, T., & Tonkyn (2017). Early language learning: The impact of teaching and teachers factors. *Language Learning*, 67(4), 922-958.
- Gougenheim, G., Michéa, R., Rivenc, P., & Sauvageot, A. (1956). *L'élaboration du Français élémentaire. Étude sur l'établissement d'un vocabulaire et d'une grammaire de base*. Didier.
- Hernández Muñoz, N., Izura, C., & Ellis, W. (2006). Cognitive aspects of lexical availability. *European Journal of Cognitive Psychology*, 18, 734-755.
- Jiménez Catalán, R.M., & Canga Alonso, A. (2020). The available English lexicon of male and female Spanish adolescents. *ELIA: Estudios de Lingüística Inglesa Aplicada*, 1, 157-176.
- Jiménez Catalán, R.M., & A. Montero-SaizAja. (2020). Conceptualization of 'school' in the English available lexicon of Spanish adolescents. *Miscelánea: A Journal of English and American Studies*, 61, 33-57.
- Jiménez Catalán, R.M., & Dewaele, J.M. (2017). Lexical availability of young Spanish EFL learners: Emotion words versus non-emotion words. *Language, Culture and Curriculum*, 30(3), 283-299.
- Jiménez Catalán, R.M., & Agustín Llach, M.P. (2017). CLIL or time? Lexical profiles of CLIL and non-CLIL EFL learners. *System*, 66, 87-99.
- Jiménez Catalán, R.M., & Fitzpatrick T. (2014). Frequency profiles of EFL learners' lexical availability. In Jiménez Catalán, R.M. (Ed.). *Lexical availability in English and Spanish as a second language* (pp. 83-99). Springer.
- Jiménez Catalán, R.M. (Ed.). (2014). *Lexical availability in English and Spanish as a second language*. Springer.
- Jiménez Catalán, R.M. (2010). Gender variation in EFL across vocabulary tests. In Jiménez Catalán, R.M. (Ed.), *Gender Perspectives on Vocabulary in Foreign and Second Languages* (pp. 117-139). Palgrave Macmillan.
- Jiménez Catalán, R.M., & Fernández Fontecha, A. (2019). Lexical availability output in L2 and L3 EFL learners: Is there a difference? *English Language Teaching*, 12(2), 77-86.
- Jing, L. (2012). El estudio de disponibilidad léxica de los estudiantes chinos de español como lengua extranjera. *Marcoele Revista de didáctica español como lengua extranjera*, 14, 1-14.
- Kartsevski, M., & Blanco, O. (2021). Léxico disponible en aprendientes con un nivel básico de inglés como segunda lengua: un estudio escolar chileno. *Literatura y Lingüística*, 44, 291-313.
- Laufer, B. (1998). The development of passive and active vocabulary: same or different? *Applied Linguistics*, 19, 255-271.
- Laufer, B., & Nation, P. (1999). A vocabulary size test of controlled productive ability. *Language Testing*, 16, 1, 36-55.
- Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied Linguistics*, 16, 307-332.
- Masrai, A., & Milton, J. (2017). Recognition vocabulary knowledge and intelligence as predictors of academic achievement in EFL context. *TESOL International Journal*, 12(1), 128-142.
- Martínez-Adrián, M., & Gallardo-Del-Puerto, F. (2016). The effects of language typology on L2 lexical availability and spelling accuracy. *International Journal of English Studies*, 17(2), 63-79.
- Meara, P., & Fitzpatrick, T. (2000). Lex30: An improved method of assessing productive vocabulary in an L2. *System*, 28, 19-30.
- Meara, P. (2009). *Connected words: Word associations and second language vocabulary acquisition*. John Benjamins.

- Nation, I.S.P. (2001). Vocabulary levels test. In Nation, I.S.P. (2001) *Learning vocabulary in another language* (pp.416-424). Cambridge University Press.
- Nation, P. (1990). *Teaching and learning vocabulary*. Newbury House.
- Nation, P. (2008). *Teaching vocabulary: strategies and techniques*. Heinle Cengage Learning.
- Richards, J. (1974). Word lists: Problems and prospects. *RELC Journal*, 2, 69-84.
- Roghani, S., & Milton, J. (2017). Using category generation tasks to estimate productive vocabulary size in a foreign language. *TESOL International Journal*, 12(1), 143-159.
- Samper Hernández, M., & Jiménez Catalán, R.M. (2014). Researching Lexical Availability in L2: Some Methodological Issues. In Jiménez Catalán, R.M. (Ed.). *Lexical availability in English and Spanish as a second language* (pp. 189-205). Springer.
- Sánchez-Saus Laserna, M. (2009). La variable ‘nivel de español’ en el léxico disponible de los estudiantes de español como lengua extranjera. *Pragmalingüística*, 17, 140-153.
- Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the Vocabulary Levels Test. *Language Testing*, 18(1), 55-88.
- Sandu, B., & Oxbrow, G. (2020). Selected poster presentations from the British Association of Applied Linguistics conference, Manchester Metropolitan University, UK, August 2019: Lexical availability and the L2 Motivational Self System. *Language Teaching*, 53(3), 378-382.
- Schmitt, N., & Schmitt, D. (2020). *Vocabulary in language teaching*. Second Edition. Cambridge University Press.
- Scott, M., (2012). WordSmith Tools version 6, Stroud: Lexical Analysis Software.
- Strand, S., & Hessel, A. (2018). *English as an Additional Language, proficiency in English and pupils’ educational achievement: An analysis of Local Authority data*. The Bell Foundation.
- Webb, S., & Nation, P. (2017). *How vocabulary is learned*. Oxford University Press.
- Tschirner, E. (2004). Breadth of vocabulary and advanced English study: An empirical investigation. *Electronic Journal of Foreign Language Teaching*, 1(1), 26-38.

Rosa M. Jiménez Catalán is Professor of Applied Linguistics at the University of La Rioja. Her research focuses on the vocabulary knowledge, and lexical availability of EFL learners. On these issues she has co-edited four books and authored many book chapters and articles in national and international journals.