

PRODUCTIVE VOCABULARY KNOWLEDGE OF SPANISH EFL LEARNERS ¹

ANDRÉS CANGA ALONSO
MARIO ARRIBAS GARCIA
UNIVERSIDAD DE LA RIOJA

Abstract. This paper aims at investigating (i) the productive vocabulary knowledge of 38 10th grade (4th ESO) EFL Spanish students in two secondary schools located in the north of Spain, (ii) analysing the results obtained according to sex-based differences among the participants and (iii) its pedagogical implications for students' understanding of written and spoken discourse in English. We used the parallel version (version A+ version C) of the Productive Vocabulary Levels Test (PVLТ) (Laufer and Nation 1995, 1999) as the instrument to measure students' productive vocabulary knowledge. Our results reveal that our students' productive vocabulary size is below 1,000 words. As for sex-based differences, girls' mean scores are higher than boys' but the differences between both sexes are not statistically significant. These findings also indicate that most of the students in the present study could have problems to understand written and spoken discourse in English due to their low scores in the PVLТ.

Key words: *PVLТ, EFL, secondary school, boys and girls.*

1. Introduction

Vocabulary is a crucial aspect in second language acquisition (SLA), overall proficiency, and general academic achievement (e.g. Daller, van Hout and Treffers-Daller 2003, Morris and Cobb 2004). Thus, the better the lexical competence of the learners is, the better their general linguistic competence can be assumed to be. In this sense, examining learners' word knowledge can provide with interesting and reliable insights into their overall language knowledge. In recent decades several studies have analysed the receptive vocabulary knowledge of EFL learners in Spain and abroad at primary and secondary school (Takala 1984, Takala 1985, Milton and Meara 1998, Jiménez Catalán and Terrazas Gallego 2005-2008, Jiménez Catalán and Ruiz de Zarobe 2009, Agustín Llach and Terrazas Gallego 2012, Canga Alonso 2013a, Canga Alonso 2013b, Canga Alonso 2013c). However, to our knowledge, there is a scarcity of research concerning productive vocabulary knowledge in EFL at secondary school in Spain. The present paper has as its main purpose to explore the productive vocabulary size of traditional EFL 4th ESO (10th grade) learners to analyse if there are statistically significant differences regarding the productive vocabulary knowledge of male and female learners. Hence, we review the main studies dealing with the importance of

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vocabulary knowledge and sex-based differences. Report of the study conducted with its methodology, main results found and interpretation of the same follows. We conclude pointing out some lines for further research trying to overcome the main limitations of the present study.

2. Vocabulary Knowledge and sex in SLA

A large vocabulary size is essential to interacting in the foreign language. In this sense, researchers have tackled the issue concerning the number of words necessary to understand spoken discourse (Nation, 2001, Adolphs and Schmitt 2004) and to read and comprehend texts in the native and foreign language (Anderson and Freebody 1981, Laufer, 1997). Among the former researchers, Adolphs and Schmitt (2004) estimate that, at least, 2,000 word forms have to be mastered in order to understand around 90% and 94% of spoken discourse in different contexts. Among the latter, Laufer (1992, 1997) states that a text coverage of 95% can be reached with a 5,000-word English vocabulary or 3,000 word families, which agrees with the assertions made by Hazenberg and Hulstijn (1996), Nation (1993, 2001) and Cobb and Horst (2004). More recently, Nation (2006) asserts that 8,000 to 9,000 word families are needed for understanding a written text and a vocabulary of 6,000 to 7,000 word families for comprehension of spoken text, if 98% coverage of a text is desired. Hirsh and Nation (1992) also point out that knowledge of 5,000 word families is necessary to enjoy reading. Estimates based on word frequency criteria have been calculated and research claims that gaining command of the 2,000-3,000 most frequent words as soon as possible is vital for the language learner to communicate orally and in written form in the foreign language (Nation 1993, Nation and Waring 1997, Milton 2009). The sooner the most frequent words are learned by students, the better their language performance will be. As Schmitt (2000: 137) claims: “The learning of these basic words cannot be left to chance, but should be taught as quickly as possible, because they open [...] the door of further learning”.

As it has been mentioned, vocabulary size is one of the most central dimensions in explorations of lexical proficiency. Different studies have set to the task of finding estimations of productive and receptive vocabulary size. The tests designed for this purpose are generally built upon frequency lists (Nation 1990, 2001) on the assumption that knowledge of less frequent words implies knowledge of more frequent words (Schmitt 2000). Based on this idea of finding estimations of productive word knowledge, several instruments

have been designed to measure productive vocabulary size. One of the most frequently used tests is Lex30 (Meara and Fitzpatrick 2000). It is a free word association task which assesses discrete, comprehensive and context-independent vocabulary. It has several practical advantages since it generates a rich vocabulary output very economically, that is, through single word prompts. It is easily administered and it requires very little time to complete (15 minutes); and it is scored automatically using a computer programme (Jiménez Catalán and Moreno Espinosa 2005). This test has been implemented at primary education (Jiménez Catalán and Moreno Espinosa 2005, Moreno Espinosa 2009) and with undergraduates (Fitzpatrick and Meara 2004, Jiménez Catalán and Moreno Espinosa 2004). However, it presents some methodological problems when classifying the words that Lex30 scorer did not recognize in their appropriate bands (Jiménez Catalán and Moreno Espinosa 2005).

Another instrument which has been used widely to explore students' productive vocabulary knowledge is the Productive Vocabulary Levels Test (PVLТ) (Laufer and Nation 1995, 1999). The PVLТ addresses two dimensions of lexical competency: partial productive word knowledge and word frequency. It measures discrete, selective and context dependent vocabulary (Moreno Espinosa 2010, Mochizuki 2012). One of the advantages of the test is that frequency bands are independent from one another, which allows researchers to give their testees either the whole test or only the bands that are suitable for their learners' level. This fact together with its format (see Appendix I) seems to be appropriate for secondary school students. Nevertheless, this test has not been as widely implemented as its receptive version (Schmitt, Schmitt and Clapham 2001), which has been used to test primary and secondary school Spanish students' receptive vocabulary knowledge (Jiménez Catalán and Terrazas Gallego 2005-2008, Terrazas Gallego and Agustín Llach 2009, Agustín Llach and Terrazas Gallego 2012, Canga Alonso 2013a). Taking account of these facts, we consider that the PVLТ is a good test to explore the productive vocabulary size of our sample of Spanish EFL learners in the last grade secondary school for three main reasons: it measures discrete, context dependent vocabulary, it allows for profiling learners' vocabulary size on the basis of the frequency level to which the words used belong, and, since, to our knowledge, only Moreno Espinosa (2010) has attempted to measure the productive vocabulary knowledge of last year secondary school Spanish EFL students by means of this test of controlled productive ability, therefore we could compare our findings with the results her students obtained in the tests. Hence, the main aim of the present paper is to explore 10th grade Spanish students' productive vocabulary size, using the PVLТ as the instrument of measurement.

Having analysed the importance of vocabulary in L2 learning as well as having referred to the research conducted on vocabulary learning, the importance of sex-based differences in the literature on vocabulary acquisition can be considered. The role of sex has also occupied an outstanding place in current research on vocabulary acquisition. Receptive and productive vocabulary knowledge of male and female learners has been widely examined, and scholars have reached different conclusions. Boyle (1987) concludes that, exceptionally, boys are superior to girls in the comprehension of heard vocabulary. Similarly, Scarcella and Zimmerman (1998) find that men performed significantly better than women in a test of academic vocabulary recognition, understanding and use. In Lin and Wu (2003), Lynn *et al.* (2005) and Edelenbos and Vinjé (2000), males also outperform females in vocabulary knowledge in the foreign language. By contrast, in Nyikos' study (1990) women perform better than men in a memorisation test of German vocabulary. Nevertheless, Jiménez Catalán and Terrazas Gallego (2005-2008) discover no significant sex-based differences in performance on a receptive vocabulary test implemented with primary students. In the same vein, in a recent longitudinal research Agustín Llach and Terrazas Gallego (2012) obtained similar results since they found very slight differences among males and females across grades in the context of Spanish primary education concerning their receptive vocabulary knowledge. Canga Alonso (2013b, 2013c) also found slight differences in study of primary and secondary school students' receptive vocabulary. Contrariwise, highly significant differences are found in favour of females in the mean number of words produced in response to the 15 cues of a lexical availability test (Jiménez Catalán and Ojeda Alba 2009). A set of recent studies compiled in Jimenez (2010) also point to mixed results on sex differences or tendencies. As Sunderland (2010) claims, a careful analysis of this compilation throws the conclusion that the relationships between vocabulary and gender are not enduring, but may be context and test type-specific. These relationships can also be influenced by L1, age or L2 proficiency.

Considering the aforementioned studies, we can state that results are inconclusive regarding the role of sex in the acquisition of the foreign language and in particular in lexical acquisition. Furthermore, the type of word knowledge explored, the learning context, or the task used for data gathering seem to play a relevant role in the establishment of sex tendencies. For these reasons, this study aims at (i) investigating the productive vocabulary knowledge of 15-16 year-old male and female Spanish students learning English in Spanish 10th grade (4th ESO) in relation to: ii) sex-based differences, and iii) ability to understand spoken and written discourse in English.

3. Method

3.1. Participants

The sample for the present study was constituted by 38 students (26 boys and 12 girls). Students came from two different schools located in the same social environment of a city in the north of Spain. All 38 subjects were 10th grade (4th ESO) students who shared Spanish as their mother tongue, had received a total amount of 1049 hours of instruction of English and were 15-16 years old.

3.2. Data gathering instrument

The 2,000 word parallel version (version A+ version C) of the Productive Vocabulary Levels Test (PVLТ) (see Appendix 1) was used to measure the productive vocabulary knowledge of these subjects (Laufer and Nation 1995, Laufer and Nation 1999). The test measures knowledge of vocabulary at the 2000, 3000, 5000 and 10,000 word bands (e.g. the 2000 word band would test words 1 – 2000. The word bands correspond to the 2000, 3000 and so on most frequent words in English, are based on West's (1953) General Service List and the Thorndike and Lorge (1944) list. We have chosen the 2,000 band of the test since as mentioned in section one, gaining command of the 2,000 most frequent words as soon as possible is vital for the language learner to communicate orally and in written form in the foreign language (Nation 1993, Nation and Waring 1997, Milton 2009). The PVLТ measures controlled productive knowledge (Laufer 1998) since test-takers have to complete a missing word in 30 different sentence contexts where they are given the first letters of the target word as a cue. Therefore, the PVLТ is a reliable, valid and practical measure of vocabulary growth (Nation and Laufer 1999: 44). Completing the test requires the knowledge of meaning, form, phonological aspect and collocations of the target word. In addition, reading comprehension is required in gaining the clues to complete the task.

3.3. Procedure and analysis

Data were collected in one session during school time. The time allotted to complete the task was 10 minutes. At the beginning of the test, clear instructions together with an example were

given both orally and in written form in the students' mother tongue to clarify what they were being asked to do.

Tests were corrected and total scores obtained. 0 was the minimum score and 30 was the maximum. Estimations in words were also obtained. In order to calculate students' word estimates, Nation's formula "Vocabulary size = N correct answers multiplied by total N words in dictionary (the relevant word list) divided by N items in test" (Nation 1990: 78) was applied. In order for an answer to be correct the word has to be both grammatically and orthographically adequate, e.g. if the missing word is a verb it has to be written in the corresponding tense, therefore a wrong verb tense would get 0 points in that given sentence.

The sample was also analysed with SPSS 19 to check whether there were statistically significant differences according to sex and productive vocabulary knowledge.

4. Results

Table 1 shows the means and standard deviations for the 2,000 word parallel version of the Productive Vocabulary Levels test scored by the 38 students involved in the study, regardless of their sex. As can be seen, the mean score is 9.66 and the standard deviation 4.89.

	Productive VLT 2,000 (n=38)
Number of items	30
Mean	9.66
SD	4.89

Table 1: Means and standard deviations

This profile is illustrated in the rankings of percentages summarized in figure 1. The results show that 19% scored between 0 and 5 points, 40% scored between 6 and 10 points, 27% of the students scored between 11 and 15 points, 11% scored between 16 and 20, 3% scored between 21 and 25. It is outstanding that none of the students was able to score more than 22 points in the test.

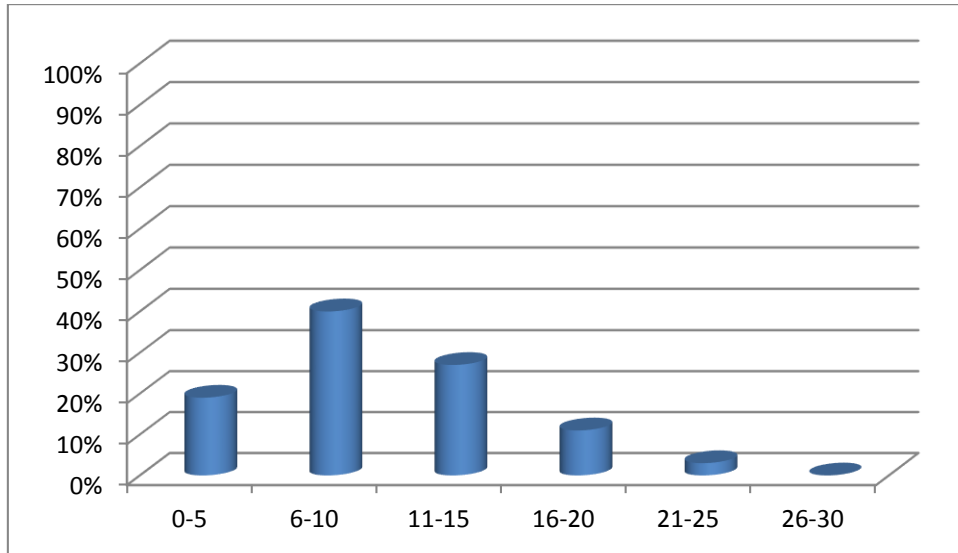


Figure 1: Frequency distribution of test scores (n= 38)

Students' scores were translated into the number of known words for each frequency level applying Nation's formula: "Vocabulary size = N correct answers multiplied by total N words in dictionary (the relevant word list) divided by N items in test" (1990: 78). The means obtained by the students analysed in the present study was 644 words. 0 right words was the minimum score and 1467 words the highest number of words recognised by the students in the PVLТ. Figure 2 shows that most of our informants' know between 400-1,000 words whereas only 4.17% of them are able to recognize between 1733-1933 and none of the informants is able to complete all the words provided in the PVLТ.

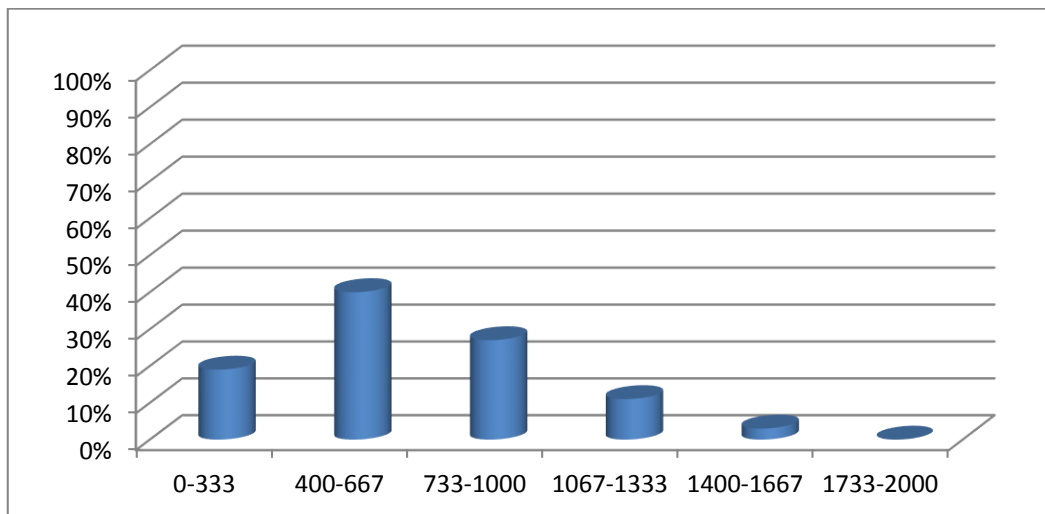


Figure 2: Estimates of known words

As far as sex differences in productive vocabulary size are concerned (see table 2), descriptive results reveal a higher means (9.92 vs. 9.54) and better minimum scores for girls (6 points vs. 0 points), whereas boys obtained better maximum scores (22 points vs. 16 points).

	N	Min.	Max.	Mean
Males	26	0	22	9.54
Females	12	6	16	9.92

Table 2: Means and standard deviations (SD) for males and females

These data indicate that the overall productive vocabulary size of this sample of 10th grade Spanish EFL learners is considerably lower than 1,000 words. Nevertheless, girls' productive vocabulary knowledge is slightly higher than boys'. As shown in figure 3, the results evince that 27% of the males involved in the study scored between 0 and 5 points, 31% between 6 and 10, 27% between 11 and 15 points, 11% between 16 and 20, points, and 4% between 21 and 25.

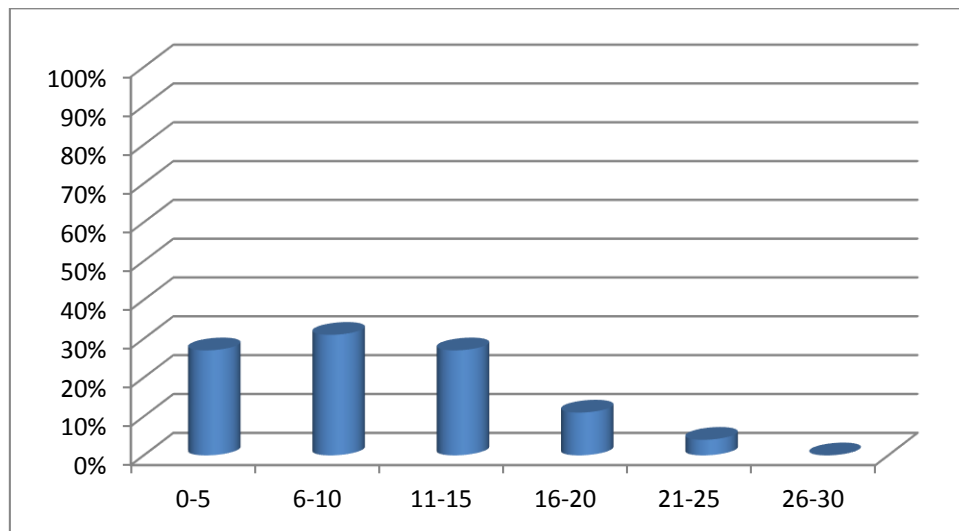


Figure 3: Males' frequency of distribution of test scores.

As for female students (see figure 4), our findings show that 59 % of the females scored between 6 and 10, 33% between 11 and 15 points, 8 % between 16 and 20. It is worth mentioning that no female was able to achieve more than sixteen points, whereas there was one male who scored seventeen and another one who obtained twenty-two points in the test. These findings reveal that girls outperformed boys in the lowest ranks i.e. 6-10, 11-15, whereas boys obtained better results in the highest, i.e. 16-20 and 21-25 points.

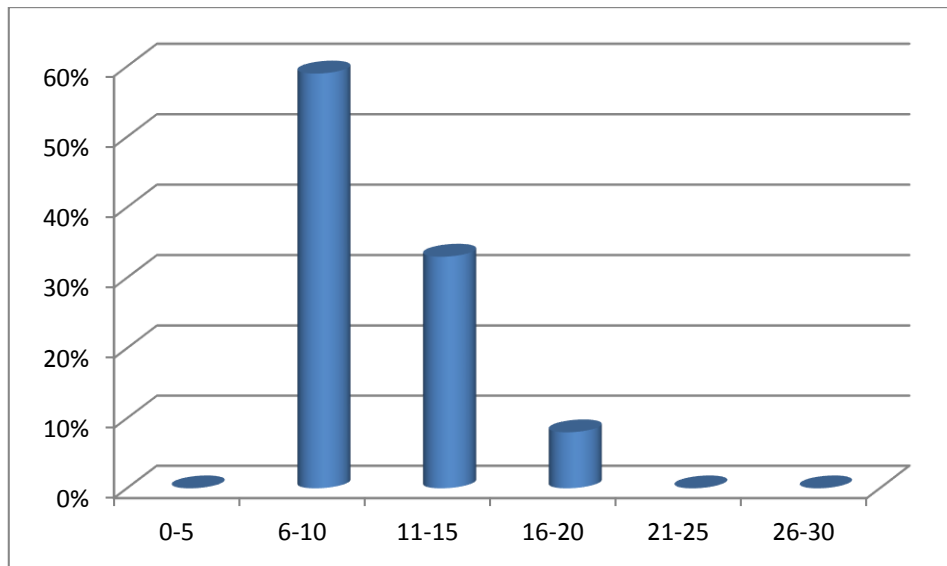


Figure 4: Females' frequency of distribution of test scores

Male and female scores were translated into the number of known words for each frequency level applying Nation's formula (1990: 78), which was abovementioned. Table 3 shows that the means of word estimates for girls (661 words) is slightly higher when compared to the results obtained by their male partners (636 words).

	N	Min.	Max.	Mean
Males	26	0	1467	636
Females	12	400	1067	661

Table 3: Word estimates for male and female students

As for descriptive statistics, the box-plot below (figure 5) reveals that the median value of the female group is higher than that of the male group. This figure clearly indicates that female learners outscored their female partners in the productive vocabulary test administered which entails that their productive vocabulary size and their word estimates are higher than their male classmates'.

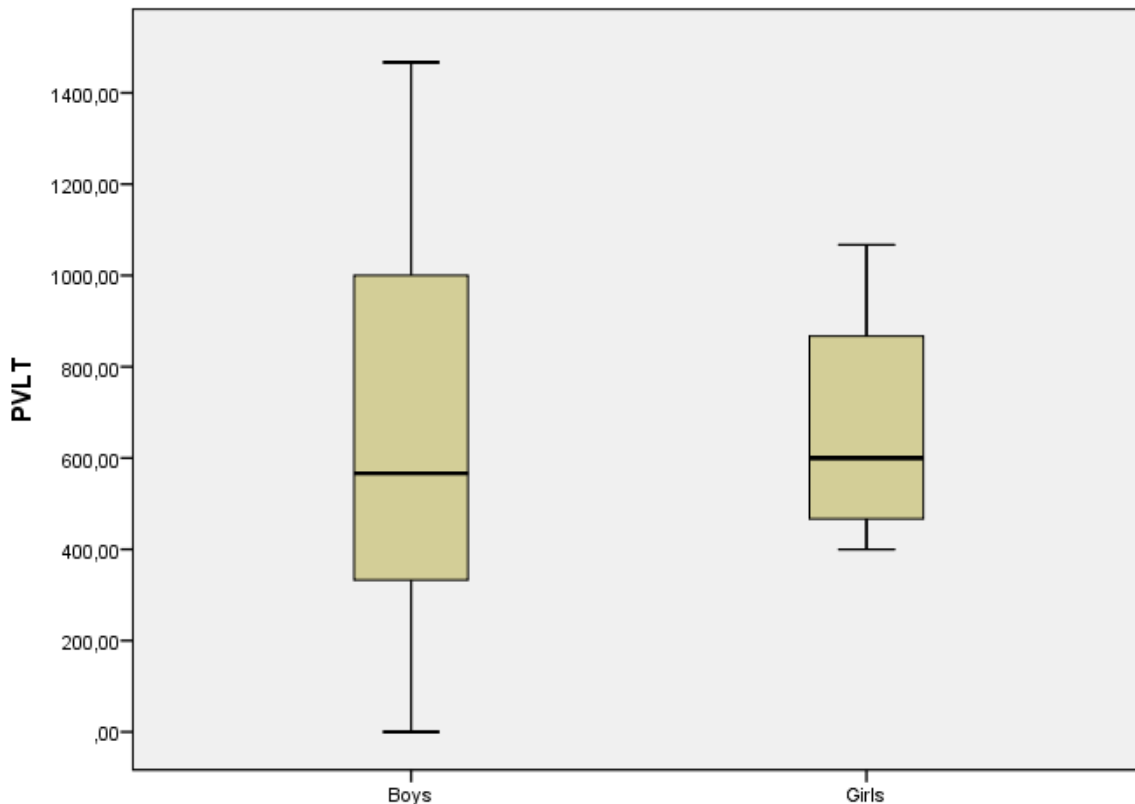


Figure 5: Box diagram of males' and females' median and score values

Kolmogorov-Smirnov and Shapiro-Wilk tests were implemented in order to ascertain if our sample met the normality assumption. As shown in table 4, the sample met normality for the male group but did not meet it for the girls', therefore non-parametric tests of means comparison for two independent samples were applied.

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	gl	Sig.		gl	Sig.
Boys	,112	26	,200*	,965	26	,503
Girls	,207	12	,164	,887	12	,108

Table 4. Normality tests for sex-based differences

The U Mann-Whitney and Wilcoxon tests were conducted to test inferential statistical differences among the groups and the p-value ($p=0.74$) does not reveal significant sex differences at a significance level of 5% in productive vocabulary size estimations. Table 5 offers these results:

Test	Statistics
Mann-Whitney U	145.50
Wilcoxon W	496,50
P (two tailed)	.74

Table 5. Results of inferential statistics for gender-based differences

5. Discussion

The analysis of our data clearly shows that the productive vocabulary knowledge of the 38 10th graders analysed in the present research (644 words) is lower than 1,000 words. If we compare these data with the findings obtained by Moreno Espinosa (2010) in the same educational level and socio-cultural context, we ascertain that productive vocabulary size is practically the same for both samples of students since our students' estimation of words is 644 and Moreno Espinosa's 645. These findings imply that the EFL instruction both groups of learners are receiving in the compulsory schooling is quite similar regardless of the type of school they attend. However, according to previous studies, our learners would have problems in performing certain linguistic tasks such as understanding informal spoken discourse for which Adolphs and Schmitt (2004) estimate that, at least, 2,000 words are needed. Nation (2006) talks of 6,000 to 7,000 word families for comprehension of spoken text, if 98% coverage of a text is desired for understanding written text, and he contends that 8,000 to 9,000 word families are needed for text understanding, or for reading for pleasure. Hirsh and Nation (1992) point out that the knowledge of 5,000 word families is required to enjoy reading. Nevertheless, EFL learners would have an easier time watching TV programmes (Webb and Rogers 2009a), or movies (Webb and Rogers 2009b), since the first 1,000 most frequent words make up for around 85% of the total word coverage. Accordingly, researchers call for the command of 2,000-3,000 most frequent words as soon as possible (Nation, 1993, Nation and Waring 1997, Webb and Chang 2012). Furthermore, we agree with Schmitt (2000) and Webb and Chang (2012) that such a paramount learning task cannot be left to chance and that the most frequent words should be taught explicitly in the EFL classroom.

If we compare these data with previous studies on receptive vocabulary size conducted in the same area and educational level but with a different sample of students (Canga Alonso 2013a), we ascertain that the estimations of words are higher in the receptive vocabulary test (935 words), which concords with previous research on students' receptive and productive

vocabulary sizes as students tend to obtain better results in receptive tests than in productive ones because reception is a previous step to production (Laufer 1998, Webb 2005, Webb 2008, Martínez Adrián and Gallardo del Puerto 2010, Yamamoto 2011, Zhong 2012). However, this comparison should be taken with caution since Canga Alonso (2013a) has not conducted research on productive vocabulary knowledge and his sample of students is different from the one analysed in the present study. Therefore, further research is called to correlate the receptive and productive vocabulary of the students in the present sample to compare it with previous studies on receptive and productive vocabulary in the same area.

Sex-based differences are non-significant in the present study although girls obtained slightly better results than boys. This finding is in line with the results obtained in receptive vocabulary tests with younger learners in their same educational context (Jiménez Catalán and Terrazas Gallego 2005-2008; Agustín Llach and Terrazas Gallego 2012, Canga Alonso 2013b, Canga Alonso 2013c) but differs from Canga Alonso's (2013a) with students of their same age where statistically significant differences were found in favour of boys. By contrast, in a study conducted by Nyikos (1990) women perform better than men in a memorisation test of German vocabulary, and highly significant differences are found in favour of females in the mean number of words produced in response to a lexical availability test by Spanish primary school students (Jiménez Catalán and Ojeda Alba 2009). In light of these results, we agree with Sunderland's (2010) assertion that the relationships between vocabulary and sex are not enduring, but may be context and test type-specific, being also influenced by L1, age or L2 proficiency.

6. Conclusion

Two main findings stand out from the present research study. First, the productive vocabulary size of our Spanish secondary school EFL learners lies below the range of first 1,000 most frequent words in English, according to the results of the PVLТ. Second, no statistically significant differences can be established according to the sex of our students. Nevertheless, these results should be taken with caution due to the reduced number of students who took part on the present research. Therefore, further research is needed in order to explore if the productive vocabulary size of a bigger sample of students of their same age and after the same amount of hours of exposure to the target language remains the same or is significantly higher or lower than our informants' productive vocabulary knowledge. One further

limitation of the present study is the use of a single, and somewhat limited, instrument to measure productive vocabulary size. Using other tests for vocabulary knowledge, such as lexical availability tests might throw even more insightful results and reveal more qualitative data concerning learners' vocabulary knowledge and lexical development, Correlations between students' receptive and productive vocabulary sizes may also be explored in order to trace the vocabulary depth and breadth of last grade secondary school learners in the same area. Finally, CLIL programmes have spread in Spain in the last decade therefore it would be interesting to relate 10th graders receptive and productive vocabulary knowledge in order to ascertain whether type of instruction (CLIL/non-CLIL) could benefit vocabulary learning. Further research is called for to overcome these limitations and address this new research path on CLIL instruction.

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Appendix 1: Productive Vocabulary: Parallel Version (A+C) (Laufer & Nation 1999)

In the following sentences we have omitted the end of a word. Complete the sentences with the right word. For examples: *He was riding a bic_____*; you should have completed the sentence as follows: *He was riding a bicycle.*

The 2,000-word level

Example: He was riding a bicycle.

1. They will restore the house to its orig_____ state.
2. Each room has its own priv_____ bath and WC.
3. The tot_____ number of students at the university is 12,347.
4. They met to ele_____ a president.
5. Many companies were manufac_____ computers.
6. The lakes become ice-free and the snow mel_____.
7. They managed to steal and hi_____ some knives.
8. I asked the group to inv_____ her to the party.
9. She shouted at him for spoi_____ her lovely evening.
10. You must spend less until your deb_____ are paid.
11. His mother looked at him will love and pri_____.
12. The wind roa_____ through the forest.
13. There was fle_____ and blood everywhere.
14. She earns a high sal_____ as a lawyer.
15. The sick child had a very high tempe_____.
16. The bir_____ of her first child was a difficult time.
17. My favourite spo_____ is football.
18. In A.D. 636 an Arab army won a famous vic_____ over another army.
19. I'm glad we had this opp_____ to talk.
20. There are a doz_____ eggs in the basket.
21. Every working person must pay income t_____.
22. The pirates buried the trea_____ on a desert island.
23. Her beauty and ch_____ had a powerful effect on men.
24. La_____ of rain led to a shortage of water in the city.
25. He takes cr_____ and sugar in his coffee.
26. Pup_____ must hand in their papers by the end of the week.
27. Ann intro_____ her boyfriend to her mother.
28. Teenagers often adm_____ and worship pop singers.
29. In order to be accepted into the university, he had to impr_____ his grades.
30. The dress you're wearing is lo_____.