

RECEPTIVE VOCABULARY SIZE OF SECONDARY SPANISH EFL LEARNERS¹

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Abstract: *This paper aims at investigating (i) the receptive vocabulary knowledge of 49 girls and 43 boys, Spanish students learning English as a foreign language in a secondary school located in the north of Spain, and (ii) its pedagogical implications for students' understanding of written and spoken discourse in English (Adolphs & Schmitt 2004; Laufer 1992, 1997; Nation 2001). We used the 2,000 frequency band of the Vocabulary Level Test (VLT) (Schmitt, Schmitt & Clapham, 2001, version 2) as the instrument to measure students' receptive vocabulary knowledge. Our results reveal that the means of girls' receptive vocabulary size is below 900 words, which is a bit lower than the estimates proposed by López-Mezquita (2005) for Spanish students of the same age and educational level. On the contrary, the means for boys is slightly above 1,000 words and the differences between boys' and girls' performance in the VLT is statistically relevant in favour of males. Our data also indicate that most of the students analysed in the present study could have problems to understand written and spoken discourse in English due to their low scores in the receptive vocabulary level test.*

Key words: *EFL, secondary education learners, boys, girls, receptive vocabulary size, VLT.*

1. INTRODUCTION

Research on vocabulary acquisition in 10th grade (4th ESO) Spanish EFL learners has not yet found conclusive results on the number of words this group of students is supposed to have acquired after more than 1,000 hours of exposure to the target language. Thus, knowing the vocabulary size these learners have acquired is of paramount importance to provide us with an idea of what foreign language tasks they are able to perform.

For the purpose of this study, words are understood as lemmas i.e.: "a headword and some of its inflected and reduced forms" (Nation, 2001: 7). We opted for this approach because the Vocabulary Level Test (VLT) (Schmitt, Schmitt and Clapham, 2001) which was administered to our students is based on two word lists which count on lemmas (Thorndike and Lorge, 1944; Francis and Kucera, 1967). Nevertheless, words will also be referred to as word families, types and tokens to compare our research with studies on receptive vocabulary size conducted in Spain (López-Mezquita, 2005) and abroad (Takala, 1984, 1985; Arnaud, 1985; Laufer, 1998; Milton and Meara, 1998 Qian, 2002).

As abovementioned, 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. As it was abovementioned, 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 & 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".

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In recent decades, a considerable number of studies have investigated receptive vocabulary size or the number of words a learner knows. Most studies coincide in indicating that vocabulary size grows as proficiency level in the foreign language (Barrow *et al.*, 1999; Fan, 2000), exposure to the target language (Golberg *et al.*, 2008) or frequency of input (Vermeer, 2001) increase. Moreover, this gain follows a systematic order related to frequency, since at the lowest levels of proficiency learners are familiar with the most frequent words, but as their experience with the foreign language increases, less frequent words are incorporated into the lexicon (Barrow *et al.*, 1999; Vermeer, 2001). The probability of a word being known by foreign language learners rises with its frequency, so higher-frequency words have a greater possibility of being known.

Table 1 presents a summary of previous estimates of receptive vocabulary size of L2 learners of English at primary and secondary level after having received different hours of instruction. The number of hours of instruction in Qian (2002) is not included since he does not include this information in his work. Studies are ordered according to the receptive vocabulary size of learners. As can be seen, the results obtained show considerable differences in receptive vocabulary knowledge on the part of the learners who were investigated. L2 students' vocabulary knowledge figures are also complex to compare due to differences concerning pupils, their contexts of learning, and the test administered for calculating vocabulary size.

Table 1. Average receptive vocabulary size in L2 English.

Study	Receptive Vocabulary Size	Hours of Instruction	L1	Participants learning context
Qian (2002)	7,224 words		Korean	Secondary School (intermediate level and beyond)
Qian (2002)	6,663 words		Chinese	Secondary School (intermediate level and beyond)
Laufer (1998)	3,500	1500	Hebraic	Secondary School
Milton and Meara (1998)	1,680 words	660	Greek	Secondary School
Takala (1984, 1985)	1,500 words	450	Finnish	Secondary School, grade 9
Milton and Meara (1998)	1,200 words	400	German	Secondary School
Arnaud <i>et al.</i> (1985)	1,000 words	400	French	Secondary School
López-Mezquita (2005)	941 words	1049	Spanish	Secondary Education (4 th ESO/10 th form)
Terrazas Gallego and Agustín Llach (2009)	817 words	734	Spanish	Secondary Education (1 st ESO/7 th Grade)
Jiménez Catalán and Terrazas Gallego (2005-2008)	559 words	419	Spanish	Primary Education (4 th Grade)
Agustín Llach and Terrazas Gallego (forthcoming)	1206 words	944	Spanish	Secondary Education (3 rd ESO/9 th Grade)

As shown in table 1, studies where L2 receptive vocabulary size is measured at secondary level in Spain are scarce (López-Mezquita, 2005; Terrazas Gallego & Agustín Llach, 2009; Agustín Llach & Terrazas Gallego, forthcoming). This lack of research is even more outstanding concerning 10th Grade (4th ESO) Spanish students since, to our knowledge, only López-Mezquita (2005) has conducted research at this educational level. Hence, this paper aims at analyzing 10th grade Spanish students' receptive vocabulary size to compare our results with the findings obtained by López Mezquita (2005) and to previous studies conducted in the same educational context with younger learners (Jiménez Catalán & Terrazas Gallego, 2005-2008; Terrazas Gallego & Agustín Llach, 2009; Agustín Llach & Terrazas Gallego, forthcoming).

The role of gender 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 gender differences in performance on a receptive vocabulary test implemented with

primary students. In a recent longitudinal study on vocabulary knowledge and gender differences, Agustín Llach and Terrazas Gallego (forthcoming) 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. 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 and Ojeda, 2009). A set of recent studies compiled in Jimenez (2010) also point to mixed results on gender 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 gender 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 gender tendencies. For these reasons, this study aims at investigating the receptive vocabulary knowledge of 15-16 year-old male and female Spanish students learning English in Spanish 10th grade (4th ESO) to relate receptive vocabulary size to language level and ability to understand written and spoken discourse in English (Nation, 1993, Laufer, 1992; Hazenberg and Hulstijn, 1996; Laufer, 1997; Nation 2001; Adolphs and Schmitt, 2004; Cobb and Horst, 2004).

2. METHOD

2.1. Participants

A total of 49 girls and 43 boys participated in the study. These were 10th grade (4th ESO) Spanish-speaking EFL learners from a high school located in the north of Spain. The sample was homogeneous as regards social environment, type of instruction and hours of instruction since all participants had received a total amount of 1049 hours of instruction in the target language. Moreover, learners shared Spanish as the same mother tongue (L1) and they were 15-16 years old.

2.2. Procedure and data gathering

The 2,000 word frequency-band from the receptive version of the VLT (see Appendix I) was used to measure the receptive vocabulary size of these subjects (Schmitt, Schmitt and Clapham, 2001, version 2). This test is based on the frequency lists collected by West (1953) in the General Service List and the Thorndike and Lorge (1944) list, which were checked against the list compiled by Kucera and Nelson Francis (1967), known as the Brown Corpus.

In the 2k VLT (see Appendix I), test-takers have to match a target word with the corresponding definition. A total of 60 target words are used for testing. Ten groups of six words and three definitions make up the test. Each correct answer, i.e. matching each target word with its definition is given one point, so that the maximum score of the test is 30 points. The research studies that have reported on the validity and reliability of the 2k VLT (Read, 2000) evince that the test is not only valid and consistent in its measurements, but also that, in fact, it measures what it sets out to measure.

Data were collected in one session during class time. The time allotted to complete the task was 10 minutes. At the beginning of the test, clear instructions were given both orally and in written form in the students' mother tongue to clarify what they were asked to do. In order to calculate descriptive values and to measure differences among male and female learners, we used the SPSS 19 to perform descriptive and inferential statistics.

3. RESULTS

Table 2 shows the means and standard deviations for the 2,000 receptive vocabulary level test scored by the 92 students involved in the study, regardless of their sex. As can be seen, the mean score is 14.03 and the standard deviation 5.53.

Table 2. Means and standard deviations.

	VLT 2,000 (n=92)
Number of items	30
Means	14.03
SD	5.53

These figures indicate that the overall receptive vocabulary size of this sample of 10th grade Spanish EFL learners is considerably lower than 2,000 words. This profile is illustrated in the rankings of percentages summarized in figure 1. The results show that 2.8% scored between 0 and 5 points, 37.50% scored between 6 and 10 points, 40.28% of the students scored between 11 and 15 points, 13.09% scored between 16 and 20, 1.39% scored between 21 and 25 and 4.17% between 26 and 30.

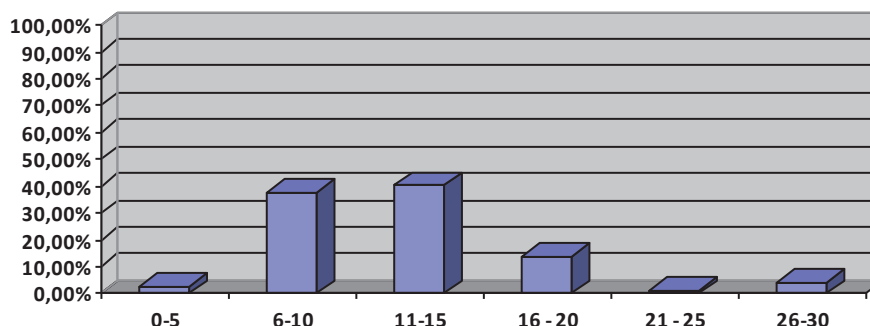


Figure 1. Frequency distribution of test scores (n= 92).

Students' scores were translated into a 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). If we compare the means obtained by the students analysed in the present study (935 words) and the estimates of words abovementioned (see table 1), we ascertain that our informants show a slightly lower vocabulary size range than López-Mezquita's estimates for 10th grade Spanish students (941 words) and much lower ranges when compared to students from other countries even with less hours of instruction (Takala, 1984, 1985; Milton and Meara, 1998; Qian, 2002). However, their estimates are higher than those found for 7th graders in a similar context than the one analysed in this paper (Terrazas Gallego and Agustín Llach, 2009), which indicates that receptive vocabulary size can be incremental. 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 associate all the words with their definition.

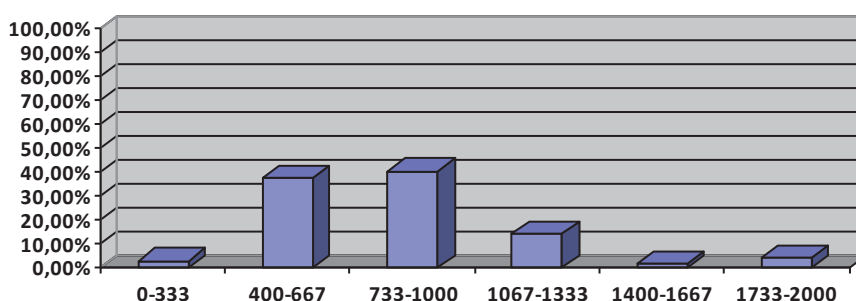


Figure 2. Estimates of known words.

As far as gender differences in vocabulary size are concerned (see table 3), descriptive results reveal a higher means for boys. Maximum and minimum values are also higher for male participants.

Table 3. Means and standard deviations (SD) for males and females.

	N	Min.	Max.	Mean	S.D.
Males	43	3	29	15.42	5.43
Females	49	5	24	12.81	5.37

As it was abovementioned, these data indicate that the overall receptive vocabulary of this sample of 10th grade Spanish EFL learners is considerably lower than 2,000 words. Nevertheless, boys' receptive vocabulary knowledge is higher than girls'. This profile is illustrated in the rankings of percentages summarized in figure 3. As shown in figure 3, the results evince that 3.03% of the males involved in the study scored between 0 and 5 points, 18.18% between 6 and 10, 48.48% between 11 and 15 points, 21.21% between 16 and 20, points, 3.03% between 21 and 25, and 6.06% scored between 26 and 30 points.

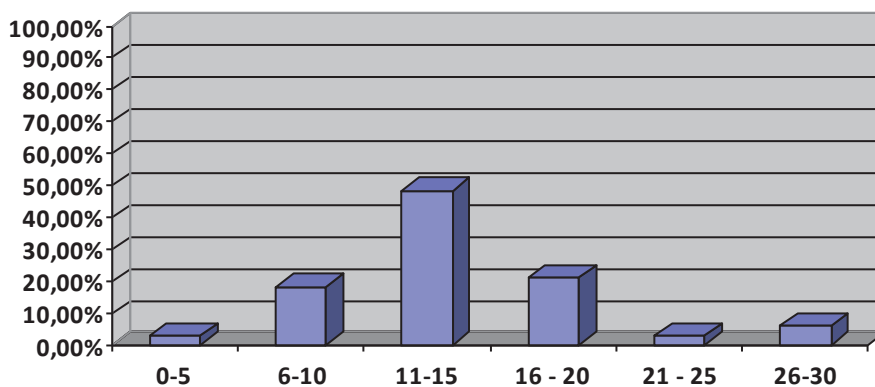


Figure 3. Males' frequency of distribution of test scores.

As for female students (see figure 4), our findings show that 2.63% of the females scored between 0 and 5 points, 55.26% between 6 and 10, 34.21% between 11 and 15 points, 7.89 % between 16 and 20, and 14% between 21-25, being 24 points the highest score achieved by these group of students. It is worth mentioning that no female was able to achieve more than twenty-four points, whereas there were three males who scored more than twenty-five points in the test.

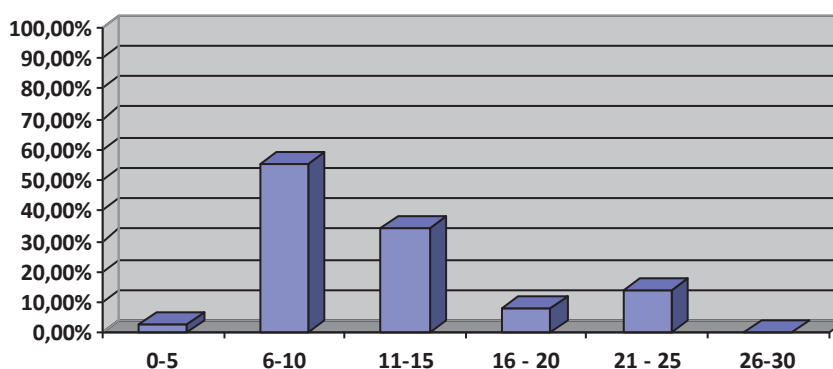


Figure 4. Females' frequency of distribution of test scores.

These findings reveal that boys outperformed girls regarding in the majority of the ranks i.e. 0-5, 11-15, 16-20 and 26-30 points, whereas girls obtained better results in two ranks 6-10 and 21-25 points.

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 4 shows that the means of word estimates for boys (1028 words) is much higher when compared to the results obtained by their female partners (854 words).

Table 4. Word estimates for male and female students.

	N	Min.	Max.	Mean	S.D.
Males	43	200	1933	1028	362
Females	49	333	1600	854	358.39

If we compare these data with the estimates of words shown in table 1, we ascertain that our male informants show a higher vocabulary size range (1028 words) than López-Mezquita's word estimates for 10th grade Spanish students (941 words), whereas our female participants are slightly below these estimates (854 words). On the contrary, our results evince that the vocabulary size of the students in this sample is much lower if compared to students from other countries even with less hours of instruction (Milton and Meara, 1998; Takala, 1984, 1985; Qian, 2002).

As for descriptive statistics, the box-plots below (figure 5 and 6) which represent the median value of males and females in the sample reveal that the median value of the male group is higher than that of the female group. These

figures clearly indicate that male learners outscored their female partners in the vocabulary level test administered which entails that their receptive vocabulary size and their word estimates are higher than their female classmates'.

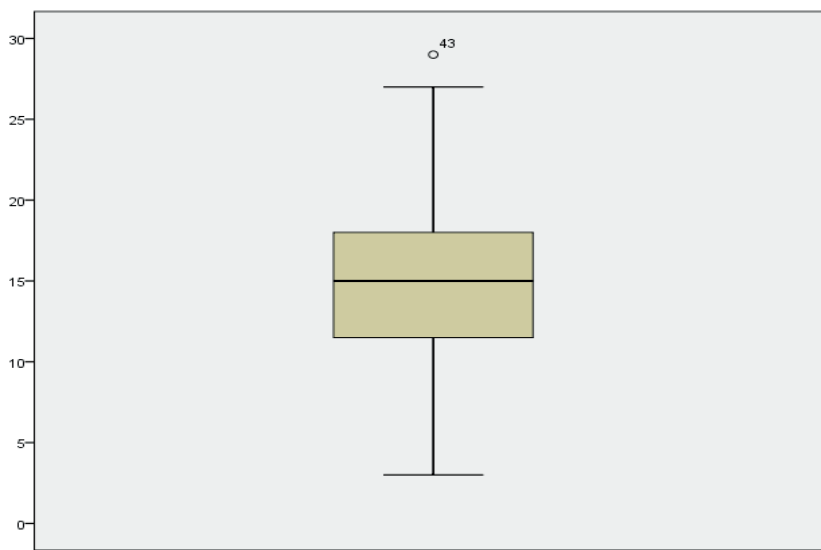


Figure 5. Box diagram of males' median and score values.

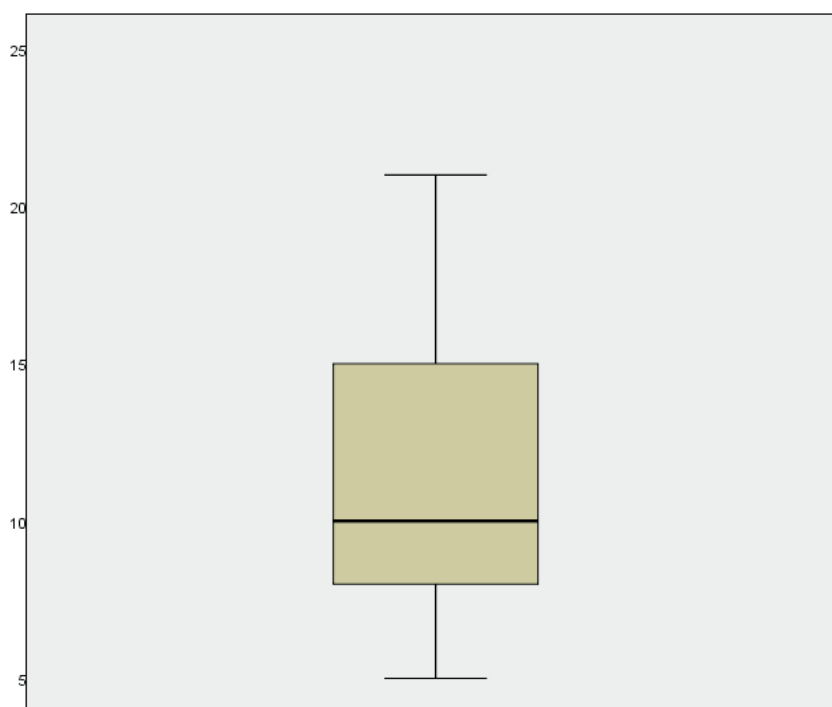


Figure 6. Box diagram of females' median and score values.

In order to gain statistical value of the nature of the differences between male and female informants Kolmogorov-Smirnov and Shapiro-Wilk were implemented in order to ascertain if our sample met the normality assumption. As shown in table 5, the sample did not meet normality and non-parametric tests of means comparison for two independent samples were applied.

Table 5. Parametric tests for gender-based differences.

	Kolmogorov-Smirnov			Shapiro-Wilk		
	gl	Sig.		gl	Sig.	
Girls	.148	43	.019	.943	43	.034
Boys	.106	43	.200	.973	43	.396

The U Mann-Whitney test was conducted to test inferential statistical differences among the groups and its results reveal significant gender differences in favour of the male participants at a significance level of 5% in vocabulary size estimations. Table 6 offers these results:

Table 6. Results of inferential statistics for gender-based differences.

	VLT
Mann-Whitney U	744.000
Wilcoxon W	1969
Z	-2.427
P (two tailed)	.015

4. DISCUSSION

Our data reveal statistically significant differences between male and female learners in favour of males. As a result, the number of word estimates boys are able to recognise is higher than the word estimates known by their female classmates. These data resemble the findings in vocabulary knowledge in the foreign language conducted overseas since boys outperform girls in vocabulary size knowledge, (Scarcella and Zimmerman, 1998; Edelenbos and Vinjé, 2000; Lin and Wu 2003; and Lynn *et al.* 2005) but differ from the results found in research conducted in Spain in primary education and the first grades of secondary education (Jiménez Catalán and Terrazas Gallego, 2005-2008; Terrazas Gallego and Agustín Llach, 2009; Agustín Llach and Terrazas Gallego, forthcoming) where girls obtain better results than their male partners.

According to our estimates, most of our female pupils know below nine hundred words of the most frequent 2,000 in English, so they are slightly below the figures pointed out by López-Mezquita (2005) for Spanish students in the same educational level (941 words). Contrariwise, males' estimates are higher than their female partners' (1028 words) but both groups of learners obtain poorer results if compared to one year younger Spanish students from a similar educational background (Agustín Llach and Terrazas Gallego, forthcoming). These findings seem to contradict the commonly accepted thesis that vocabulary size grows as proficiency level in the foreign language and exposure to the target language increase (Barrow *et al.*, 1999; Fan, 2000; Goldberg, 2001) since our students are one year older than the informants analysed in Agustín Llach and Terrazas Gallego's study and had being exposed to the foreign language for a longer period of time, but their vocabulary size knowledge is lower. However, this assertion should be taken with caution since the studies were conducted in the same area but in different schools, therefore the context is not exactly the same. Furthermore, one year younger students in one school may well have a higher proficiency level than the same year group in another school as they can have been exposed to different language input, and their motivation to L2 learning could be also higher.

Our sample also obtains lower levels of receptive vocabulary size than learners who have received lower amounts of instruction in EFL in other countries (Staehr, 2008; Milton and Meara, 1998; Takala, 1985; Barrow *et al.*, 1999). These results concur with Sunderland (2010) assertions which relate vocabulary acquisition to socio-cultural contexts in which learning takes place and to the teaching materials used in the classroom interaction.

As for students' understanding of oral and written discourse in the foreign language, their word estimates show that the top scores obtained more than 40% of the students are in the 1,000 frequency band. These data evince that our students may find it difficult to understand written and spoken discourse in English since they need to master at least 2,000 word forms to be able to understand around 90% and 94% of spoken discourse in different contexts (Nation, 2001; Adolphs and Schmitt, 2004) and about 5,000-word English vocabulary or 3,000 word families to reach a text coverage of 95% (Laufer, 1992; Hazenberg and Hulstijn, 1996; Laufer, 1997; Nation 2001; Adolphs and Schmitt, 2004; Cobb and Horst, 2004).

5. CONCLUSION

The results of the present study reveal that the receptive vocabulary size of our 10th grade learners is slightly lower when compared to other EFL learners of their same age and with the same number of hours of instruction from a different context in Spain (López Mezquita, 2005). We have also ascertained statistically significant differences in favour of our male learners. These data cannot be generalised since our research presents limitations since the number of informants who took part in the study is quite reduced. Nevertheless, it is valuable as a starting point to measure the receptive vocabulary knowledge of last grade secondary school Spanish EFL learners in the context where the study was carried out.

Consequently, further research needs to be conducted to analyse the number of words known and unknown by 10th graders is relevant to allow teachers to adopt informed decisions on the number of words to be introduced in the lesson as well as the strategies to adopt in the teaching of vocabulary. In this way, it will be useful to compare two groups of learners' of the same educational level and different high schools in the same area using different textbooks, therefore different vocabulary input, to analyse if the differences between learners are statistically relevant concerning word estimates and vocabulary size knowledge. Besides, it seems necessary for teachers to find out the type of vocabulary input which is included in the textbook they often use with their students as well as the number of occurrences of the words contained in them, so that their students can progressively acquire new words (Jiménez Catalán & Mancebo Francisco, 2008). Finally, receptive vocabulary knowledge can also be attached to the six levels of the *Common European Framework of Reference* (2001), therefore X_Lex (Meara and Milton, 2003; Milton, 2010) could be implemented to test if there are differences in students' level according to sex and social context.

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APPENDIX I. VOCABULARY LEVEL TEST 2,000

2,000 WORD LEVEL TEST
2005/2006

COLEGIO _____

CURSO _____ FECHA _____

APELLIDOS _____ NOMBRE _____

Este es un test de vocabulario. En la parte izquierda te presentamos grupos de seis palabras inglesas y a su derecha, los significados de sólo tres de ellas. **Escribe** junto a éstos, el **número** de la palabra inglesa correspondiente a dichos significados. Observa el siguiente ejemplo:

EJEMPLO	→	RESPUESTA CORRECTA
1 business 2 clock _____ part of a house 3 horse _____ animal with 4 legs 4 pencil _____ something used for writing 5 shoe 6 wall	→	1 business 2 clock _____ 6 part of a house 3 horse _____ 3 animal with 4 legs 4 pencil _____ 4 something used for writing 5 shoe 6 wall
1 coffee 2 disease _____ money for work 3 justice _____ a piece of clothing 4 skirt _____ using the law in the right way 5 stage 6 wage		1 adopt 2 climb _____ go up 3 examine _____ look at closely 4 pour _____ be on every side 5 satisfy 6 surround
1 choice 2 crop _____ heat 3 flesh _____ meat 4 salary _____ money paid regularly for doing a job 5 secret 6 temperature		1 bake 2 connect _____ join together 3 inquire _____ walk without purpose 4 limit _____ keep within a certain size 5 recognize 6 wander
1 cap 2 education _____ teaching and learning 3 journey _____ numbers to measure with 4 parent _____ going to a far place 5 scale 6 trick		1 burst 2 concern _____ break open 3 deliver _____ make better 4 fold _____ take something to someone 5 improve 6 urge
1 attack 2 charm _____ gold and silver 3 lack _____ pleasing quality 4 pen _____ not having something 5 shadow 6 treasure		1 original 2 private _____ first 3 royal _____ not public 4 slow _____ all added together 5 sorry 6 total
1 cream 2 factory _____ part of milk 3 nail _____ a lot of money 4 pupil _____ person who is studying 5 sacrifice 6 wealth		1 ancient 2 curious _____ not easy 3 difficult _____ very old 4 entire _____ related to God 5 holy 6 social