

Article

The Controlled Productive Vocabulary of Unimodal EFL Learners

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Abstract

The present study seeks to fulfill the following three objectives: (1) to examine the controlled productive vocabulary of unimodal EFL learners, (2) to identify their perceptual learning style preferences, and (3) to determine whether the major preference for a specific perceptual learning style ensures a higher controlled productive vocabulary. The sample of the present study comprised 36 unimodal EFL learners who were enrolled in the 12th grade in the Spanish educational system. Two data collection instruments were administered. The 2,000-word parallel version (version A + version C) of the *Productive Vocabulary Levels Test* (Laufer & Nation, 1995, 1999) was used to obtain the controlled productive vocabulary knowledge of the participants. The *Learning Style Survey* (Cohen et al., 2009) was used to assess their perceptual learning style preferences (visual, auditory, and tactile/kinesthetic). Findings revealed that the informants had an overall controlled productive vocabulary knowledge of 948 words, out of the 2,000 most frequent words that the test measured. Visual appeared to be the most favored perceptual learning style, followed by tactile/kinesthetic and auditory styles. Similarly, visual learners were reported to have a larger productive vocabulary knowledge, followed by tactile/kinesthetic and auditory learners. Nevertheless, the results indicated that there were not statistically significant differences among controlled productive vocabulary knowledge and each perceptual learning style preference. These findings are suggestive of the need for further instruction on EFL vocabulary in the Spanish educational system so that learners would be able to communicate effectively both orally and in written form in English.

Keywords

Controlled productive vocabulary, perceptual learning style preferences, English as a foreign language, 12th grade, Spanish educational system

1 Introduction

The important role given to vocabulary in second or foreign language acquisition has been undeniably acknowledged (e.g., Laufer, 1998; Nation, 2013; Webb, 2020). In fact, it is regarded as one of the crucial elements of language, since “without grammar very little can be achieved, without vocabulary nothing can be achieved” (Wilkins, 1972, p. 111). The field of L2 vocabulary acquisition had been neglected

until the beginning of the 1980s, with the emergence of the pioneer work conducted by Meara (1980). From this date onwards, investigations into second and foreign language vocabulary acquisition began to increase considerably. Despite the abundance of literature on this field over the last years, the dearth of studies on English as a foreign language (EFL) productive vocabulary knowledge has been observed (e.g., Castro García, 2017; Laufer & Nation, 1999; Meara & Miralpeix, 2021). Following these lines, productive vocabulary is defined as the production of words in both speaking and writing in order to convey meaning (Nation, 2001). Therefore, studies on productive vocabulary would ascertain the number of words that language learners are ready to use for effective communication.

In EFL classrooms, the learning of English vocabulary might be influenced by the individual differences of learners. For example, learning styles are one of the individual differences which are crucial in the acquisition of a foreign language. Learners may resort to different sensory modalities (visual, auditory, or tactile/kinesthetic) to comprehend, process, and store information. These sensory modalities are also known as perceptual learning styles, which is the term used in this paper. Consequently, some of the information that is comprehended, processed and stored through the sensory modalities might include vocabulary. Research into perceptual learning styles is of paramount importance for foreign language teachers and researchers because it will uncover the individual preferences of language learners when they are learning a foreign language. Some scholars (e.g., Akbarian et al., 2019; Hatami, 2018; Kassaian, 2007; Shen, 2010) have explored the relationship among L2 vocabulary learning and perceptual learning style preferences. Nevertheless, as far as we are aware, studies on the relationship among controlled productive vocabulary knowledge and perceptual learning style preferences of EFL learners are lacking in the literature.

For that reason, the present investigation is intended to shed some light on this relationship by examining the controlled productive vocabulary knowledge of unimodal EFL learners enrolled in the second year of Spanish non-compulsory secondary education, which is equivalent to the 12th grade. The second section of this paper gives a brief overview of the notions of productive vocabulary and perceptual learning styles, and it also reviews some of the existing literature on these issues. A report of the study conducted, along with the main results found and their interpretation follows. This paper concludes by indicating the main limitations, some pedagogical implications, and some lines for further research.

2 Literature Review

2.1 Productive vocabulary

The distinction between receptive and productive vocabulary knowledge has been acknowledged by most scholars (e.g., Laufer & Nation, 1999; Melka Teichroew, 1982; Webb, 2008). Learning vocabulary productively is thought to be a more demanding process than learning vocabulary receptively (Nation, 1990, 2001; Waring, 1997). In fact, native speakers tend to understand more words than they produce, as it happens to foreign language learners. There are differing views in the literature on whether receptive and productive vocabulary are a continuum (e.g., Faerch et al., 1984; Henriksen, 1999; Nation, 2013) or a dichotomy (Meara, 1990). We support the continuum view because a word needs to be known receptively in order to be able to produce it. Several communication issues might arise when trying to produce a word that is not understood first. Therefore, productive vocabulary presumes receptive vocabulary. However, Schmitt (2000) argued that a word might be known productively (e.g., oral production) but not receptively (e.g., reading). This idea is not widely supported by research (e.g., Melka Teichroew, 1987; Waring, 1997), as they pointed to an overlap between receptive and productive vocabulary. The present paper is devoted to this notion of productive vocabulary, as it is crucial to know how many words are available to be used effectively in communicative contexts. In this respect, research

on word frequency (e.g., [Schmitt & Schmitt, 2014](#); [Webb & Nation, 2017](#); [Webb & Rodgers, 2009](#)) estimated the knowledge of at least 2,000 or 3,000 most frequent words to be able to have an effective communication both verbally and in written form.

Concerning productive vocabulary, three different types can be distinguished: controlled, free, and production/association. Controlled productive vocabulary refers to the production of words when a task requires them ([Laufer, 1998](#)). Thus, it would be to complete the following sentence: “the garden was full of fra_____flowers” with the word “fragrant” (p. 257). On the other hand, free productive vocabulary means using the words out of choice. As Laufer (1998, p. 257) stated, it is defined as “the use of words at one’s free will, without any specific prompts for particular words, as is the case of free composition.” This could happen in a written or oral task. Finally, production/association alludes to the diverse relations that can be established among words ([Meara, 1982](#)). Specifically, this paper focuses on controlled productive vocabulary, since it would shed some light on EFL learners’ level of this type of vocabulary in the 2,000-word frequency band.

2.2 Perceptual learning styles

Learning styles are a crucial individual difference in the foreign language process, as they determine the various preferences that language learners have towards learning the foreign language. They are defined as “an individual’s natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills” ([Reid, 1995](#), p. viii). A wealth of classifications on learning styles has been proposed in the literature (e.g., [Briggs Myers, 1962](#); [Dunn & Dunn, 1972](#); [Felder & Silverman, 1988](#); [Fleming & Mills, 1992](#); [Gregorc, 1979](#); [Witkin et al., 1962](#)). However, we decided to choose perceptual learning styles because most of the classifications included the perceptual component, and these styles can be found in the foreign language classroom ([Barbe et al., 1979](#); [Tight, 2010](#)).

Perceptual learning styles involve the preferences that learners have in the learning process: “the senses through which each person takes in and retains new and difficult information” ([Kinsella, 1995](#), p. 225). Regardless of the consensus achieved on the definition of perceptual learning styles, the reasons why a specific sensory modality is chosen in the learning process ought to be considered as well. Choosing a specific perceptual learning style might be affected by internal (e.g., aptitude, learning strategies) and external (e.g., context, culture) factors, as they might play a significant role in the learning process. According to Barbe et al. (1979) and Tight (2010), sight, hearing, and touch are considered to be the most important senses encountered in the educational context. Consequently, this paper explores the visual, auditory, and tactile/kinesthetic learning styles because it makes teachers aware of the learning preferences of their students. Learners might have different preferences while learning. For example, visual learners prefer to learn through the sense of sight. They like reading, using the textbook, taking notes, or written directions, among others (e.g., [Dörnyei & Ryan, 2015](#); [Oxford, 1995a](#); [Peacock, 2001](#)). Auditory learners prefer to learn through the sense of hearing. They like reading aloud, listening to lectures, classroom discussions, or role-play activities, among others (e.g., [Dörnyei, 2005](#); [Oxford, 2003](#)). Tactile/kinesthetic learners prefer to learn through the sense of touch and movement. They like drawing, painting, acting out, or group work, among other activities (e.g., [Hyland, 1993](#); [Oxford, 2000](#)). On the whole, learners may have a single preference for learning a foreign language (visual, auditory, or tactile/kinesthetic), or they may have a mixed-modality preference if they favor two or three of those perceptual learning styles in balance. The present paper focuses on the first type of learners, which are also called unimodal, since they only have one preference for learning. It is worth noting that we regard perceptual learning styles as a general preference for learning, which does not entail that learners exclusively learn in the preferences they report to have. Depending on the situation or activity, they might resort to other perceptual learning styles.

2.3 Review of studies

Despite the plethora of research on the controlled productive vocabulary knowledge of university EFL learners, very few studies have investigated secondary school students, in particular the 12th grade. To our knowledge, only two investigations can be found in the literature that researched 12th grade EFL learners through the 2,000-word band level of the *Productive Vocabulary Levels Test* (Laufer & Nation, 1995, 1999) (see Section 4.2.1 for an explanation): Laufer and Nation (1999) and Montero-SaizAja (2021). Laufer and Nation (1999) found that their sample of 18 12th grade EFL learners were reported to have an average of 16.2 correct items in the controlled productive vocabulary test. Nevertheless, the number of known words out of the 2,000 most frequent ones were not reported in this study. Montero-SaizAja (2021) concluded that 1,014 words seemed to be the controlled productive vocabulary knowledge of a sample of 12th grade EFL learners who were enrolled in a Spanish high school.

Likewise, the perceptual learning style preferences of secondary and university ESL/EFL learners have been widely investigated. Nonetheless, as far as we are concerned, no study has examined the perceptual learning style preferences of 12th grade EFL learners. Most of the studies on secondary and university ESL and EFL learners (e.g., Arif et al., 2021; Chen, 2009; Mulyadi et al., 2017; Muniandy, 2013; Nge & Eamoraphan, 2020; Payaprom & Payaprom, 2020; Reid, 1987; Swartz & Ye, 2018; Tuan, 2011), which were mainly conducted in the Asian continent, concluded that tactile/kinesthetic was their major perceptual learning style preference, followed by auditory and visual styles.

Regarding the relationship among controlled productive vocabulary and perceptual learning style preferences, to our knowledge, it has not been investigated yet. In addition, studies on L2 vocabulary learning and perceptual learning style preferences seem to be scarce. Disparity of findings arises in the relation between these two variables: some studies (Shen, 2010; Tight, 2010) found that the relationship was statistically significant, other scholars (Akbarian et al., 2019; Hatami, 2018; Kassaian, 2007; Yeh & Wang, 2003) reported that the relationship was not statistically significant, and Pouwels (1992) obtained mixed results. These few studies focused on intentional (Kassaian, 2007; Pouwels, 1992; Tight, 2010) and incidental (Hatami, 2018) L2 vocabulary acquisition, lexical inferencing (Shen, 2010), vocabulary annotations (Yeh & Wang, 2003), and vocabulary depth (Akbarian et al., 2019). Even though these investigations did not address productive vocabulary or any of its three types, with caution we dare to speculate that there will not be any statistically significant differences among controlled productive vocabulary knowledge and perceptual learning style preferences. These findings would be very useful for foreign language teachers and researchers, since they will make them aware of EFL learners' level of controlled productive vocabulary, and whether their perceptual learning style preferences influence their EFL vocabulary learning.

3 Research Questions

Controlled productive vocabulary and perceptual learning style preferences are two variables which have not been correlated in the literature, as far as we know. This study is intended to ascertain whether the preference for a particular perceptual learning style would ensure a larger controlled productive vocabulary knowledge. As explained in the review of studies provided in Section 2.3, university or high school students usually serve as the participants in the investigations conducted on vocabulary and learning styles. However, there is a scarcity of studies that investigates these issues on 12th grade EFL learners.

Taking everything into consideration, the research questions of the present investigation are the following:

1. What is the controlled productive vocabulary knowledge of 12th grade unimodal EFL learners?
2. What are the perceptual learning style preferences of 12th grade unimodal EFL learners?

3. To what extent do differences in perceptual learning style preferences account for controlled productive vocabulary knowledge?

4 Methodology

The present investigation offers a quantitative, cross-sectional, descriptive, and correlational research.

4.1 Participants

A group of 36 EFL learners participated in the present study. They were unimodal learners, that is, they had a single perceptual learning style preference (visual, auditory, or tactile/kinesthetic). These informants were selected out of a sample of 60 EFL learners based on their reported learning preferences in a learning style questionnaire, as it will be explained in Section 4.3. Only unimodal learners were chosen because it was thought that it would be more interesting to compare the controlled productive vocabulary knowledge of three specific groups of learners (visual, auditory, and tactile/kinesthetic) instead of groups with combination of preferences, as is the case of multimodal learners. They attended the second year of Spanish post-secondary education (equivalent to the 12th grade) in a state school in La Rioja. All the informants were learners of English as a foreign language and were at the B1 level, which was the level assigned to this course by the educational board of the autonomous community of La Rioja (Spain). At testing time, their mean age was 17.17 years old. The majority of the sample (83.33 per cent) spoke Spanish as their mother tongue. The rest of the participants (16.67 per cent) had other languages as their mother tongue, such as Arabic (5.55 per cent), Bulgarian (2.78 per cent), Macedonian (2.78 per cent), and Romanian (5.55 per cent).

4.2 Instruments

4.2.1 *Productive Vocabulary Levels Test (PVLТ)*

The *Productive Vocabulary Levels Test* (Laufer & Nation, 1995, 1999) was administered to ascertain the controlled productive vocabulary knowledge of the participants of this study. Specifically, the 2,000-word parallel version (version A + version C) was implemented because the knowledge of at least the 2,000 most frequent words appears to be necessary to be able to communicate orally and in written form in a foreign language (e.g., Nation & Waring, 1997; Schmitt & Schmitt, 2014). This test comprises 30 different sentence contexts; students have to complete the missing word in each sentence. The first letters of the target word are provided to be able to complete it. For example, the first item of this test is the following: “They will restore the house to its orig_____ state.” Informants would have to write the word “original” in this sentence. This instrument was selected owing to two main reasons. First, it has been reported to be a reliable and valid measure (Laufer & Nation, 1999). Second, the words that this test measures belong to the high-frequency level, which correspond to the basic vocabulary of a language (Nation, 2006). Consequently, the knowledge of these 2,000 most frequent words would assure that the test-takers would be able to make use of them in communicative situations.

4.2.2 *Learning Style Survey (LSS)*

The first part of the *Learning Style Survey* (Cohen et al., 2009), which is entitled “How I use my physical senses,” was administered to the participants of this investigation in order to assess their perceptual learning style preferences (visual, auditory, and tactile/kinesthetic). It consists of 30 behavioral statements: 10 for each perceptual learning style. Informants have to circle their answer based on a five-

point Likert Scale (0=never, 1=rarely, 2=sometimes, 3=often, 4=always). For example, the first item which is related to the tactile/kinesthetic learning style reads as follows: "I'd rather start to do things, rather than pay attention to directions" (p. 2). This instrument was selected for several reasons. First, it has been implemented in several investigations conducted in the L2 learning context (e.g., [Hatami, 2018](#); [Huang et al., 2018](#); [Meguro, 2020](#)). Second, the items comprised in this questionnaire are more L2 specific than other widely used learning style instruments, such as the *Perceptual Learning Style Preference Questionnaire* ([Reid, 1987](#)) or the *Style Analysis Survey* ([Oxford, 1995b](#)). Third, there is a specific part which focuses on the perceptual learning style preferences. Finally, the first part of this questionnaire has been proved to have a test-retest reliability of .74 ([Tight, 2010](#)).

4.3 Data collection, procedure, and analyses

Before the instruments explained in the previous section were distributed to the participants of this investigation, the headmaster of the participating school signed a written consent so that those instruments could be administered. All the participants, their parents, tutors, and teachers were informed of the research objectives of this study and its voluntary basis. Data were collected in one session at the end of the first semester. Participants completed the PVLТ test in 10 minutes. It was distributed in English because our goal was to ascertain their controlled productive vocabulary knowledge in EFL. However, the first part of the LSS was administered in Spanish after The Center for Advanced Research on Language Acquisition (CARLA), from the University of Minnesota, granted us the permission to distribute this questionnaire and translate it into Spanish. This decision was made since, as stated in the previous section, most of the test-takers had Spanish as their native language (83.33 per cent) and it was the L2 of the rest of the sample (16.67 per cent), who used Spanish in their daily lives. As the informants did not have the same linguistic competence in English, it was considered that they would answer more accurately if they understood this questionnaire better. Before responding to each test, written instructions were given in English in the PVLТ and in Spanish in the LSS; those instructions were also uttered in Spanish in both tests to explain what the participants were expected to do. Their teachers and researcher were present at all times in the classroom.

After the data collection, the PVLТ and LSS were corrected and marked. After that, all the responses were coded into a Microsoft Excel spreadsheet. With reference to the PVLТ, zero and 30 were the lowest and highest points to be achieved, respectively. According to Nation (1990, p. 78), the controlled productive vocabulary knowledge of the participants was calculated as the number of correct answers multiplied by the total number of words of the test (2,000) and divided by the number of items (30). For us, one point was obtained if a word was grammatically and orthographically correct, since the first letters of each target word were given as a clue. As for the LSS, zero and four were the lowest and highest points to be achieved in each item. 40 were the maximum points to be obtained in each perceptual learning style, as there were 10 items per modality. Therefore, after summing all the points, the modality which had the highest score was established as the test-takers' perceptual learning style preference. If there was not a difference of at least three points between the highest modality and the following highest, informants were considered to have mixed-modality preferences. These types of learners are also called multimodal. On the contrary, if there was a difference of three points, the participants were considered to be unimodal learners. This latter type of learners are the participants on which this paper is based.

RStudio version 2022.12.0+353 was used to implement the descriptive and inferential statistics. The Kolmogorov-Smirnov test was applied to ascertain the normality of the variables, and the ANOVA test was run to determine whether there were any statistically significant differences among controlled productive vocabulary knowledge and perceptual learning style preferences.

5 Results

The first objective of the present investigation aimed at identifying the controlled productive vocabulary knowledge of unimodal EFL learners. Table 1 presents the descriptive statistics for the words known out of the 2,000 most frequent ones that the PVLТ measured. As can be seen in that table, the participants appeared to have an average knowledge of 948 words. The maximum of word estimates was around 1,733 words, whereas the minimum achieved was of 200 words. Hence, their overall controlled productive vocabulary knowledge did not surpass the half of the words measured in this test, that is, 1,000 words out of 2,000.

Table 1

Descriptive Statistics for the Controlled Productive Vocabulary Knowledge

	N	Mean	Standard Deviation	Standard Error	95% Confidence Interval		Min.	Max.
					Lower Bound	Upper Bound		
Controlled productive vocabulary	36	948.148	469.545	78.257	789.276	1,107.019	200	1,733.33

The second objective aimed at ascertaining the perceptual learning style preferences of the informants of this study. From the data in Table 2, it can be inferred that the visual learning style was reported to be the preferable perceptual learning style, followed by the tactile/kinesthetic and auditory styles. The results revealed that the maximum scores were obtained in the tactile/kinesthetic style, followed by visual and auditory styles. Nevertheless, the minimum scores were achieved in the tactile/kinesthetic style, followed by the auditory and visual styles. As for the 95 per cent of confidence interval for mean for each perceptual learning style, Table 2 shows that the auditory and visual learning styles did not intersect.

Table 2

Descriptive Statistics for the Perceptual Learning Style Preferences

Perceptual learning style	N	Mean	Standard Deviation	Standard Error	95% Confidence Interval		Min.	Max.
					Lower Bound	Upper Bound		
Auditory	36	18.92	4.129	.688	17.519	20.313	11	31
Tactile/kinesthetic	36	22	6.989	1.164	19.635	24.365	9	36
Visual	36	23.94	4.458	.743	22.435	25.453	13	35

The third objective of this study was to discern whether the differences in perceptual learning style preferences accounted for controlled productive vocabulary knowledge. A Kolmogorov-Smirnov test was run to determine whether the dependent variable (controlled productive vocabulary) and the independent variables (visual, auditory, and tactile/kinesthetic) met the normality assumption. Findings revealed that the dependent and independent variables followed a normal distribution: controlled productive vocabulary (p-value=.093), auditory learning style (p-value=.248), tactile/kinesthetic learning style (p-value=.174), and visual learning style (p-value=.687).

From the figures in Table 3, it can be observed that the participants who favored the visual learning style seemed to have a larger controlled productive vocabulary knowledge (1,009 words), followed by those informants who preferred the tactile/kinesthetic style (872 words) and the auditory learning style (822 words). The tactile/kinesthetic and visual learners were reported to coincide with the minimum of word estimates in the PVLТ test (200 words), being around 666 words for the auditory learners. On the contrary, our results indicated that EFL learners obtained different maximum word estimates, being visual learners the ones who reported to have more words (1,733 words), followed by tactile/kinesthetic and auditory learners. What is more, the limits of the 95 per cent confidence interval for the mean for each perceptual learning style intersected.

Table 3

Descriptive Statistics for the Controlled Productive Vocabulary Knowledge in each Perceptual Learning Style

Controlled productive vocabulary	N	Mean	Standard Deviation	Standard Error	95% Confidence Interval		Min.	Max.
					Lower Bound	Upper Bound		
Auditory style	36	822.222	214.303	123.728	289.863	1,354.581	666.66	1,066.667
Tactile/kinesthetic style	36	872.222	507.286	146.441	549.907	1,194.537	200	1,600
Visual style	36	1,009.523	479.483	104.631	791.265	1,227.782	200	1,733.33

Finally, an ANOVA test was applied to the data to determine whether there were any statistically significant differences among controlled productive vocabulary knowledge and each perceptual learning style. In other words, whether the preference for a particular perceptual learning style ensured a higher controlled productive vocabulary knowledge. The findings showed that the probability of the F in the ANOVA test was higher than .05: auditory learning style (F sig.=.567), tactile/kinesthetic learning style (F sig.=.886), and visual learning style (F sig.=.86). This implied that the controlled productive vocabulary knowledge of the participants was not statistically significant in any of their perceptual learning style preferences. A Pearson's correlation was run to ascertain whether there was a statistically significant relationship among the controlled productive vocabulary knowledge out of the 2,000 most frequent words and each perceptual learning style preference. The results revealed that there was not a statistically significant relationship, as the p-value was higher than .05: auditory learning style (p-value=.025), tactile/kinesthetic learning style (p-value=.033), and visual learning style (p-value=.174). Thus, the higher preference for one of the three perceptual learning styles did not entail a higher controlled productive vocabulary.

6 Discussion

The first objective formulated in this investigation was to examine the controlled productive vocabulary of unimodal EFL learners. Findings indicated that their overall controlled productive vocabulary knowledge was of 948 words, out of the 2,000 most frequent words that the PVLТ measured. This result is congruent with the investigation conducted by Montero-SaizAja (2021). This researcher concluded that the sample of 12th grade EFL learners in the Spanish educational system had a controlled productive vocabulary knowledge of around 1,000 words. The background of the participants of this study and the

present one coincides. Therefore, these results might entail, with caution, a similar instruction on EFL vocabulary up to the 12th grade. Nonetheless, it cannot be generalized to the autonomous community of La Rioja (Spain) owing to the limited sample of both studies. Several scholars (e.g., [Schmitt & Schmitt, 2014](#); [van Zeeland & Schmitt, 2012](#); [Webb & Nation, 2017](#); [Webb & Rodgers, 2009](#)) suggested the knowledge of 2,000 to 3,000 words to be able to achieve 98 per cent coverage of written texts and 95 per cent of spoken texts. Accordingly, the informants of the present investigation might find it very complicated to communicate orally and in written form in the English language, since they have around 950 words available to use.

The second objective aimed at identifying the perceptual learning style preferences of unimodal EFL learners. Results revealed that visual was the most favored perceptual learning style, followed by tactile/kinesthetic and auditory styles. Our findings are not in line with the ones obtained in previous research on EFL perceptual learning styles (e.g., [Arif et al., 2021](#); [Chen, 2009](#); [Muniandy, 2013](#); [Reid, 1987](#); [Tuan, 2011](#)), since the tactile/kinesthetic learning style seemed to be the major preference, followed by auditory and visual styles. Nevertheless, we ought to be cautious with this result because, as far as we are aware, the perceptual learning style preferences of 12th grade EFL learners in the Spanish educational system have not been addressed yet. An interpretation for the outcome of visual as the preferable perceptual learning style might be because the textbook appears to be the main material used to teach EFL (e.g., [Gibbons, 2015](#); [Hutchinson & Torres, 1994](#); [Jiménez Catalán & Mancebo Francisco, 2008](#)). Some researchers (e.g., [Hatami, 2018](#); [Reid, 1987](#)) confirmed that reading, using textbooks, and taking detailed notes are predominant activities in EFL classrooms. In addition, EFL teachers might use visual aids and teacher-produced materials (e.g., PowerPoint presentations, handouts), the blackboard, and technological resources to support their teaching. Another issue that is worth noting is the fact that in the Spanish educational system 12th graders are prepared throughout this grade to pass their state exam at the end of the course and be able to access university. As it is a written examination, teaching throughout this educational level might be mainly based on textbooks and visual materials. On the other hand, the tactile/kinesthetic learning style was reported to be the second major preference of the participants of this investigation. A possible explanation for this finding might be the predominance of communicative activities (e.g., discussion, group work, role-play) (e.g., [Ochoa et al., 2016](#); [Phoeun & Sengsri, 2021](#); [Weda et al., 2021](#)), as well as the extensive use of technological resources (e.g., YouTube, TED Talks, Kahoot!) (e.g., [Fakih, 2022](#); [Lee, 2019](#); [Lin & Wang, 2021](#)) in EFL classrooms. In fact, one of the main goals of the Common European Framework of Reference for Languages (CEFR) ([Council of Europe, 2020](#)) is to promote communicative competence. Finally, the fact that auditory appeared to be the least preferable perceptual learning style might be for two main reasons. First, there seems to be a smaller number of auditory activities and materials (e.g., listening, oral presentation) than visual ones in the EFL classroom (e.g., [Hatami, 2018](#); [Kim & Kim, 2018](#)). Second, some researchers (e.g., [Goh, 2002](#), [Nushi & Orouji, 2020](#); [Vandergrift, 2007](#)) proved that listening is viewed as the most difficult language skill when learning English as a foreign language.

The third objective pursued to explore whether the differences in perceptual learning style preferences accounted for controlled productive vocabulary knowledge. The results showed that there were not any statistically significant differences, and there was not a statistically significant relationship either. From this finding, it can be concluded that the preference for a specific perceptual learning style (visual, auditory, or tactile/kinesthetic) did not influence the amount of controlled productive vocabulary knowledge. We are unaware of the existence of evidence regarding this relation. However, with caution, these results can be associated with the ones achieved in previous studies (e.g., [Akbarian et al., 2019](#); [Hatami, 2018](#); [Kassian, 2007](#); [Yeh & Wang, 2003](#)), which pointed at the lack of relationship among perceptual learning style preferences and L2 vocabulary learning (vocabulary annotations, intentional vocabulary, incidental vocabulary, or vocabulary depth). These researchers did not investigate controlled productive vocabulary, as in the present study. Following [Willingham \(2005\)](#), one possible explanation

for this result could be related to how information is learnt, which is usually meaning-based instead of sensory-based. He stated that although we can first learn information from our visual, auditory, and physical interactions with it, it is not usually stored as such. Although we could not find any statistically significant differences among controlled productive vocabulary and perceptual learning styles, visual learners were reported to have a higher controlled productive vocabulary knowledge (1,009 words). They were followed by tactile/kinesthetic and auditory learners. This result might be linked to the type of materials employed in the EFL classroom to teach vocabulary. As visual materials appear to predominate in foreign language classrooms, most of the instruction on EFL vocabulary might also be done through them (e.g., textbook, photocopies, vocabulary lists). Owing to the lesser amount of tactile/kinesthetic and auditory activities and materials in comparison with visual ones, as stated before, this could explain why both tactile/kinesthetic and auditory learners were reported to have a smaller controlled productive vocabulary knowledge.

7 Conclusions

The present study aimed to examine the controlled productive vocabulary knowledge of unimodal EFL learners who were enrolled in the 12th grade in the Spanish educational system. Our results indicated that the participants had a controlled productive vocabulary knowledge of 948 words, out of the 2,000 most frequent words that the PVLТ assessed. It was reported that visual was the most favored perceptual learning style preference, followed by tactile/kinesthetic and auditory learning styles. Likewise, visual learners appeared to have a larger controlled productive vocabulary, followed by tactile/kinesthetic and auditory learners. Our findings also confirmed that the differences in perceptual learning style preferences did not account much for controlled productive vocabulary knowledge.

Some limitations to this investigation need to be acknowledged. The sample of informants was very limited because there were just 36 unimodal learners. Moreover, only a state school of post-secondary education was analyzed, which leads to the impossibility of generalizing these findings and being representative of the 12th grade population of the autonomous community of La Rioja (Spain). Another constraint was the administration of only the 2,000-word frequency level of the PVLТ; the inclusion of other levels might have prompted other results. Neither the PVLТ nor the LSS were contrasted with other productive vocabulary or perceptual learning style tests, respectively, which might have influenced the results.

This study presents some pedagogical implications which are relevant for the field of foreign language education. As the controlled productive vocabulary of 12th grade unimodal EFL learners was around 948 words, more instruction on EFL vocabulary would be necessary to ensure an effective communication. Although having a specific perceptual learning style did not guarantee a higher controlled productive vocabulary knowledge, vocabulary activities that cater for the different perceptual learning styles (visual, auditory, and tactile/kinesthetic) could be designed to prevent the predominance of a specific preference (e.g., visual). Instead of depending exclusively on the vocabulary activities provided by the textbook, which mainly benefit visual learners, teachers could produce other materials, such as quiz games, videos, or role-plays, among other activities, which will promote the learning of vocabulary with different learning styles.

In the future, it would be interesting to increase the sample size by means of incorporating more schools and autonomous communities to allow the comparison of the results. To overcome another limitation revealed before, further research could implement more productive vocabulary and perceptual learning style questionnaires to determine whether similar results arise. The other two types of productive vocabulary (free, production/association) explained in the second section of this paper could also be investigated. Likewise, as the textbook seemed to be the main medium of instruction, future studies could analyze the vocabulary activities included in the textbooks to acknowledge whether they are more suitable for a particular learning style or address the three learning styles.

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