

## Stress Assignment by Spanish Learners

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**Abstract:** The phenomenon of Spanish stress has drawn the attention of linguists and therefore has been studied extensively within various phonological models: rule-based, constraint-based, and usage-based. The current study is focused on stress assignment (non-verbal) by analogy and is motivated by Aske [1]. The goal of this study is to provide some evidence for or against the proposed hypothesis that “stress resides in the lexicon and not in abstract rules” [1]. While Aske investigated mechanisms that govern stress assignment by native Spanish speakers, the present study was aimed to examine how Spanish learners assign stress. In this experiment 12 words - six -en#<sup>1</sup> and six other -Vn#<sup>2</sup> words - created by Aske [1] were used to observe whether Spanish learners access their lexicon for a similar pattern or they assign stress to new words according to generalizations. Another objective of this study was to examine if a correlation between proficiency level and stress assignment pattern exists. A possible effect of extralinguistic variables is analyzed. The results show that overall Spanish learners tend to assign stress by analogy and that proficiency level may affect performance.

**Keywords:** L2 phonology, adult Spanish learners, stress assignment.

### INTRODUCTION

In the recent decades various language researchers have studied Spanish stress within different phonological theories: rule-based [2-4], constraint-based [5, 6], and usage-based [1, 7-9]. Some experiments within usage-based model have challenged the traditional generative standpoint regarding Spanish stress assignment, whose supporters believe that generalizations govern Spanish stress. Several studies that have recently been carried out empirically demonstrated that Spanish stress may be assigned by analogy with similar words stored in one's lexicon rather than by generalizations: “[W]hen presented with new words, Spanish speakers pronounce them based on similar words in the lexicon” [10]. Aske [1] carried out a study on stress production, which was aimed to determine what mechanisms are triggering stress assignment in Spanish. Aske realized that even though the majority of Spanish words that end in -Vn# (non-verbs), have final stress, this is not the case with Spanish words that end in -en#. The researcher analyzed -Vn# words ending in any vowel followed by -n# in a Spanish dictionary [11]. After the elimination of “words [that] were not exceedingly learned or archaic and thus were likely to be least vaguely familiar to an educated speaker” [1], the author found out that approximately 50% of words ending in -en# have penultimate stress (62% before the exclusion of the uncommon words). However, most of the other -Vn# words have final stress. By analyzing Spanish words in a dictionary, Aske clearly demonstrated that a subregular stress pattern exists for -en# words. Therefore, if speakers assign stress by generalizations, they must stress unknown -Vn# words finally.

Nonetheless, if words are stored with a stress in the lexicon, Spanish speakers should assign stress to the new words by analogy with known words. Consequently, about half of new -en# words would be stressed on the penultimate syllable and the other half would be stressed on the last syllable, which mirrors the stress placement in known -en# words whereas the majority of other -Vn# words would be stressed finally. To test out his hypothesis, Aske's subjects were asked to read a number of sentences that included 12 made-up -en# and -Vn# words. The results of this experiment confirmed Aske's claim – while the experimental words ending in -en# were stressed on the last syllable a little over half of the time, all the other -Vn# words were almost exclusively stressed on the last syllable. Aske concludes: “[S]peakers of Spanish do not make absolute abstract generalizations about stress patterns, which are then overridden by lexical specifications [...] Rather, the results suggest that speakers look at the lexicon directly for a suitable pattern, concentrating on the last few segments of a word” [1].

Along the same lines, Eddington [8] provided additional supporting evidence for Aske's conclusions. The author utilized Skousen's [12] Analogical Modeling of Language (AML<sup>3</sup>). According to this computer model, when speakers encounter an unfamiliar word, they look for similar words in their lexicons and once such word(s) is (are) found, speakers assign stress to a new word by analogy. In his experiment [8] used 4,970 common Spanish words. “AML correctly assigned stress to about 94% of these words” [8]. Interestingly enough, Eddington [8] decided to see if Aske's findings would be confirmed by AML analysis. The outcome clearly reflects Aske's results i.e. certain subpatterns in stress assignment do exist.

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<sup>1</sup># - word boundary

<sup>2</sup>In this paper V stands for a vowel

<sup>3</sup>According to Eddington, “AML is a model that attempts to reflect how speakers determine linguistic behaviors such as stress placement[...]AML assumes that all regular as well as irregular forms may be attributed to the analogical influence of other forms[...]AML predicts the probability that one or more outcomes will be chosen” [8].

Some other studies also support Aske's findings. Face [9] looked at the perception of Spanish stress in nonce words where acoustic cues to stress were neutralized. His study participants perceived penultimate stress on -en# made-up words in 29% of the cases whereas on -an# and -on# words they perceived penultimate stress in 19% and 12% of the cases respectively. The final stress distribution had a reversed sequence: -en# words – 59%, -an# – 68%, and -on# words – 75% of the cases. Apparently, the subjects' stress perception was influenced by a stress pattern of similar words stored in their lexicons. The author concludes that "The difference between the [en] and [an] sets [...] appears to be the result of the lexical subregularity discussed by Aske (1990)" and that "the results of both studies point toward the same conclusion" [9].

Over the course of the years a number of empirical studies have looked into stress acquisition by second language learners: [e. g. 13-21]. As Lord [22] highlights, many of these studies "have concentrated primarily on whether or not L2 learners do acquire stress patterns, and if so to what accuracy level they can produce them" (p.3). These studies investigated the quality of ultimate stress attainment. They also examined a potential influence of learners' L1 stress patterns on their L2 stress acquisition, but they did not focus on the processes underlying L2 stress acquisition.

[22] focused on stress perception by L2 learners. The results of this study demonstrated that L2 learners' stress perception skills are acquired before their stress production skills and that the perception accuracy is a prerequisite for the production accuracy. The results also showed that accuracy of stress perception increases with L2 proficiency. The author highlights that the target language exposure and the amount of L2 input may influence "a learner's ability to perceive accurate stress placement, be it through increased skills or through a more developed 'lexicon'" (p. 11).

The results of a recent study by Face [23] reveal that native English speakers perceive penultimate stress more accurately than the antepenultimate or final. Given that the vast majority of Spanish substantives have a penultimate stress, the respondents' perception is consistent with the default pattern.

Lord [24] investigated mechanisms underlying stress production by Spanish learners. The analysis of the oral production data, gathered from English speaking learners of Spanish (Beginning, Intermediate, and Advanced levels) and from a group of native Spanish speakers (a control group), demonstrated that stress production considerably depends on the lexicon, much more than previously thought. The author underlines "Stress production involves lexical storage and analogy, and these processes are shown to be utilized by native speakers and language learners alike" (p.1).

Bullock and Lord [7] conducted a study to examine the role of analogy in the acquisition of Spanish stress by adult learners. Their results show that in order to assign stress to an unfamiliar word, Spanish learners employ the same strategy as native Spanish speakers: they search for a word with a similar stress pattern stored in their Spanish lexicon and then assign stress by analogy with this word. Nevertheless, learners' lexicons may not always hold a fitting entry. Therefore, if they cannot find a similar word in their L2 lexicon, they

resort to their L1 lexicon. All in all, the authors conclude that analogy is "a learning tool in Second Language Acquisition" [7].

In light of these studies, I decided to further analyze mechanisms that govern stress assignment by Spanish learners. The main objective of this study is to provide some evidence for or against the proposed hypothesis that "stress resides in the lexicon and not in abstract rules" [1]. I believe that this evidence was essential because overall little has been done to investigate how Spanish learners assign non-verbal stress. Furthermore, it was important to analyze if a correlation between proficiency level and stress assignment pattern exists. Another issue that I examined was a possible effect of extralinguistic variables such as study abroad, gender, frequency of Spanish use, and age of exposure on stress assignment pattern.

My research questions and hypotheses were the following:

1. Do Spanish learners, similarly to native Spanish speakers in Aske's experiment, assign stress by analogy i.e. access their lexicon directly for a similar pattern when they come upon a new word or they assign stress according to generalizations?

Based on the results of some previous studies described above [1, 7], I expected Spanish learners to assign stress by analogy.

2. Does any correlation between proficiency level and stress assignment pattern exist?

I hypothesized that there is a correlation between proficiency level and stress assignment pattern i.e. more advanced learners store a larger quantity of words in their lexicons than less advanced learners. Therefore, when they need to assign stress to a new word, they may have more analogous words to compare with. Consequently, I expected that more proficient study participants would assign stress in more concordance with existing words than less proficient respondents.

3. Do extralinguistic variables such as gender, age of exposure, frequency of Spanish use, and study abroad have any impact on the outcome?

I expected these extralinguistic variables to have some influence on the results. In addition, I hypothesized that the variable *Frequency of Spanish Use* would be a very influential extralinguistic variable because as learners use their target language, they may learn new vocabulary and thus expand their lexicons.

## MATERIALS AND METHODOLOGY

### Study Design and Instruments

To gather data, the participants were given a series of sentences (18) that included the target items: 6 made-up -en# and 6 made-up -Vn# words: BESOREN, CORUMEN, PETABEN, FADEN, GORQUEN, MERASEN, SEBORAN, PORUBON, TEDON, PETAMIN, SORQUIN, and PERASUN. The respondents were asked to place an accent mark on the vowel of each word that they would emphasize the most if they were to pronounce the words. Although the participants assigned stress to every word because I did not want them to focus on the phenomenon that was being inves-

tigated, I analyzed only the target words. They were spread throughout the text in order to offset recency effects (see Appendix A). Six out of 18 sentences were used as distractors and I excluded them from assessment. Everything was typed in capital letters. The instructions were given in English and the participants were provided with examples in order to ensure that they fully understood the assignment (see Appendix A). Also, I utilized high frequency words used in the sentences as control items to verify if the respondents were clear on the task. In fact, one person was excluded because his/her stress placement on well known words demonstrated confusion, therefore this person's data were not valid for the analysis. Some of the instruments used in this study were originally utilized in [1]. However, I made a few minor changes to them so that they better fit my study. For instance, sentence 16 was changed because the target word MERASEN sounded like a proper name in the original variant (see Appendix A).

To obtain some background information that was important for the analysis of the results such as gender, study abroad, use of Spanish per week, etc., I created a questionnaire (see Appendix B).

### Subjects

There were 44 participants in this study, whose native language was English. Some of them did not know any other foreign language besides Spanish according to self-report. Others had had formal studies in other languages and/or informal language experiences in the past.

The participants were divided into two groups according to their proficiency level<sup>4</sup>. The first group called *Graduate* consisted of graduate students and Spanish instructors who were required to have at least a Master's degree in Spanish. All of them were fluent in Spanish and had taught between 1 and 3 undergraduate Spanish courses every semester at the university where the experiment was conducted. Most of them were in their 20s and 30s. There were 18 participants in this group: 12 women and 6 men. These subjects were recruited through my personal contacts. The second group called *Undergraduate* consisted of 26 undergraduate students: 16 women and 10 men. They were enrolled in advanced undergraduate level<sup>5</sup> Spanish Literature courses at the time of the data collection. Several of them had chosen Spanish as their minor or major. These participants were fairly proficient in Spanish, but not as advanced as those in the *Graduate* group. All of them were in their 20s. The respondents from both groups were further divided into subgroups for the analysis of extralinguistic variables. A detailed description of the subgroups is provided later in this paper. Beginning and intermediate Spanish learners were not selected for this experiment because their lexicons may not be developed enough to test out this hypothesis effectively. As Bullock and Lord [7] state, "Since the L2 lexicon is limited at lower proficiency levels and is restricted to high-frequency words, they may not find a suitable match for an atypical token."

<sup>4</sup>The group assignment was based on the assumption that graduate Spanish students and Spanish instructors are more proficient in Spanish than undergraduate students. All participants were non-native Spanish speakers.

<sup>5</sup>3xxx level Spanish courses at the university where the experiment took place.

### Data Collection Procedures

Participation in the study was absolutely voluntary and anonymous. The participants were informed that the focus of this experiment was Spanish phonological acquisition, but they did not know the details because I did not want to increase their attention to the experimental items, which could have influenced the results. The entire activity lasted for 20-25 minutes. The data were collected individually from each *Graduate* group participant. To collect data from undergraduate students, group data collection sessions were arranged in their Spanish classes. I monitored the activity and assured that the participants did not interact and/or consult dictionaries and other sources during the procedure because the experiment was aimed to evaluate stress placement by individual language learners.

### Data Analysis Procedures

Using the data collection forms, which were filled out by the participants, the number of occurrences of antepenultimate, penultimate, and last stress placement was counted for each of the 12 test items. The obtained numbers were recorded in various tables to be analyzed later by the SPSS statistical software. For example, to look at the respondents' stress placement patterns in -en# versus -Vn# words, the data collected from all the respondents were analyzed together. Then, to investigate some possible differences in stress assignment pattern due to proficiency level, the data elicited from the *Graduate* and *Undergraduate* study participants were analyzed separately. Since there were a different number of subjects in the *Graduate* and *Undergraduate* groups, the data were converted into percentages to enable me to make a comparative analysis between the groups. This conversion was essential because otherwise any type of comparisons between the groups would not be possible. Nonetheless, within the same group this conversion was not always necessary. Therefore, the actual numbers as well as percentages (when needed) are used for the analysis within each group.

The data (real numbers and percentages) were entered in the SPSS statistical package. I ran descriptive statistics to calculate the mean and standard deviation of the experimental results to analyze a possible influence of some extralinguistic variables such as *Study Abroad*, *Gender*, *Frequency of Spanish Use*, and *Age of Exposure* on the outcome. Also, I used bar charts for a visual representation of the results.

### RESULTS

One of the objectives of this experiment was to test out Aske's hypothesis with adult Spanish learners. 44 participants completed the stress assignment task. The collected data were compared with the results of [1]. Also, since the subjects belonged to two different language proficiency levels, the results of the two groups were analyzed separately in order to investigate if a correlation between proficiency level and stress assignment pattern exists. Finally, a possible influence of some extralinguistic variables on the outcome was analyzed.

My first research question was: Do Spanish learners assign stress by analogy i.e. access their lexicon directly for a similar pattern when they come upon a new word or do they assign stress according to generalizations?

First, I looked at the overall performance of the participants. The results are summarized in Table 1 below, which shows how each word was stressed. There were only a few occurrences of the antepenultimate stress; they were excluded from the analysis because these cases were of a low frequency.

According to Aske's analysis of the  $-en\#$  and  $-Vn\#$  words found in [11] dictionary, approximately 62% of words ending in  $-en\#$  have penultimate stress or about 50% if some rare words are excluded. One can see that in the present study the mean for the  $-en\#$  words stressed on the penultimate syllable is 50.4%, which perfectly agrees with a 50% of occurrences found by [1]. The findings indicate that other  $-Vn\#$  words were stressed on the penultimate syllable in only 25.8% of the cases. If stress were assigned by rules, the majority of  $-en\#$  words, which are a subcategory of the  $-Vn\#$  category, would be stressed on the last syllable. However, the results of the present study do not demonstrate this. It seems that for Spanish learners a distinct stress assignment subpattern exists for Spanish words ending in  $-en\#$ , which challenges the generative standpoint. This idea is strengthened by the fact that only 44% of the  $-en\#$  words were stressed on the final syllable. An interesting observation can be made by looking at the results (Table 1): the distribution of the penultimate and final stress in GORQUEN and

MERASEN follows a reverse distribution pattern in comparison with the rest of the words. It is hard to explain this finding. These two words might have reminded the respondents of some existing words that have final stress such as *desdén* (d disdain) and *andén* (platform).

Based on the overall data analysis described above, it appears reasonable to expand the analysis further i.e. to evaluate each proficiency level separately in order to provide the answer for my second research question. My second research question was: Does any correlation between proficiency level and stress assignment pattern exist?

The stress placement on made-up  $-en\#$  and  $-Vn\#$  words for the *Graduate* and *Undergraduate* groups is presented in Table 2, which consists of four charts. The first two charts display the performance of the *Graduate* and *Undergraduate* groups respectively on  $-en\#$  words whereas the last two charts display the same thing for the  $-Vn\#$  words. The actual numbers are exhibited as well as percentages, which was necessary in order to make a valid comparison between the two groups since they do not have the same number of participants.

The mean for  $-en\#$  words for the *Graduate* group is 50.9% while the mean for the *Undergraduate* group is 49.9%. It seems that there is almost no difference between

**Table 1. Overall Results for Stress Placement on Made-Up Words**

**Part 1.  $-en\#$  words**

$-en\#$ words	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1. BESOREN	7	16	21	47.7	16	36.4
2. CORUMEN	1	2.3	32	72.7	11	25
3. PETABEN	4	9.1	23	52.3	17	38.6
4. FADEN	0	0	28	63.6	16	36.4
5. GORQUEN	0	0	15	34.1	29	65.9
6. MERASEN	3	6.8	14	31.8	27	61.3
MEAN	2.5	5.6	22.1	50.4	19.3	44
TOTAL	15	34.3 <sup>6</sup>	133	302.2	116	263.5

**Part 2.  $-Vn\#$  words**

$-Vn\#$ words	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1. SEBORAN	5	11.3	17	38.6	22	50
2. PORUBON	1	2.3	10	22.7	33	75
3. TEDON	0	0	8	18.2	36	81.8
4. PETAMIN	3	6.8	9	20.5	32	72.7
5. SORQUIN	0	0	19	43.2	25	56.8
6. PERASUN	1	2.3	5	11.3	38	86.4
MEAN	1.66	3.75	11.33	25.8	31	70.45
TOTAL	10	22.8	68	154.5	186	422.7

<sup>6</sup>From now on each total in the column “%” is calculated out of 600 because there are six words in each table.

**Table 2. Stress Placement on Made-Up Words by Two Groups****Part 1. Graduate group -en# words**

Word #	-en#	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1	BESOREN	2	11.1	10	55.6	6	33.3
2	CORUMEN	0	0	14	77.8	4	22.2
3	PETABEN	1	5.5	8	44.5	9	50.1
4	FADEN	0	0	10	55.5	8	44.5
5	GORQUEN	0	0	6	33.3	12	66.7
6	MERASEN	0	0	7	38.9	11	61.1
	TOTAL	3	16.6	55	306	50	278
	MEAN	.5	2.8	9.1	50.9	8.3	46.3

**Part 2. Undergraduate group -en# words**

Word #	-en#	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1	BESOREN	5	19.2	11	42.3	10	38.5
2	CORUMEN	1	3.8	18	69.2	7	26.9
3	PETABEN	3	11.5	15	57.7	8	30.8
4	FADEN	0	0	18	69.2	8	30.8
5	GORQUEN	0	0	9	34.6	17	65.4
6	MERASEN	3	11.5	7	26.9	16	61.9
	TOTAL	12	46	78	300	66	254
	MEAN	2	7.27	13	49.9	11	42.4

**Part 3. Graduate group -Vn# words**

Word #	-en#	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1	SEBORAN	1	5.5	6	33.3	11	61.2
2	PORUBON	0	0	2	11.1	16	88.9
3	TEDON	0	0	5	27.7	13	72.3
4	PETAMIN	0	0	1	5.5	17	94.5
5	SORQUIN	0	0	16	88.9	2	11.1
6	PERASUN	0	0	1	5.5	17	94.5
	TOTAL	1	5.5	31	172	76	422.5
	MEAN	.16	.9	5.16	28.6	12.6	70.5

**Part 4. Undergraduate group -Vn# words**

Word #	-en#	Antepenultimate Stress	%	Penultimate Stress	%	Final Stress	%
1	SEBORAN	3	11.5	11	42.3	12	46.2
2	PORUBON	1	3.8	8	30.8	17	65.4
3	TEDON	0	0	3	11.5	23	88.5
4	PETAMIN	3	11.5	8	30.8	15	57.7
5	SORQUIN	0	0	3	11.5	23	88.5
6	PERASUN	1	3.8	4	15.4	21	80.8
	TOTAL	8	30.6	37	142.3	111	427.1
	MEAN	1.33	5.1	6.16	23.7	18.5	71.2

these numbers, nor between these two means and the overall mean (50.4%). However, one can make a misleading conclusion by taking into consideration only the means. A deeper analysis should include a measurement of standard deviation in order to see the spread of the results around the mean. The

SPSS statistical software was used to calculate standard deviation for all categories (stressed syllable in -en# and -Vn# words) in each group as shown in Table 3. For the *Graduate* group, the standard deviation for -en# words stressed on the penultimate syllable is 15.8 whereas for the *Undergraduate*

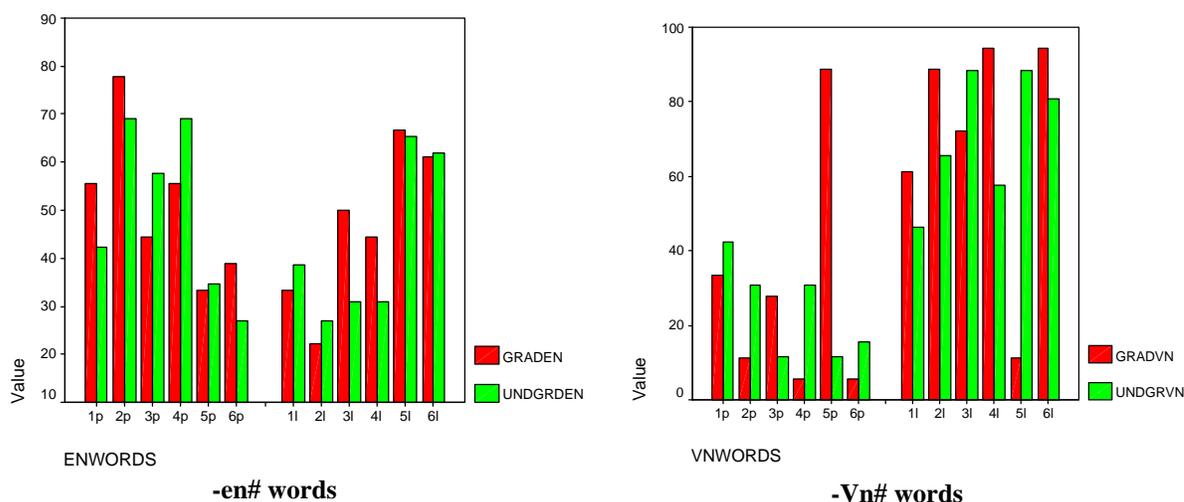


Fig. (1). Stress placement on -en# and -Vn# words Graduate group versus Undergraduate group.

#p – words stressed on penultimate syllable.  
 #1 - words stressed on last syllable.  
 GRADEN – en# words stressed by the Graduate group.  
 UNDRDEN - en# words stressed by the Undergraduate group.  
 GRADVN - Vn# words stressed by the Graduate group.  
 UNDRVN – Vn# words stressed by the Undergraduate group.

group it is 18.03. This means that although there is no substantial difference between the means, it is evident that in the Undergraduate group there was more dispersion around the mean than in the Graduate group. The Graduate group performed more consistently than the Undergraduate group, which may suggest that more advanced Spanish learners tend to stress -en# words on the penultimate syllable somewhat more consistently than less proficient learners.

Given that in general very few words were stressed on the antepenultimate syllable, we can consider having only two possibilities that technically complement each other: penultimate and last stress patterns. Means and standard deviations were calculated for both patterns as seen in Table 3 (a comparison between Graduate and Undergraduate groups) and in Tables 5, 7, 9, and 11 (an analysis of extralinguistic variables). One can observe that not only the means, but also the standard deviations for each category (e.g. Male

Graduate/Female Graduate; After Puberty Graduate/Before Puberty Graduate) in the case of final stress complement the case of penultimate stress. Therefore, provided that these two categories are complementary, a further analysis of the -en# words stressed on the last syllable will not offer any additional information to this study (see Fig. 1).

As to the analysis of -Vn# words, the findings indicate that the stress on the last syllable was overall more frequent than the stress on the penultimate syllable (see Fig. 1), which means that the majority of the -Vn# words were stressed finally by the respondents from both experimental groups. Interestingly enough, the means of the two groups are very close (70.4 for the Graduate group and 71.1 for the Undergraduate group), but the standard deviations are quite different: 31.96 for the Graduate group versus 17.50 for the Undergraduate group (see Table 3).

Table 3. Case Summaries for Stress Placement by the Two Groups

Part 1. -en# words

-en# words	GPEN*	UPEN**	GLAST †	ULAST ‡
1	55.6	42.3	33.3	38.5
2	77.8	69.2	22.2	26.9
3	44.4	57.7	50.1	30.8
4	55.5	69.2	44.5	30.8
5	33.3	34.6	66.7	65.4
6	38.9	26.9	61.1	61.9
Mean	50.917	49.983	46.317	42.383
Std. Deviation	15.8926	18.0368	16.7493	16.9342
Minimum	33.3	26.9	22.2	26.9
Maximum	77.8	69.2	66.7	65.4

\*penultimate stress (Graduate group).  
 \*\*penultimate stress (Undergraduate group).  
 †final stress (Graduate group).  
 ‡final stress (Undergraduate group).

(Table 3). Contd.....

**Part 2. -Vn# words**

-Vn# words	GPEN*	UPEN**	GLAST †	ULAST ‡
1	33.3	42.3	61.2	46.2
2	11.1	30.8	88.9	65.4
3	27.7	11.5	72.3	88.5
4	5.5	30.8	94.5	57.7
5	88.9	11.5	11.1	88.5
6	5.5	15.4	94.5	80.8
Total number	6	6	6	6
Mean	28.667	23.717	70.417	71.183
Std. Deviation	31.7252	12.7542	31.9644	17.5022
Minimum	5.5	11.5	11.1	46.2
Maximum	88.9	42.3	94.5	88.5

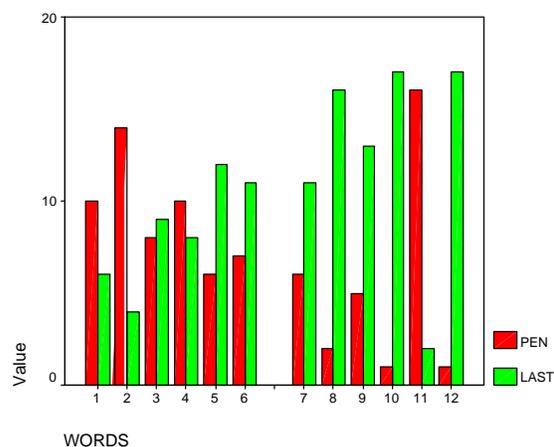
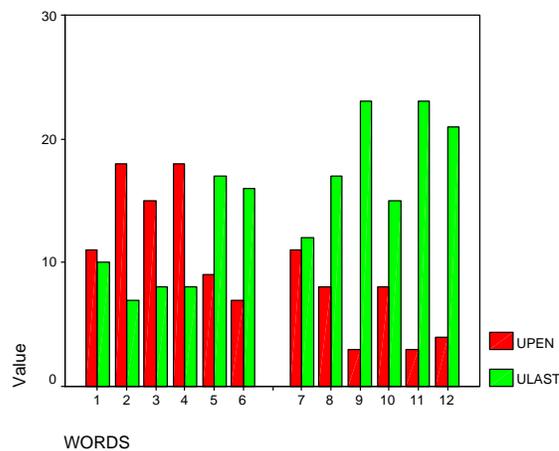
\*penultimate stress (*Graduate* group).\*\*penultimate stress (*Undergraduate* group).†final stress (*Graduate* group).‡final stress (*Undergraduate* group).

Table 3 shows that the dispersion around the mean in the *Undergraduate* group is substantially lower than in the *Graduate* group. This finding is rather remarkable because one would expect more advanced learners to show more consistency on stressing the last syllable in -Vn# words. If we look closely at the results for each experimental -Vn# word for the *Graduate* group (Table 3, part 2), we can observe that 5 experimental words were consistently stressed by the respondents on the last syllable. The range is 61.2-94.5% of the time. However, there is one outlier - the word SORQUIN (#5), which was stressed on the last syllable only 11.1% of the time. Evidently, the standard deviation for the *Graduate* group (-Vn# words) was highly affected by the respondents' stress assignment to the word SORQUIN. A possible expla-

nation of this finding is provided in the "Discussion" section. Since the penultimate syllable stress distribution is complementary to the last syllable stress distribution, the former will not be discussed further.

Fig. 2 displays the comparison between the stress distribution in -en# and -Vn# words within each group. It is obvious that in both groups there is a clear trend of assigning stress to the last syllable of -Vn# words whereas for -en# words the stress distribution on the penultimate and last syllable is roughly 50/50 for the graduate group and 50/40 for the undergraduate group.

Having analyzed the correlation between proficiency level and stress assignment pattern (penultimate or last), I

**Graduate group**1-6 are -en# words;  
7-12 are -Vn# words**Undergraduate group**1-6 are -en# words;  
7-12 are -Vn# words**Fig. (2).** Stress placement by the two groups on -en# and -Vn# words.

PEN – words stressed by the Graduate group on penultimate syllable.

LAST - words stressed by the Graduate group on last syllable.

UPEN - words stressed by the Undergraduate group on penultimate syllable.

ULAST – words stressed by the Undergraduate group on last syllable.

decided to continue the analysis of the stress placement on made-up -en# words taking into account several extralinguistic variables. This analysis was conducted within each group of subjects (*Graduate* and *Undergraduate*). In the future it will be important to perform the same analysis on the made-up -Vn# words in order to see a possible impact of these extralinguistic variables on the outcome in this word category. This future analysis will allow me not only to look at the potential influence of the extralinguistic variables on the stress placement in the -Vn# word category, but also to compare the results with the analysis of the -en# words carried out in this study. Hence, the analysis of the extralinguistic variables conducted with regards to the -en# words in the present project opens the door to future research. This work in progress is intended to be continued.

My third research question was: Do extralinguistic variables such as gender, age of exposure, frequency of Spanish use, and study abroad have any impact on the outcome?

As was mentioned earlier in this paper, in order to collect some background information, I asked the participants to answer a few questions. Four extralinguistic variables were selected for further analysis although originally I also included the *Language Background* and *Age* variables. This decision was based on the preliminary analysis of the respondents' answers. I did not proceed with the analysis of

the language background (third language, fourth language, etc.) because I observed that the vast majority of the participants either had never studied other foreign languages besides Spanish or their proficiency level was extremely low according to self-report. Likewise, since most of the participants were in their 20s and 30s, it was not reasonable to analyze the variable *Age*.

The first variable that I analyzed was *Gender*. The data were further divided into two subgroups (Female and Male) and are presented in Table 4. There were 12 women and 6 men in the *Graduate* group. The female/male ratio in the *Undergraduate* group was 16/10 respectively.

For the *Graduate* group, the means for each subgroup (stress placement on the penultimate syllable) are 45.8 for the Female and 61.1 for the Male (see Table 5). If these numbers are compared with the overall mean for the *Graduate* group, which is 50.9, one can observe that they are somewhat different. Moreover, the standard deviations are 22.8 for Female, 8.6 for Male, and 15.9 for the *Graduate* group (overall). This demonstrates that the males' performance was homogeneously high whereas the females' performance shows that there was even more dispersion around the mean than in the overall performance of the *Graduate* group (see Fig. 3 for visual representation). In general, women tend to stress penultimate syllable less frequently

**Table 4. Stress Placement on Made-Up -en# Words by the Two Groups Divided by Gender**  
**Part 1. Graduate group**

#	-en# words	Females				Males			
		Penultimate	%	Final	%	Penultimate	%	Final	%
1	BESOREN	7	58.3	4	33.3	3	50	2	33.3
2	CORUMEN	10	83.3	2	16.7	4	66.7	2	33.3
3	PETABEN	4	33.3	7	58.3	4	66.7	2	33.3
4	FADEN	6	50	6	50	4	66.7	2	33.3
5	GORQUEN	3	25	9	75	3	50	3	50
6	MERASEN	3	25	9	75	4	66.7	2	33.3
	TOTAL	33	274.9	37	308	22	367	13	217
	MEAN	5.5	45.8	6.16	51.4	3.66	61.1	2.16	36.1

**Part 2. Undergraduate group**

#	-en# words	Females				Males			
		Penultimate	%	Final	%	Penultimate	%	Final	%
1	BESOREN	5	33.3	5	33.3	6	54.5	5	45.5
2	CORUMEN	8	53.3	6	40	10	90.9	1	9.1
3	PETABEN	10	66.7	3	20	6	54.5	5	45.5
4	FADEN	10	66.7	5	33.3	8	72.7	3	27.3
5	GORQUEN	4	26.7	11	73.3	5	45.5	6	54.5
6	MERASEN	5	33.3	8	53.3	3	27.3	8	72.7
	TOTAL	42	280	38	253	38	345	28	255
	MEAN	7	46.7	6.33	42.2	6.33	57.6	4.66	42.4

than men. This intriguing finding should be explored in future studies with a larger number of participants and if a similar pattern emerges again, a t-test should be performed to determine whether the differences are statistically significant.

The means for the two subgroups of the *Undergraduate* group are 46.6 for the Female and 57.5 for the Male. The overall mean for the *Undergraduate* group is 49.9. One may notice a similar tendency (just a little weaker) as in the *Graduate* group. The standard deviations are 17.9, 22.0, and 18.0 respectively (see Table 5, part 2). The standard deviation for the Male subgroup is much higher in the *Under-*

*graduate* group than in the *Graduate* group, which shows a lot more dispersion around the mean in the former (see Fig. 3).

The second variable that I analyzed was *Age of Exposure* (AE). The subjects were further divided into two subgroups according to self-report, *Before Puberty* (BP) i.e. before 13 years of age and *After Puberty* (AP) i.e. after 13. The data are presented in Table 6. The following distribution of respondents within the subgroups was observed: *Graduate* group - 12 (BP) and 6 (AP); *Undergraduate* group - 13 (BP) and 13 (AP).

**Table 5. Case Summaries for Stress Placement by the Two Groups Divided by Gender**

**Part 1. Graduate group**

#	G†F*PEN	GM**PEN	GPEN	GFLAST	GMLAST	GLAST
1	58.30	50.00	55.60	33.30	33.30	33.30
2	83.30	66.70	77.80	16.70	33.30	22.20
3	33.30	66.70	44.40	58.30	33.30	50.10
4	50.00	66.70	55.50	50.00	33.30	44.50
5	25.00	50.00	33.30	75.00	50.00	66.70
6	25.00	66.70	38.90	75.00	33.30	61.10
Total	6	6	6	6	6	6
Mean	45.8167	61.1333	50.9167	51.3833	36.0833	46.3167
Std. Deviation	22.81082	8.62384	15.89257	23.21718	6.81775	16.74926
Minimum	25.00	50.00	33.30	16.70	33.30	22.20
Maximum	83.30	66.70	77.80	75.00	50.00	66.70

†G - GRADUATE.

\*F - FEMALE.

\*\*M - MALE.

**Part 2. Undergraduate group**

#	U†F*PEN	UM**PEN	UPEN	UFLAST	UMLAST	ULAST
1	33.30	54.50	42.30	33.30	45.50	38.50
2	53.30	90.90	69.20	40.00	9.10	26.90
3	66.70	54.50	57.70	20.00	45.50	30.80
4	66.70	72.70	69.20	33.30	27.30	30.80
5	26.70	45.50	34.60	73.30	54.50	65.40
6	33.30	27.30	26.90	53.30	72.70	61.90
Total	6	6	6	6	6	6
Mean	46.6667	57.5667	49.9833	42.2000	42.4333	42.3833
Std. Deviation	17.90348	22.00279	18.03679	18.68968	22.00279	16.93416
Minimum	26.70	27.30	26.90	20.00	9.10	26.90
Maximum	66.70	90.90	69.20	73.30	72.70	65.40

†U - UNDERGRADUATE.

\*F - FEMALE.

\*\*M - MALE.

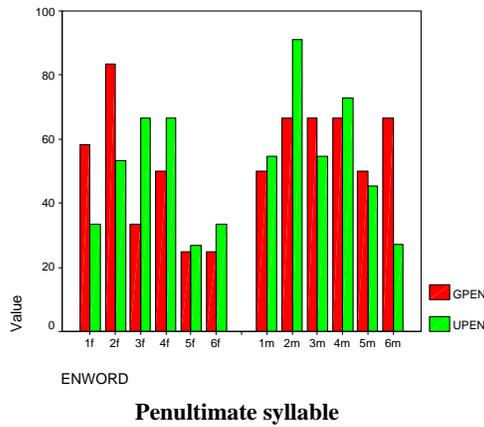


Fig. (3). Penultimate stress placement on -en# words divided by gender Graduate group versus Undergraduate group.

#f - words stressed by the female subjects.

#m - words stressed by the male subjects.

GPEN - words stressed on the penultimate syllable by the Graduate subjects.

UPEN - words stressed on the penultimate syllable by the Undergraduate subjects.

For the Graduate group, the means for each subgroup (stress placement on the penultimate syllable) are 43.6 for the BP and 70.0 for the AP whereas the mean for the overall group is 50.9 (see Table 7). The standard deviations are 16.5, 20.9, and 15.8 respectively. The Graduate group participants, who were exposed to Spanish after puberty, stressed penultimate syllables in -en# words more frequently than those who were exposed to Spanish before puberty. The word CORUMEN was stressed on the penultimate syllable 100%, which skewed the overall mean to some extent. Such a uniform stress pattern is an interesting finding, which may be explained by the fact that many real -men# words have penultimate stress.

The results for the Undergraduate group show that the means are 47.4, 52.5, and 49.9 for the BP, AP, and the overall Undergraduate group respectively. The standard deviations are 25.4, 11.2, and 18.0 (see Table 7), which shows that based on the results of the present study age of exposure does not appear to be an influential factor for stress assignment.

The third variable that I analyzed was Frequency of Spanish Use per week. Based on the information received from the questionnaires, I found out that the range of this variable is quite different for the two groups: from about 10 to more than 50 hours per week in the Graduate group versus 3 - 23 hours per week for the Undergraduate group. Both groups were divided into three subgroups - A1, B1, and C1. The cutoffs for the groups are different as shown in Table 8. The following distribution of respondents within the subgroups was observed: Graduate group - 8 (A1), 7 (B1), and 3 (C1); Undergraduate group - 8 (A2), 14 (B2), and 4 (C2).

The means of the three subgroups of the Graduate group are 55.5 (A1), 38.8 (B1), and 66.6 (C1); their standard deviations are 13.6, 21.9, and 42.1 respectively (see Table 9). A very high standard deviation for the C1 subgroup (42.1) indicates a substantial dispersion around the mean showing that the respondents' performance was rather inconsistent. This finding should be reexamined in the future with a larger sample size. By looking at the means and standard deviations, it appears that the least frequent Spanish users in the Graduate group demonstrated a quite strong tendency to assign stress by analogy with familiar words stored in their lexicons than the other 2 subgroups.

The Undergraduate group was divided into the following subgroups: 3-5 hours per week (A2), 6-15 hours per week (B2), and 16-23 hours per week (C2). The means for these subgroups are 56.2, 54.7, and 20.8. Their standard deviations are 18.9, 21.9, and 18.8 correspondingly (see Table 9). By looking at these standard deviations, one can observe that all three subgroups have a similar dispersion around the mean. However, this is not the case with their means: A2 and B2

Table 6. Results for the Two Groups Divided by Age of Exposure (AE)

Part 1. Stress Placement on Made-Up -en# Words - Graduate Group

# -en# words	Before Puberty (BP)				After puberty (AP)				
	Penultimate	%	Final	%	Penultimate	%	Final	%	
1	BESOREN	6	46.2	5	38.5	4	80	1	20
2	CORUMEN	9	69.2	4	30.8	5	100	0	0
3	PETABEN	4	30.8	8	61.5	4	80	1	20
4	FADEN	7	53.8	6	46.2	3	60	2	40
5	GORQUEN	3	23.1	10	76.9	3	60	2	40
6	MERASEN	5	38.5	8	61.5	2	40	3	60
Total		34	262	41	315	21	420	9	180
Mean		5.66	43.6	6.8	52.6	3.5	70.0	1.5	30.0

(Table 6). Contd.....

**Part 2. Stress Placement on Made-Up -en# Words - Undergraduate Group**

# -en# words		Before Puberty (BP)				After Puberty (AP)			
		Penultimate	%	Final	%	Penultimate	%	Final	%
1	BESOREN	5	38.5	6	46.2	6	46.2	4	30.8
2	CORUMEN	9	69.2	3	23.1	9	69.2	4	30.8
3	PETABEN	8	61.5	4	30.8	7	53.8	4	30.8
4	FADEN	10	76.9	3	23.1	8	61.5	5	38.5
5	GORQUEN	3	23.1	10	76.9	6	46.2	7	53.8
6	MERASEN	2	15.4	9	69.2	5	38.5	7	53.8
Total		37	285	35	269	41	315	31	239
Mean		6.16	47.4	5.8	44.8	6.83	52.6	5.2	39.7

**Table 7. Case Summaries - Stress Placement for the Two Groups Divided by Age of Exposure****Part 1. Graduate group**

#	G1* PEN	G2* * PEN	G† PEN	G* ILAST	G2* * LAST	G† LAST
1	46.20	80.00	55.60	38.50	20.00	33.30
2	69.20	100.00	77.80	30.80	.00	22.20
3	30.80	80.00	44.40	61.50	20.00	50.10
4	53.80	60.00	55.50	46.20	40.00	44.50
5	23.10	60.00	33.30	76.90	40.00	66.70
6	38.50	40.00	38.90	61.50	60.00	61.10
Total	6	6	6	6	6	6
Mean	43.6000	70.0000	50.9167	52.5667	30.0000	46.3167
Std. Deviation	16.59072	20.97618	15.89257	17.11089	20.97618	16.74926
Minimum	23.10	40.00	33.30	30.80	.00	22.20
Maximum	69.20	100.00	77.80	76.90	60.00	66.70

\*age of exposure before puberty.

\*\*age of exposure after puberty.

†overall Graduate group.

**Part 2. Undergraduate group**

#	U1*PEN	U2* * PEN	U† PEN	U*ILAST	U2* *LAST	U† LAST
1	38.50	46.20	42.30	46.20	30.80	38.50
2	69.20	69.20	69.20	23.10	30.80	26.90
3	61.50	53.80	57.70	30.80	30.80	30.80
4	76.90	61.50	69.20	23.10	38.50	30.80
5	23.10	46.20	34.60	76.90	53.80	65.40
6	15.40	38.50	26.90	69.20	53.80	61.90
Total	6	6	6	6	6	6
Mean	47.4333	52.5667	49.9833	44.8833	39.7500	42.3833
Std. Deviation	25.44796	11.28657	18.03679	23.51794	11.28428	16.93416
Minimum	15.40	38.50	26.90	23.10	30.80	26.90
Maximum	76.90	69.20	69.20	76.90	53.80	65.40

\*age of exposure before puberty.

\*\*age of exposure after puberty.

†overall Undergraduate group.

**Table 8. Results for Two Groups Divided by Frequency (Hours Per Week) of Spanish Use**

**Part 1. Graduate group**

#	Up to 19 hours * (A1)				20-49 hours ** (B1)				More than 50 hours † (C1)			
	Pen ultimate	%	Final	%	Pen ultimate	%	Final	%	Pen ultimate	%	Final	%
1	4	66.7	2	33.3	3	33.3	4	44.4	3	100	0	0
2	4	66.7	2	33.3	7	77.8	2	22.2	3	100	0	0
3	3	50	2	33.3	4	44.4	5	55.6	1	33.3	2	66.7
4	4	66.7	2	33.3	3	33.3	6	66.7	3	100	0	0
5	3	50	3	50	1	11.1	8	88.9	2	66.7	1	33.3
6	2	33.3	4	66.7	3	33.3	4	44.4	0	0	3	100
Total	20	333	15	250	21	233	29	322	12	400	6	200
Mean	6.66	55.6	2.5	41.7	3.5	38.9	4.8	53.7	2	66.7	1	33.3

\*performance of the graduate subjects in A1 subgroup (up to 19 hours per week).

\*\*performance of the graduate subjects in B1 subgroup (20-49 hours per week).

†performance of the graduate subjects in C1 subgroup (more than 50 hours per week).

**Part 2. Undergraduate group**

#	Up to 5 hours * (A2)				6-15 hours ** (B2)				16-23 hours † (C2)			
	Pen ultimate	%	Final	%	Pen ultimate	%	Final	%	Pen ultimate	%	Final	%
1	3	37.5	1	12.5	8	57.1	6	42.9	0	0	3	75
2	7	87.5	1	12.5	10	71.4	3	21.4	1	25	3	75
3	5	62.5	1	12.5	9	64.3	4	28.6	1	25	3	75
4	5	62.5	3	37.5	11	78.6	3	21.4	2	50	2	50
5	4	50	4	50	5	35.7	9	64.2	0	0	4	100
6	3	37.5	3	37.5	3	21.4	10	71.4	1	25	3	75
Total	27	338	13	163	46	329	35	250	5	125	18	450
Mean	4.5	56.2	2.2	27.1	7.7	54.8	5.8	41.7	.83	20.8	3	75

\*performance of the undergraduate subjects in A2 subgroup (up to 19 hours per week).

\*\*performance of the undergraduate subjects in B2 subgroup (20-49 hours per week).

†performance of the undergraduate subjects in C2 subgroup (more than 50 hours per week).

**Table 9. Case Summaries for Stress Placement by the Two Groups Divided by Frequency of Spanish Use (Hours Per Week)**

**Part 1. Graduate group**

#	G1*PEN	G2* *PEN	G3† PEN	G‡ PEN	G1*LAST	G2* *LAST	G3† LAST	G‡ LAST
1	66.70	33.30	100.00	55.60	33.30	44.40	.00	33.30
2	66.70	77.80	100.00	77.80	33.30	22.20	.00	22.20
3	50.00	44.40	33.30	44.40	33.30	55.60	66.70	50.10
4	66.70	33.30	100.00	55.50	33.30	66.70	.00	44.50
5	50.00	11.10	66.70	33.30	50.00	88.90	33.30	66.70
6	33.30	33.30	.00	38.90	66.70	44.40	100.00	61.10
Total	6	6	6	6	6	6	6	6
Mean	55.5667	38.8667	66.6667	50.9167	41.6500	53.7000	33.3333	46.3167
Std Dev	13.63549	21.95620	42.16898	15.89257	13.97222	22.70189	42.16898	16.74926
Min	33.30	11.10	.00	33.30	33.30	22.20	.00	22.20
Max	66.70	77.80	100.00	77.80	66.70	88.90	100.00	66.70

\*G1- performance of the graduate subjects in A1 subgroup (up to 19 hours per week).

\*\*G2- performance of the graduate subjects in B1 subgroup (20-49 hours per week).

†G3- performance of the graduate subjects in C1 subgroup (more than 50 hours per week).

‡G- performance of all the graduate subjects.

## Part 2. Undergraduate group

#	U1*PEN	U2**PEN	U3†PEN	U‡PEN	U1*LAST	U2**LAST	U‡3LAST	U‡LAST
1	37.50	57.10	.00	42.30	12.50	42.90	75.00	38.50
2	87.50	71.40	25.00	69.20	12.50	21.40	75.00	26.90
3	62.50	64.30	25.00	57.70	12.50	28.60	75.00	30.80
4	62.50	78.60	50.00	69.20	37.50	21.40	50.00	30.80
5	50.00	35.70	.00	34.60	50.00	64.20	100.00	65.40
6	37.50	21.40	25.00	26.90	37.50	71.40	75.00	61.90
Total	6	6	6	6	6	6	6	6
Mean	56.2500	54.7500	20.8333	49.9833	27.0833	41.6500	75.0000	42.3833
Std Dev	18.95719	21.99043	18.81932	18.03679	16.61450	21.84287	15.81139	16.93416
Min	37.50	21.40	.00	26.90	12.50	21.40	50.00	26.90
Max	87.50	78.60	50.00	69.20	50.00	71.40	100.00	65.40

\*U1- performance of the subjects in A2 subgroup (up to 5 hours per week).

\*\*U2- performance of the subjects in B2 subgroup (6-15 hours per week).

†U3- performance of the subjects in C2 subgroup (16-23 hours per week).

‡U- performance of all the Undergraduate subjects.

have similar means. The respondents in the C2 subgroup stressed the last syllable more often than the other respondents in the *Undergraduate* group. Therefore, these results mimic the general stress pattern for -Vn# words (stress on the last syllable). It looks like the most frequent Spanish users in the *Undergraduate* group did not show a strong tendency to assign stress by analogy with real -en# words. This finding is further discussed in the "Discussion" section.

The last extralinguistic variable that I investigated was *Study Abroad* (SA). Having read the respondents' answers, I realized that the majority of the *Graduate* students had studied abroad (16/18) whereas over half of the *Undergraduate* students had not studied nor traveled to Spanish-speaking countries (15/26). In addition, overall *Graduate* students spent more time abroad than *Undergraduate* students. Three subgroups were established for the *Graduate* group: a few weeks-6 months (X), 7-12 months (Y), and more than one year (Z). The following distribution of respondents within these subgroups was observed: 8 (X), 4 (Y), and 4 (Z). For the *Undergraduate* group, two subgroups were created: subjects who had never studied abroad (No) and subjects who had some formal studies in Spanish-speaking countries (Yes). There were 15 participants in the No subgroup and 11 participants in the Yes subgroup. The data are presented in Table 10.

First, I will analyze the results for the *Graduate* group. All subgroups X, Y, and Z have approximately the same means: 50.0, 52.8, and 50.0 respectively. The standard deviations are 15.3, 26.6, and 34.9 (see Table 11). It seems that this variable may not have an effect on the stress placement for -en# words.

In the *Undergraduate* group, the No subgroup has a mean of 57.1 and a standard deviation of 16.9 whereas the Yes subgroup has a mean of 41.6 and a standard deviation of 19.7 (see Table 11). It looks like people who had not studied

abroad tended to stress penultimate syllable in -en# words more than those who had studied in Hispanic countries.

## DISCUSSION

The overall performance of the participants in this study supports my first hypothesis, which was based on Aske's [1] results from the experiment with native speakers - Spanish learners have a tendency to assign stress by analogy. Some examples of real -en# and -Vn# words<sup>7</sup> that could have led to the participants' decisions on stress assignment are: crimen (crime), certamen (competition, contest), germen (germ), origen (origin), volumen (volume), examen (exam), resumen (summary), cerumen (ear wax), mentón (chin), cabezón (stubborn), jabón (soap), jubón (jupon), embrión (embryo), montón (a load of, lots of), carmín (lipstick), Joaquín (proper name), monopatín (scooter, skateboard), judión (butter bean), hurón (ferret), jirón (shred), muñón (stump), bufón (clown), buzón (mailbox). As seen earlier in this paper, the participants in my study had to assign stress to unfamiliar made-up -en# and -Vn# words. Based on the statistical analysis, the 50/50 ratio for penultimate/last stress proposed by Aske's [1] dictionary analysis was found in the present study. Also, the vast majority of the -Vn# words were stressed on the last syllable as I expected.

At the first glance, it seems that the second hypothesis - there is a correlation between proficiency level and stress assignment pattern - is not confirmed because the values of the means for both groups are fairly close. However, since the *Undergraduate* group had a higher standard deviation than the *Graduate* group, which may mean that there was not a well defined trend - rather at random - for stress assignment (there was more dispersion around the mean for the *Undergraduate* group), one may conclude that proficiency level is an important factor for stress assignment. The

<sup>7</sup>Stressed vowels are underlined.

**Table 10. Results for Two Groups Divided by Length of Study Abroad - Stress Placement on Made-Up -en# Words**

**Part 1. Graduate group**

-en# words	Up to 6 months (X)				7-12 months (Y)				More than 1 year (Z)			
	#	Penultimate	%	Final	%	Penultimate	%	Final	%	Penultimate	%	Final
1	5	55.6	4	44.4	3	50	2	33.3	2	66.7	0	0
2	6	66.7	3	33.3	5	83.3	1	16.7	3	100	0	0
3	6	66.7	3	33.3	1	16.7	4	66.7	1	33.3	2	66.7
4	3	33.3	6	66.7	5	83.3	1	16.7	2	66.7	1	66.7
5	3	33.3	6	66.7	2	33.3	4	66.7	1	33.3	2	66.7
6	4	44.4	5	55.6	3	50	3	50	0	0	3	100
Total	27	300	27	300	19	317	15	250	9	300	8	267
Mean	4.5	50	4.5	50	3.2	52.8	2.5	41.7	1.5	50	1.3	44.5

**Part 2. Undergraduate group**

-en# words	No				Yes			
	#	Penultimate	%	Final	%	Penultimate	%	Final
1	7	50	4	28.6	4	33.3	6	50
2	10	71.4	3	21.4	8	66.7	4	33.3
3	9	64.3	3	21.4	6	50	5	41.7
4	11	78.6	3	21.4	7	58.3	5	41.7
5	6	42.9	8	57.1	3	25	9	75
6	5	35.7	7	50	2	16.7	9	75
Total	48	343	28	200	30	250	38	316.7
Mean	8	57.2	4.66	33.3	5	41.7	6.33	52.8

**Table 11. Case Summaries - Stress Placement by the Two Groups Divided into Subgroups by Length of Study Abroad**

**Part 1. Graduate group**

#	G1*PEN	G2* *PEN	G3‡ PEN	G‡ PEN	G1*LAST	G2* *LAST	G3‡ LAST	G‡ LAST
1	55.60	50.00	66.70	55.60	44.40	33.30	.00	33.30
2	66.70	83.30	100.00	77.80	33.30	16.70	.00	22.20
3	66.70	16.70	33.30	44.40	33.30	66.70	66.70	50.10
4	33.30	83.30	66.70	55.50	66.70	16.70	33.30	44.50
5	33.30	33.30	33.30	33.30	66.70	66.70	66.70	66.70
6	44.40	50.00	.00	38.90	55.60	50.00	100.00	61.10
Total	6	6	6	6	6	6	6	6
Mean	50.0000	52.7667	50.0000	50.9167	50.0000	41.6833	44.4500	46.3167
Std Dev	15.35109	26.68195	34.97302	15.89257	15.35109	22.97585	40.37785	16.74926
Min	33.30	16.70	.00	33.30	33.30	16.70	.00	22.20
Max	66.70	83.30	100.00	77.80	66.70	66.70	100.00	66.70

\*G1 – performance of the subjects in X subgroup (up to 6 months).

\*\*G2 – performance of the subjects in Y subgroup (7-12 months).

‡G3 – performance of the subjects in Z subgroup (more than one year).

‡G – performance of all the Graduate subjects.

## Part 2. Undergraduate group

#	U1*PEN	U2* *PEN	U† PEN	U1*LAST	U2* *LAST	U† LAST
1	50.00	33.30	42.30	28.60	50.00	38.50
2	71.40	66.70	69.20	21.40	33.30	26.90
3	64.30	50.00	57.70	21.40	41.70	30.80
4	78.60	58.30	69.20	21.40	41.70	30.80
5	42.90	25.00	34.60	57.10	75.00	65.40
6	35.70	16.70	26.90	50.00	75.00	61.90
Total	6	6	6	6	6	6
Mean	57.1500	41.6667	49.9833	33.3167	52.7833	42.3833
Std Dev	16.90311	19.71747	18.03679	16.07637	18.00105	16.93416
Min	35.70	16.70	26.90	21.40	33.30	26.90
Max	78.60	66.70	69.20	57.10	75.00	65.40

\*U1 – performance of the subjects in *NO* subgroup (no studies abroad).

\*\*U2 – performance of the subjects in *YES* subgroup (some studies abroad).

†U – performance of all the Undergraduate subjects.

*Graduate* subjects demonstrated more consistency as to the penultimate stress placement in the –en# words. It would be important to examine again the role of proficiency level in stress assignment in future studies, especially because of the limited number of respondents in this experiment. All in all, a precise measure of subjects' proficiency level should be made (particularly for not fully proficient speakers) because even if all study participants are enrolled in the same level undergraduate courses, their L2 proficiency may somewhat vary. Unexpectedly, an interesting fact was noticed regarding –Vn# stress assignment. Even though the means for the two groups were quite similar, the difference between the standard deviation is substantial (32 for the *Graduate* group versus 17.5 for the *Undergraduate* group). The high standard deviation of the *Graduate* group is due to the fact that the word SORQUIN was stressed 88.9% of the time on the penultimate syllable by the *Graduate* subjects (see Table 3 part 2). If this word were excluded from the analysis, the mean for the *Graduate* group would be 82.3 and the standard deviation would be 14.9. Therefore, without this word the results show even a clearer tendency for final stress assignment in –Vn# words. Also, if SORQUIN is excluded, the correlation between proficiency level and stress assignment pattern becomes more obvious. It is impossible to know for sure why the majority of the *Graduate* respondents assigned penultimate stress to the word SORQUIN. Perhaps this word resembled a familiar word that has a penultimate stress. It could have been a last name, e.g. *Sorkin* (an American screen writer and producer Aaron Sorkin), *Dvorkin*, *Gorkin*. According to [4], if L2 learners cannot find analogous words in their L2 lexicon, they access their L1 lexicon in search of a similar word. Perhaps this was the case here given that in Spanish there are not similarly sounding common nouns that could have influenced the respondents' stress assignment pattern.

As to the possible influence of the extralinguistic variables, my third hypothesis was that *Gender*, *Age of Exposure*, *Frequency of Spanish Use*, and *Study Abroad* have some influence on the results. Moreover, due to the fact that

language users may expand their lexicon by using language more often, I hypothesized that *Frequency of Spanish Use* would be the most influential extralinguistic variable among them. With regard to *Gender*, male subjects in both groups tended to assign stress to the penultimate syllable more often than the female subjects. This tendency is a little stronger in the *Graduate* group (see Table 5). This finding should be explored in future studies with a larger number of participants. With respect to the *Age of Exposure*, this variable was not found important for the *Undergraduate* group (see Table 7, part 2). In the *Graduate* group, the *After Puberty* (AP) subgroup stressed –en# words 70% of the time on the penultimate syllable whereas *Before Puberty* (BP) subgroup stressed –en# words 43.6% of the time. The outcome of the AP subgroup of the *Graduate* group was influenced by the fact that its subjects stressed the word CORUMEN on the penultimate syllable 100% of the time, which is concordant with Aske's explanation (many real –men# words have a penultimate stress). Those who support the Critical Period Hypothesis<sup>8</sup> would expect the BP (*Before Puberty*) respondents to stress more on the penultimate syllable if they had achieved a high proficiency level in Spanish before puberty. However, we do not know if their exposure to the target language was significant, perhaps it was minimal in this case. Future studies should further examine this variable.

The *Frequency of Spanish Use* is indeed a quite influential variable because it seems logical for accuracy of stress assignment to be correlated with higher proficiency. In the *Graduate* group (see Table 9, part 1), the most frequent users of Spanish (subgroup C1 with more than 50 hours of Spanish use per week) did not quite demonstrate analogically-based stress assignment because they stressed penultimate syllables 66.7% of the time (the default case is around 50%). The standard deviation for this subgroup was very high (42.1), which means that the performance was not homogeneous.

<sup>8</sup>The Critical Period Hypothesis postulates that due to biological constraints post-pubescent L2 learners are not able to reach native-like proficiency i.e. generally pre-pubescent L2 learners are more successful than post-pubescent learners.

The most frequent users of Spanish in the *Undergraduate* group stressed penultimate syllable only 21% of the time. Therefore, my expectation about this variable was not met for both experimental groups. High frequency of language use does not always result in effective vocabulary acquisition. We do not know where and how these learners use Spanish. They may use it frequently, but not adequately. For instance, one of my former students had told me that he had regularly used Spanish with some Spanish-speaking kitchen workers in a restaurant where he used to work. Their communication was limited to the same vocabulary: food items and numbers. Provided that this experiment was a small-scale study, the variable *Frequency of Spanish Use* should be looked at in a larger-scale future study in order to examine a potential correlation between proficiency level and stress assignment patterns with a larger number of participants at both advanced and superior proficiency levels. If this variable is found influential only for very frequent Spanish users, who are also very advanced in Spanish, one may hypothesize that the effect of this variable may not be shown until higher proficiency level is reached.

The variable *Study Abroad* did not appear to be influential because the results in all the subgroups of the two groups are quite similar. This is not surprising because overall for many people the length of study abroad was fairly short. Also, other factors such as intense formal studies in the United States may have helped learners who had not studied abroad to build a well-developed lexicon.

## CONCLUSION

All in all, the influence of the extralinguistic variables should not be ignored in future studies. Their role and possible correlations with each other must be carefully analyzed. The results of this pilot study provide some insights into processes underlying L2 learners' stress assignment. Among other suprasegmental features such as pitch and rhythm, stress is an essential component of successful language acquisition. The findings reveal that overall Spanish learners tend to assign stress by analogy and that proficiency level may affect performance. This last finding may mean that more advanced learners whose lexicon is quite extensive have more possibilities to construct analogical connections than less advanced learners. A pedagogical implication derived from the results of this study is that L2 learners can learn Spanish stress patterns without rules and then apply these patterns to unfamiliar words. I strongly agree with [24] that through intense exposure to an L2 and experiences in it, language learners can build large lexical inventories that may lead "to more accurate stress patterns, and perhaps also to better techniques for achieving native-like stress production on unknown words. Teachers may be able to overcome the fact that most textbooks and language programs neglect stress by providing rich lexical input" (p 13).

## APPENDIX A

### Data Collection form

Please read the following sentences in Spanish and write an accent mark on each word to indicate which vowel you would emphasize the most if you were to pronounce the words.

1. EL LIQUIDO QUE SALE DE ESA OLANDULA SE LLAMA BESOREN.
2. DESCUBRIERON UN SEBORAN PREHISTORICO DENTRO DE UNA CUEVA.
3. LOS MIEMBROS DEL COMITE SE REUNEN TODOS LOS VIERNES.
4. ¿A QUIEN SE LE OCURRIRIA TRAER UN CORUMEN TAN GRANDE?
5. ANUNCIARON LA ENTRADA DE UN PORUBON EN LA ATMOSFERA.
6. MI AMIGO QUIERE COMPRAR UN COCHE DEPORTIVO.
7. ME DIJO EL DOCTOR QUE ME TOMARA UN PETABEN CADA NOCHE.
8. PARA ABRIR LA CAJA FUERTE ERA NECESARIO UN TEDON.
9. LA COMPUTADORA DE JUAN VALE MUCHO PORQUE ES MUY MODERNA.
10. ESTA MODA DE CALZADO ES DEMASIADO FADEN PARA MI GUSTO.
11. DIJERON QUE EL QUE TUVIERA UN PETAMIN QUE SE FUERA.
12. MARISOL EXCLAMO: "¡ES EL ULTIMO GRITO DE MODA!"
13. AUN NO ME HAN MANDADO EL GORQUEN QUE PEDI HACE UN MES.
14. EL SORQUIN ES UN INSTRUMENTO QUE USABAN LOS CARPINTEROS.
15. ESTA UNIVRSIDAD ES MUY ANTIGUA.
16. ¡ES INCREIBLE QUE UN MERASEN CUESTE TANTO!
17. EL PATRON ME MANDO QUE TRAJERA UN PERASUN METALICO.
18. TODOS LOS ESTUDIANTES ESTAN MUY CONTENTOS.

## APPENDIX B

### Questionnaire

*Please Answer the Following Questions:*

1. Do you speak any languages besides Spanish? Please provide details.  
\_\_\_\_\_
2. If you answered "Yes" in #1, how would you rate your proficiency level in that language?  
\_\_\_\_\_
3. How old were you when you started learning Spanish?  
\_\_\_\_\_
4. What is your age? Circle one of the following choices:  
18-25 26-31 32-37 38-43 44-49 50-55 56-61 more than 62

5. Have you lived in a Spanish-speaking country? If yes, for how long?
- 
6. Have you studied abroad? If yes for how long?
- 
7. How many hours a week do you use Spanish? Where? (Provide details).
- 

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