

# Consonant errors are more frequent than vocalic errors in Spanish reading acquisition.

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The first goal of our study was to ascertain the distribution of consonant and vowel errors when Spanish children learn to read. Some studies have shown that the number of vocalic mistakes is higher than consonant mistakes in the acquisition of reading by English children. However, we thought that taking into account the characteristics of Spanish language just the opposite could happen. In our opinion, the transparency of the Spanish orthography and the low number of vocalic sounds would produce a different proportion of these kinds of errors.

Our second aim was to know about the influence of the syllabic structure in the number of reading errors made by Spanish children. Previous studies, carried out in English and French (Mehler *et al.* 1981., Cutler *et al.* 1986), have shown the importance of syllabic structure in the recognition of words.

The third goal was to determine if the different position of the letter in a letter string or pseudoword affects the number of reading errors made by children.

Lastly, we wanted to find out the influence of these variables in the developmental pattern of reading acquisition.

## SUBJECTS

Sixty-four children from second grade up to sixth were tested. Each group was balanced in gender. Retarded readers were excluded.

## READING TASK

The reading task consisted of a balanced pseudoword reading test. The test included a total of 80 items. Each item was a pseudoword built by the combination of four letters: two vowels and two consonants. Only four possible combinations were considered because other combinations produce illegal orthographic combination in Spanish and they are not possible to pronounce. All combinations that produced real words, homophones or pseudohomophones were specifically excluded. All the positions were permuted to balance the influence of the position of each letter in the string. As a result, all vowels and consonants were located in all possible positions. Accordingly, the sequence of letters considered were:

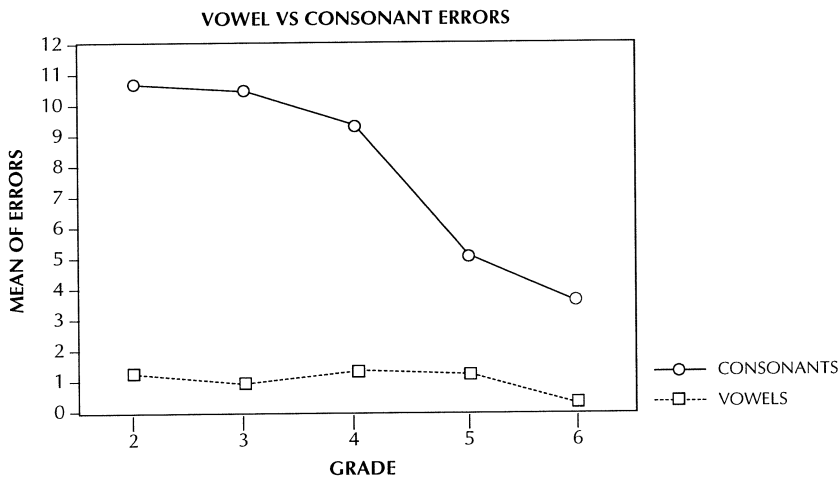
|          | CVCV | CVVC | VCCV | VCVC |
|----------|------|------|------|------|
| Example: | BAFU | BAUF | ABFU | ABUF |
|          | FABU | FAUB | AFBU | AFUB |
|          | BUFA | BUAF | UBFA | UBAF |
|          | FUBA | FUAB | UFBA | UFAB |

## RESULTS

*Vowel versus consonant errors:* We recorded the reading performance of the children and collapsed the number of consonant and vocalic errors on each school grade. The results showed that children in every school grade made more consonant than vowel errors.

The number of vowel errors did not vary between the second and the sixth grades. It means that children in second grade already discriminate the different vocalic graphemes without difficulty. On the contrary, there is a robust learning slope for consonants. The results showed the existence of significant differences between the first three grades (second, third and fourth) and the last two (fifth and sixth). See Figure 1.

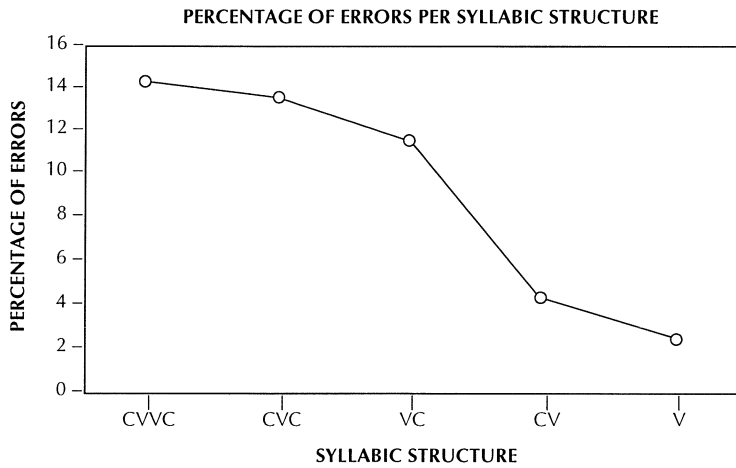
Figure 1. Mean of consonant and vowel errors per grade.



*Syllabic structure:* The reading test allowed us to discriminate the effect of five different syllabic structures: V; CV; VC; CVC; CVVC.

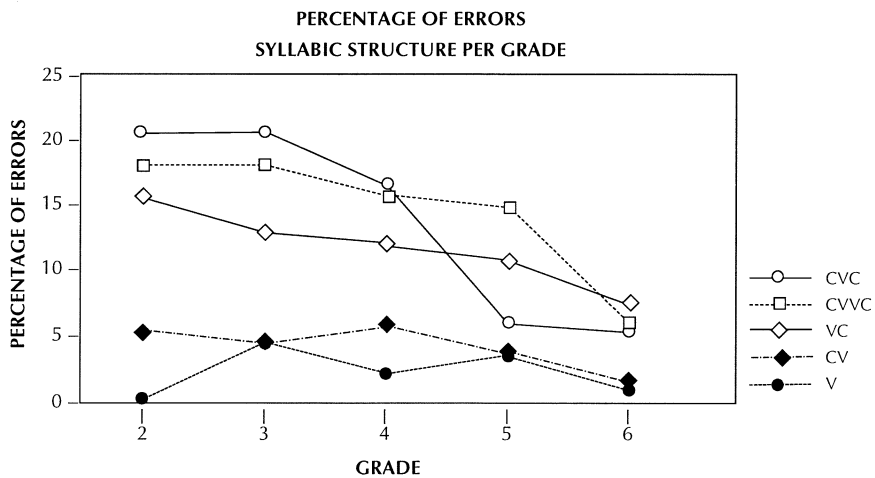
The results showed a significant effect of syllabic structure. As can be seen in the figure 2, the higher is the number of graphemes in the syllable, the higher is the number of errors. However, a more detailed analysis showed the existence of two different groups of syllabic structure: CVVC; CVC and VC on one hand and CV and V on the other. There were significant differences between both groups but not between each one of them.

Figure 2. Percentage of errors per syllabic structure.



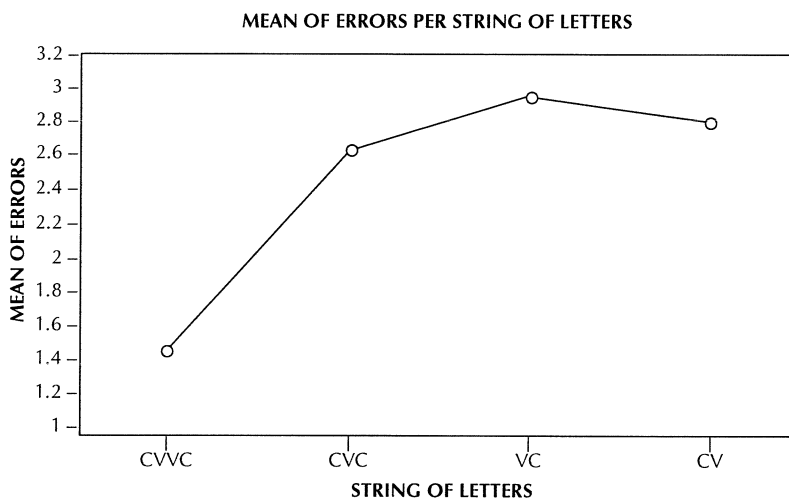
The differences between both groups of syllabic structure are also manifest regarding the developmental pattern of reading acquisition. As can be seen in the figure 3 there are no significant differences in the number of errors from second to sixth grade considering the V and CV syllabic structures. Children made a low level of errors already in second grade. However, the rest of syllabic structure showed a learning effect that became steady only in the fifth grade.

Figure 3. Percentage of errors on each syllabic structure per grade.



*String of letters:* The comparison among the four different combinations of letter considered showed the existence of significant differences. However, the post-hoc comparison among the different levels of this variable only showed the existence of significant differences between the CVCV string and the rest. There were no significant differences between the remaining possible comparisons (see figure 4).

Figure 4. Mean of errors on each string of letters considered.



## CONCLUSIONS

Spanish children made less vowel than consonant errors when reading. Children are already able to discriminate between vowels in the second grade. However, this level of knowledge is not reached till fifth grade for consonants.

Regarding syllabic structure our data reflect differences between them. Syllabic structures with more letters produce more reading errors. That is true excepting the comparison CV and VC. The structures V and CV are easier than VC; CVC and CVVC. However, this effect could be interpreted as influence of frequency. There is an inverse relation between the frequency of the syllabic structure in the Spanish language and the number of errors made by children. In fact, Carreiras *et al.* (1993) and Dominguez *et al.* (1993), using time reaction as dependent variable, showed the influence of syllabic structure frequency in the recognition of words.

The frequency effect could also explain the results found in the comparison of the letter strings. The CV-CV sequence is the most frequent in the Spanish language and Broadbent and Gregory (1968) and McClelland and Rumelhart (1981) using lexical decision tasks, already showed the influence of bigram frequency in the English language.

In conclusion, we suggest that the effect of all the variables considered could be caused by the different frequency that graphemes, bigrams and syllabic structures have in the Spanish language.

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