

The prosodization of neoclassical elements in Brazilian Portuguese: evidence from vowel reduction

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Neoclassical elements (NCEs), such as *agro* in *agronomy* and *psycho* in *psychology*, have been assigned different morphological classifications: from affixes, to stems, to combining forms (see [2], [6]). Assuming that NCEs belong to any of these categories implies that they present a consistent behavior throughout the language. However, not only do NCEs combine with distinct types of structures (e.g. other NCEs, such as in *psycho-logy*, or independent words, such as in *psycho-linguistics*), but they may also exhibit different phonological aspects according to the element to which they attach. In this paper, we argue that differences in vowel reduction (VR) in the NCE-final /o/ indicate that NCEs in Brazilian Portuguese (BP) are prosodized in two ways: as regular prosodic words (PWds) when combined with another NCE (1a), and as compounds (recursive PWds) when combined with an independent PWd (1b).

- (1) NCE + NCE (a), and NCE + PWd (b) sequences
- a. ‘**agr-o**-nomia’ (*agro-nomy*), ‘**psic-o**-logia’ (*psycho-logy*)
 - b. ‘**agr-o**-negócio’ (*agribusiness*), ‘**psic-o**-terapira’ (*psycho-therapy*)

Our hypothesis is that BP speakers recognize the PWd boundary in constructions such as those in (1b). In this case, the NCE-final vowel would correspond to a post-tonic vowel, thus being more subject to reduction ([5],[7]). The NCE-final vowel in constructions such as (1a), on the other hand, would correspond to a pre-tonic vowel, which is less susceptible to reduction.

Methods

Two independent preliminary tests were conducted to investigate whether morphological construction had the predicted effect on VR in the NCE-final vowel /o/. The production test involved carrier sentences containing constructions from both groups (1a) and (1b). Target ($n=32$) and filler ($n=32$) sentences were randomly presented to BP speakers ($n=5$) in both focus and non-focus positions. Speakers' production of target items ($n=320$) was analyzed in terms of formant values (F1, F2) of the NCE-final vowel. The experiment also controlled for duration, preceding and following vowel and consonant, focus/non-focus position, and distance from target syllable to stressed syllable in the construction.

The perception test was developed on Praat [3] and involved an almost identical set of target words ($n=30$), which were recorded by a native speaker of BP—production data were not used in the perception test due to the subtle differences in F values involved. Each construction had reduced and unreduced versions, and was replicated twice during the test. Speakers ($n=10$) judged items on a 10-point scale, based on what sounded more frequent/natural to them. A pre-test containing common and unattested reductions ($n=10$) was used to verify speakers' understanding of the task. Each subject judged a total of 402 items (272 fillers). Perception and production data were analyzed in R and modelled with Ordinal Regression and Linear Mixed-Effects Regression, respectively.

Results

In the production test, only F2 values of the NCE-final /o/ were significantly affected by morphological construction. As predicted, NCE + PWd sequences (1b) yielded more vowel reduction in terms of F2 ($\hat{\beta} = 105$, $p < 0.01$, with by-speaker and by-item random effects). These results are consistent with what has been cross-linguistically observed ([4],[1]).

In the perception test, VR in NCE + PWd sequences was judged significantly better than in NCE + NCE constructions ($\hat{\beta} = 1.18$, $p = 0.004$, with by-speaker and by-item random effects). In other words, speakers judged VR in PWd-boundary position as significantly more natural, which follows from our predictions. Results of both tests are shown in Fig. 1—perception test results refer to items with VR.

Figure 1: Production and perception tests



The preliminary results confirm the hypothesis that speakers do seem to identify a prosodic boundary between an NCE and the following form in NCE + PWd constructions. Thus, we argue that distinct prosodic representations are empirically motivated for NCEs in BP: NCE+NCE \rightarrow PWd, whereas NCE+PWd \rightarrow compound (recursive PWd).

References

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