

## An Acoustic Analysis of Svarabhakti Vowels in Guatemalan Spanish /rC/ Clusters

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Quilis's (1970, 1993) instrumental work on the acoustic analysis of svarabhakti vowels (henceforth, SVs) in Spanish has greatly enhanced our understanding of these short, vowel-like fragments found between a Spanish tap, /r/, and its adjacent consonant. His work on SV formant structure in /Cr/ clusters suggests that SVs exhibit the same properties of the nuclear vowel, prompting his hypothesis that SVs that realize into phonological full vowels over time are always copied from the nuclear vowel (1970:102), as in (1a). However, we observe no evidence of this diachronic phenomenon in Spanish for the heterosyllabic, /rC/ clusters, in which the SV never achieves full vowel status, as in (1b):

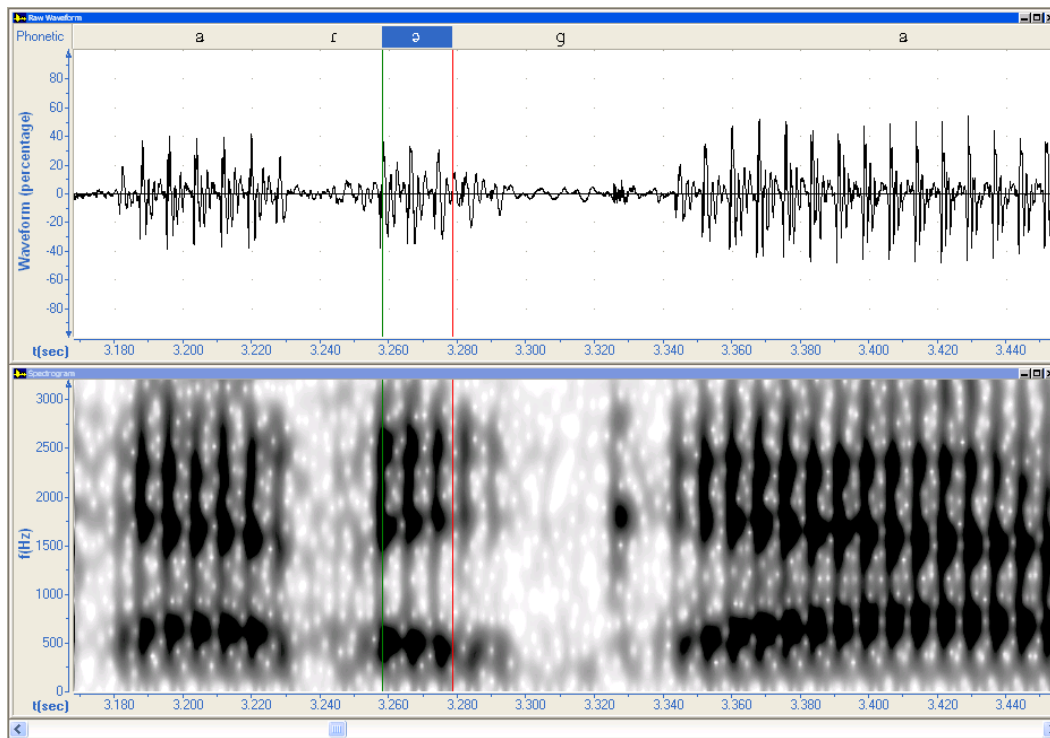
- (1) a. tigre > tiguere 'tiger'  
b. parte > \*parate 'parte'

Further evidence that SVs pattern differently exists in recent studies (Colantoni and Steele, 2005, 2007; Ramírez, 2002, 2006; Schmeiser, 2007b) which suggest segmental factors might affect SV duration more than prosodic ones. However, Schmeiser's (2007a) lone empirical study on /rC/ clusters suggests that prosodic factors, more than segmental factors, significantly affect SV duration. Given these differences, it is the central goal of the current study to examine the acoustic properties of SVs in Spanish /rC/ and compare them to Quilis's (1970, 1993) findings on /Cr/ clusters. By doing so, the study greatly contributes to linguistic research by offering empirical data on a topic previously unattested and advances our understanding of SV formant structure.

With regard to experimental design, I analyze the acoustic properties of the intervening svarabhakti vowel from a corpus that includes twenty-eight speakers from Guatemala City, Guatemala; 496 /rC/ clusters are analyzed spectrographically using Speech Analyzer 2.6 and categorized by their flanking vowels (e.g. a\_a). Participant recordings are in MPEG format at a sample rate of 22,050 Hz and sample size of 16-bit. Preliminary data results suggest that the acoustic properties of SVs in /rC/ clusters are unlike those of their /Cr/ counterpart in that they are not linked to a particular nuclear vowel. The formant structure is typically that of a mid vowel, with an average F1 value of 425 and an average F2 value of 1480, regardless of the flanking vowels' quality, as in Figure 1 below.

In theoretical, Articulatory Phonological (Browman and Goldstein, 1989 et seq.) terms, Gafos (2002) notes that both consonants in the tautosyllabic onset cluster have a timing relationship with the underlying (nuclear) vowel. However, Gafos (2002) also mentions that whereas a consonant in coda position has a timing relationship with its nuclear vowel, the following (heterosyllabic) consonant has a timing relationship the nuclear vowel of the following syllable. The current study's findings are novel in that they suggest the SV in a /rC/ cluster has *no* apparent timing relationship with *either* of the neighboring nuclear vowels, as evidenced by its neutral formant structure. Thus, the findings corroborate Gafos's (2002) notions with empirical evidence and shed new light on how we view the syllable.

Figure 1 SV formant structure in *cargados* [kar<sup>ə</sup>.gá.ðos] ‘full’



### Selected References

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