

Dialect-specific /s/-lenition and vowel shortening in Southern Cone Spanish

Introduction. In this paper, we present results from a pilot study analysing the interaction between dialect-specific /s/-lenition and compensatory durational patterns (shortening and lengthening) in Southern Chilean Spanish (SCS) and Buenos Aires Spanish (BAS). Our findings show the following:

- /s/-lenition (aspiration and elision) occurs more frequently in SCS than BAS.
- Aspirated realisations of /s/ are significantly shorter than sibilant /s/-realisations.
- Aspiration causes concomitant shortening of preceding vowels in both dialects (i.e., there is no compensatory vowel lengthening).

Our study is motivated by previous research showing that vowels in certain /s/-lenition varieties, e.g., Andalusian and Caribbean dialects, undergo compensatory lengthening when a following /s/ elides ([1], [2], [3]). However, research into these processes has focussed on ‘advanced’ varieties, i.e., those in which /s/-elision is very common, such that these effects remain under-researched in more ‘conservative’ dialects, e.g., SCS and BAS ([4], [5]). Moreover, despite extensive research on the effects of elision on preceding vowels, research into the effect of aspiration to [h] as an intermediate step towards elision remains to be undertaken. In line with these facts, our study aims to explore durational changes affecting both vowels and /s/ in /s/-aspiration contexts, with a view to determining to what extent changes are compensatory—i.e., whether one element lengthens as the other shortens—or whether the entire rhymal unit (vowel+/s/) shortens or lengthens. Thus, our study asks the following research questions:

RQ1. What is the relative frequency of /s/-lenition variants ([s, h, Ø]) in BAS and SCS?

RQ2. What are the durational consequences of /s/-aspiration, i.e. in [s] vs [h]-realisations?

RQ3. Does compensatory shortening or lengthening of vowels occur depending on the following /s/-allophone?

Methodology. We analysed approximately 35 minutes of spontaneous speech elicited through photo and comic book description tasks from six speakers of SCS and four speakers of BAS. Speech was recorded using the video-conferencing software Zoom, segmented using the Montreal Forced Aligner ([6]) and manually corrected. Durational measurements were extracted from vowels and /s/ in word-final syllables by script in Praat [7]. Statistical analysis of the durational patterns was carried out using linear mixed effects regression in R.

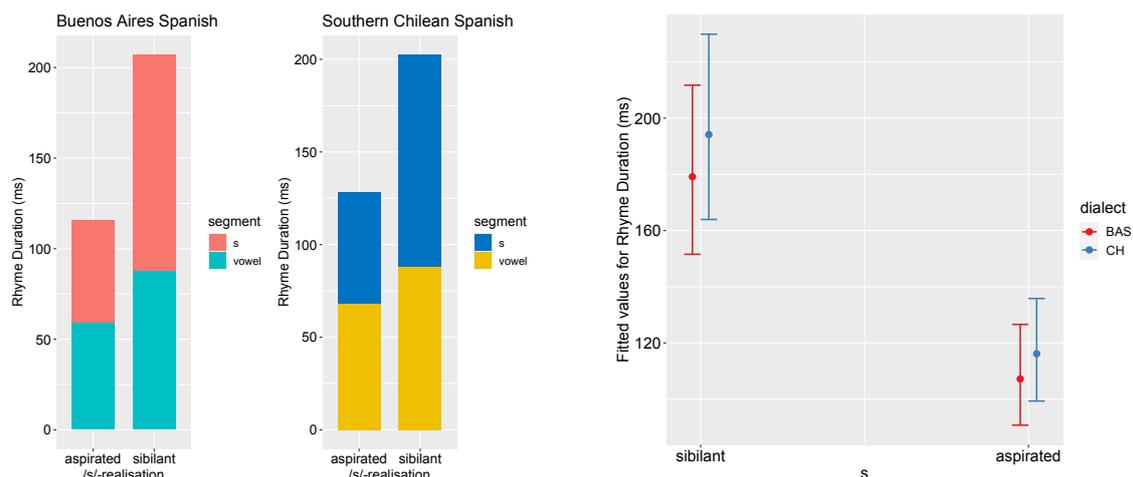


Figure 1. Rhyme duration (ms) for aspirated and sibilant realisations of /s/ in BAS and SCS (left) and fitted values (ms) for rhyme duration (right).

Results. In response to RQ1, our findings show that lenition is more common in SCS than BAS. For SCS, lenited tokens represent 83.39% of /s/ realisations (aspiration ~ 59.94%, elision ~ 23.45%) whilst BAS favours retention (63.41%) with aspiration and elision accounting for 31.4% and 5.18% of tokens, respectively. Regarding RQ2, our results show that aspirated realisations of /s/ are significantly shorter than sibilant realisations in both dialects ($t = -4.002, p < .01$). In

a similar vein, we observe that aspiration causes durational reduction of the rhymal unit as a whole in both varieties ($t = -16.556, p < .001$) (RQ3, see Figure 1).

Discussion. Although /s/-lenition rates differ between the dialects, the durational effects are similar: for both varieties, aspiration does not cause compensatory vocalic lengthening. Rather, both vowels and /s/ shorten when /s/ undergoes aspiration. Our findings therefore confirm that the entire rhymal unit (nuclei and codas) displays durational reduction as a result of aspiration.

We suggest that the significance of these results may be two-fold. Firstly, they bear upon debates surrounding syllable structure, providing evidence in support of the *rhymal hypothesis* – i.e. that nuclei and codas form a macro-unit within the syllable ([8], [9], [10], cf. [11]). Secondly, and most crucially, they may provide insights into the dialect-specific operation of vowel compression. Our previous work has shown that syllable shape influences duration in SCS: vowels in closed syllables shorten regardless of stress or following context (coda-driven compression). By contrast, vowel duration in BAS varies owing to the interaction between syllable shape and following context: the more simple the syllable shape, the greater the effects of contextual lengthening and shortening (e.g pre-pausally vs pre-vocalically). Thus, vowels in simplex syllable structures (CV, CVC, V, VC) display greater overall contextual variation than those in complex structures (CCV, CCVC).

We theorise that this difference may be linked to the findings presented above. As RQ1 highlights, lenition is more advanced as a phonological process in SCS than in BAS. Thus, it is likely that aspiration contributes significantly to the coda-driven shortening effects that we have previously observed. By contrast, since aspiration is much less frequent in BAS, it may contribute less significantly to syllabically-conditioned vowel clipping. Nonetheless, our current findings are preliminary: further analysis using a larger data set will be necessary to compare a range of licit coda types to confirm the overall contribution that /s/-lenition makes to vowel compression in these varieties.

References

- [1] Henriksen, N. (2017). Patterns of vowel laxing and harmony in Iberian Spanish: Data from production and perception. *Journal of Phonetics* 63: 106–126.
- [2] Carlson, K. M. (2012) An Acoustic and Perceptual Analysis of Compensatory Processes in Vowels Preceding Deleted Post-Nuclear /s/ in Andalusian Spanish. *Concentric: Studies in Linguistics* 38(1): 39–67.
- [3] Figuera, N. (2000) An acoustic and perceptual study of vowels preceding deleted post-nuclear /s/ in Puerto Rican Spanish. In H.Campos, E. Herburger, A. Morales-Front, and T. J. Walsh (eds.) *Hispanic linguistics at the turn of the millennium: papers from the 3rd Hispanic linguistics symposium*, 66–79, Somerville, MA: Cascadilla Press.
- [4] Honsa, V. (1965) The Phonemic Systems of Argentinian Spanish. *Hispania* 48: 275
- [5] Bolyanatz, M. A. (2018) Evidence for Incomplete Neutralization in Chilean Spanish. *Phonetica* 77: 107–130
- [6] McAuliffe, M., Socolof, M., Mihuc, S., Wagner, M. & Sonderegger, M. (2017) Montreal Forced Aligner: Trainable Text-Speech Alignment Using Kaldi. *Proc. Interspeech*, 498–502
- [7] Boersma, P. & Weenink, D. (2021) *Praat: doing phonetics by computer* [Computer program]. Version 6.1.50
- [8] Farnetani, E. & Kori, S. (1986) Effects of syllable and word structure on segmental durations in spoken Italian. *Speech Communication* 5: 17–34
- [9] Maddieson, I. (1985) Phonetic Cues for Syllabification. In V. A. Fromkin (ed.), *Phonetic Linguistics: Essays in honor of Peter Ladefoged*. 203–221. New York, NY: Academic Press
- [10] Munhall, K., Fowler, C., Hawkins, S., & Saltz, E (1992) Compensatory shortening in monosyllables of spoken English. *Journal of Phonetics* 20: 225–239
- [11] Katz, J. (2012) Compression Effects in English. *Journal of Phonetics* 40: 390–402.