

An Investigation of Andalusian Stop Cluster Post-aspiration in Naturalistic Speech

Duna Gylfadottir University of Pennsylvania

The weakening of syllable-final /s/ is a widespread phenomenon in the Spanish-speaking world. When a standard Spanish /s/ precedes a voiceless stop in dialects with /s/-aspiration, the result is normally a pre-aspirated stop. In recent years, attention has been drawn to a change in this particular environment. For some speakers in Andalusia in southern Spain, /s/ + stop (sC) clusters are realized as post-aspirated stops. There have also been reports of /st/ being affricated to [ts]. The change is most advanced in the western part of the region and is spreading east.

An articulatory model that has been suggested for this change is one of gestural realignment (Parrell 2012), wherein the glottis opening gesture and the closure gesture are simply shifting in relation to each other in time. Such a model predicts trade-offs between pre- and post-aspiration but does not predict any closure lengthening in either case, nor does it predict a change in the overall length of the sequence. Torreira (2012) found a relationship between closure length on the one hand and pre- and post-aspiration on the other and revised this simple model to a more complex one. Ruch and Harrington (2014) instead found a trade-off relationship between closure duration and post-aspiration, arguing against a gestural alignment analysis. O'Neill (2009) made the observation that more post-aspirated tokens tended to be shorter in overall duration. The above studies, and indeed most of the work on this phenomenon to date, are limited to acoustic analysis of read laboratory speech.

This study uses the measurement techniques outlined in Ruch and Harrington (2014) to investigate the realization of sC clusters in naturalistic data. Post-aspiration is measured by VOT, and pre-aspiration as Voice Termination Time (VTT), or the length of time between cessation of voicing and full stop closure. Sociolinguistic interviews with accompanying reading tasks were conducted with 6 young adult speakers from Western Andalusia and 1 from Malaga. An additional 3 speakers were drawn from the PRESEEA Malaga sociolinguistic corpus.

Existing work is in disagreement about details of the acoustics of Andalusian sC clusters, including whether stop closure lengthening occurs and about the relationships between acoustic elements mentioned above. This may be because some authors explicitly separate pre-aspirated and post-aspirated tokens in their analysis, but others do not. If speakers are employing distinct strategies within the same speech event, speaker means will not be maximally informative as to the properties of tokens produced with these strategies, and combining all tokens together may cloud the picture. In order to avoid this problem, tokens were coded as employing one of three strategies: post-aspiration, pre-aspiration, and long closure.

The results show a weak negative relationship between closure duration and VOT (see Figure 1). That relationship disappears when the data is separated by strategy type. A trade-off between VTT and VOT is not supported. The most striking finding is support for the overall length difference O'Neill observed: Figure 2 shows that the median overall length of heavily post-aspirated sC clusters is more than 20 ms shorter than for those that are not, and is comparable to that of a single stop. O'Neill put forth an proposal in which Andalusian post-aspirated sC clusters have been reanalyzed as single post-aspirated stops. This reanalysis gives a straightforward explanation for the length difference found in his data and here. I argue that some speakers alternate between this new, reanalyzed variant and more traditional post-aspirated or geminated variants.

An additional piece of evidence in this data is the occurrence of a number of phrase-initial tokens with no preceding vowel at all, all displaying long-lag VOT. It should be noted that consonant clusters with /s/ are not permitted in the onset in Spanish, and such a reanalysis would

make that phonotactic restriction irrelevant. Another phenomenon observed in the data, affrication to [ts], can be seen under this analysis as analogous to affrication of /t^h/ in English dialects, something that has been analyzed as a fortition strategy (Buizza and Plug 2012).

Little has been said about the social salience of this change in the literature. Coda /s/-aspiration generally (vs. retention) is known to be socially stratified and is often stereotyped (Dohotaru 2004). Metalinguistic commentary was elicited from three of the aforementioned speakers, using a sound clip of clear post-aspiration. Two were immediately able to identify the phenomenon as associated with Seville province and produced imitations with exaggeratedly long VOTs. At least some speakers, therefore, are explicitly aware of this phenomenon. A speaker who primarily pre-aspirated in the data shifted in the reading task to shorter closure duration and longer VOT. This suggests that post-aspiration has not risen to the level of a stereotype and is not stigmatized to a greater degree than /s/-aspiration generally.

This study contributes to a growing body of acoustic work examining an intriguing change in progress in Andalusia from pre- to post-aspirated stops. It challenges some of the previous findings about relationships among different acoustic parts of the cluster as well as corroborating an important finding of a short overall duration of the novel post-aspirated variant in naturalistic speech. Additionally, this study provides some arguments for a phonological analysis of this change based on phenomena that have not been observed in laboratory speech. It is argued that the predictions made by gestural alignment models are not well borne out. Finally, this study presents some evidence for speaker awareness of the change, as well as evidence against stigmatization of this variable.

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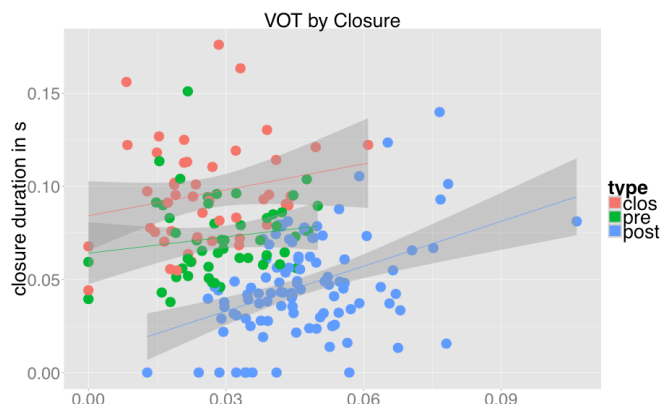


Figure 1

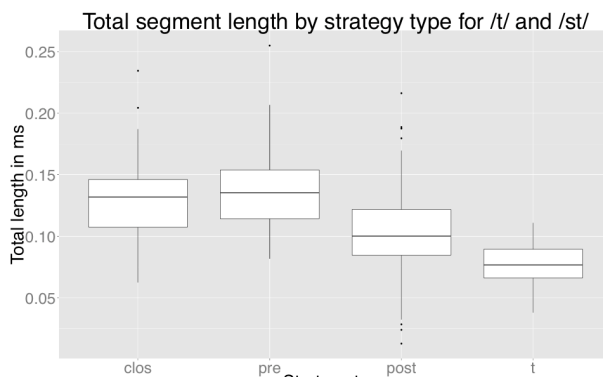


Figure 2