

The origin and motivation(s) of Alpine preconsonantal s-retraction

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Germanic (e.g. Swiss/Tyrolean German) and Romance (e.g. Ladin/Rumantsch) varieties in and around the Alps exhibit a phonological pattern where a preconsonantal alveolar /s/ or retracted alveolar /s/ (Basque <z> and <s>) became palatoalveolar /ʃ/ (Basque <x>) at least word-initially (e.g. [ʃp] in *Spanien/Spagna* ‘Spain’; Schmid 1956; Rohlfs 1966; Benware 1996; Alber et al. 2021). Several of its aspects are still calling for an explanation, for instance:

1. Why was a preconsonantal sibilant fricative retracted to /ʃ/ at all?
2. Is /sC/ retracted more readily than /sC/? If yes, can preconsonantal s-retraction start to occur in an inventory with only /s/ and /ʃ/, or does it need /s/ to act as an initial trigger?

W.r.t. [1], it has been hypothesised (though not tested) by Flemming (2020) that preconsonantal s-retraction is motivated perceptually by the higher intensity of posterior ([ʃ]-like) sibilants, serving to better distinguish /sC/ from /ØC/ (e.g. so that German *fest* is not misheard as *fett*). Preconsonantal sibilants would thus be retracted to reduce their likelihood of being too weak to be heard, especially word-initially where they lack some acoustic cues found word-medially.

Study 1: We test Flemming (2020)’s hypothesis with acoustic measurements in Praat (Boersma & Weenink 2020) from recordings made for the ATHEME (2019) project (Alber & Kokkelmans in prep.). Languages in the sample include Germanic, Ladin and Gallo-Italic dialects that have [s] and/or [ʃ] and/or [ʒ]. Out of 4148 sibilants, 1743 preconsonantal sibilants (out of which 550 word-initial) were compared to 492 word-initial prevocalic sibilants. It results that word-initial

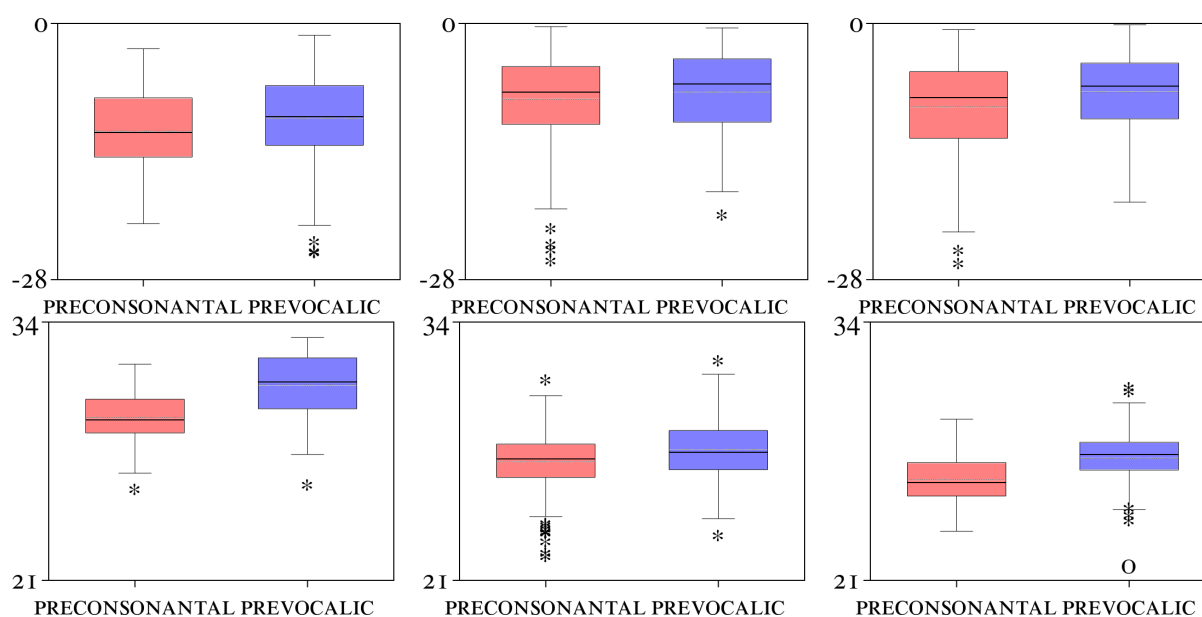


Figure 1: *Above:* Relative intensity (dB) of alveolar (left), retracted alv. (centre) and palatoalv. (right) word-initial sibilants w.r.t. the max. vowel intensity in the preceding/following 0.44 sec., preconsonantly vs. prevocalically. *Below:* Centre of gravity (ERB) of the same sibilants.

preconsonantal sibilants are **weaker in intensity** w.r.t. the nearby vowel than word-initial prevocalic sibilants ($t = -4.069$, $p < 0.001$), irrespectively of the place of articulation. They are also weaker than word-medial preconsonantal sibilants ($t = -3.892$, $p < 0.001$). There is no significant difference in relative intensity word-medially between preconsonantal and prevocalic

sibilants, suggesting that Flemming (2020)'s explanation holds **only word-initially**. On the other hand, the **centre of gravity** of frequencies between 1000 and 11000 Hz is lower i.e. more [ʃ]-like preconsonantly **both initially and medially** ($t = -14.982, p < 0.001$) within each language group (Germanic, Ladin, Gallo-Italic). Acoustic biases towards the perception of /sC/ as more retracted (cf. Baker et al. 2011; Stevens et al. 2015) are thus both stronger than their potential intensity-related motivation and extended to more contexts (not only word-initially), meaning that another explanation is needed for word-medial preconsonantal s-retraction.

Even if preconsonantal [s] is acoustically nearer to [ʃ] than prevocalic [s] is, the acoustic distance between [s] and [ʃ] remains large. [s] however is located in between the two and is therefore easily confusable with both (Adams 1975). W.r.t. question [2], Alber et al. (2021) thus argue that preconsonantal s-retraction occurred only in varieties that originally possessed [s] and [ʃ] (e.g. almost all Alpine varieties, European Portuguese), where [s] could be perceived as [ʃ], but not in varieties with only historical [s] and [ʃ] (e.g. Slovene).

Study 2: In German, historical /sC/ is rare because it originates in /tC/ > /ʃsC/. Nevertheless, placenames offer such contexts across morpheme boundaries where analogy is weak and the outcomes of /sC/ and /ʃsC/ can be compared. This was done in a sample of 65 Southwestern German placenames (letters A-MIE in Niemeyer 2012) with their local dialectal version (e.g. *Innschprugg* for *Innsbruck* with historical [s] but *Schdroosburi* for *Straßburg* with historical [ʃ]). Only placenames that already had /sC/ or /ʃsC/ in the 1300s and with no /r/ preceding the sibilant were considered. It results that 29 out of 43 occurrences (67%) of /ʃsC/ have become /ʃC/ as predicted, while 20 out of 22 (91%) of /sC/ have been preserved as predicted.

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