

Historical */s/ in Preconsonantal Position in the German Minority Language of Sauris/Zahre in North-Eastern Italy

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Abstract In this paper aspects of the sibilant system in the variety spoken in the Germanic language island Sauris/Zahre in north-eastern Italy are presented. I investigate whether an intermediate, postalveolar “shibilant” (from Protogermanic */s/) in preconsonantal position is preserved from Middle High German as observed in other German minority languages in northern Italy. In Sauris/Zahre, in preconsonantal position a postalveolar realization is sometimes mentioned in literature, while in Modern Standard German and most related varieties in this position historical, postalveolar */s/ is retracted to palatoalveolar /ʃ/.

Keywords Sibilants. S-retraction. Language contact. Language change.

Summary 1 Introduction. – 2 The Germanic Language Island Sauris/Zahre in the Carnic Alps. – 3 Diachronic Development of the Sibilant Systems in Germanic Varieties. – 4 Preconsonantal Sibilants in the Variety of Sauris/Zahre – Descriptions in the Literature and in (Acoustic) Atlases. – 5 Sibilants in Carnic Friulian. – 6 Production Study. – 6.1 Consultants and Data Collection. – 6.2 Methods. – 7 Results. – 7.1 Auditory Analysis. – 7.2 Acoustic Analysis. – 8 Discussion.



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1 Introduction

In this contribution, I examine phonological change in the German minority language of Sauris/Zahre located in the Carnic Alps in north-eastern Italy using data elicited from four native speakers. I specifically investigate sibilants occurring in preconsonantal position. In this context, Proto-Germanic (PG) */s/ has undergone a sound change: the intermediate postalveolar articulation that was still present in Middle High German (MHG) has merged with palatoalveolar /ʃ/ in Modern Standard German (MSG) and most related varieties (but perhaps not in Sauris/Zahre, see the timeline in (3) in section 3).

Compare, e.g.:

(1)	MSG	MHG		gloss
a	[ʃ]ne	snē	*/s/ ¹	'snow'
b	[ʃ]tein	stein	*/s/	'stone'

This sound change is called 's-retraction' and can be formulated as follows. Benware (1996, 265) gives the following description:

(2) */s/ > /ʃ/ / # ____ C

S-retraction in word-initial preconsonantal position is currently a productive phonological process in MSG (Alber et al. 2021; Benware 1996) and most related varieties (see below).

The paper is organized as follows. In section 2, I present the Germanic language island Sauris/Zahre. Section 3 provides a broad overview of the evolution of the sibilant system in MSG starting from Old High German (OHG)/MHG. Section 4 presents a review of the available data from historical phonology and dialect atlases on the variety in question (Sauris/Zahre). Denison and Grassegger's (2007) dictionary and the work of the dialectologist Kranzmayer (1956) in particular are referred to and compared. In section 5, I present Carnic Friulian, the surrounding Romance variety, as this dialect is reported to also feature preconsonantal s-retraction. In section 6, I present my own data collected in Sauris/Zahre, and in section 7 the results of acoustic and auditory analyses. It turns out that in the Sauris/Zahre dialect historical */s/ in preconsonantal position is retracted to voice-

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1 The PoA (place of articulation) of the sibilant is postalveolar; see section 3.

less [ʃ], as in MSG and related varieties. In the discussion in section 8, I show that language contact is not necessarily responsible for preconsonantal s-retraction in Sauris/Zahre, as sometimes claimed in the past, but that changes can be explained as internally motivated.

2 The Germanic Language Island Sauris/Zahre in the Carnic Alps

Sauris/Zahre is a German language island in the north-eastern Italian region of Friuli-Venezia Giulia, which shares borders with Austria and Slovenia. Due in part to the presence of a Slovenian-speaking minority, the region is one of five in Italy with autonomous status. The language island is part of the historically and culturally defined area of Friuli, which has more than 600,000 speakers of Friulian, one of the three Western Romance languages spoken in the Alps (besides Ladin and Romansh).

According to available documents, the mountain village of Sauris/Zahre was founded in the 13th century by Southern Bavarian-speaking settlers from Carinthia and East Tyrol. For centuries, the settlers led very isolated lives, but from the 16th century onwards there was increased contact with the surrounding Romance-speaking communities.² The community in the language enclave has been bi- or trilingual since the 19th century: besides the local German dialect, the inhabitants of Sauris/Zahre spoke Carnic Friulian (a variety of Friulian) as a lingua franca, while standard Italian was their official language as a consequence of compulsory schooling.³ The picture changes in the second post-war period: following Angeli (2003), parents then stopped gradually talking to their children in the *Zahrar Sproch*, so the number of speakers of the local dialect is declining, and among the younger generations only a few people still use it (Geyer 2018). According to the *Sprachinselvein*, just 200 people – about half the population of the village – still speak or use the Sauris/Zahre dialect.⁴

² See Wiesinger 1983; Baum 1983; Wurzer 1973.

³ See the detailed description of the trilingual community in Denison 1968.

⁴ <https://www.sprachinselvein.at/home.html>, see also Costantini 2019.

3 Diachronic Development of the Sibilant Systems in Germanic Varieties

Language islands sometimes preserve features from earlier stages of language development. In some of the Germanic language islands in northern Italy, a contrast in the place of articulation between post-alveolar ‘shibilants’ and alveolar sibilants is still attested (see, e.g., Alber, Rabanus 2018; Alber 2014). These sibilants and the palatoalveolar [ʃ] form the 3-sibilant system based on PoA attested in MHG.

In the following, I use the symbols [ś, ź] to designate the articulatory position intermediate between alveolar and palatoalveolar without specifying further phonetic parameters, such as apical, retroflex etc. (see, e.g., Cercignani 1979; Joos 1952; Penzl 1968 for discussion), instead concentrating on the 3-way PoA distinction. The intermediate articulatory position will be labelled postalveolar, and I will also use the term ‘shibilant’ (blend of *esh*+sibilant). This terminology and the symbols have been used in recent publications (e.g., Alber et al. 2021; Alber, Rabanus 2018) and are also found in traditional dialectology.

While the postalveolar shibilant continues PG historical */s/, the alveolar sibilant [s] entered the system with the Old High German (OHG)⁵ consonant shift from PG */t/ to [s] in postvocalic position. Palatoalveolar [ʃ] arose in late OHG through the merging of /sk/ into [ʃ] and paved the way for a phonemic split, namely the division of the “shibilants” into palatoalveolar /ʃ/ (in preconsonantal position) and the alveolar sibilants /s/ and /z/ (other contexts), i.e. the sibilant inventory of MSG (see Paul [1881] 2007, 170; Cercignani 1979, 73-86; Joos 1952; Penzl 1968; Szulc 2002).

Historical */s/ was a fortis sound: [ś] (Lessiak 1933; Cercignani 1979, 73-82); during the *Althochdeutsche Frikativenschwächung* (OHG-FL, around 750 AD), a lenis allophone arose ([ź]). In dialectological and historical linguistics the fortis vs. lenis distinction, referring (broadly speaking) to the realization of the fricatives with relatively greater or lesser energy, is used and applied to the two series of sibilants [s], [ś] and [ʃ], vs. [z] and [ź] in OHG/MHG. I use this distinction in what follows, without attempting an exact phonetic description, as it is a useful way to refer to the two distinct classes of fricatives in OHG/MHG. The lenis allophone of historical */s/ was realized with voicing in a voicing context in MHG. The feature [+voice] was then phonemized in MSG resulting in intervocalic position in a ‘new’ contrast (/z/ vs /s/) based on the feature [+/-voice], cf. in MSG: *reisen* /z/ ‘to travel’ (< PG */s/) and *reißen* /s/ ‘to tear’ (< PG */t/). That is, in the transition from [ź] to [z], the feature [+voice] is preserved and be-

⁵ OHG was spoken from the 6th century to 1050 AD, MHG from 1050-1350 AD; Mettke 2000.

came distinctive. Compared to the preconsonantal context – in which historical */s/ was retracted, not fronted – it is important to bear in mind that in prevocalic and intervocalic contexts change from [ʒ] to alveolar [z] affected PoA, while voicing is preserved.

Kranzmayer (1956, 89) assumes that in the Central Bavarian dialects the lenis shibilant [ʒ] became a voiced alveolar [z] in word-initial prevocalic position first (before 1200), while the change to a palatoalveolar articulation in preconsonantal position began later. According to Moser (1951, 222), s-retraction began in the second half of the 13th century throughout the High German region. The Southern Bavarian speakers who settled in Sauris/Zahre during the 13th century may have left the inland variety before or during this change and therefore preserved */s/ in preconsonantal position. The following timeline can be drawn:

- (3) Timeline of important changes in the sibilant system before/during settlement in Sauris/Zahre:
- | | | | |
|------------------|--------------|----------------------------|-----------------------------|
| 750 | 11th century | before 1200 | 13th century |
| ----- | | | |
| OHG-FL | OHG /sk/>[ʃ] | [ʒ]>[z] (initial position) | preconsonantal s-retraction |
| (*/s/ => [ś, ʒ]) | | | settlement in Sauris/Zahre |

In MSG and most related varieties, the sound change /s/ > /ʃ/ before consonants is today a synchronically active phonological process as also evidenced by adaption of recent loanwords like e.g. *spaghetti* [ʃpa'gɛti]. It occurs word initially, but is also attested in word-medial or word final coda position in some dialects of German, as e.g. in [ʃ]we[ʃ]ter 'sister' or *fā*[ʃ]t 'almost' in southwestern dialects, but [ʃ]we[s]ter 'sister' or *fā*[s]t in MSG (König 2011, 150; Stevens et al. 2015).

As mentioned above, historical */s/ was a voiceless fortis sound (Lessiak 1933), while lenis [ʒ] entered the system during the OHG-FL. According to descriptions in historical grammars and in diachronic phonology, in MHG the shibilant [ś] realized in preconsonantal position before a voiceless consonant (/p, t/) was a fortis sound. Before the sonorants /m, n, l, w/ a lenis [ʒ] is sometimes assumed (Szulc 2002, 117; Paul [1881] 2007).

In the language islands Sappada/Plodn and Timau/Tischelbong (in close proximity to Sauris/Zahre), a voiced palatoalveolar articulation [ʒl-], [ʒn-], [ʒm-], [ʒb-], which in Timau is also signaled in the official spelling (cf. <sghl->, <sghn-> etc., Geyer 2018), is reported. This might reflect the lenis character hypothesized in MHG for */s/ before sonorants (see above): in word initial prevocalic and in intersonorant position, lenis [ʒ] is continued in MSG with voiced, fronted (alveolar) [z]. In an analogous manner, if in MHG before the sonorants /m, n, l, w/ lenis [ʒ] was realized with voicing (Szulc 2002, 117; Paul

[1881] 2007), the feature [+voice] might have been preserved resulting in a voiced allophone of /ʃ/.

By contrast, in MSG and in most German dialects, the former shibilant has merged with voiceless palatoalveolar [ʃ] in preconsonantal position (see the examples in (1)).

4 Preconsonantal Sibilants in the Variety of Sauris/Zahre – Descriptions in the Literature and in (Acoustic) Atlases

The literature does not, unfortunately, contain any clear, consistent descriptions of the phonemic and phonetic properties of the sibilants in preconsonantal position in the system of the Sauris/Zahre dialect. Kranzmayer (1956, 89), who gives detailed descriptions of the Germanic language islands in northern Italy, holds that the postalveolar shibilant resisted change where it preceded a voiceless stop, which would mean that the contemporary dialect of Sauris/Zahre should preserve to some degree the MHG articulatory distinction between [s] (< PG */t/), [ʃ]/[z] (< PG */s/) and [ʃ] (< OHG /sk/). Consider the description in Kranzmayer 1956:

- (4) Postalveolar PoA in the Sauris/Zahre dialect according to Kranzmayer (1956)⁶
- | | Sauris/Zahre | PoA | MSG | gloss |
|----|----------------|--------------------------|----------|------------|
| a. | <i>Speck</i> | [ʒ] _{voiceless} | [ʃ]peck | 'bacon' |
| b. | <i>huasten</i> | [ʃ] | hu[s]ten | 'to cough' |

In the dictionary compiled by Denison and Grassegger (2007), however, in word-initial or word-medial preconsonantal position before stops we mostly find the voiceless palatoalveolar fricative, the same sibilant that is found in MSG word initially: [ʃ]tan (MSG: [ʃ]tehen 'to stand'), [ʃ]peck (MSG: [ʃ]peck 'bacon'); word medially: mi[ʃ]t (MSG: Mi[s]t 'dung'), hue[ʃ]tn⁷ (MSG: 'to cough'); and also before <p>: be-[ʃ]pl (MSG: We[s]pe 'wasp'). In contrast to Kranzmayer (1956), therefore, Denison and Grassegger (2007) no longer (50 years later) find the intermediate PoA in the contemporary dialect of Sauris/Zahre.

⁶ Kranzmayer distinguishes graphically between three postalveolar shibilants (< PG */s/): a fortis [ʒ], a voiceless lenis [ʃ], and a voiced lenis [z]. Compare, e.g., Kranzmayer's notations of a. hua[ʒ]tn 'to cough', b. [ʃ]peck 'bacon' (preconsonantal position before voiceless stops), c. [z]naidar 'tailor' (this last in Cimbrian in preconsonantal position before voiced stops and sonorants). As mentioned in section 3, a fortis fricative is assumed in context b. in MHG by, e.g., Paul [1881] 2007.

⁷ Kranzmayer (1956) and Denison and Grassegger (2007) describe the diphthong differently.

In preconsonantal position before voiced stops and sonorants, Kranzmayer (1956) transcribes a voiced palatoalveolar [ʒ]: [ʒ]naider (MSG: [ʃ]neider ‘tailor’); the same voiced sibilant is also reported in the neighboring Sappada/Plodn and Timau/Tischelbong language islands (see § 3).

Denison and Grassegger’s (2007) dictionary reports the voiced fricative [ʒ] in only a few items in the contemporary Sauris/Zahre system. In most contexts, the voiceless palatoalveolar sibilant is transcribed, even in word-initial position before sonorants, e.g. [ʃ]naidar ‘tailor’. The dictionary only contains six entries with initial preconsonantal [ʒ], mainly proper names borrowed from other languages and before /w/, e.g. [ʒ]walt Ital. ‘Osvaldo’) or [ʒ]wan ‘John’ (cf. Germ. *Hans*, *Johannes*, Ital. *Giovanni*).

A further source for the spoken language of Sauris/Zahre – and other Germanic minority languages, like Cimbrian – is the VIVALDI multi-media atlas of Italian dialects and minority languages in Italy.⁸ The atlas contains lists of stimuli grouped according to linguistic criteria along with IPA transcriptions and sound recordings. The focus is on dialects of Italian, which is reflected in the choice of stimuli, although individual items from the Germanic minority languages are also featured. Here, too, a voiceless (prepalatal/palatoalveolar) fricative in preconsonantal position, including before sonorants, is transcribed, e.g., [ʃ]nea ‘snow’, [ʃ]mit ‘blacksmith’.

To summarize, when describing the current sibilant system in the Sauris/Zahre dialect, the literature and dictionaries are not wholly in agreement with regard to the PoA of preconsonantal /s/. Before voiceless consonants, sometimes a postalveolar articulation is assumed to be preserved (e.g. [ʃ]tan ‘to stand’), and before voiced consonants sometimes a voiced palatoalveolar sound [ʒ] is transcribed.

Table 1 provides an overview of the descriptions given in linguistic atlases and dictionaries and in the literature in the contexts under investigation (D&G = Denison and Grassegger, K = Kranzmayer).

⁸ <https://www2.hu-berlin.de/vivaldi/index.php>.

Table 1 Descriptions in the literature of sibilants in preconsonantal contexts in the Sauris/Zahre dialect

context	Sauris/Zahre	example	MSG	gloss
initial position, #/s/+C _{VOICELESS}	[ʃ]	[ʃ]/[š]tan (D&G/K)	[ʃ]tehen	to stand
initial position #/s/+C _{VOICED}	[ʃ]/[ʒ]	[ʃ]/[ʒ]naidar (D&G/K) [ʒ]walt (D&G)	[ʃ]neider O[s]wald	Tailor (proper name) Oswald
word-medial position ⁹ /s/+C _{VOICELESS}	[ʃ]/[š]	be[ʃ]pl (D&G) mi[ʃ]/[š]t (D&G/K)	We[s]pe, Mi[s]t	wasp dung

The hypothetical existence of a voiced palatoalveolar sibilant [ʒ] in the inventory of the Sauris/Zahre dialect is explained by Kranzmayer (1956) as related to language contact: postalveolar fricatives are not found in the inventory of the surrounding Friulian dialect, so the Germanic variety adapts to the Friulian system by eliminating the intermediate category of sibilants taking a voiced [ʒ] before voiced consonants (Kranzmayer 1956, 89). In order to verify the hypothetical influence of language contact, in the following section I present a short description of the sibilant system in Carnic Friulian based on current information.

5 Sibilants in Carnic Friulian

The sibilant system in (Standard) Friulian contains only alveolar [s] and [z] (Carrozzo 2000). The sibilant is inherited from Latin /s/ (also with retracted, postalveolar articulation; see Lessiak 1933, 93-113). Intervocally, Latin /s/ tended to become voiced, and this weakening favored the phonemization of voiced [z] in Friulian (compare minimal pairs such as *mu[s]e* Ital. *asina* ‘jenny’ vs. *mu[z]e* Ital. *faccia* ‘face’; see Frau 1984, 52-3; Rizzolatti 1981).

Francescato (1970, 102-4) classified the northern varieties surrounding the Sauris/Zahre language island as the most “conservative” (zone A). In these dialects, voiceless palatoalveolar [ʃ] (the outcome of Latin <ce, ci>) in word-final position contrasts with /s/, so both are considered to belong to the phoneme inventory (Frau 1984, 18). Furthermore, in these conservative varieties, Lat. <ce, ci, cj> often evolved into [ʒ] in intervocalic position; see Francescato 1970,

⁹ /s/+sonorant in word-medial position was not investigated and is therefore omitted from table 1. In Denison and Grassegger’s dictionary (2007), nearly all the items with these sound combinations contain a morphological boundary, e.g. *los+n* ‘to let’ and *aus+mochn* ‘to turn out’, which means that s-retraction, which normally does not apply across morphological boundaries, cannot be checked.

113-14; Frau 1984, 55; and recent studies on the phoneme /ʒ/ in northern Friulian: Carrozzo 2000, Miotti 2007; Roseano 2013.

Also in these conservative varieties, alveolar /s/ is often retracted to /ʃ/ before consonants, as in [ʃ]crivere ‘to write’, and word-medially, as in avo[ʃ]t ‘August’. This s-retraction is also reflected in the spelling rules:¹⁰ regarding the palatoalveolar fricatives in the Carnic variety, the digraph <sj> and the trigraph <ssj> transcribe the palatal consonants, e.g. <sjemenâ> [ʃ]emenâ ‘to sow’ (Ital. [s]eminare) or <pussjibil> pu[ʃ]ibil ‘possible’ (Ital. possibile). However, these graphs are not used in preconsonantal position to avoid confusing the reader who – following German spelling rules – would without graphic signaling give them a palatal pronunciation: *cjastine* > *cja[ʃ]tine* ‘chestnut’.

The following table presents examples from the Forni Avoltri variety for the relevant contexts taken from the VIVALDI multi-media atlas.¹¹

Table 2 Examples of sibilants in Friulian (Forni Avoltri variety) taken from the VIVALDI multi-media atlas of Italian dialects and minority languages in Italy

context	Carnic Friulian Forni Avoltri	Italian	gloss
initial, prevocalic position	[s]otil [s]ak	[s]ottile [s]acco	thin bag
initial, preconsonantal position	[ʃ]krivi [ʃ]telo	[s]crivere [s]tella	(to) write star
word internal, intervocalic position	tʃəri[ʒ]iə tʃame[ʒ]o se[ʒ]olo	cilie[dʒ]e cami[tʃ]a fal[tʃ]e	cherry shirt scythe
word-medial, preconsonantal position	ve[ʃ]kom ra[ʃ]tyel avo[ʃ]t	ve[s]covo ra[s]trello ago[s]to	bishop rake August
word-final, post-vocalic position	di[ʃ] kruo[ʃ] grues[s] lor[s]	di[tʃ]e cro[tʃ]e gro[s]o or[s]o	(s/he) says cross huge, big bear

10 The official spelling rules of standard Friulian are laid down in a regional law of 1996, while symbols for the ‘special sounds’ in Friulian language varieties were added later (2013). This more recent supplement mentions the sounds being examined here, namely the voiceless and voiced palatoalveolars (/ʃ/, /ʒ/).

11 The phonetic transcriptions in the VIVALDI corpus are very detailed and distinguish six PoAs for sibilants. Here, only three PoAs are distinguished: alveolar [s]/[z] (also including dental and dental-alveolar), postalveolar [ʃ]/[ʒ], and palatoalveolar [ʃ]/[ʒ] (including prepalatal [ʃ]). I listened to and verified the following items, all of which are transcribed with a voiceless palatoalveolar [ʃ] before a voiced consonant: [ʃ]novl ‘beak’, [ʃ]mit ‘blacksmith’, [ʃ]nea ‘snow’, [ʃ]naibm ‘to snow’, [ʃ]be[ʃ]ter ‘sister’.

The data show that the Germanic dialect spoken in Sauris/Zahre is in contact with a variety of Friulian (Carnic Friulian) that has a 2-sibilant PoA inventory (alveolar and palatoalveolar). The fricative in preconsonantal position is the outcome of Lat. /s/, while the palatoalveolar /ʃ/ is the outcome of a previous sound change. In preconsonantal position, s-retraction applies, while in intersonorant contexts a voiced palatoalveolar [ʒ] is found.¹²

In the following production study, I will address the following questions:

- A. Does the system in the Sauris/Zahre dialect still preserve a postalveolar articulation ([ʃ], [ʒ]) in the preconsonantal position, as hypothesized by Kranzmayer (1956) and as attested for Cimbrian and Mòcheno, for instance (see Alber et al. 2021; Alber, Rabanus 2018), thus representing an intermediate stage in the development from a 3-sibilant system in MHG to a 2-sibilant system in MSG?
- B. Do we find a voiced allophone of /ʃ/ in the pre-sonorant/pre-voiced stop contexts, as described by Kranzmayer (1956) and as attested in other language islands in the Carnic Alps (Sapada/Plodn and Timau/Tischelbong)?

6 Production Study

6.1 Consultants and Data Collection

As mentioned in section 3, I specifically target the preconsonantal context in this study. Acoustic and auditory analyses were carried out to investigate whether the system in the Sauris/Zahre dialect still preserves a postalveolar articulation ([ʃ], [ʒ]) in preconsonantal position, and whether there is a voiced palatoalveolar articulation in the preconsonantal context. Two or three items for each context were taken from Denison and Grassegger's (2007) dictionary. Four native speakers of the Sauris/Zahre language were recorded producing 187 items. The recordings were annotated manually by the author using Praat. The Sauris/Zahre data were elicited through the following procedure: the author presented the items orally in Italian and asked the informants to translate them into their German dialect. If they were unable to recall the relevant item, it was first

¹² I found no examples in the VIVALDI corpus of [ʒ] in word-initial prevocalic position in the Forni Avoltri variety, although the phoneme /ʒ/ is assumed in this position in northern Friulian (see, e.g., Carrozzo 2000, 47; cf. [ʒ]ave <'sjave'> 'toad'. <https://www2.hu-berlin.de/vivaldi/index.php>).

paraphrased in Italian, and then if necessary the German equivalent was suggested. This was (in the following analysis) the case with the items *bešpl* (two speakers), *burštle* and *šlös* (one speaker each). Table 3 shows the tested items.

Table 3 Sibilants in preconsonantal position with their expected realizations in the Sauris/Zahre dialect

context	Zahre*	expected sibilants	MSG	gloss
initial position #/s/+C _{VL}	špeckh špeitar	[ʃ]/[š]	[ʃ]peck [ʃ]päter	bacon later
initial position #/s/+sonorant	šnea šlisl šlös	[ʃ]/[ʒ]	[ʃ]nee [ʃ]lüssel[[ʃ]loss	snow key lock
word-medial position /s/+C _{VL}	bešpl raštn** burštle	[ʃ]/[s]	We[s]pe, ra[s]ten Wur[s]t	wasp (to) rest sausage

* Transcription follows Denison, Grassegger 2007.

** This item is not found in the D&G dictionary.

The recordings were made on an Olympus LS-14 (sampling frequency 48 kHz, 16 bit) with the informant about 25 cm from the microphone, and were conducted in February 2019, either in the homes of the participants or at the “Haus van der Zahre” ethnographic center, so the sound quality is not optimal.

The Sauris/Zahre informants were two women and two men, aged 66-77. They were native speakers of the dialect which was the only language they used to speak until they went to school at the age of six and started learning Italian. They also had active and passive knowledge of Friulian as the colloquial oral language they mainly used at work with people who did not speak the German dialect. One of the two women was a housewife and had only a passive knowledge of Friulian, since she had no need to speak it for work purposes.

6.2 Methods

6.2.1 Auditory Analysis

The data were analyzed auditorily and acoustically. For the auditory analysis, four linguists classified the data as voiced vs. voiceless. Evaluation sheets, one per speaker, each containing a list of 29 items were given to the linguists to rate. Only those items with sibilants in preconsonantal contexts and two items with final, post-vocalic [ʃ] are analyzed here, not the postvocalic realizations (except in word-final contexts for control) as they are not under investigation

in this study. The relevant fricatives were indicated on the evaluation sheets with the neutral symbol <S> (see Appendix) in order to avoid a writing bias. Otherwise, the items were transcribed following Denison and Grassegger (2007). Along with the evaluation sheets, the linguists were given the audio recordings of the items (each pronounced twice) listed in table 4.

Table 4 Items and contexts subjected to acoustic and auditory analyses

context	examples	glosses
word-initial: s+C _{VOICELESS}	Speckh, Spaitar	bacon, later
word-initial: s+C _{VOICED}	Snea, Slisl, Slös	snow, key, lock
word-medial: s+C _{VOICELESS}	beSpl, raStn, бүrStl	wasp, (to) rest, sausage
word-final, postvocalic	vlaiS, viS	meat, fish

6.2.2 Acoustic Analysis

For the acoustic analysis, the author labeled the audio files using Praat.¹³ The visual representation of the sound and the audio signal were both referred to in annotating the fricatives. Visually, the aperiodicity of the waveform in the oscillogram clearly shows the beginning and end of the fricative; in the spectrogram, the beginning and end of the fricative are shown by a dark pattern signaling the frication noise.

Spectral moments are used to classify the PoA of fricatives. Fricative noise moves towards lower frequencies as the place of articulation moves further back (as the length of the cavity in front of the main constriction becomes longer). Center of gravity (CoG), which will be used in the following analysis, is a measure of the average height of the frequencies in the spectrum over the frequency domain weighted by the amplitude. The CoG value will be higher for sounds with greater high frequency energy (see Kiss 2013). Current research gives a value of about 5000/6000 Hz for alveolar fricatives [s/z], and only 2500/3000 Hz for palatoalveolar fricatives [ʃ] (see Jongman 2000, 1253). Zygis (2010) investigated the 3-sibilant inventory in Polish (/s/ʃ/ç/) and reported the following values: alveolar /s/: 6000 Hz, alveolar palatalized /ç/: 4000 Hz, postalveolar /ʃ/ (transcribed as retroflex): 3000 Hz.

A word of caution is needed here. Since the recordings were not carried out in soundproof spaces, the analysis may well be affected by background noise and vowel echoes. Moreover, measurements

¹³ Praat: doing phonetics by computer (version 5.3.56). <http://www.praat.org/>.

can be influenced by casual acoustic variability within the frication noise. Lastly, CoG values vary depending on the speaker and the context (for example, the preceding and following vowels).

7 Results

7.1 Auditory Analysis

The auditory analysis shows that the sibilant in preconsonantal position was classified as voiceless in all but one case (word-medially), and this was confirmed by the author's auditory judgement and by visual analysis (no clearly visible voice bar, no pitch curve, no visible formant structures in the spectrogram). This would not be surprising before a voiceless consonant, but is less expected before a voiced consonant. The auditory analysis therefore shows that in preconsonantal, word-initial contexts the system in the Sauris/Zahre variety has the same distribution as MSG, i.e. all sibilants are neutralized to voiceless, which is also confirmed by the transcriptions of the items in Denison and Grassegger (2007) and in the VIVALDI multi-media atlas.

Table 5 Auditory evaluation with regard to voicing and place of articulation

context	items	VD	VL ¹⁴
#/s/+C _{VL}	Speckh, Spaitar	0	18*
#/s/+C _{VD}	Slisl, Snea, Slös	0	27*
word-medial: s+C _{VL}	beSpl, bürStl, raStn,	1	22**
V+/s/# (<OHG /sk/)	vlaisch, visch	0	18*

* One rater made no choice between voiced and voiceless in this context on two evaluation sheets.

** Three evaluation sheets did not contain the relevant items (hence only 8 evaluations); the item *raStn* was not rated on one evaluation sheet.

14 There were 11 evaluation sheets; where there were 3 items to rate in a given group (e.g., *glos*, *haus*, *hols*) a total of 33 evaluations were made, where the group contained only two items, 22 evaluations were made.

7.2 Acoustic Analysis

The acoustic analysis was carried out with a script (Elvira-García 2014)¹⁵ that generates an FFT spectrum over the whole fricative (minus 1ms at the edges); frequencies below 1000 Hz were filtered out.¹⁶

Table 6 Acoustic analysis of /s/ in preconsonantal (< PG */s/) and word-final (< OHG /sk/) contexts; script: Elvira-García 2014

context	items	CoG	standard deviation	max. freq	mean intensity	interval duration	no. of tokens
#/s/+C _{VL}	Speckh Spaitar	2489.84	1980.35	2511.06	55.62	68.5	16
#/s/+C _{VD}	Slisl Snea Slös	2886.08	1987.42	2752.52	53.56	105.13	23
word-medial: s+C _{VL}	beSpl bürStl raStn	2585.76	2560.74	3421.9	62.4	94.85	20*
final (OHG / sk/)	viS, vlaiS	2961.32	2130.51	3063.62	60.87	194.19	16

* In this context, one female speaker (G., aged 66) was replaced by another (R., aged 49) because the first speaker failed to produce the items requested.

Table 6 shows that the sibilants in question have very similar values. Focusing specifically on CoG, there was a small difference between /s/+C_{VD} with a value of about 2900 Hz, and word-medial and word-initial /s/+C_{VL} with values around 2500 Hz. Preservation of an intermediate postalveolar ‘shibilant’ in word-initial preconsonantal position, which has been suggested in the literature, could not be confirmed. In all contexts, the CoG was within the 2500-3000 Hz range previously reported for palatoalveolar articulation (Jongman 2000, 1253; Zygis 2010).

The differences of about 400-500 Hz found between, for example, the values for [ʃ] (< OHG /sk/) in word-final position and the values for /s/+C_{VL} in word-initial position, were too small to confirm a distinct, contrastive PoA. If these CoGs are taken as relational values,

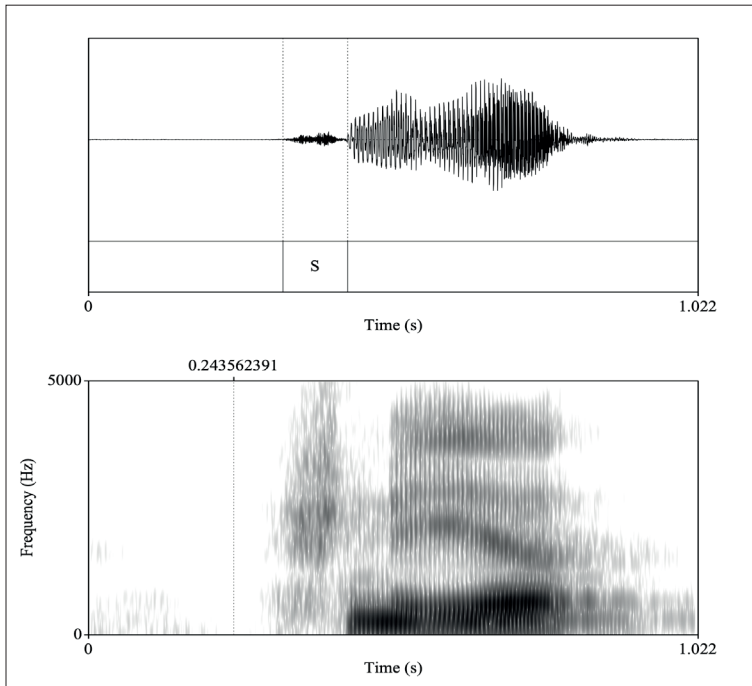
¹⁵ <http://stel.ub.edu/labfon/sites/default/files/zero-crossing-and-spectral-moments13.praat>. The script calculates the following parameters: duration of the interval, zero crossing in the first 30 ms of the interval, number of crosses in the whole interval, zero crosses in the interval*10/duration of the interval, intensity, center of gravity, skewness, kurtosis, standard deviation, central moment.

¹⁶ In order to reduce the background noise in the spectrum settings the dynamic range was changed to 60 dB.

this would point at most to the articulation of #/s/+C_{VL} being more retracted than [ʃ] (< OHG /sk/) in final position. As in most Germanic dialects, historical */s/ and the new phoneme [ʃ] (< OHG /sk/) in preconsonantal position merge with regard to both PoA and voicing, regardless of the hypothetical lenis character of MHG [ʒ] before a voiced consonant.

Graph 1 below shows a voiceless palatoalveolar sibilant realized by a male speaker of the Sauris/Zahre dialect. The oscillations are irregular and no voice bar is visible in the spectrogram, while the frequencies of the energy concentration of the fricative are fairly low (about 2000-3000 Hz), and the formant structure is only faintly visible.

Graph 1 N_Snea_1 'snow' (Sauris/Zahre)



8 Discussion

This contribution presents an acoustic and auditory analysis of one aspect of the sibilant system of the dialect of the Germanic language island Sauris/Zahre. Specifically, sibilants in preconsonantal position were investigated and compared with the sibilant systems in MSG and the surrounding Romance variety, Carnic Friulian. The following questions were raised (see § 5) and are reiterated here:

- A. Does the system in the Sauris/Zahre dialect still preserve a postalveolar articulation in this context, which represents an intermediate stage in the development from a 3-sibilant inventory in MHG to a 2-sibilant system in MSG?
- B. Do we find a voiced allophone of /ʃ/ in the pre-sonorant/pre-voiced stop contexts, as described e.g. by Kranzmayer (1956), Lessiak (1933; 1959) and as attested in other language islands in the Carnic Alps (Sappada/Plodn and Timau/Tischelbong)?

Question A

Acoustic analysis shows that in the Sauris/Zahre variety a postalveolar articulation ([ʃ, ʒ] < PG */s/) is no longer evident in word-initial preconsonantal position. That is, the reorganization from a 3-sibilant inventory to a 2-sibilant inventory based on PoA is complete, and historical */s/, the only sibilant realized in preconsonantal position, is realized consistently as a voiceless palatoalveolar [ʃ] in word-initial position (and frequently word medially before /p/, /t/). Therefore, as far as the preconsonantal position is concerned, the Sauris/Zahre dialect follows the same development as most varieties on which MSG is based as well as MSG itself,¹⁷ while in other Germanic varieties in northern Italy, e.g., Cimbrian spoken in Lusérn (Alber, Rabanus 2018) a postalveolar realization is still detectable in some contexts.

Recent studies have drawn attention to the process of s-retraction observed in Germanic and Romance varieties in northern Italy and have raised the question if language contact could have played a role (Alber et al. 2021; Schmid 1956). The language islands in this area provide important insights into the discussion about contact related change and therefore I will briefly analyze the results of the production study in Sauris/Zahre against the background of contact linguistics.

As claimed by e.g. Schmid (1956), contact may have played a role in the implementation of s-retraction in the German based minority lan-

¹⁷ The same development is observed in prevocalic, intersonorant and final contexts, see Vogt 2000.

guages in the northern Alps, i.e. also in the Sauris/Zahre variety: between the 11th and 13th centuries, s-retraction was an active process in northern Italy (see the Lombard language in the Alps: [ʃ]tela ‘star’, [ʃ]piga ‘spike’ [ʃ]kur ‘dark’ (Pfister 1984)), and might therefore have triggered s-retraction also in the Germanic minority languages in Italy. Schmid (1956, 50) concludes that in the areas of Romance-Germanic language contact (Tyrol, Vorarlberg, Eastern Switzerland), the Germanic dialects borrowed s-retraction, and the process then spread to the north. One of Schmid’s arguments is that the two centers of s-retraction, Romansh and Ladin – in close contact, respectively, with Tyrol and Western Upper Kärnten – pattern with Swabian and Alemannic (s-retraction also word-internally). Sauris/Zahre would therefore represent the eastern edge of the area reached by this Germanic-Romance language contact phenomenon.

On the other hand, also contact independent motivations for s-retraction are discussed in literature. From a phonetic point of view, there is experimental evidence for a general lowering effect of /s/ in preconsonantal position, that is, /s/ is observed to have a lower centroid frequency and therefore to be more /ʃ/-like when followed by /p, t, k/ (Phillips 2020; Stuart-Smith et al. 2019; Stevens, Harrington 2016; Stevens et al. 2015). Besides this phonetic bias, there is evidence that a three-way articulatory contrast is difficult to maintain. Typologically, such systems are rare, reflecting the fact that the intermediate category presents articulatory and acoustic instability. Polish is one of the comparatively few languages with a 3-way articulatory contrast (dental, retroflex and alveopalatal sibilants). Regarding the intermediate sibilant, retroflex [ʂ], Bukmaier & Harrington (2016) provide evidence for the relative weakness of acoustic cues for PoA, and for low perceptual salience. They also point to data that suggest that retroflex [ʂ] is acquired relatively late by children. Reorganization of the sibilant system through removal of the intermediate category may therefore be interpreted as a kind of optimization of the sibilant system. The motivation for the ‘direction’ of the intermediate category towards retraction rather than towards fronting in the varieties with s-retraction could be the above-mentioned phonetic bias (/s/ more /ʃ/-like before voiceless stops). The extension to all consonants in MHG is accounted for by Benware (1996) as phonetic analogy induced by acoustic-auditory similarity: /ʃr/ triggered the following diachronic scale: [l > n > m > w].¹⁸

Realignment of the system after change is recognized by Alber et al. (2021) as the driving force behind preconsonantal s-retraction. The authors analyze Germanic and Romance varieties and identify the in-

¹⁸ The position of the stops [p, t] in the diachronic scale was not investigated by Benware (1996).

roduction of a new phoneme, namely palatoalveolar [ʃ], into the sibilant system as the common denominator in all the language groups involved in the process of preconsonantal s-retraction – with subsequent reorganization from a 3-sibilant inventory (in Germanic varieties) or 1-sibilant inventory (in Romance varieties) to a 2-sibilant one. Both types of reorganization share the characteristic that only the historical sibilant is found in preconsonantal position,¹⁹ so it could merge with the ‘new’ palatoalveolar sibilant /ʃ/ without a loss of distinction in this position. Both dialects discussed here, the Germanic Sauris/Zahre variety and the Romance Forni Avoltri variety, fit this pattern and can therefore count as further examples illustrating this language contact independent trajectory. To conclude, the latter arguments provides an internal motivation for the change in Sauris/Zahre.

Question B

Lessiak (1933; 1959) and Kranzmayer (1956, 89) claim that in the pre-sonorant/pre-voiced stop contexts, the voiced palatoalveolar sibilant [ʒ] is realized in the Sauris language. In their view, lenited [ʒ] evolved into voiced [ʒ] in the Sauris/Zahre dialect by adapting to the inventory of the surrounding varieties Carnic Friulian and Slovenian (Neweklowski 1990) (see § 4). Thus, the existence of the voiced palatoalveolar [ʒ] in the German minority language is ascribed to language contact, too. However, auditory analysis shows that (more than 50 years later) we do not find a voiced realization of the palatoalveolar sibilant, which is also confirmed by the transcriptions of the items in Denison and Grassegger (2007) and in the VIVALDI multi-media atlas. By consequence, in this context and regarding the feature [+/-voice] no language contact influence is observable. A voiced palatoalveolar articulation [ʒl-], [ʒn-], [ʒm-], [ʒb-] is reported in the varieties of the neighboring language islands Sappada/Plodn and Timau/Tischelbong (Geyer 2018). This might reflect the lenis character hypothesized in MHG for */s/ in this context, but in Sauris/Zahre a voiced allophone of /ʃ/ as remnant of OHG-FL is not observable in preconsonantal position.

Taking the different pieces of evidence together, we can say that preconsonantal s-retraction in the Sauris/Zahre dialect is no different from the development observed in MSG and related varieties: it is part of the reorganization of the sibilant systems (elimination of the intermediate articulatory category), is grounded in phonetics (has a perceptual and articulatory trigger). Hypothesized language contact influence in Sauris/Zahre is explainable by internal motiva-

¹⁹ Before /r/ only /ʃ/ is found, e.g. *schrïben* ‘to write’ (Paul [2007] 1881, 171).

tions (preconsonantal s-retraction) or is not attested (the borrowing of a voiced allophone of /ʃ/ from the neighboring Romance variety is not observed).

Turning back to the discussion regarding sound change in contact settings and the dichotomy between contact-induced and internally motivated change it is important to note that external motivation for sound change has recently been viewed with more caution, especially by theoretically-orientated linguists (see Lucas 2015; Hickey 2010; Muysken 2010 for overviews). Strictly speaking, in the presence of an internal motivation, it is difficult to demonstrate the real influence of an external motivation like contact. Even where certain features resulting from change are present in neighboring varieties, we cannot exclude that the features may have arisen independently of contact, but rather from internal motivations only; see e.g. Alber, Rabanus, Tomaselli (2012) for this narrow definition of language contact-induced change. The authors state also that contact *independent* change is even more likely if the same change is also observed in varieties outside the contact situation and if it gives rise to unmarked features. This is the case with s-retraction which is not confined only to situations of language contact as, for instance, it is also found in many Southern Italian dialects and in other Romance varieties; Rohlf's (1949), cit. Alber et al. (2021). Other varieties of Portuguese, Catalan, Persian, Slovenian and Spanish are mentioned in the literature (Kümmel 2007; Stevens et al. 2015; Phillips 2020), so it is unlikely that the phenomenon is the result of language contact alone.

Many scholars agree that assuming a strict dichotomy between internal and external motivations is inappropriate (Romaine 1995; Dorian 1993; Hickey 2010). It is often pointed out that in contact settings contact may catalyze and transmit a phenomenon which has emerged through internal motivation. According to these “integrative” accounts, internal and external motivations are not mutually exclusive. Therefore, also in Sauris/Zahre change might have been underpinned and heightened by language contact.

Bibliography

- Alber, B. (2014). "Obstruent Systems of Northern Italy", in D'Alessandro, R. et al. (a cura di), "Approcci diversi alla dialettologia italiana contemporanea", num. speciale, *L'Italia Dialettale*, s. 3, 75, 11, 13-36.
- Alber, B. (2018). "Die Sibilanten des Zimbrischen: Konservativität durch Sprachkontakt". Rabanus, S. (Hrsg.), *Deutsch als Minderheitensprache in Italien. Theorie und Empirie kontaktinduzierten Sprachwandels*. Hildesheim et al.: Olms, 19-47. <https://doi.org/10.1515/9783110261295-042>.
- Alber, B., Kokkermans, J.; Rabanus, S. (2021). "Preconsonantal s-retraction in the Alps: Germanic, Romance, Slavic", in Gaeta, L.; Seiler, G. "The Alps as a Linguistic Aerea", special issue, *STUF. Language Typology and Universals*, 74, 19-42. <https://doi.org/10.1515/stuf-2021-1022>.
- Alber, B.; Rabanus, S.; Tomaselli, A. (2012). "Contatto linguistico nell'area alpina centro-meridionale". Colombo, L.; Dal Corso, M.; Frassi, P.; Genetti, S.; Gorris Camos, R.; Ligas, P.; Perazzolo, P. (a cura di), *La sensibilità della ragione. Studi in omaggio a Franco Piva*. Verona: Fiorini, 1-19.
- Angeli, F. (2003). "Conservazione e innovazione nella parlata germanofona di Sauris". *Ce Fastu?*, 79, 183-204.
- Baum, W. (1983). *Deutsche Sprachinseln in Friaul*. Klagenfurt: Carinthia Verlag.
- Benware, W.A. (1996). "Processual Change and Phonetic Analogy: Early New High German <s> <sch>". *American Journal of Germanic Linguistics and Literatures*, 8(2), 265-87.
- Bukmaier, V.; Harrington, J. (2016). "The Articulatory and Acoustic Characteristics of Polish Sibilants and their Consequences for Diachronic Change". *Journal of the International Phonetic Association*, 46(3), 311-29. <https://doi.org/10.1017/S0025100316000062>.
- Carrozzo, A. (2000). *Gramatiche fonetiche furlane*. Udine: Centri Friùl Lenghe.
- Cercignani, F. (1979). *The Consonants of German: Synchrony and Diachrony*. Milano: Cisalpino-Goliardica.
- Costantini, F. (2019). *Aspetti di linguistica saurana*. Roma: Il Calamo.
- Denison, N. (1968). "Sauris: A Trilingual Community in Diatypic Perspective". *Man*, n.s. 3(4), 578-92. <https://doi.org/10.2307/2798580>.
- Denison, N.; Grassegger, H. (2007). *Zahrer Wörterbuch = vocabolario saurano*. Udine: Amaro.
- Dorian, N. (1993). "Internally and Externally Motivated Change in Language Contact Settings: Doubts About the Dichotomy". Jones, C. (ed.), *Historical Linguistics: Problems and Perspectives*. London: Longman, 131-55.
- Francescato, G. (1970). "Il sistema dei suoni sibilanti nel dominio friulano". Francescato, G., *Studi linguistici sul friulano*. Firenze: Olschki, 99-118.
- Frau, G. (1984). *I dialetti del Friuli*. Udine: Società Filologica Friulano.
- Geyer, I. (2018). "Wortschatzentwicklung in den Sprachinseln Sappada/Pladen, Sauris/Zahre und Timau/Tischelwang im historischen Friaul". Rabanus, S. (Hrsg.), *Deutsch als Minderheitensprache in Italien. Theorie und Empirie kontaktinduzierten Sprachwandels*. Hildesheim et al.: Olms, 325-43.
- Hickey, R. (2010). "Language Contact: Reconsideration and Reassessment". Hickey, R. (ed.), *The Handbook of Language Contact*. Malden; Oxford: Wiley-Blackwell, 1-28.
- Jongman, A.; Wayland, R.; Wong, S. (2000). "Acoustic Characteristics of English Fricatives". *Journal of Acoustical Society of America*, 108(3), 1252-63. <https://doi.org/10.1121/1.1288413>.

- Joos, M. (1952). "The Medieval Sibilants". *Language*, 28, 222-31.
- Kiss, Z.G. (2013). "Measuring Acoustic Correlates of Voicing in Stops and Fricatives". Szigetvári, P. (ed.), *Papers Presented to László Varga on His 70th Birthday*. Budapest: Department of English Linguistics, Eötvös Loránd University. <http://seas3.elte.hu/VLlxx/gkiss.html>.
- König, W. (2011). *dtv-Atlas Deutsche Sprache*. 17th ed. München: Deutscher Taschenbuch Verlag.
- Kranzmayer, E. (1956). *Historische Lautgeographie des gesamtösterreichischen Dialektraumes*. Wien; Graz: Herrmann Böhlau.
- Kümmel, M. (2007). *Konsonantenwandel: Bausteine zu einer Typologie des Lautwandels und ihre Konsequenzen für die vergleichende Rekonstruktion*. Wiesbaden: Reichert Verlag.
- Lessiak, P. (1933). *Beiträge zur Geschichte des Deutschen Konsonantismus*. Brünn; Prag; Leipzig; Wien: Rudolf Rohrer.
- Lessiak, P. (1959). *Die deutsche Mundart von Zarz in Oberkrain. A. Grammatik. Mit Ergänzungen von Kranzmayer, Eberhard & Annemarie Richter*. Marburg: Elwert Verlag.
- Lucas, C. (2015). "Contact-Induced Language Change". Bowers, C.; Evans, B. (eds), *The Routledge Handbook of Historical Linguistics*. London: Routledge, 519-36.
- Mettke, H. (2000). *Mittelhochdeutsche Grammatik*. 8th ed. Tübingen: Max Niemeyer.
- Miotti, R. (2007). "Le varietà di Dignano, Flaibano e Sedegliano". Vicario, F. (a cura di), *Ladine loqui, Ats dal IV Colloquium Retoromanistich*. Udine: Società Filologica Friulana, 1-117.
- Moser, V. (1951). *Frühneuhochdeutsche Grammatik. Band III: Lautlehre*. Heidelberg: Carl Winter Universitätsverlag.
- Muysken, P. (2010). "Scenarios for Language Contact". Hickey, R. (ed.), *The Handbook of Language Contact*. Malden; Oxford: Wiley-Blackwell, 265-81.
- Newekłowski, G. (1990). "Kärntner Deutsch als slawistischer Sicht: zum deutsch-slowenischen Sprachbund in Kärnten". *Germanistische Linguistik*, 100-103, 477-500.
- Paul, H. [1881] (2007). *Mittelhochdeutsche Grammatik*. 25th ed. Revised by T. Klein, H.-J. Solms, K.-P. Wegera. Tübingen: Max Niemeyer Verlag.
- Penzl, H. (1968). "Die mittelhochdeutschen Sibilanten und ihre Weiterentwicklung". *Word*, 24(1-3), 340-9. <https://doi.org/10.1080/00437956.1968.11435536>.
- Pfister, M. (1984). "Italienisch und Rätoromanisch/Deutsch". Besch, W.; Reichmann, O.; Sonderegger, S. (Hrsgg), *Sprachgeschichte Ein Handbuch zur Geschichte der deutschen Sprache und ihrer Erforschung*. Berlin; New York: Mouton de Gruyter, 879-92. <https://doi.org/10.1515/9783110158823.2.12.1673>.
- Phillips, J. (2020). *Sibilant Categorization, Convergence, and Change: The Case of /s/-retraction in American English* [PhD Dissertation]. Chicago: University of Chicago.
- Rizzolatti, P. (1981). *Elementi di linguistica friulana*. Udine: Società Filologica Friulana.
- Rohlf, G. (1949). *Historische Grammatik der Italienischen Sprache und ihrer Mundarten*. Band 1, *Lautlehre*. Bern: A. Francke Verlag.
- Romaine, S. (1995). "Internal vs. External Factors in Socio-Historical Explanations of Change. A Fruitless Dichotomy?". *Proceedings of the Twenty-First Annual Meeting of the Berkeley Linguistics Society: General Session and*

- Parasession on Historical Issues in Sociolinguistics/Social Issues in Historical Linguistics*. Berkeley: BLS, 478-90. <https://doi.org/10.3765/bls.v21i1.1404>.
- Roseano, P. (2013). "I plurali in sibilante postalveolare nel friulano del Canale di Gorto". *Annals of the University of Craiova, Physics*, 35(1-2), 136-43.
- Schmid, H. (1956). "Über Randgebiete und Sprachgrenzen". *Vox Romanica*, 15(2), 19-84.
- Stevens, M.; Harrington, J. (2016). "The Phonetic Origins of /s/-retraction: Acoustic and Perceptual Evidence from Australian English". *Journal of Phonetics*, 58, 118-34. <https://doi.org/10.1016/j.wocn.2016.08.003>.
- Stevens, M.; Bukmaier, V.; Harrington, J. (2015). "Pre-consonantal /s/-retraction". The Scottish Consortium for ICPhS 2015 (eds), *Proceedings of the 18th International Congress of Phonetic Sciences*. Glasgow: University of Glasgow, 1-5.
- Stuart-Smith, J.; Sonderegger, M.; MacDonald, R.; Mielke, J.; McAuliffe, M.; Thomas, E. (2019). "Large-Scale Acoustic Analysis of Dialectal and Social Factors in English /s/-retraction". Calhoun, S et al. (eds), *International Congress of Phonetic Sciences (ICPhS 2019)* (Melbourne, Australia, 5-9 Aug 2019), 1273-7.
- Szulc, A. (2002). *Geschichte des standarddeutschen Lautsystems*. Ein Studienbuch. Wien: Edition Praesens.
- Vogt, B. (2020). "Das Sibilantensystem in der deutschen Sprachinsel Zahre/Sauris in Friaul im Vergleich zum Zimbrischen (Lusérn) - Sibilanten zwischen Bewahrung und Veränderung". *Zeitschrift für Dialektologie und Linguistik*, 87(3), 375-96. <https://doi.org/10.25162/zdl-2020-0013>.
- Wiesinger, P. (1983). "Deutsche Dialektgebiete außerhalb des deutschen Sprachgebiets: Mittel-Südost- und Osteuropa". Besch, W.; Knoop, U.; Putschke, W.; Wiegand, H.E. (Hrsgg), *Dialektologie. Ein Handbuch zur deutschen und allgemeinen Dialektforschung*. Berlin; New York: Mouton de Gruyter, 900-29. <https://doi.org/10.1515/9783110203332.900>.
- Wurzer, B. (1973). *Die deutschen Sprachinseln in Oberitalien*. Bozen: Athesia Tappeiner Verlag.
- Zygis, M. (2010). "On Changes in Slavic Sibilant Systems and their Perceptual Motivation". Recasens, D.; Sánchez Miret, F.; Wireback, K.J. (eds), *Experimental Phonetics and Sound Change*. München: Lincom, 115-38.

Appendix (questionnaire)

	VD	VL
Test person:		
1. aiSn		
2. beiSn		
3. beSpl*		
4. бүrStl*		
5. eiSl		
6. epaS		
7. gieSn		
8. gloS		
9. groaS		
10. hauS		
11. hoIS		
12. leSn		
13. paiSe		
14. raSten*		
15. Salvia		
16. Sedano		
17. Slisl*		
18. Slös*		
19. Snea*		
20. Snur		
21. Sörge		
22. spaiSn		
23. Spaitar*		
24. Spekh*		
25. Sune		
26. veinSter		
27. viS*		
28. vlaiS*		
29. vueS		

* The preconsonantal and final sibilants investigated here are signaled by the asterisk.

