LENITION IN CONTEMPORARY SPEECH FROM GRAN CANARIA: TWO CORPUS CASE STUDIES

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Abstract

This paper discusses the corpus of Gran Canarian Spanish gathered in 2016 in order to provide an in-depth sociolinguistic account of the lenition processes identified in the dialect. After a detailed description of the methodology and database preparation, two case studies showcasing the utility of such corpora are presented. First, we show the phonetic and social factors governing the distribution of different surface variants of the underlying coda /s/, pointing to generalised variation and hence incompleteness of any of the weakening options. Second, we provide a comparison of the spontaneous speech produced by the 6 informants of the corpus with their productions from a laboratory study, which leads to the conclusion that variation is subject to yet another important factor: social setting and that the options chosen on each occasion are reflections of competing stages on the same lenition trajectory that is systematically applied by language users. All in all, the paper shows the advantages of using fieldwork data vis à vis lab speech elicitations, both as an independent sociophonetic database and as a starting point for comparative studies on sound weakening.

Keywords: Weakening; Corpus phonology; Lenition; Spanish; Canary Islands

La lenició en la parla contemporània de Gran Canaria: dos estudis de cas

Resum: En aquest article, s'analitza un corpus d'espanyol de Gran Canària recopilat el 2016 amb la finalitat de proporcionar una anàlisi sociolingüística del processos de lenició identificats en el dialecte. Després d'una descripció detallada de la metodologia i de la preparació de la base de dades, l'autora presenta dos estudis de cas que mostren la utilitat d'aquests corpus. El primer estudi demostra els factors fonètics i socials que controlen la distribució de diferents variants superficials de la /s/ implosiva, i assenyala la variació generalitzada i, per tant, el fet que el debilitament no s'ha completat. El segon estudi proporciona una comparació de la parla espontània i de produccions enregistrades al laboratori per part d'uns mateixos 6 informants del corpus. En aquest cas, podem veure que la variació està subjecta a un altre factor important, l'entorn social, i que les opcions triades en cada moment són reflexos de dues etapes diferents de la mateixa trajectòria de lenició aplicades sistemàticament pels usuaris de la llengua, tot depenent del context.

Paraules clau: *Debilitament; Corpus, Lenició; Espanyol; Gran Canària*

La lenición en el habla contemporánea de Gran Canaria: dos estudios de caso

Resumen: *En este artículo se analiza el corpus de español de Gran Canaria recopilado en 2016 con el fin de proporcionar un análisis sociolingüístico de los procesos de lenición identificados en el dialecto. Tras una descripción detallada de la metodología y de la preparación de la base de datos, la autora presenta dos estudios de caso que muestran la utilidad de dichos corpus. El primer estudio demuestra los factores fonéticos y sociales que gobiernan la distribución de diferentes variantes superficiales de la /s/ implosiva, señalando la variación generalizada y, por lo tanto, el hecho de que el debilitamiento no está completo. El segundo estudio proporciona una comparación del habla espontánea producida por 6 informantes del corpus con las producciones de las mismas personas grabadas durante un estudio de laboratorio. En este caso podemos ver que la variación está sujeta a otro factor importante, el entorno social, y que las opciones elegidas en cada ocasión son reflejos de dos etapas diferentes de la misma trayectoria de lenición aplicadas sistemáticamente por los usuarios de la lengua dependiendo del contexto.*

Palabras clave: *Debilitamiento; Corpus; Lenición; Español; Gran Canaria*

1. Introduction

Speech corpora are a very powerful tool in the hands of researchers interested in sociophonetics, acoustics, phonological processes, as well as the study of language variation and change. With a growing number of digital tools helping with the gathering of data as well as (semi-)automated data handling, annotation and analysis, the use of quantitative approaches has become extremely popular in recent years, not only among language typologists, but also sociophoneticians and phonologists interested in linking theory with data. Having a large database of annotated sounds and sentences produced in a naturalistic setting, as opposed to laboratory productions, is an added value as it allows us to look into the actual speech of a community living in a given town or region and make correct generalisations based on up-to-date productions. Very often, it is the only way of seeing whether or when a given process applies in the language as it may be suppressed or restricted by the speakers depending on the situation, or even missed if it belongs to the phrase rather than the word domain.

In the first case, the situational or social setting, i.e. the conditions in which the speech takes place may determine which allophones are used or how often a given variant of a phoneme occurs. We know that speakers may feel intimidated in the lab or when reading texts from a screen and alter their natural pronunciations, use hypercorrection, rely too much on orthography or use unnatural intonation, among others. The same strategies may apply in response to the presence of a researcher as the receiver of the message – speakers will talk differently depending on the interlocutor or onlooker.

Using a different method and trying to elicit more continuous, spontaneous productions is a good way of overcoming the orthographic bias or hypercorrections resulting from reading lists of words or keywords in repeated sentence frames. Another reason to look for more spontaneous productions is related to studying phenomena that have to do with larger-than-word constituents, such as intonation or phrase-level processes, especially *sandhi*. This paper is an attempt to show the usefulness of corpora gathered in precisely such a way based on the example of Spanish. It also shows a comparison of different speaking situations and their effects on the speech of the same persons, with implications for theories of language variation and change.

In the remaining sections, we describe a fieldwork-based corpus of contemporary dialectal Spanish from Gran Canaria and present two case studies that elucidate the insight speech corpora give us into the workings of sound change and the social variables conditioning inter- and intra-speaker variation.

2. Canary Islands Spanish: main features and previous studies

The Spanish of the Canary Islands is characteristic for its innovative features that phonetically differentiate it from most of the varieties of the Iberian Peninsula. Many researchers have described it as a dialect that is more similar to Caribbean speech than to European speech, given that *seseo* (i.e. the lack of distinction between the alveolar and the interdental fricatives) has become general, aspiration and loss of coda /s/ are widespread, the velar fricative is debuccalized to [h] and its approximants are very open and often elided in everyday speech (Alarcos, 1950; Harris, 1969; Lapesa, 1988; Almeida & Díaz, 1989). The dialect is also similar to the Caribbean varieties in its intonational patterns, especially in interrogative sentences (e.g. Dorta, 2013). At the same time, Canarian Spanish is often classified as similar to the Andalusian variety since it shares a good part of the articulatory features with that dialectal area. However, it should be noted that the Canarian dialect also abounds in features that are not typically Andalusian, such as the plosive rather than affricated pronunciation of *ch*, as well as its voicing; approximant

pronunciation of the voiced palatal /j̮/, velarisation of the /n/ in final position, the loss of other coda consonants, especially the *r*, and the voicing of /p t k/. Moreover, Canarian speech itself is not uniform: phonetic and phonological differences can be observed from one island to another. However, the literature on Canarian phonetics and phonology is quite scarce. Most of the works focus on morphosyntax and lexicon. Apart from that, the majority of the research conducted so far is qualitative rather than quantitative. A good summary of the studies on this dialectal area is provided by Carmen Díaz Alayón in her article titled *Estudios del español de Canarias* (1990). It is also worth mentioning *El español de Canarias* by Almeida and Díaz (1988), *Algunas características de las hablas canarias* by Trujillo (1981), as well as works by Morera (1990, 1997). As can be seen from this list of articles and books, more recent research within the sociolinguistic and phonetic field is lacking, perhaps with the exception of the works by Dorta (1997), Herrera (1997), Martín Gómez (2010) and Broś and Lipowska (2019), all of which provide experimental studies of the Canarian stops and/or the affricate.

As for the subdialect which constitutes the focus of this paper, i.e. the Spanish of Gran Canaria, there has been some work focusing on the descriptive side. Perhaps the best known studies on the subject are those of Manuel Alvar (1972, 1975), followed by Manuel Almeida (1990). They focus on sociolinguistic factors. A fairly in-depth study of lenition on Gran Canaria was provided by Oftedal (1985), who provides detailed information on the acoustic features and phonetic contrasts between the sounds produced by native speakers from various parts of the island, especially representatives of rural speech. Since these works were published more than 30 years ago, a more up-to-date quantitative sociolinguistic contribution is more than welcome. This is precisely the aim of this paper and of the corpus-based project it is a part of.

3. Methodology

This paper reports to case studies based on a corpus of Gran Canarian Spanish gathered in 2016 in the course of semi-structured interviews conducted with 44 native speakers of the dialect.[1] The recordings were made using a Zoom H4N digital recorder and a Shure SM10a head-worn microphone at 44,100 Hz sampling frequency. Initially, 55 speakers were interviewed but the quality of some recordings was insufficient to enable phonetic analysis. As a result, 11 speakers were excluded from the database and a total of 44 recordings were selected for further analysis. The files have a duration between 5 and 40 minutes per speaker. The procedure used by the interviewer was the following. Native speakers were invited to say a few words about the culture and traditions of the Canary Islands. Some speakers were approached on the street, in the public library, museum and in the cultural centre for the elderly, while others were approached via personal contacts. The latter group included the friends and family of the two native speakers that were the interviewer's contact persons upon arrival. In this case, the recordings were made at people's homes or in the car. Indoor interviews were naturally of the best quality while some of the outdoor recordings had to be dismissed due to noise in the background, especially wind. Out of the files selected for analysis (44 speakers), 11 recordings were deemed noisy but suitable for acoustic analysis and bandpass-filtered using Adobe Audition (FFT filter, Blackman-Harris windowing function) before the annotation.

The interviews were conducted in Gáldar and El Risco de Agaete in the northern part of the island of Gran Canaria. The speakers were born and raised in the northern municipalities of Gáldar, Agaete, Guía, Firgas, Moya and Arucas. Fig. 1 shows a map of the island on which these areas are shaded in grey.

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[1] The way the corpus was collected was earlier described in a more succinct form in Broś et al. (2021), which focused on the sociophonetic and phonological aspects of stop lenition in the dialect.
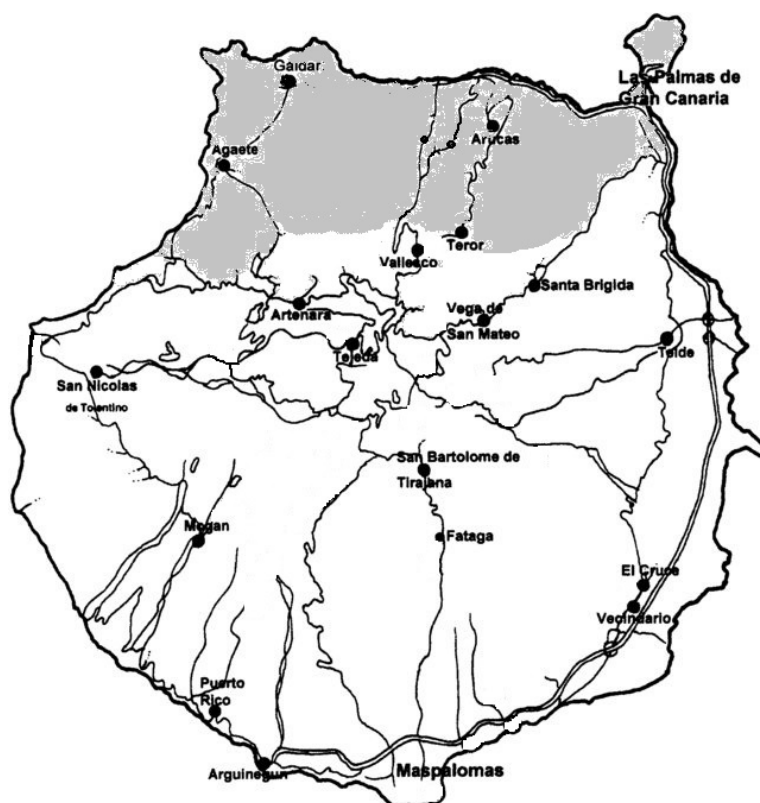
Figure 1. The map of Gran Canaria showing the places of residence of the interviewed speakers (in grey).

As a part of a long-term project concerning the production and perception of obstruents among the speakers from Gran Canaria, funded by the National Science Centre (see acknowledgements), the recordings were subjected to orthographic and then a phonetic annotation. First, a designated annotator listened to the recordings, annotated the sentences uttered and segmented the speech into smaller files corresponding to around 60 sentences each. This step was necessary in order to subsequently use an automatic annotation plugin available for Praat (Boersma & Weenink, 2022), namely EasyAlign (Goldman, 2011). The plugin produces a phonetic transcription of audio files provided that a list of up to 60 sentences per file corresponding to the audios is added. The algorithm, however, was trained on different types of dialects and hence produced only a preliminary approximation of the phonetic transcriptions. Given the fact that we were analysing dialectal data from spontaneous speech, with lots of omissions and imprecise pronunciations, all the transcriptions created by the programme had to be manually corrected. To save time, we were forced to annotate only the information that was crucial for the project, i.e. the phones tier with each pronounced segment, the underlying tier with information on the underlying representation of a given segment, the word tier and the sentence tier. We decided to remove the syllable tier as it was not needed for the analysis of obstruents planned in the project. Crucially, the pauses between sentences are not reliable given the annotation method. To segment speech and make the EasyAlign algorithm work properly and detect sentence ends and beginnings, additional pauses were sometimes added. Besides, all instances of the interviewer talking were eliminated from the recordings. Thus, only pauses in between words within sentences can be reliably used for analysis.

As for the rules of annotation, we had to make certain decisions. We decided that underlying stops would be annotated according to the following rules: 1) stops were considered voiced and were annotated as [b d g] if more than 50% of their duration was voiced as per the visual inspection of the spectrogram (voicing bar) and the voice report in *Praat*; 2) stops were deemed approximant realisations if formants were visible on the spectrogram, the waveform did not show signs of a

complete closure and periodicity was identified in the signal; they were annotated using capital [B D G]; 3) stops were delimited from the end of the preceding vowel to the beginning of the periodic cycle of the following vowel, the beginning of the following consonant or the end of the release when prepausal; and 4) approximants were delimited from the fall in intensity at the end of the preceding vowel to the corresponding rise in intensity in the following vowel or at an inflection point marking a change in intensity when the approximant was followed by a consonant. The intensity contour-based delimitation of approximants was based on Eddington (2011) and Hualde et al. (2011), among others. Whenever the differences in intensity were too small to identify the beginning and end of the approximant between vowels, the sound was deemed elided.

As for other symbols used in the annotations, [H] was used to mark a voiced glottal fricative realisation, which could correspond either to /s/ or to /x/ since both segments are aspirated and usually voiced intervocalically. A capital [N] marked a velar nasal. [r] was used to denote a multiple trill as in the word *perro* 'dog', while [4] was used to denote a tap as in *pero* 'but'. [J] was used to refer to a palatal nasal and a capital [S] corresponded to a palatal fricative or part of the palatal affricate as in the Spanish word *chico* 'boy', in accordance with SAMPA. Additionally, due to some coding issues encountered at the level of data extraction, we changed the lateral alveolar sound annotation from [l] to [L].

It should be noted that we did not include a stress tier. Instead, we marked stressed syllables by using capitalised vowel symbols [A E I O U]. Unstressed vowels were [a e i o u]. Furthermore, [@] was used to refer to a vowel that seemed to be reduced and did not correspond to any vowel quality nor to the underlying specification. Also, since we were interested in deletions, especially the deletions of /s/, we added deletion information to the preceding vowels with the use of a dot. Thus, a vowel followed by a deleted segment had a dot: [a. e. i. o. u. A. E. I. O. U.], e.g. *pues* 'so' /pues/ would be annotated [pwe.]. We then added a deletion tier on which we annotated the deleted segment in the slot corresponding to each vowel marked with a dot. In the case of the word *pues* in which the final /s/ is deleted, the deletion tier annotation would be [_ _ s]. An example of an annotated phrase from the corpus is presented in Fig. 2 below.
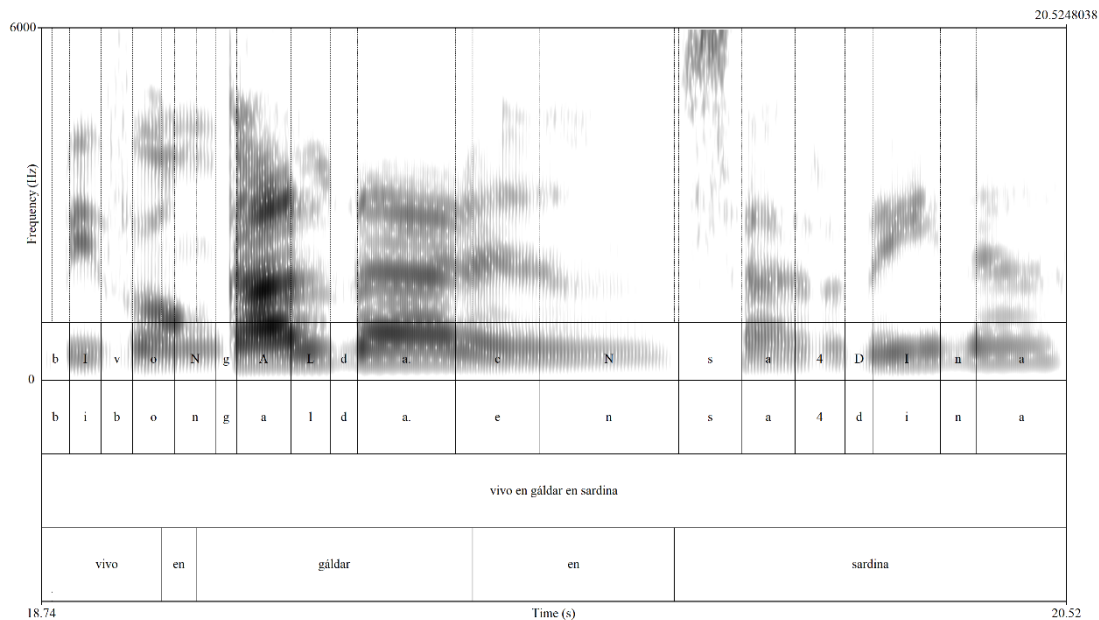

Figure 2. Example showing the way different tiers were annotated in the corpus. It shows the phrase *Vivo en Gáldar, en Sardina* 'I live in Gáldar, in Sardina' produced by speaker 1.

Following the annotation of the data, which consisted of several phases (one senior annotator revised the corrections introduced to the original automated annotations made by two junior annotators), we had a total of 136 files from 44 native speakers, with a total of 4,481 sentences and 111,317 phones to analyse. Table 1 presents a summary of the data together with the interviewees' demographic information.

ID	Age	Sex	Education	Sentences	Phones	ID	Age	Sex	Education	Sentences	Phones
1	49	F	secondary	170	427	23	50	F	university	194	661
2	24	M	university	98	253	24	19	F	secondary	87	170
3	23	M	secondary	145	417	25	24	M	university	121	610
4	21	F	secondary	42	74	26	24	M	university	106	254
5	24	M	university	122	334	27	50	M	university	143	716
6	60	M	N/A	89	275	28	18	M	secondary	50	99
7	16	M	secondary	47	75	29	25	M	secondary	89	193
8	55	M	N/A	45	105	30	37	M	N/A	163	397
9	45	M	secondary	43	121	31	65	M	primary	70	185
10	48	M	university	175	551	32	55	F	secondary	160	486
11	28	F	university	117	283	33	65	F	primary	48	144
12	25	M	secondary	162	439	34	70	F	primary	41	115
13	56	F	university	194	705	35	22	F	university	167	503
14	22	F	university	113	398	36	23	M	secondary	62	172
15	79	F	primary	156	524	37	45	F	university	37	158
16	70	F	primary	55	123	38	40	M	university	91	250
17	68	M	primary	34	98	39	76	M	primary	121	269
18	23	F	university	123	345	40	71	F	primary	70	117
19	55	M	N/A	60	244	41	40	M	university	153	345
20	45	M	university	19	125	42	58	M	N/A	121	233
21	30	F	university	64	305	43	63	M	university	151	533
22	45	F	university	162	523	44	51	M	secondary	121	314

Table 1. Participant data, including demographics and the number of sentences and phones per speaker.

As showed in Table 1, the speakers were quite evenly distributed in terms of age and gender. There were 17 young interviewees aged 30 or below, 12 middle-aged speakers aged 37-52 and 15 people aged 55-79. The corpus consists of the speech of 18 females and 26 males. As for the level of education, 8 people had primary education, 12 people finished high school and 19 speakers had university education. We had no information on the remaining five speakers. All in all, with this demographic information and a quite substantial number of speakers, we gathered a corpus that enables a comprehensive sociophonetic analysis. Such a database allows for a quantitative analysis of phonetic and phonological phenomena that can help elucidate factors affecting sound change, identify gradient and categorical changes in the dialect and compare them to other varieties of Spanish, identify co-phonologies by looking at inter- and intra-speaker differences, look at the role of variation and optionality in the grammar, get to the bottom of the internal and external conditioning of particular processes and, possibly, disentangle phonetics from phonology. With this in mind, we would like to present two case studies showing the

usefulness of such speech corpora in analysing certain phenomena and their potential for providing insightful comparative analyses.

4. Case study 1. The many faces of /s/ lenition in Gran Canarian Spanish

Syllable-final /s/ is well-known to undergo weakening in many Spanish dialects. The process has been widely discussed in the literature (Harris, 1969, 1983; Hualde, 1987; Colina, 1997, 2002; Kenstowicz, 1996; Face, 2002; Lipski, 1999; Morris, 2000; Shepherd, 2003, among others). It has a wide array of manifestations across the Spanish varieties and involves various types of interactions with other phonological processes encountered in the language. The most popular output of /s/ weakening is the so-called aspiration, a term deriving from the Spanish-speaking literature whereby the consonant is debuccalized and realised as a glottal fricative [h]. Here, we can talk of several advancement stages which divide the varieties of Spanish into those that are more conservative and those that have a more extended process of /s/ weakening, with a couple of options in between (Carvalho, 2006). According to Lipski (1999), at the initial stage of the process /s/ is aspirated before consonants, then at the second stage it tends to undergo the same change in phrase-final contexts and hence encompasses all syllable-final /s/ segments. Finally, word-final prevocalic /s/ can also get aspirated before vowels, in which case aspiration interacts with resyllabification and the process is rendered opaque. To illustrate this, consider the examples presented in (1).

(1)   Coda /s/ in Spanish

a) no aspiration

   esto [esto] 'this'   *cosas* [kosas] 'things'
   las cosas [las#kosas] 'the things'   *las alas* [las#alas] 'the wings'

b) aspiration before consonants

   esto [ehto] 'this'   *cosas* [kosas] 'things'
   las cosas [lah#kosas] 'the things'   *las alas* [las#alas] 'the wings'

c) aspiration before consonants and pauses

   esto [ehto] 'this'   *cosas* [kosah] 'things'
   las cosas [lah#kosah] 'the things'   *las alas* [las#alah] 'the wings'

d) aspiration before consonants, pauses and vowels across words

   esto [ehto] 'this'   *cosas* [kosah] 'things'
   las cosas [lah#kosas] 'the things'   *las alas* [lah#alah] 'the wings'

As illustrated in (1), different outputs of underlying /s/-forms are produced depending on the context to which the process of aspiration is sensitive in a given dialect. Note that underlying onset /s/ is not aspirated in most dialects (but see e.g. Lipski, 1996 for a descriptive account of

onset /s/ aspiration in Mexican Spanish and other Latin American varieties). However, whenever the word-final coda /s/ is aspirated before a word beginning with a vowel, an opaque interaction ensues. Note that the phrase *las alas* 'the wings', for instance, is produced with resyllabification, which means that the /s/ belongs to the first syllable of the word alas [la.ha.lah]. Looking at the surface forms only, it is therefore difficult to explain why onset /s/ gets aspirated if aspiration concerns coda segments only. It can be explained by the precedence of aspiration with respect to resyllabification, i.e. a particular ordering of the two rules.[2]

Needless to say, a voiceless glottal fricative pronunciation is not the only possible output of /s/ weakening in Spanish. Other possibilities are elision (Broś, 2013; Rogers, 2020), tapping (Moreno Fernandez, 1996), gemination and change of the place of articulation (Penny, 2000), loss and compensatory changes in vowel quality (Hernandez-Campoy and Trudgill, 2002; Madrid Servín and Santana Cepero, 2009) and preaspiration of the following stop, among others (see also Núñez-Méndez, 2022 for a recent overview). Thus, there are lots of weakening strategies that vary from one Spanish dialect to another. The most important fact, however, is that most Spanish varieties today display some form of coda /s/ weakening, from the southern part of the Iberian Peninsula, through the Caribbean and South America to the Spanish of the Canary Islands, which is of interest in this paper.

Despite the abundance of literature on /s/ aspiration and related processes, information on the voicing of the resultant surface forms is quite scarce. Among the few researchers discussing the issue, we can mention Gerfen (2002), Dorta (1992) and Marrero (1990). The latter work is of particular relevance as it is an in-depth analysis of the surface realisations of /s/ in Canarian Spanish. In her paper, Marrero provides acoustic evidence of different types of aspiration and of the relative voicing of aspirated segments, looking at the right-hand context. The results of her study show that many of the coda /s/ segments are realised as voiced or partially voiced glottal or pharyngeal fricatives. Quite interestingly, voiced variants, although most abundant before vowels and voiced consonants, also occur before voiceless consonants and in phrase-final position. This observation is important given that the data from the Gran Canarian corpus gathered many years later (in 2016) show a similar pattern, which will be shown in this section.

As mentioned in the Introduction, Canarian Spanish is very advanced in various types of consonant weakening. This also includes coda /s/ which is either aspirated or deleted, depending on the context. Furthermore, aspirated /s/ can be either voiced or voiceless and weakening of any type can occur both inside words and across word boundaries. In the latter case, it also happens before a vowel, which leads to opacity, as described above. The aim of this case study is to provide a quantitative analysis of this complicated weakening pattern and point to both phonetic and external factors involved in the process. With a large database of spontaneous productions made by Gran Canarian speakers, we are able to investigate this issue in detail. Thus, we extracted all underlying coda /s/ productions together with their phonetic contexts from the recordings in order to analyse the rates of surface productions and their durations, and look at the demographic information concerning the speakers.[3]

4.1. Results

The total number of sounds analysed was 3,577. These included three different surface variants of the underlying /s/, the distribution of which is as follows. 1,817 sounds were realised as

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[2] Resyllabification in Spanish has been discussed, e.g. by Hualde (1989), Face (2002) and Colina (1997) and is a generally accepted phenomenon, although some evidence to the contrary has been presented (e.g. Strycharczuk and Kohlberger, 2016).

[3] The analysis does not include deletions of the underlying /s/ and focuses on other types of weakening. It must be emphasised, however, that elisions constitute an important part of the phonology of /s/ in the dialect (up to 50% in weakening contexts, see Broś, 2022).

voiceless glottal fricatives [h], 1,341 sounds were their voiced counterparts, and the remaining 419 were unlenited final /s/ consonants, i.e. [s]. The prevalence of each variant differs depending on the immediate phonetic context, i.e. on whether the coda /s/ was followed by a consonant, by a pause or by a vowel. In the case of preconsonantal coda /s/, the vast majority were pronounced as [h] (67%), followed by [ɦ] (25%) and [s] (8%). Before a pause, 56% of coda /s/ were produced as [h], 12% as [ɦ] and 31% as [s]. Finally, before vowels, the majority option is [ɦ] (76%), followed by [h] (14%) and then [s] (10%). Fig. 3 presents the distribution of surface sounds by context for illustration.
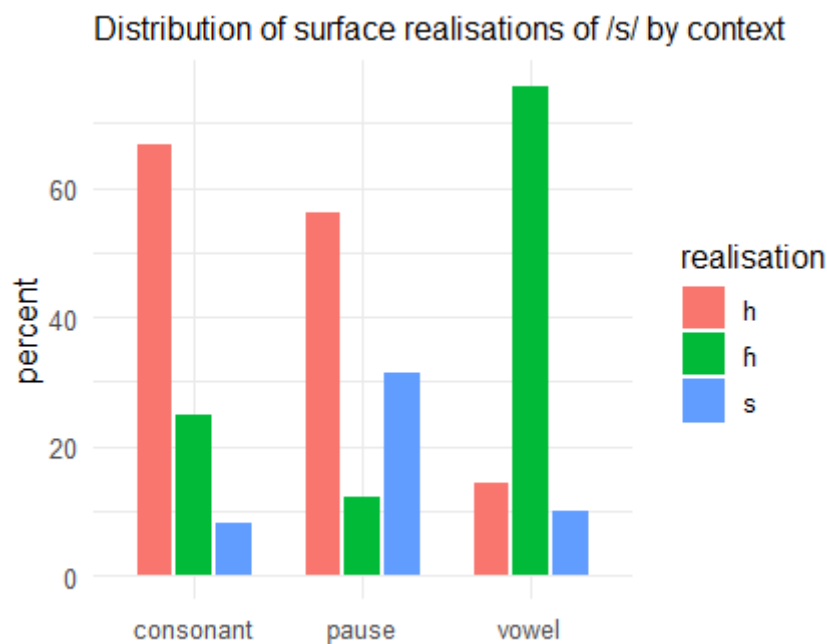
Figure 3. Distribution of [h ɦ s] depending on the following context.

As shown in Fig. 3, the vast majority of underlying coda /s/ sounds in the dialect are realised as glottal fricatives, i.e. aspirated segments. Nevertheless, there is still some percentage of /s/ that remain unchanged, hence the process is incomplete. Quite surprisingly, the rate of [s] realisations is especially high before a pause. This may be functionally grounded in that segment loss at the end of a phrase may be more costly in terms of getting the message across (whereas inside phrases other constituents help get lexical information across, e.g. *las pasas* 'the raisins' where both words have a plural marker and one of them is redundant). Another reason may be perceptual – the aspirated /s/ is not very salient acoustically and may not be audible at the end of a phrase. Yet another interpretation comes from intonation and phrasing: the [s] may be emphatic as a boundary marker (see e.g. Cho, 2016).

As for the aspirated variants of /s/, it is worth mentioning that while voiceless [h] is the most popular option, voiced [ɦ] is also applied quite often before consonants and it is the most common variant before vowels. In the latter case, we are dealing with a process of intervocalic voicing which may be to some extent phonetic. However, given the numbers (76% of voiced glottals before vowels) and the fact that there is a possible interaction with general post- or intervocalic voicing observed in the dialect, we can assume a more strategic application of the process by the speakers. Note that before consonants the /s/ is also quite often voiced. If we divide these

consonants into voiced and voiceless, we can see that the rate of aspirating /s/ with voicing is 62% before a voiced consonant. Before a voiceless one /s/ is realised as a voiceless [h] 76% of the time. The voiced context ranges from underlying /b d g/ to liquids and nasals. It should be mentioned that most Spanish dialects have coda consonant voicing before a consonant, e.g. *mismo* 'the same' [miz.mo], *isla* 'island' [izla], *afgano* 'Afghan' [avɣano], *juzgar* 'to judge' [xuzɣar] / [xuðɣar]. The process is often obscured by coda /s/ debuccalisation and loss. The dialect in question has either word-internal deletion or aspiration with voicing in such contexts, as evidenced by this case study (the outputs being [miɦmo] / [mi.mo], [iɦla] / [i.la], etc.). Additionally, as will be shown in the next section, it also has post-vocalic obstruent voicing and some of its intervocalic /s/ segments are realised as [z] in the database. Thus, the data discussed in this study add weight to the observation that Gran Canarian Spanish has a strong tendency to lenite consonants and this includes both debuccalisation and voicing, among others.

Apart from looking at the general distributions of the three surface variants of /s/ in the Gran Canarian dialect, we also investigated several demographic factors: gender, age and the level of education. Fig. 4 shows that there are no substantial differences in the use of particular variants of /s/ depending on the gender of the speaker apart from the fact that males use slightly more unlenited variants and around 5% less voiced aspirated sounds.
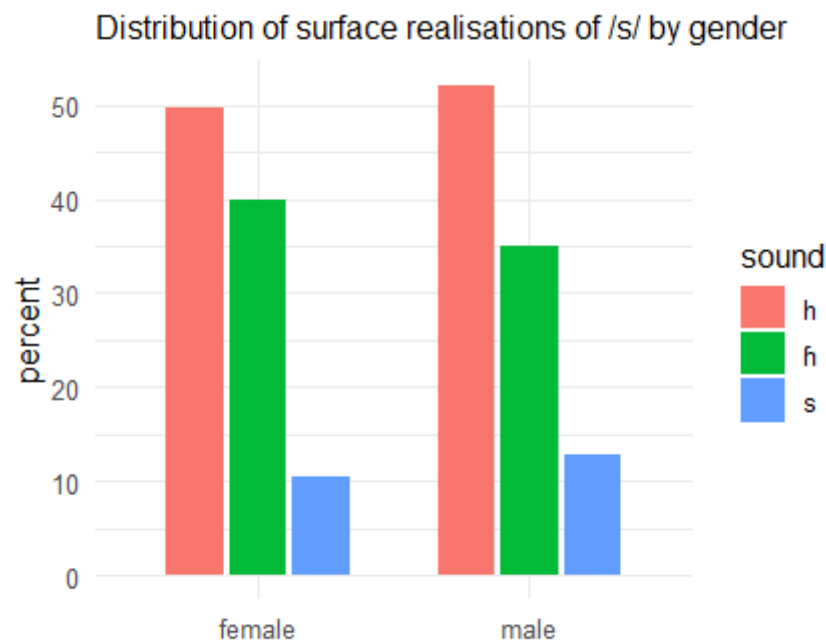

Figure 4. Distribution of [h ɦ s] depending on the gender of the speaker.

As for the level of education, speakers who graduated from high school or university use notably more voiced aspirated variants than people who only finished primary school (see Fig. 5). The voiceless [h] is definitely more frequent in this group compared to others. At the same time, speakers with high school education use [h] and [ɦ] equally frequently.
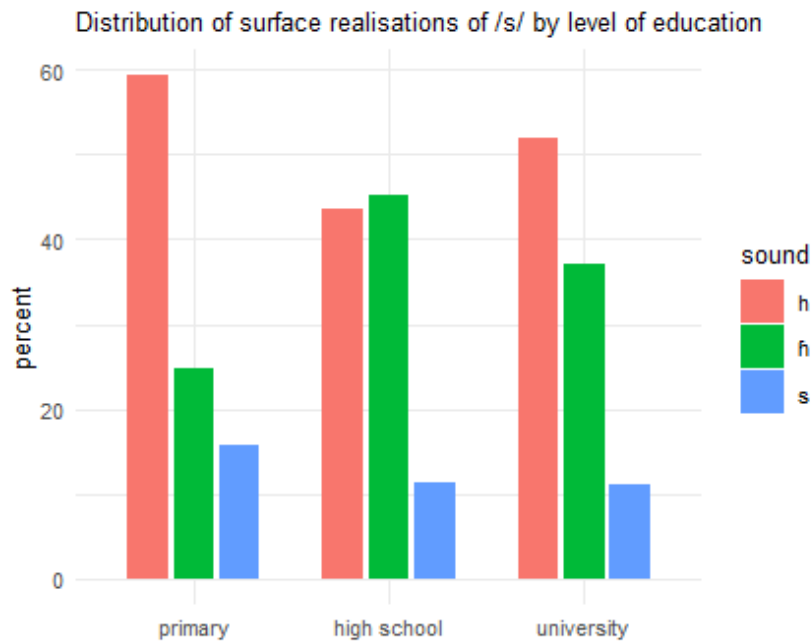
Figure 5. Distribution of [h ɦ s] depending on the level of education of the speaker.

It must be noted that the primary education group consists of older speakers only. Fig. 6 presents the distribution of surface variants by age. Here, the speakers were divided into three age groups: young, middle-aged and older speakers.
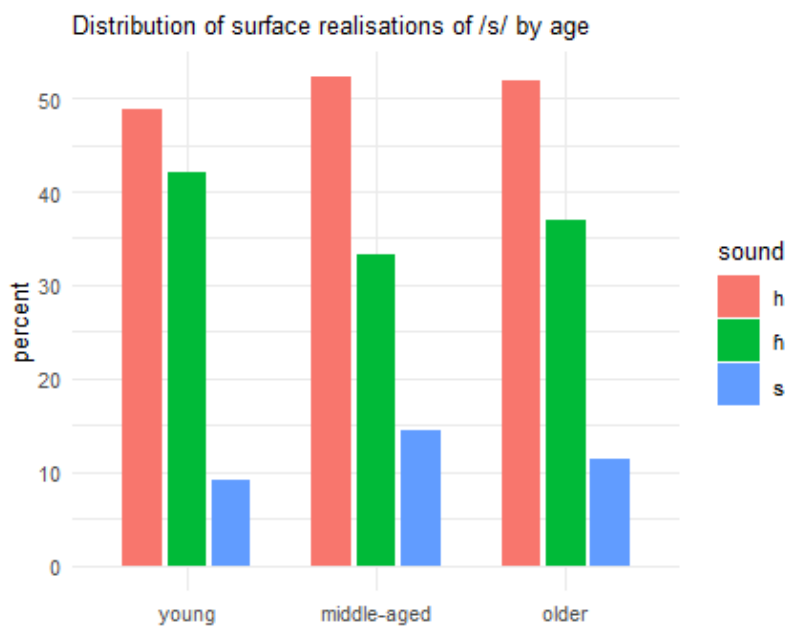

Figure 6. Distribution of [h ɦ s] depending on the age of the speaker.

In Fig. 6, we can see that the youngest speakers use the lowest number of unlenited /s/ variants and the most voiced [ɦ] realisations of all the three age groups. If we combine this information with the effect of the level of education, we can see an indication of a progressive change towards the use of aspirated variants only, as well as voicing of the glottal fricative regardless of the following context. Most importantly, there is voicing also prepausally and before consonants, not only between vowels, and the number of voiced variants increases at the cost of unlenited [s] and not necessarily [h] (see Fig. 7). Thus, it seems that the generalised process of postvocalic voicing is spilling over from other obstruents to the /s/ in the dialect. Since the youngest speakers show a difference compared to older generations, we are probably observing sound change in progress.
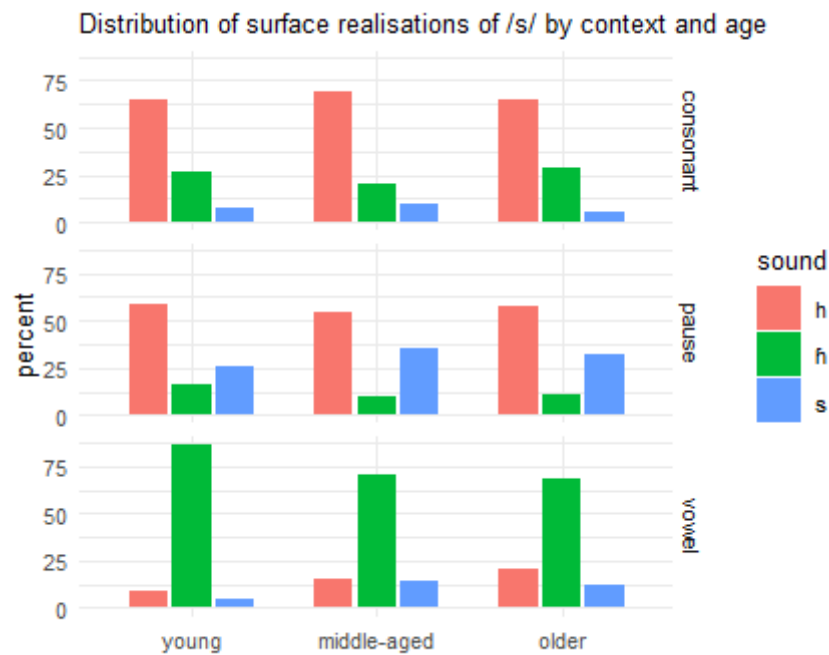

Figure 7. Distribution of [h ɦ s] depending on the context and the age of the speaker.

Finally, we looked at sound durations to see if there are any significant differences depending on the context. Here, we divided the consonantal context into voiced and voiceless to get more precise information. Quite unsurprisingly, surface [s] is the longest sound while both glottal variants are of more or less similar durations. Interestingly, however, we found [s] to be especially long in prepausal position and before a vowel. It is slightly shorter before a voiced consonant and the shortest before a voiceless one. [h] shows a similar tendency – it is the longest prepausally and the shortest before a voiceless consonant. While [ɦ] behaves similar to some extent, it tends to be equally long before vowels and voiced consonants, and slightly shorter before voiceless consonants, but these differences are not so great compared to the other variants of /s/ (see Fig. 8 for illustration).
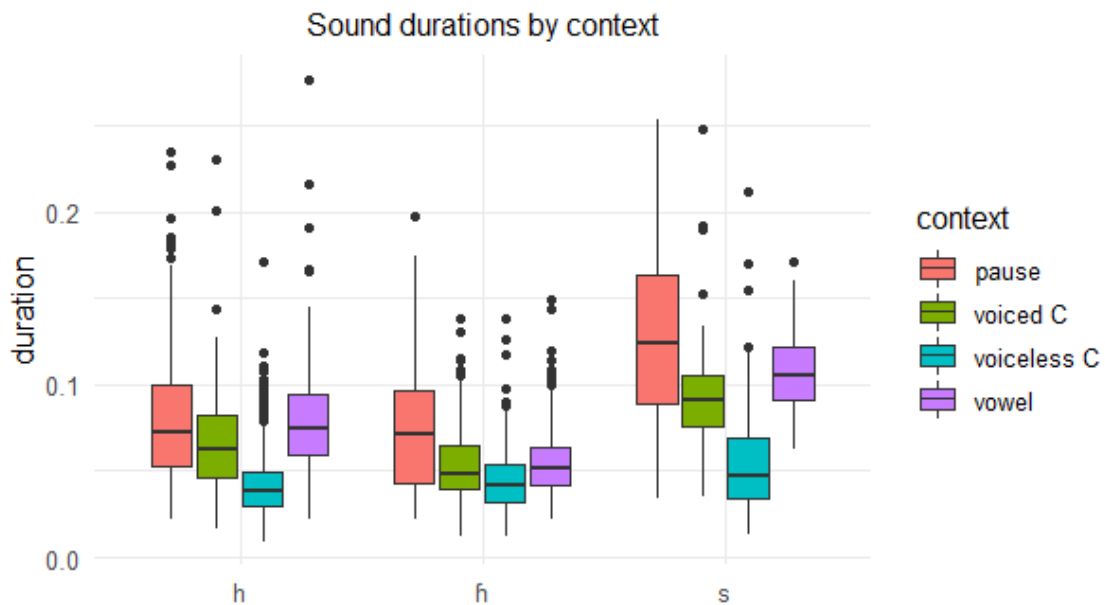
Figure 8. Durations of [h ɦ s] depending on the context.

4.2. Discussion

All in all, the data show that the surface variants depend on the following context, both in terms of the choice of a particular option, aspirated or not, and in terms of sound duration. Sounds produced before voiceless consonants are the shortest, while sounds produced before a pause are the longest. The latter may have to do with boundary effects or emphatic marking. A study focused on the prosodic profile of Canarian speech might help confirm this tentative conclusion.

Furthermore, it is worth comparing these results with the data provided by Marrero back in 1990. Although they were based on a smaller sample and only four speakers from a different island (Tenerife), there is some ground for comparison. The study from 1990 was specifically targeting aspiration and not other surface variants, hence we can only compare the rates of voicing in the aspirated variants in the different phonetic contexts. In word-internal position, speakers from Tenerife produce voiced aspirations 45% of the time and semi-voiced variants 42% of the time. At the end of a word before a vowel, 91% of the aspirated /s/ were voiced, the rest were partially voiced. Before a pause, 18% of aspirated /s/ were realised as [h], while 33% were partially voiced and 49% were fully voiced. This suggests that most of the aspirated /s/ variants are at least partially voiced in the variety from Tenerife. If we extract only aspirated variants from our data, we can make similar calculations. Thus, in contemporary Gran Canarian Spanish, 73% of preconsonantal aspirated segments are voiceless and this rate increases to 82% in prepausal position. Voiced [ɦ] is the majority option only before vowels (84%). No definite category of partial voicing has been observed.[4] Consequently, we can conclude that the data presented in this study show a different tendency on the voicing side which may be due to the time elapsed from

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[4] Although it must be noted that in principle in our annotations sounds were deemed voiced when we observed voicing throughout the majority of their duration, not necessarily 100%. Incomplete voicing may sometimes be observed prepausally, where voicing is difficult to maintain.

1990 or to the fact that different subdialects of the Canary Islands were studied. More research is needed to provide the missing information and allow for a more reliable comparison.

As for the phonological interpretation of the data presented in this case study, we can see that there is substantial variation in speakers' productions that is caused by the phonetic environment but also, to some extent, social factors such as age and level of education. The presence of non-lenited variants speaks to the influence of orthography, style and, possibly, pragmatic factors. It also shows that despite the generalised weakening of /s/ in the dialect, the alveolar fricative is in the underlying representation and other variants are its allophones. This is confirmed by the fact that there are no instances of weakening of the underlying /s/ to a glottal fricative in canonical onsets, although there is variable voicing to [z]. The latter observation suggests that in the case of a /s/ to [ɦ] mapping, a second process is involved. Voicing is an independent phenomenon that apparently interacts with /s/ aspiration. In a rule-based phonological account, we would therefore derive the voiced glottal fricative as follows: /s/ -> [h] (aspiration), [h] -> [ɦ] (voicing). In addition, it must be noted that there seems to be no gradience in the voicing of [h] – it is either applied or not, which is an argument for analysing it phonologically. Finally, both processes interact with resyllabification, the ordering of which is probably irrelevant for voicing as long as it is after the process of aspiration. The data show that voicing can happen in all contexts, i.e. before vowels, consonants and pauses, hence regardless of the position of the surface [ɦ] in the syllable.

5. Case study 2. Social setting as a determinant of variation

The corpus presented in Section 3 can be used to provide a comparative analysis of speaker productions from different social settings. As mentioned in the corpus description, the speech presented by the speakers has the characteristics of spontaneous productions as the speakers were encouraged to describe events or tell stories of their own with minimal interviewer intervention. As a result, the database presents a variety of connected speech phenomena, such as vowel mergers across word boundaries, deletions of medial and final consonants and voicing applied across words. This type of speech can be clearly differentiated from laboratory recordings in which a list of words or sentences is read from the screen. However, it must be mentioned that the interviews do constitute monitored speech and certain phonetic or phonological processes can be inhibited at least in some speakers given the need to put a head-mounted microphone and speak to a recording device, as well as the presence of a foreigner (interviewer, i.e. the author of this paper).

In this case study, we provide a direct comparison of the productions made by the same speakers in two settings: spontaneous speech during interviews (the Gran Canarian corpus) and lab speech produced in the course of a phonetic study conducted the same year. To make the comparison possible, we had to use the recordings of those speakers who participated both in the fieldwork and in the subsequent experiment, hence the number of participants is limited. More specifically, recordings of 6 speakers (5 males, 1 female) aged 23-25 were taken under analysis. Those included 5-minute excerpts of spontaneous speech from the Gran Canarian corpus and recordings made during the subsequent experiment, described in detail in Author (2019). In the latter case, the participants had to repeat sentences from hearing (Part I) and then read a list of sentences (Part II) containing carrier phrases with target words beginning with underlying voiceless obstruents occurring after the vowel [o]. Examples of sentences are provided in (2).

(2) List of sentences used in the lab production study (a sample of 6 sentences)

*He comprado cinco **panes** de millo*	*'I have bought 5 corn breads'*
*He comprado cinco **pruebas** de embarazo*	*'I have bought 5 pregnancy tests'*
*He comprado cinco **trabas** de la ropa*	*'I have bought 5 laundry pins'*
*He comprado cinco **tornillos** de hierro*	*'I have bought 5 iron screws'*
*He comprado cinco **cubos** de basura*	*'I have bought 5 trash bins'*
*He comprado cinco **crepes** de Nutella*	*'I have bought 5 pancakes with Nutella'*

It must be emphasised that the focus of the abovementioned experiment was to investigate the rate of voiceless non-continuant voicing after vowels. Naturally, however, the sentences used also contained instances of postvocalic /b d g/ and word-final /s/, making it possible to study the interplay between /s/ weakening and stop lenition in the dialect. Consequently, to provide a comparison of all forms relevant for the present analysis, we calculated not only the percentages of post-vocalic voicing, but also all instances of /b d g/ lenition and /s/ aspiration and deletion occurring elsewhere in these sentences.[5] This gives us a complete picture of the interactions between /p t k b d g/ lenition and the weakening of underlying /s/. The same processes are investigated in the data from the spontaneous speech corpus in order to provide evidence for the differences in process distribution depending on the setting.

As demonstrated in Section 4, Canary Islands Spanish has an extended process of /s/ weakening encompassing aspiration and voicing, as well as deletion depending on the context. Moreover, the process forms part of a wider phenomenon by which all coda consonants tend to be weakened or elided completely. There is some optionality to the process, however, which leads to inter- and intra-speaker variation in the data.

The second process of interest in this section is the weakening of /p t k b d g/. In the vast majority of Spanish dialects, /b d g/ are realised as approximants when preceded by vowels or other continuant segments, such as sonorants or fricatives (e.g. *la vaca* 'the cow' /la#baka/ [la#βaka], *afgano* 'Afghan' /afgano/ [avɣano], *desde* 'from' /desde/ [dezðe]). The degree of approximantisation is the greatest after vowels and /b d g/ are often deleted in intervocalic position. This is especially prominent in Canary Islands Spanish. To illustrate the phenomenon with an example, the word *hablaba* 'talked' /ablaba/ is usually pronounced [aβla:] with the approximantisation of the first /b/ and elision leading to vowel merger and lengthening. The /p t k/ series of stops, on the other hand, undergoes weakening in some Spanish varieties, such as the Spanish from Barcelona (Machuca, 1997), Majorca (Hualde et al., 2011) or Murcia (Martinez, 2009), among others. The Spanish of the Canary Islands is well-known for this phenomenon as it is quite widespread among Canarian speakers (see e.g. Almeida, 1982; Dorta and Herrera, 1993; Herrera, 1989, 1997; Marrero, 1986; Oftedal, 1985; Trujillo, 1980). Voiceless stop weakening applies both inside words and across word boundaries, but strictly after a vowel. If the segment following the voiceless stop is a sonorant, voicing is applied as well (e.g. *bote* 'jar' [bode], *la playa* 'the beach' [la#blaja]). Furthermore, /p t k/ can be weakly approximantised and not only voiced, which leads to some overlap with the weakening outputs of /b d g/.

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[5] We were able to use distractors from the study as well. They contained, among others, words beginning with /b d g/, e.g. *He comprado cinco botes de aceitunas* 'I have bought 5 olive jars'. Also, /s/ could be found before voiceless obstruents: *He comprador cinco chocolates con leche* 'I have bought 5 milk chocolate bars'.

In this case study, we will focus on the interaction between /s/ weakening and the most common outputs of stop weakening, i.e. /p t k/ voicing and /b d g/ approximantisation. We will ignore variable approximantisation of the voiceless stop series and the deletion of /b d g/ to make the comparison more straightforward. For the sake of clarity, we will present the differences between the two investigated social settings in order to point out that synchronic variation may depend on some external factors other than speaker identity, gender or education. Before presenting the data, the term 'social setting' should be explained, however.

Following the classical works in sociolinguistics by Labov (1963, 1972, 1980, 2001) and others, we assume that the social context of speech events is an important part of linguistic competence and performance. It is also an important contributor to the variation observed in any spoken variety, as we have seen in Section 4 with the examples of Gran Canarian /s/. Within this social context, one aspect is of special importance in this case study, namely its situational dimension and the resultant expectations towards and relationship with the person present during the speech event. The social setting of language was defined by Hymes (1967) as the time and place of speech. In this paper, we use the term not in conjunction with the content or meaning of the message in any speech event but rather as a marker of the situation a given speaker finds him/herself in that may affect the type of speech applied, be it register, degree of hypo- or hypercorrection or style.[6] In our case, a situation in which a speaker is being recorded is not an everyday or natural one. Furthermore, being recorded in a laboratory, in the presence of several people and having to read a prepared list of utterances makes the situation even more unusual, which will definitely be of consequence for the produced speech. While we cannot assume that interviews with randomly selected speakers are the natural context in which their language productions occur, even if we speak the target language and try to make sure spontaneous speech takes place, it is also true that a fieldwork setting is presumably different than the lab setting. Due to the number of factors involved (specific room/building, sitting in front of a computer, recording device, experimenter/interviewer, reading, prepared utterances), we can assume that lab speech is a more artificial albeit a more controlled speaking situation and will therefore show less advanced change, phonetic or phonological process inhibition, a greater amount of hypercorrection, a more formal style and/or higher register, etc. In other words, lab experiments will elicit a more controlled speech modality while fieldwork interviews will result in a relatively more spontaneous or careless speech modality.

In the remainder of this section, we present comparative data from both types of social settings and discuss the differences in pronunciation and their implications concerning variation and change in progress. We will use the term 'modality' to refer to each type of productions. We dub the productions made in the lab/experimental setting 'Modality 1' and those made in spontaneous speech 'Modality 2'.

5.1. Results

The data gathered in the course of the production study reported above show that in Modality 1, /s/ is typically[7] deleted before a voiced consonant but not before a voiceless one, and aspirated otherwise. Additionally, the resultant glottal fricative is voiced to [ɦ] before vowels.

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[6] Although it must be emphasized that the situational context or social setting as defined here is a broader concept and is not equivalent to register or style. A speaker's register, for instance, cannot be unequivocally determined based on reading a list of sentences in a lab.

[7] By typically, we refer to the majority option or otherwise a frequent change. Also, note that the description of the two modalities in terms of rates of /s/ deletion depending on the context is in line with the results of the case study presented in Section 4. The data show that there is a large discrepancy between the number of aspirated /s/ variants occurring before voiced and voiceless stops. The small number in the former case

(3) Processes identified in Modality 1: /s/ weakening

/s/ → [h/ ɦ] /_V	*prensas hidráulicas*	[pɾensa**h**#iðɾawlikah]	'hydraulic presses'
/s/ → [h] /_ /p t k/	*chocolates con*	[tʃogolade**h**#kon]	'chocolates with'
/s/ → [∅] /_ /b d g/	*panes de*	[pane**∅**#de]	'breads of'

As for the behaviour of underlying stops, they are lenited after vowels. /p t k/ undergo voicing and /b d g/ undergo approximantisation. However, when the preceding /s/ is deleted, the voiced stops do not change their underlying specification, i.e. approximantisation is blocked.

(4) Processes identified in Modality 1: stop weakening

/p t k/ → [b d g] / V_	*cinco panes*	[siŋko#**b**aneh]	'five breads'
/b d g/ → [β ð ɣ] / V_	*cinco dulces*	[siŋko#**ð**ulseh]	'five sweets'
/b d g/ → [b d g] / V(C)_	*panes de*	[pane**∅**#**d**e]	'breads of'

In Modality 2, /s/ is usually deleted both before voiced AND voiceless consonants, but aspiration with voicing takes place before words beginning with a vowel.

(5) Processes identified in Modality 2: /s/ weakening

/s/ → [ɦ] /_V	*prensas hidráulicas*	[pɾensa**ɦ**#iðɾawlikah]	'hydraulic presses'
/s/ -> [∅] /_C	*chocolates con*	[tʃogolade**∅**#kon]	'chocolates with'

As for the lenition of the stops, /b d g/ go one step further than in Modality 1 in that they approximantise both in underlyingly postvocalic position and in derived environments, i.e. when they become postvocalic due to the deletion of the preceding /s/. The voiceless series /p t k/ undergoes voicing only in underlyingly postvocalic positions. Otherwise it is blocked, just like approximantisation in Modality 1.

(6) Processes identified in Modality 2: stop weakening

/b d g/ → [β ð ɣ] / V_	*cinco dulces*	[siŋko#**ð**ulseh]	'five sweets'
/b d g/ → [β ð ɣ] / V(C)_	*panes de*	[pane**∅**#**ð**e]	'breads of'
/p t k/ → [b d g] / V_	*cinco panes*	[siŋko#**b**aneh]	'five breads'
/p t k/ → [p t k] / V(C)_	*chocolates con*	[tʃogolade**∅**#**k**on]	'chocolates with'

(376 cases compared to 1573 in the latter context) suggests that more /s/ segments get deleted before a voiced sound than before a voiceless sound.

A comparison of the different forms and modalities can be appreciated on the spectrograms presented in Fig. 9-10 below.
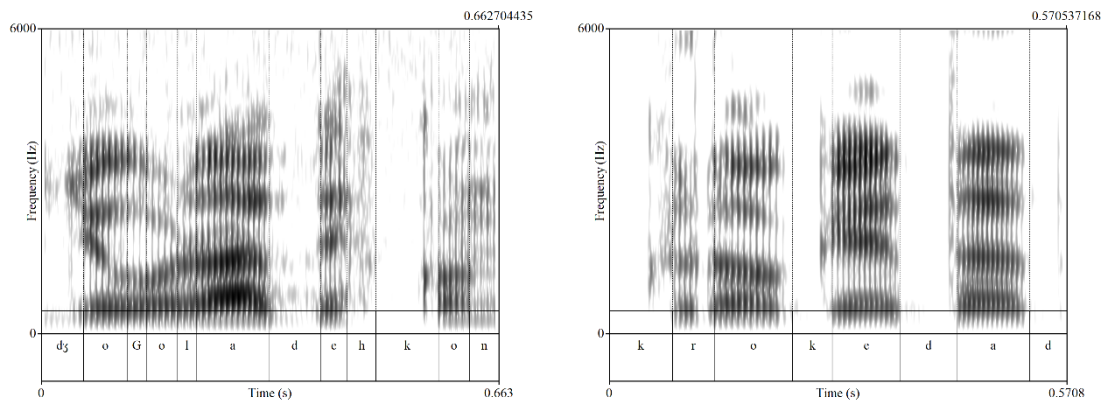

Figure 9. Controlled speech (Modality 1). Left: *chocolates con* 'chocolate with' presents no /s/ deletion before a voiceless stop and no voicing. Right: *croquetas de* 'croquettes with' presents deletion before a voiced segment but no approximantisation. In both cases, we can see variable lenition of the voiceless stops /k/ and /t/.
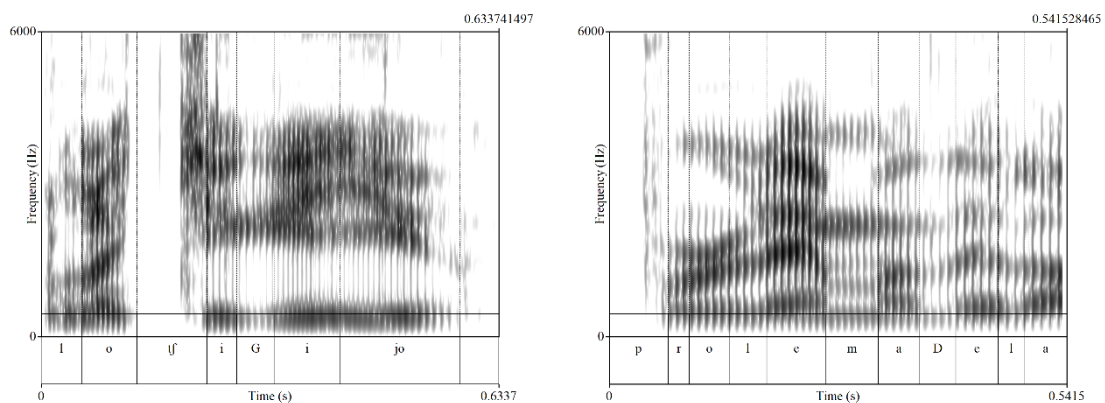

Figure 10. Spontaneous speech (Modality 2). Left: *los chiquillos* 'the guys' presents deletion before a voiceless sound and no voicing. Right: *problemas de la* 'problems with/about' presents deletion before a voiced sound and approximantisation.

Two important observations can be made with respect to the data presented above. First, there are systematic differences in productions depending on the modality. Second, these differences point to two different levels of lenition. More specifically, Modality 2 shows more advanced lenition encompassing more environments, while Modality 1 seems to show an earlier stage of the changes in question. In both cases, however, we see an asymmetry between /p t k/ and /b d g/, which is not surprising given that the process of intervocalic /b d g/ lenition has been part and parcel of the phonology of Spanish for quite some time and involves similar changes in most of the Spanish dialects. The lenition of /p t k/, on the other hand, is a more recent change present in a subset of Spanish dialects and with a small percentage of segments voiced in a given community of speakers, with the exception of Canary Islands Spanish, as mentioned in Section 2.

However, the picture portrayed above is incomplete without the knowledge concerning the actual rates of lenition for all the segments concerned. We merely stated the generalisations based on the tendencies discovered in the data. While the rules provided above usually apply in a given setting, they are not absolute and some variation can be observed. The question is whether this variation shows a systematic change from one modality to another. Having a large database is very useful as it allows us to make a quantitative analysis and a reliable comparison. Fig. 11-13 summarise the quantitative analysis conducted on the data from both controlled and spontaneous speech.
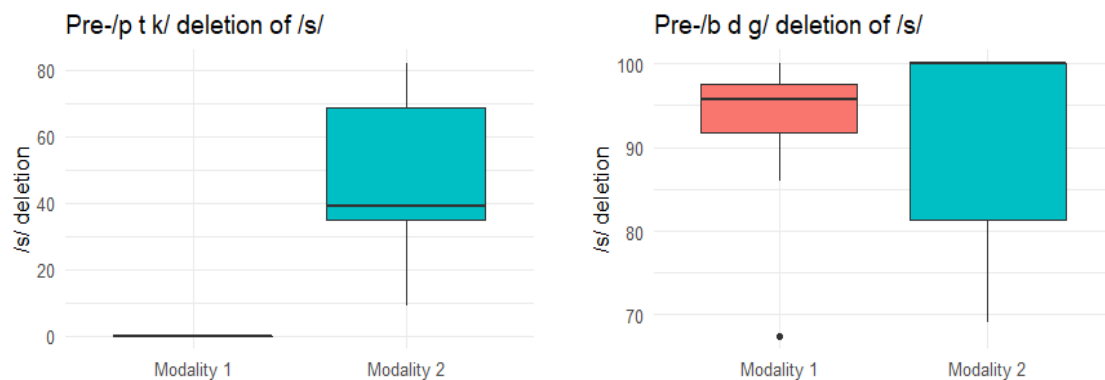

Figure 11. Deletion rates of /s/ by modality when preceded by /p t k/ (left) and /b d g/ (right).

Fig. 11 shows that while /s/ is never deleted before /p t k/ in controlled speech (Modality 1) by any of the speakers, its deletion rate increases to around 48% in spontaneous speech (Modality 2). As for /s/ deletion before voiced consonants, it is more or less the same across the two modalities, remaining in the high range (90-93%). However, some inter-speaker variation can be observed. In fact, 3 speakers delete all their underlying /s/ before voiced consonants in Modality 2, which is a rise from around 93% in Modality 1. The remaining 3 speakers produced more aspirated variants of /s/ in Modality 2 and hence deleted fewer /s/ consonants than in Modality 1. The largest drop in /s/ deletion was observed in the female speaker and in one male who, quite surprisingly, has the second highest rate of /s/ deletion before /p t k/. This unexpected result may be because final /s/ consonants in Modality 1 appear almost exclusively before the preposition *de* 'of/with' whereas there is much more variability in terms of lexical context in Modality 2. Fig. 12 shows a summary of /s/ deletion by context rather than modality.
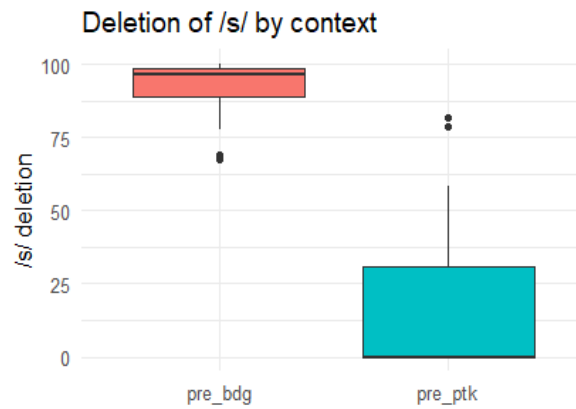
Figure 12. Comparison of deletion rates depending on the context.

As demonstrated in Fig. 12, if we take all deletions of /s/ together and compare them by context, we can see that in general pre-/b d g/ deletion happens almost all the time while before /p t k/ the rate is quite low, aspiration to [h] being the preferred speaker strategy.
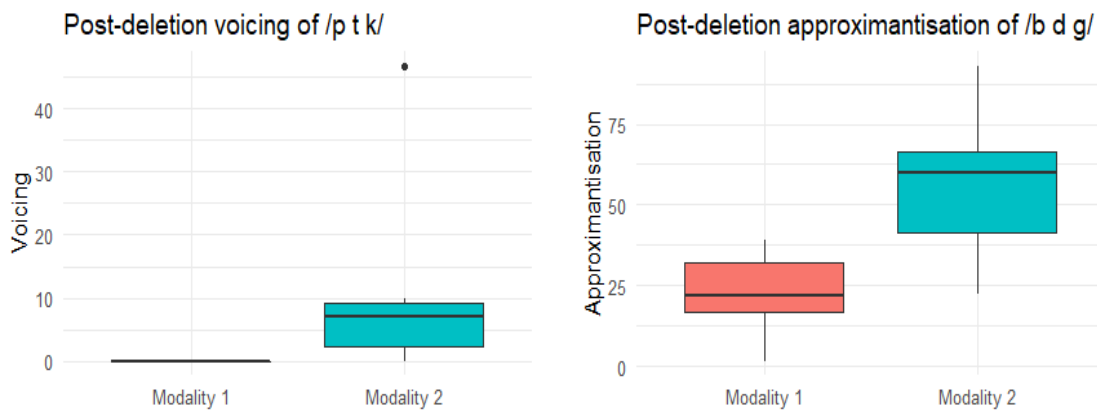

Figure 13. Post-deletion rates of /p t k/ voicing (left) and /b d g/ approximantisation (right) by modality.

Fig. 13 shows the rates of stop weakening by modality in the context of a deleted /s/. Since the /s/ does not delete before /p t k/ in controlled speech, the voicing rate is 0%. Once the /s/ deletion rate rises to around 48% on average (compare Fig. 11), some /p t k/ get voiced but not many of them (11% on average). As for the approximantisation of /b d g/ in post-deletion contexts, the rate more than doubles from 22% in Modality 1 to 60% in Modality 2.

5.2. Discussion

All in all, the case study shows that individual speaker choices can be systematic across different social settings. Depending on the situation and the type of speech a person is asked to deliver,

they either choose more conservative variants or more advanced options on the same weakening trajectory. The systematicity of these changes, both percentagewise and in terms of non-gradient productions (e.g. /s/ deletion before a voiced stop only vs deletion everywhere), points to a set of two weakening stages. Thus, intra-speaker variation can be a reflection of sound change in progress, which is characterised by the coexistence of different variants, and probably co-phonologies. The data presented in this case study show that the observed variation is situational and that it should be modelled by incorporating such external factors as social setting into the grammar.

As for the comparison with previous studies, no attempt was made to show differential setting-based results for Canary Islands Spanish. Rather than that, in accordance with the sociolinguistic tradition, earlier works typically refer to urban vs rural speech and focus on the representatives of particular social groups and their productions in general (e.g. Alvar, 1972; Almeida, 1990). In the context of quantitative predictions concerning particular lenition variants, it is worth noting that there are discrepancies between our study and the 'classic' earlier works, perhaps due to the time elapsed or given the sample of participants recorded, their social backgrounds and levels of education. In the case of /p t k/ voicing, for instance, previous literature reports high rates of voicing in spontaneous speech regardless of the gender of the speaker, age or social status (Herrera Santana, 1989; Marrero, 1986), although Trujillo (1980) does point out that the phenomenon is more prevalent in rural areas. Additionally, speech style has been mentioned as an important factor, with formal styles yielding voicing only sporadically (Herrera Santana, 1997; Lewis, 2001). This lower than expected rate of /p t k/ weakening was recently confirmed by Broś and Lipowska (2019) who reported less than 50% of voicing in postvocalic position in a perception-production study on Gran Canarian, and differences in the rates of voicing depending on the gender of the speaker. In our data, the voicing of /p t k/ happens variably but remains the majority pronunciation post-vocalically, especially in spontaneous speech (albeit close to the 50% threshold).

In the case of /b d g/, researchers are in agreement that heavy approximantisation and consonant loss takes place in Canarian Spanish. There have also been some analyses looking at the interaction of /b d g/ lenition with the deletion of a preceding sound. According to Alvar (1972), /b d g/ are lax and weakened in underlyingly intervocalic position (e.g. *la vaca* 'the cow' [la#baka], *la dama* 'the lady' [la#dama]) and tense in post-deletion contexts (e.g. *las vacas* 'the cows' [la#b:aka], *las damas* 'the ladies' [la#d:ama]) as a compensatory effect. Almeida (1982) shows quantitative data of the particular variants, distinguishing between the tense [b: d: g:] that are also non-continuant but not specified for voicing and the lax [b d g] that are voiced but unspecified for continuancy. Thus, it is not entirely clear what phonetic variants were referred to with the symbols used.[8] Fricative pronunciations were mentioned in these works but the main feature differentiating intervocalic from post-deletion stops was the tense/lax distinction. There was no mention of approximantisation. While our data do not confirm the existence of tense or long voiced stops after deleted /s/, we do see non-lenited [b d g] in such contexts which may be what was meant in earlier works. However, it must also be noted that, as exemplified in the figures above, post-deletion /b d g/ do weaken to some extent in the speech of Gran Canaria, especially in spontaneous productions (up to 60%), which suggests that the blocking or tensing effect is modulated by other factors. This stands in contrast with Almeida's (1982) report in which the tense variant was the majority pronunciation.[9]

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[8] There is no comparison with e.g. postnasal or postpausal /b d g/, which would make it easier to relate our results with those earlier works.
[9] We refer the reader to that paper for a more detailed description of the featural characteristics of the surface forms and percentages of each form by generation. Also, it should be mentioned that tensing was the majority option in /b d/ but not /g/.

6. Conclusions

In this paper, we presented the corpus of Gran Canarian Spanish gathered in 2016. We also described its utility when it comes to analysing inter- and intra-speaker variation, phonetic and phonological phenomena that are either changes in progress or optional processes, and the way social variables add to our understanding of sound weakening. The two case studies discussed herein have shown that a large database of (semi-)natural productions can help identify surface sound distributions and the factors governing them on the internal and external sides of language, and that it can serve as a point of comparison with other types of data gathered for the same or similar purpose, uncovering additional variables and co-dependencies. More specifically, we have shown that several independent weakening processes interact in the investigated dialect and that we can identify different weakening levels or stages that co-occur in the same speakers depending on the situation. In this context, quantitative analyses can be very helpful in studying language variation and change in a more in-depth manner in the future.

Acknowledgements

References

Alarcos Llorach, E. (1950/1968). *Fonología española.* Gredos.

Almeida, M. (1982). En torno a las oclusivas tensas grancanarias. *Revista de Filología de la Universidad de La Laguna*, 1, 77–88.

Almeida, M. (1990). El habla de las Palmas de Gran Canaria: niveles sociolingüísticos. Centro de la Cultura Popular Canaria.

Almeida, M., & Díaz Alayón, C. (1989). *El español de Canarias*. Edición de los autores (Santa Cruz de Tenerife).

Alvar, M. (1972). *Niveles socio-culturales en el habla de las Palmas de Gran Canaria*. Cabildo Insular de Gran Canaria.

Alvar, M. (1975). *Atlas lingüístico y etnográfico de las Islas Canarias*. Cabildo Insular de Gran Canaria.

Boersma, P., & Weenink, D. (2019). *Praat: doing phonetics by computer.* Computer programme, version 6.0.49. http://www.praat.org.

Broś, K. (2013). La aspiración y la pérdida de /s/ en el español de Chile como ejemplo de opacidad. *Onomázein,* 28, 56–71.

Broś, K., & Lipowska, K. (2019). Gran Canarian Spanish non-continuant voicing: gradiency, sex differences and perception. *Phonetica,* 76, 100–125.

Broś, K., Żygis, M., Sikorski, A., & Wołłejko, J. (2021). Phonological contrasts and gradient effects in ongoing lenition in the Spanish of Gran Canaria. *Phonology,* 38(1), 1–40. https://doi.org/10.1017/S0952675721000038

Carvalho, A.M. (2006). Spanish (s) aspiration as a prestige marker on the Uruguayan-Brazilian border. *Spanish in Context,* 3, 85–114.

Cho, T. (2016). Prosodic boundary strengthening in the phonetics-prosody interface. *Language and Linguistics Compass,* 10 (3), 120–141.

Colina, S. (1997). Identity constraints and Spanish resyllabification. *Lingua,* 103, 1–23.

Colina, S. (2002). Interdialectal variation in /s/ aspiration: The role of prosodic structure and output-to-output constraints. In J.F. Lee, K.L. Geeslin, & J.C. Clements (Eds.), *Structure, Meaning and Acquisition in Spanish: Papers from the 4thHispanic Linguistics Symposium* (pp. 230–243). Cascadilla Press.

Dorta Luis, J., & Herrera Santana, J. L. (1993). Experimento sobre la discriminación auditiva de las oclusivas tensas grancanarias. *Estudios de fonética experimental,* 5, 163–188.

Dorta Luis, J. (1997). Datos acústicos y percepción de la /c/ adherente de Canarias y de la prepalatal castellana. In M. Almeida, J., Dorta (Eds.), *Contribuciones al estudio de la lingüística hispánica (Homenaje al profesor Ramón Trujillo)* (pp. 57–72)*.* Montesinos.

Dorta Luis, J. (ed.) (2013). *Estudio comparativo preliminar de la entonación de Canarias, Cuba y Venezuela.* La Página ediciones S/L, Colección Universidad.

Eddington, D. (2011). What are the contextual phonetic variants of /β, ð, ɣ/ in colloquial Spanish? *Probus*, 23, 1–19.

Face, T.L. (2002). Re-examining Spanish 'resyllabification'. In D. Cresti, T. Satterfield, & C. M. Tortora (Eds.), *Current Issues in Romance Languages* (pp. 81–94). John Benjamins Publishing Company.

Gerfen, C. (2002). Andalusian Codas. *Probus*, 14, 247–277.

Goldman, J-P. (2011). EasyAlign: an automatic phonetic alignment tool under Praat. *Proceedings of Interspeech* 2011, 3233–3236.

Harris, J. (1969). *Spanish Phonology*. MIT Press.

Harris, J. (1983). *Syllable Structure and Stress in Spanish*. MIT Press.

Hernández-Campoy, J.M., & Trudgill, P.J. (2002). Functional compensation and southern peninsular Spanish /s/ loss. *Folia Linguistica Historica,* 23, 141–167.

Herrera Santana, J. (1989). Sonorizaciom de oclusivas sordas en Tenerife. In J. Dorta, & J. Herrera (Eds.), *Tres estudios de Fonetica* (pp. 111–121). Universidad de La Laguna.

Herrera Santana, J. (1997). Estudio acústico de /p, t, c, k/ y /b, d, y, g/ en Gran Canaria. In M. Almeida, J., & Dorta (Eds.), *Contribuciones al estudio de la lingüística hispánica (Homenaje al profesor Ramón Trujillo)* (pp. 73–86). Montesinos.

Hualde, J. I. (1987). Delinking processes in Romance. In C. Kirschener & J. DeCesaris (Eds.), *Studies in Romance Linguistics* (pp. 177–193). John Benjamins.

Hualde, J. I. (1989). Silabeo y estructura morfémica en español. *Hispania*, 72, 821–831.

Hualde, J. I., Simonet, M., & Nadeu, M. (2011). Consonant lenition and phonological recategorization. *Laboratory Phonology*, 2 (2), 301–329. https://doi.org/10.1515/labphon.2011.011

Hymes, D. (1967). Models of the Interaction of Language and Social Setting. *Journal of Social Issues,* 23 (2), 8-28.

Kenstowicz, M. (1996). Base-identity and uniform exponence: alternatives to cyclicity. In J. Durand, & B. Laks (Eds.), *Current Trends in Phonology: Models and Methods* (pp. 363–393). European Studies Research Institute and University of Salford.

Labov, W. (1963). The social motivation of language change. *Word*, 19, 273–309.

Labov, W. (1972). The study of language in its social context. In W. Labov (Ed.), *Sociolinguistic Patterns* (pp. 183–259). University of Pennsylvania Press.

Labov, W. (1980). The social origins of sound change. In W. Labov (Ed.), *Locating Language in Time and Space* (pp. 251–65). Academic Press.

Labov, W. (2001). *Principles of linguistic change: Social factors*. Blackwell Publishers, Inc.

Lapesa, R. (1988). *Historia de la lengua española*. Gredos.

Lipski, J. (1996). *El español de América*. Cátedra.

Lipski, J. (1999). The many faces of Spanish /s/-weakening: (Re)aligment and ambisyllabicity. In J. Gutiérrez-Rexach (Ed.), *Advances in Hispanic Linguistics. Papers from the 2nd Hispanic Linguistic Symposium*. Cascadilla Press.

Machuca Ayuso, M. J. (1997). *Las obstruyentes no continuas del español: relación entre las categorías fonéticas y fonológicas en habla espontánea*. [PhD dissertation, Universitat Autònoma de Barcelona].

Madrid Servín, E. A., & Santana Cepero, E. (2009). Variación de las vocales medias en el español hablado en la ciudad de La Habana: evidencia fonético-acústica. *Nueva revista de filología hispánica*, 57(1), 65–87.

Marrero, V. (1986). Fonética estática y fonética dinámica en el habla de las Islas Canarias. [PhD dissertation). Universidad Complutense de Madrid].

Marrero, V. (1990). Estudio acústico de la aspiración en español. *Revista de Filología Española*, 70 (3/4), 345–397.

Martín Gómez, J. A. (2010). Estudio acústico de las variantes de ch en Tenerife en comparación con la alveolopalatal castellana. *Estudios de fonética experimental*, 11, 165–203.

Martínez Celdrán, E. (2009). Sonorización de las oclusivas sordas en una hablante murciana: problemas que plantea. *Estudios de fonética experimental*, 18, 253–271.

Moreno Fernández, F. (1996). Metodología del proyecto para el estudio sociolingüístico del español de España y de América. *Lingüística,* 8, 257–287.

Morera, M. (1990). *Lengua y colonia en Canarias.* 1ª edición*. Ed. Globo.

Morera, M. (Ed.) (1997). *En defensa del habla canaria*. Academia Canaria de la Lengua.

Morera, M. (2007). Unidad y variedad del español de Canarias. *Revista de Filología,* 25, 443–455.

Morris, R. (2000). Constraint interaction in Spanish /s/ aspiration: three peninsular varieties. In E. Herburger, H. Campos, A. Morales Front, & T. J. Walsh (Eds.), *Hispanic Linguistics at the Turn of the Milennium. Papers from the 3rd Hispanic Linguistic Symposium*. Cascadilla Press.

Núñez-Méndez, E. (2022). Variation in Spanish /s/: Overview and New Perspectives. *Languages,* 7, 77. https://doi.org/10.3390/languages7020077.

Oftedal, M. (1985). *Lenition in Celtic and in Insular Spanish*. Universitetsforlaget Oslo.

Penny, R. (2000). *Variation and Change in Spanish*. CUP.

Rogers, B. (2020). The state of Spanish /s/ variation in Concepción, Chile: Linguistic and social trends. *Open Linguistics*, 6 (1), 132-153. https://doi.org/10.1515/opli-2020-0010

Shepherd, M. A. (2003). *Constraint Interactions in Spanish Phonotactics: An Optimality Theory Analysis of Syllable-Level Phenomena in the Spanish Language.* [Unpublished Master's thesis]. California State University.

Strycharczuk, P., & Kohlberger, M. (2016). Resyllabification reconsidered: on the durational properties of word-final /s/ in Spanish. *Laboratory Phonology,* 7, 1–24.

Trujillo, R. (1980). Sonorización de sordas en Canarias. *Anuario Letras*, 18, 247–254.