

## Lo vuoi co[z]ì o co[s]ì? A sociophonetic study on sibilants in the regional Italian of Livorno (Tuscany)

Nadia Nocchi<sup>1</sup>, Lorenzo Filipponio<sup>2</sup>

<sup>1</sup>University of Pisa, <sup>2</sup>University of Zurich

nocchi\_nadia@yahoo.com, filippon@rom.uzh.ch

### Abstract

The aim of the following study is to verify to what extent the voiced variant [z] is increasingly spreading into the north-western Tuscan territories. This variant is typical of northern Italy varieties but it has also been recently found within Florentine speech, whereas a research on the north-western part of Tuscany has not been conducted up to now.

This paper presents therefore the results of a sociophonetic analysis of intervocalic /s/ as it is realised in the regional Italian spoken in Livorno. Moreover, the following research aims to verify if [z] selection is determined according to gender and social class. Preliminary results show that gender seems to be the parameter which mostly influences the phonetic realization of /s/.

### 1. The status of /z/ in Italian

The exact number of Italian consonants has often been discussed: researchers such as [1] and [2] have been debating whether the phonemic inventory of Italian consonants consists of 21, 23 or rather 36 phonemes. This controversy is due to the fact that some phonological contrasts have a low functional load, being geographically and distributionally limited, such as the phonemic opposition between the voiceless sibilant /s/ and its voiced counterpart /z/. This contrast seems to occur only in intervocalic context for Tuscan speakers who realise minimal pairs such as: /'fuso/ ('spindle') vs /'fuzo/ ('melted'), /'kjese/ ('(he) asked') vs /'kjeze/ ('churches').

However, the above minimal pairs appear to be active only in the speech of old Tuscan individuals in intervocalic context, since younger people tend to use only the voiced variant [z]. The research conducted by [3] about the pronunciation of /s/ in central Italy has broadly demonstrated that teenagers in Florence produce [z] more often than Roman teenagers do. The voiced variant is typical of northern regional Italian where the phonemic opposition between /s/ and /z/ is neutralised in intervocalic position ([4], § 211), being [z] the preferred variant which is slowly spreading in the Peninsula: according to [5], p. 77, in fact, [z] can be nowadays ascribed to the pronunciation of 'neutral Italian'. As it results from [3], Florentine speakers realise therefore the variant they consider more similar to the standard. Although the quoted research reports a sociolinguistic survey on Tuscan speech, it focuses only on Florence, while a sociolinguistic research on the phonetic status of /s/ in the north-western part of Tuscany is still lacking. Thus, this pilot study provides a sociophonetic analysis on the pronunciation of /s/ in intervocalic context for two different social groups of Livorno speakers. We intend to investigate whether [z] is being introduced into the north-western Tuscan territories and to what extent this innovation is influenced by sociophonetic factors.

### 2. Research outline

#### 2.1. Data collection and analysis methods

Two groups of 16 speakers (8 males and 8 females, aged 30-35) were selected according to their gender and social category ('working-class', henceforth WC vs 'middle-class', henceforth MC). In particular, social category selection was based on parents' social background and on speakers' social environment. This parameter was measured in terms of: a) kind of high school attended by the speakers, b) sport practiced, c) beach attended during summertime, and d) town borough.

In order to verify whether /s/-variation was influenced by stylistic condition, two different kinds of *corpora* were recorded: a semi-spontaneous *corpus* elicited by the Map Task technique [6], and a read *corpus* created to test whether diaphasic constraints could influence the selection of prestigious variants.

Digital recordings were made using wide-frequency response clip-on microphones onto a Fostex FR2LE recorder with a sampling rate of 22050 Hz and a 16 bits frequency. The instrumental analysis of 1150 phones was carried out using the Praat software (version 4.4.22): the beginning and the end of each occurrence of /s/ in VCV context were selected and the duration of the sibilants was measured on the temporal axis by means of a textgrid file. Sonorisation was analysed manually in terms of presence or absence of the pulses on the waveform: they represent the periodicity of the acoustic signal and are an acoustic correlate of glottal vibration.

Following the advice given in [7], the sibilant is said to be pronounced as voiceless when it occurs:

- (i) in adjectives ending with the suffix *-ése* (with the exception of *francese* and *cortese*) and *-oso* such as *famoso* ('famous', m.s.), *meraviglioso* ('wonderful', m.s.);
- (ii) in simple past, past participle and in the nouns ending in: *-éso*, *-a*, *-i*, *-e* such as *teso*, ('tensed', m.s.) *sorpresa* ('surprise');
- (iii) in some words considered by [4], § 210, as belonging to a native Tuscan pronunciation such as *casa* ('house'), *cosa* ('thing'), *così* ('so'), *riso*, ('rice'), *chiuso*, ('closed', m.s.), *naso*, ('nose'), and *Pisa*.

In this preliminary stage of our research, we selected only a small number of lexical items contained in both speech *corpora*. These are the words depicted within the Map Task; referring to (i): *famosi* ('famous', m.pl.); referring to (ii): *inglese* ('English', s.), *francese* ('French', s., with *-z/-*), *spesa* ('shopping'); referring to (iii): *casa* ('house') *chiuso*, ('closed', m.s.), *Pisa* and *rasoio* ('shaver', in which /z/ is considered alternative to /s/ in many Italian dictionaries). As regards the read *corpus* the following items were added: referring to (i): *meraviglioso* ('wonderful', m.s.), *nervoso* ('nervous', m.s.), *dolosi* ('barbarous', m.pl.), *desiderosi* ('willing', m.pl.);

referring to (ii): *chiusura* ('closure'), *presa* ('catch'), *teso* ('tensed', m.s.), *libanese* ('lebanese' s.); referring to (iii): *cosa* ('thing'), *così* ('so'), *posa* ('exposure'), *raso* ('satin'), *riso* ('rice'), *gelosia* ('jealousy'); finally, we compared the verbs *eseguire* ('execute'; < EX + *seguire*) and *proseguire* ('carry on'; < PRO + *seguire*), since they can give us some hints about the speakers' morpheme boundary perception: the former is attested with [z] pronunciation, probably due to the loss of morpheme boundary perception. The expected outcome of EX + s- should be [ʃ] (compare EX + SOLVĒRE > *sciogliere* 'melt', where <sci> = [ʃ]). On the contrary, *eseguire* ([eze'gwi:re]) shows the same outcome of words like *esame* ([e'za:me] < EXĀME(N), 'examination'), in which intervocalic -x- (> It. /z/) was no more perceived as morpheme boundary even by Latin speakers [4], § 210. In *proseguire*, where the boundary is still perceived, [s] is expected. Thus, the outcome of *proseguire* will allow us to verify whether the spreading of [z] can cross this morpheme boundary (see § 1).

## 2.2. First sight results: the spectrographic analysis

At the very beginning of our research we expected to find only two allophonic variants for the phoneme /s/, i.e. a voiceless variant [s] and its voiced counterpart [z]. However, during the analysis we identified another allophone which was perceptually very similar to [z], although it did not show either pulses nor voicing bar (compare Figures 1 to 3). For this reason, we decided to classify this variant as a *lenis* [z̥].

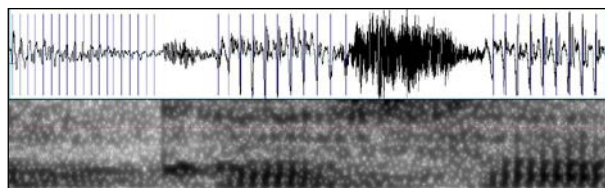


Figure 1: Waveform and spectrogram of the word *cosa* ('thing') realized with the voiceless allophone [s].

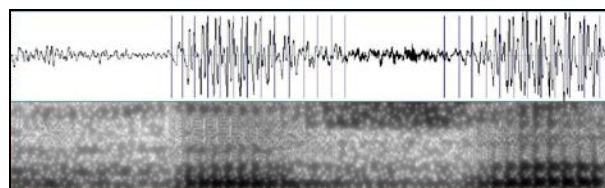


Figure 2: Waveform and spectrogram of the word *cosa* ('thing') realized with the lenis allophone [z̥].

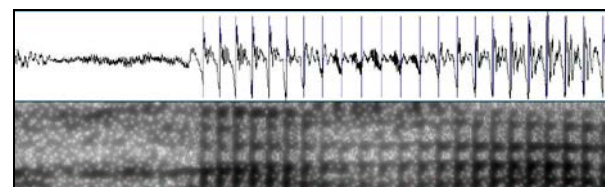


Figure 3: Waveform and spectrogram of the word *cosa* ('thing') realized with the voiced allophone [z].

Lenition is indeed traditionally defined as a weakening process of a consonantal sound involving a reduction of articulatory energy which usually affects either the manner of articulation and/or the glottal state, along the dimensions of 'opening' and 'sonorisation' [8]. The dichotomy *fortis* vs. *lenis* refers to an

opposition between obstruents relying both on the laryngeal mechanism and on different degrees of 'articulatory strength' (i.e. duration and energy). This opposition has been reinterpreted with the phonological feature [±tense] by [9].

We therefore decided to classify our speech material according to these three phonetic variants: [s], [z̥], and [z].

At this point of our analysis, we consider the *lenis* variant together with the voiced variant as representing a divergence respect to /s/ which is the expected pronunciation. As it is evident from the spectrogram in Figure 2, this phone is realised with lack of sonority but with a scant degree of constriction which makes it seem more similar to [z] than [s]. Both phonetic and perceptual investigation will be required to better classify this variant.

## 2.3. Map Task results

### 2.3.1. Class parameter

The following histograms (Figures 4 to 12) represent the realisation percentages of the three allophones: the red columns are for [s], the grey ones for [z̥], and the black columns for [z].

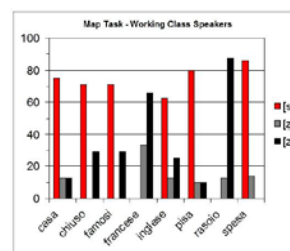


Figure 4: Realisation percentage of the three allophones by WC speakers.

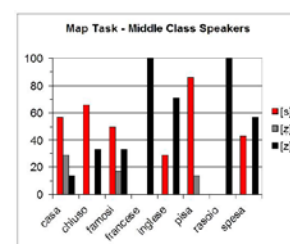


Figure 5: Realisation percentage of the three allophones by MC speakers.

From the comparison of Figures 4-5 we can observe that the voiceless variant appears to be the most used for the WC speakers, as it is shown by the words *casa*, *chiuso*, and *famosi*, where [s] shows an overall percentage of 75%, which decrease to about 50-60% in the MC speakers. These pronunciation differences are clearly stronger in the words *spesa* and *inglese* (60-80% of [s] for the WC speakers against 30-40% for the MC speakers), which represent both the best items to portray the tendency towards voiceless pronunciation typical of WC speakers, and the sonorisation tendency of MC speakers. In this picture the word *Pisa* seems to be the only item which shows a certain resistance of [s] variant in both social classes. Similar results for both classes were found in the words *rasoio* (see above § 2.1) and *francese*, where the voiced variant and the phoneme /z/ overlap as expected.

### 2.3.2. Gender parameter

The gender parameter allows us to get a clearer picture of the phenomenon investigated, since it appears to be quite relevant in the selection of the /s/ allophone.

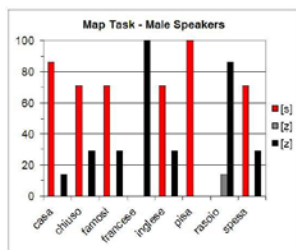


Figure 6: Realisation percentage of the three allophones by male speakers (Map Task).

As we can observe from Figures 6-7, male speakers show indeed a strong and uniform tendency towards the voiceless sibilant [s] which is the preferred variant in the whole word set with values between 70% and 85%; notice that *Pisa* shows only voiceless variant realisation, whereas *francese* and *rasoio* are realised with [z] as expected (see §§ 2.1, 2.3.1).

By isolating the WC male productions, we get a further striking outline as it is shown in Figure 7.

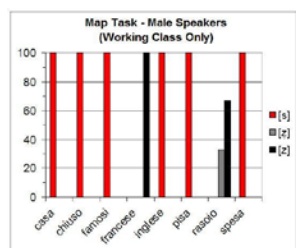


Figure 7: Realisation percentage of the three allophones by WC male speakers (Map Task).

WC male speakers appear to identify themselves through [s], and let us attribute a sociolinguistic mark to this allophone which can be described with the features [-prestige +overt]. This allophone represents a social marker of this category and can be therefore considered as the sociophonetic counterpart of [z], which is identified as a *prestige* label expected (see above § 1). It would be interesting to verify through further perceptual tests whether WC male speakers identify themselves with [s] and are able to perceive the difference between [z] and [z̥].

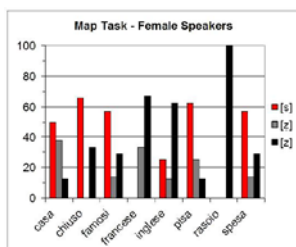


Figure 8: Realisation percentage of the three allophones by female speakers (Map Task).

Finally, Map Task results provide further evidence for socio-indexical features in speech production, since data show a gendered production of /s/ which is not dependent on anatomical differences but expresses rather a social identity. Female speakers tend, on the contrary, to show higher

percentage of sonorisation for all the words included in the Map Task without doing any peculiar distinction. Women ratings of [s] tend to decrease between 65% and 50% and they drastically collapse in the phonetic outcomes of *inglese*, which presents only a 25% rating of [s] occurrences (see Figure 8).

### 2.4. Read corpus results

Data will be presented according to class parameter first, and then the gender parameter will be examined.

#### 2.4.1. Class parameter

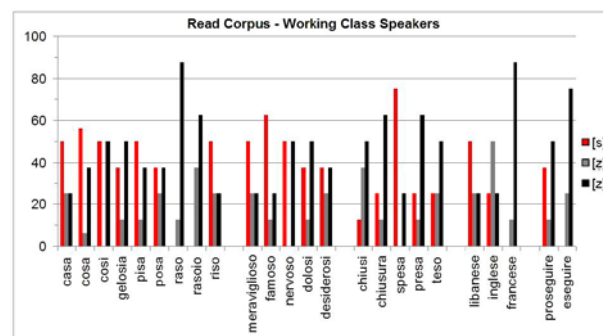


Figure 9: Realisation percentage of the three allophones by WC speakers (read speech).

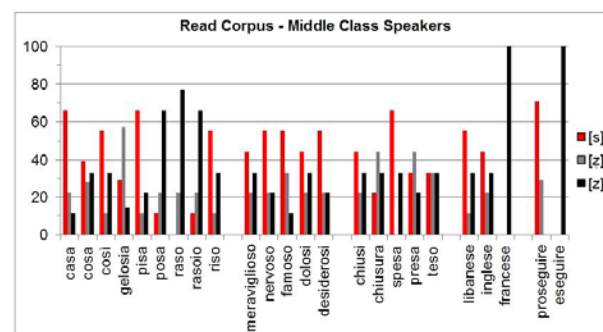


Figure 10: Realisation percentage of the three allophones by MC speakers (read speech).

Figures 9 and 10 show similar tendencies both for MC and WC, since the greater part of the items shows a voiceless realisation of the sibilant in 45-55% of the items. There are even cases of higher percentages of voiceless realisation by MC speakers (e.g. *casa*, *Pisa*, *desiderosi*, *chiusi*, *prosequire*), which are in countertendency to the Map task results (see § 2.3.1).

#### 2.4.2. Gender parameter

As stated by [10], women tend to use prestige variables more often than men do. Read *corpus* results provided clear evidence in support of this tendency, since they show higher percentage of sonorisation identified as [z] or [z̥] for the whole words set.

From a very quick observation, it is remarkable how Figures 11 and 12 differ one from another: the voiceless allophone preferred by male speakers, whereas women prefer the voiced allophone. However, it has to be noticed that *lenis* [z̥] plays also an important role for female speakers (see Figure 11): percentages of this allophone increases abruptly in the read speech when compared to the Map Task data (Figures 4 to 8). This is probably due to speech style which leads the reader towards variants he considers more similar to the standard and

more socially prestigious. Thus, we assist to the raising of a new phonetic variant characterised by the sociolinguistic values [+prestige, –overt] that may correspond to an unconscious speaker’s will to realise a more standard form.

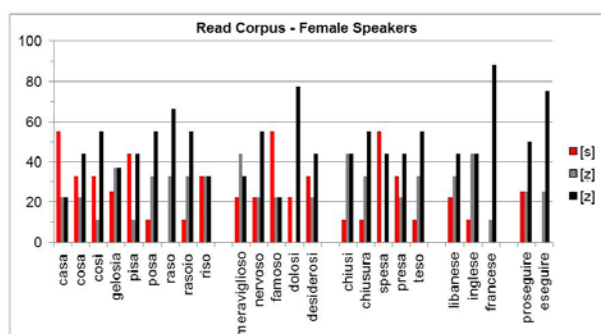


Figure 11: Realisation percentage of the three allophones by female speakers (read corpus).

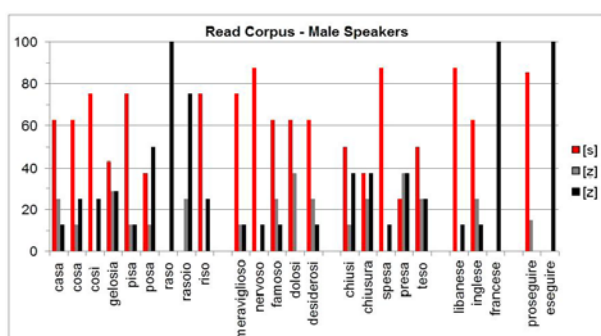


Figure 12: Realisation percentage of the three allophones by male speakers (read corpus).

These results seem to confirm one of the principles summarised by [11], p. 205, that “[i]n change from above women favour the incoming prestige forms more than men”. Sonorisation of /s/ is definitely a typical label of female speakers who sonorise /s/ even in words like *proseguire* (‘to continue’), where the morphological boundary should have blocked the lenition process (see above § 2.1).

### 3. Conclusions

This research has provided a sociophonetic survey on /s/ in VCV position in the regional Italian of Livorno. Three allophones have been identified during our spectrographic analysis. Every phonetic variant has its sociolinguistic weight which can be represented as follows:

[s]	– prestige	+ overt
[z]	+ prestige	– overt
[z̥]	+ prestige	+ overt

The *lenis* variant [z̥] could represent a phonetic merging between /s/ and /z/ in VCV position with specific sociolinguistic features: it is a style-constrained variant, since it is mostly found in read speech but at the same time it shows to be gender-conditioned, being more often produced by women. Female speakers seem to be therefore more sensitive to the *prestige* factor, since they tend to produce variants which are closer to the standard and characterised by the features [+prestige, +/–overt, –stigmatised], confirming that they are generally more status conscious than men. This implies their greater awareness of the social significance of linguistic variables and could be a sort of catalyzer for the merging of [z̥] which is produced with a reduced degree of

articulatory constraint and may be therefore considered very similar to the voiced variant [z] (see § 2.2). However, we are aware that it would be necessary to conduct a perceptual experiment in support of our hypothesis. On the other hand, male speakers identify themselves with the voiceless allophone [s] hindering the incoming prestige forms and preferring the standard ones (see also Figure 7). Gender is the relevant parameter for the selection of the phonetic variants which show to be less sensitive to class factor.

In conclusion, this pilot study confirms that the sonorisation of /s/ is spreading down the Peninsula ([3], [5]) and supports the importance of a sociophonetic analysis of this feature. However, further investigations have to be conducted in terms of: a) speaker’s number, b) statistical and perceptual tests and c) acoustically analysis on [z̥].

### 4. Acknowledgements

We would like to thank all the speakers who took part in the corpora recording and the PAZ of the University of Zurich for lending us the recording tool. This paper has been written jointly by the two authors. For academic purposes, NN bears responsibility for §§ 1, 2.1, 2.2, 3, LF for §§ 2.3, 2.4.

### 5. References

- [1] Hall R.A. Jr. 1944. Italian phonemes and orthography. *Italica* 21. 72-82.
- [2] Calamai S. 2008. *L’italiano: suoni e forme*. Roma: Carocci.
- [3] Galli de’ Paratesi N. 1984. *Lingua toscana in bocca ambrosiana. Tendenze verso l’italiano standard: un’inchiesta sociolinguistica*. Bologna: Il Mulino.
- [4] Rohlfs G. 1966-9. *Grammatica storica della lingua italiana e dei suoi dialetti*. Torino: Einaudi.
- [5] Canepari L. and B. Giovannelli. 2010<sup>3</sup>. *La buona pronuncia italiana del terzo millennio*. Roma: Aracne.
- [6] Brown G., A. Anderson, G. Yule and R. Shillcock. 1984. *Teaching talk*. Cambridge: CUP.
- [7] Migliorini B., C. Tagliavini and P. Fiorelli. 1981. *Dizionario d’Ortografia e di Pronuncia*. Torino: RAI.
- [8] Jakobson R. and M. Halle. 1962. Tenseness and laxness. In Abercrombie D. et al. (eds.). *In honour of Daniel Jones*. London: Longmans. 96-101.
- [9] Lass R. 1984. *Phonology. An introduction to basic concepts*. Cambridge: CUP.
- [10] Trudgill P. 1972. Sex, covert prestige and linguistic change in the Urban British English of Norwich. *Language in Society* 1. 175-195.
- [11] Labov W. 1990. The intersection of sex and social class in the course of linguistic change. *Language Variation and Change* 2. 205-254.