

The acquisition of the English /s-z/ voice contrast by learners of three L1s



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Introduction

We investigate the acquisition of the /s/ - /z/ contrast in L2 English by French L1 (FR), Northern Italian L1 (NI) and American Spanish L1 (AS) learners. Given the status of [s] and [z] in their L1s, and based on predictions of current L2 phonology acquisition models^{1,2}, we expect that the three groups will show different voicing patterns for these sounds.

- In **FR**, /s/ and /z/ are both phonemes
→ *casse* /kas/ - *case* /kaz/
- In **NI**, [s] and [z] are obligatory allophones
→ [z] before voiced sounds
→ [s] in front of voiceless consonants³
yet voicing contributes to oppose minimal pairs such as *casa* /'kasa/ ['kaza] - *cassa* /'kas:a/ ['kas:a] where the primary feature is length.
- In **AS** only /s/ exists, but partial [s̥] or total voicing [z] can happen in various contexts due to non-obligatory voice assimilation with the following consonant⁴.

We expect that:

- FR** and **NI** learners will exhibit no difficulties in producing distinct realizations for /s/ and /z/.
- AS** learners will exhibit difficulties in producing distinct realizations for this contrast.

Additionally, based on the Markedness Differential Hypothesis², we also expect that:

- AS** learners will have difficulties producing /z/ rather than /s/.
→ /z/ is universally and cross-linguistically more marked
- AS** and **NI** learners will show difficulties with /z/ word-finally (more marked than word-initially, and non-existent in NI).

Methodology

We analysed productions by 40 instructed learners from the **Interphonology of Contemporary English** corpus (IPCE) of L2 English.

L1	Count	Age avg	sd
FR	12F, 3M	24	6.59
NI	11F, 4M	22.5	2.38
AS (Chile, Colombia, Peru)	3F, 7M	30.2	6.98

Read-aloud task (506 words)

Extraction of periodic signal (voicing) and duration of all occurrences of /s-z/.

→ Except for cases of inflectional /s-z/ (see our **other poster**):

- Plural
- 3rd person singular
- Genitive 's
- Clitic forms of *is* or *has*

Results

Linear mixed effect model analyses showed significant interactions between variables **PHONEME** and **L1 GROUP** in terms of **periodicity** (Figure 1) and **duration** (Figure 2):

FR and NI speakers produce differences in periodicity between /s/ and /z/, whereas AS learners do not.

Furthermore, by-item analyses showed differences in periodicity associated to the spelling of words (Figure 3):

There might be an effect of orthography on voicing: sounds graphically represented with <c> and <ss> tend to be voiceless whereas sounds represented with <s> or <z> tend to be more voiced, regardless of their target L1 voicing patterns.

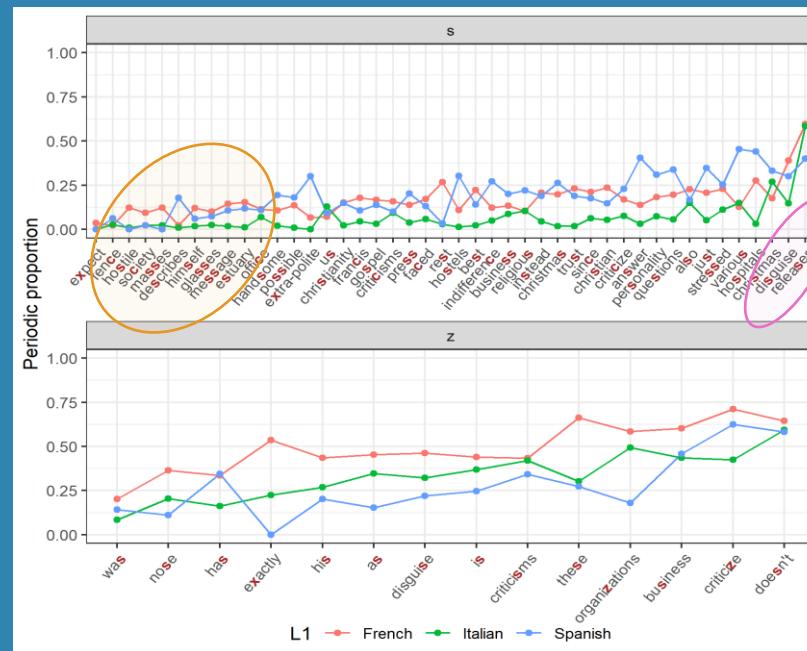


Figure 3. By-item proportions of periodicity for realisations of /s/ and /z/.

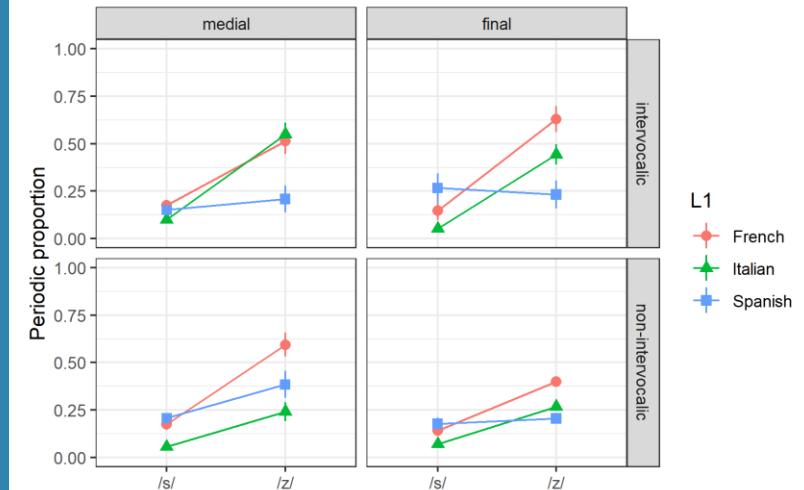


Figure 1. Average periodic proportion for realisations of /s/ and /z/.

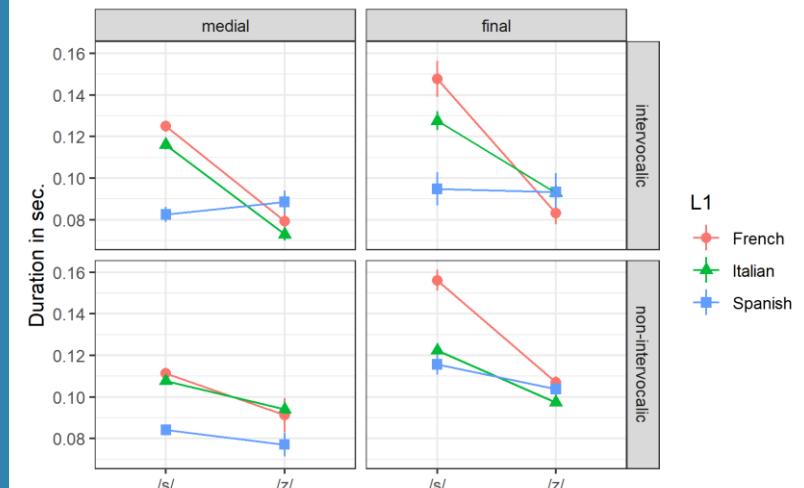


Figure 2. Average duration for realisations of /s/ and /z/.

Conclusions

Non-inflectional medial and final /s-z/ are produced differently in terms of duration and periodicity by learners of all three different L1s.

The spelling associated to /s-z/ might have an effect on voicing, regardless of learners' L1.

For more on this topic:

Mairano, P., Contreras-Roa, L., Capliez, M. & Bouzon, C. (forthcoming). "The /s/~z/ voice contrast in L1 French, L1 Spanish and L1 Italian learners of L2 English". *Language, Interaction and Acquisition*.

References

- Best, C. T., & Tyler, M. D. (2007). Nonnative and second-language speech perception: Commonalities and complementarities. In M. Munro, & O.-S. Bohn (Eds.), *Second language speech learning* (pp.13–34). Amsterdam, The Netherlands: John Benjamins.
- Eckman, F. R. (2008). Typological markedness and second language phonology. In H. C. Hansen Edwards, M.L. Zampini (Eds.) *Phonology and second language acquisition* (pp. 95–115). Amsterdam: John Benjamins.
- Bertinetto, P. M., & Loporcaro, M. (2005). The sound pattern of Standard Italian, as compared with the varieties spoken in Florence, Milan and Rome. *Journal of the International Phonetic Association*, 35(2), 131-151.
- Hualde, J. I. (2005). *The sounds of Spanish with audio CD*. Cambridge University Press.