

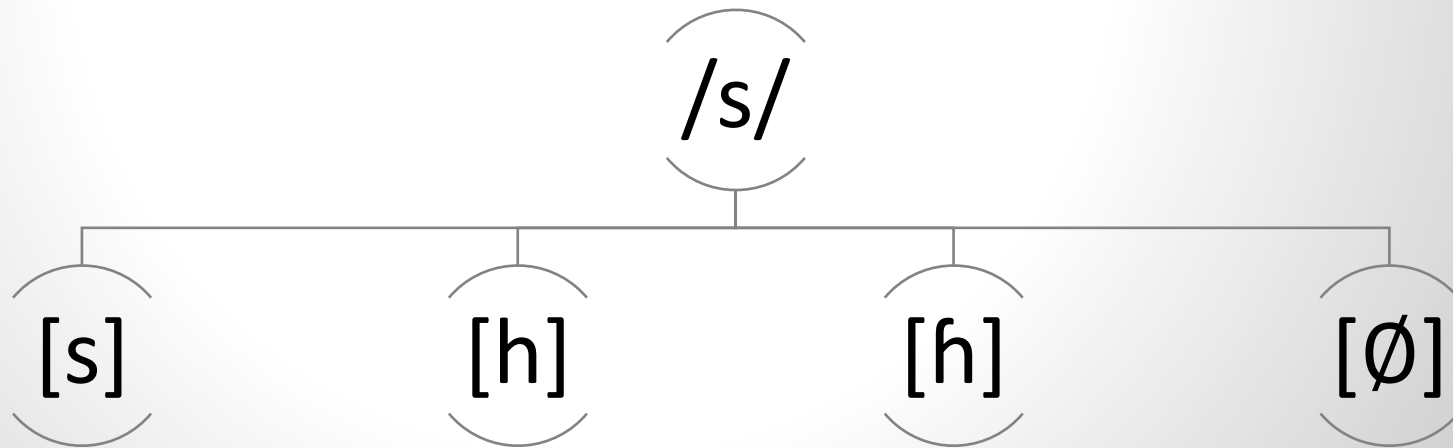
Perception of word-final aspirated /s/ - a cross-dialectal and cross-linguistic study

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About the Spanish /s/

- the most frequent consonant in Spanish
- frequent in word-final position (grammatical function)
- undergoes weakening in the majority of dialects



Geographical distribution (Hualde 2005)

Spain

- Andalusia
- the Canary Islands
- Extremadura
- the Region of Murcia

Latin America

- Almost everywhere in the region with few exceptions such as:
 - the mountainous area of the Central Mexico
 - Guatemala
 - Central Costa Rica
 - the Andes region

Disambiguating function of the /s/

- Singular vs. plural

- *Lo hago para mi[h] padre[h].*

‘I am doing this for my parents’

- Use of the "tú" form vs. "usted" form

- *¿Cómo está[h]?*

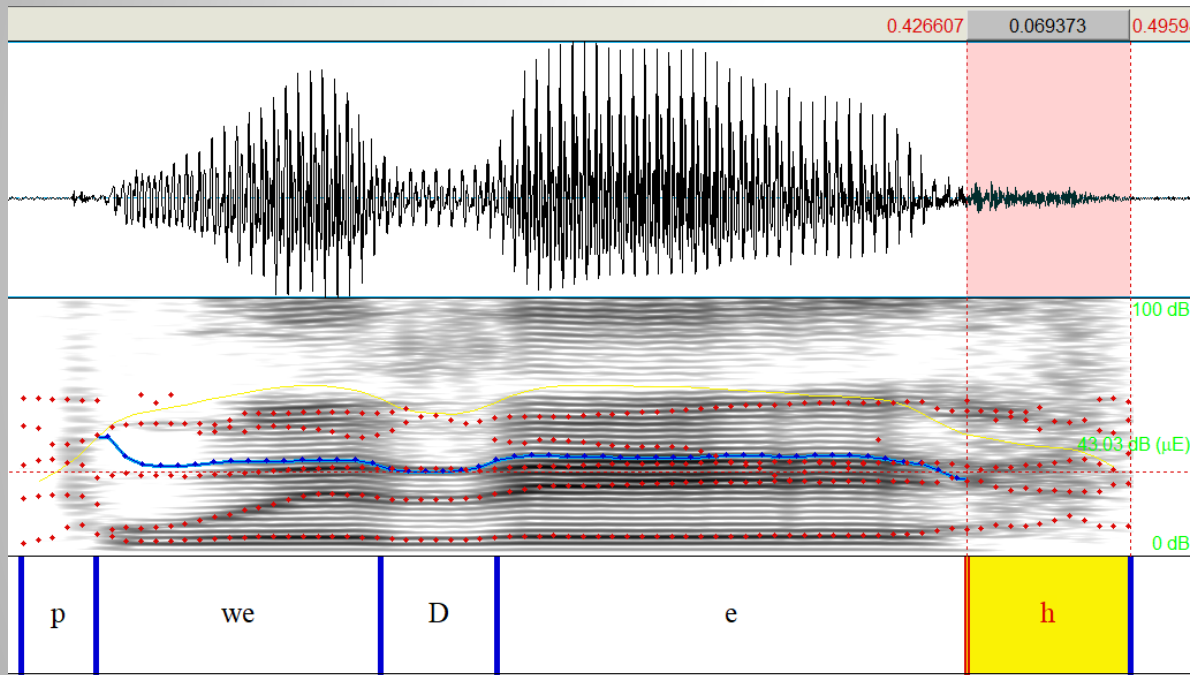
‘How are you?’

- Proper nouns

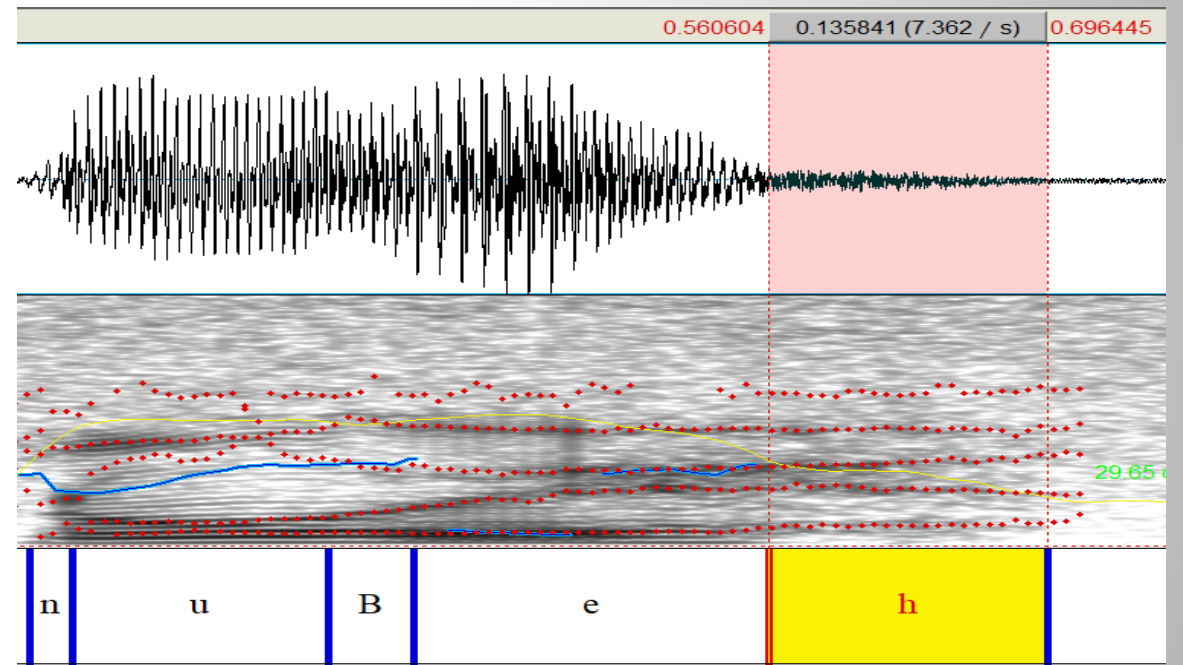
- *Soy de La[h] Palma[h].*

‘I’m from Las Palmas’

The length of word-final aspirated /s/ may vary



puedes 'you can'), aprox. 69 ms



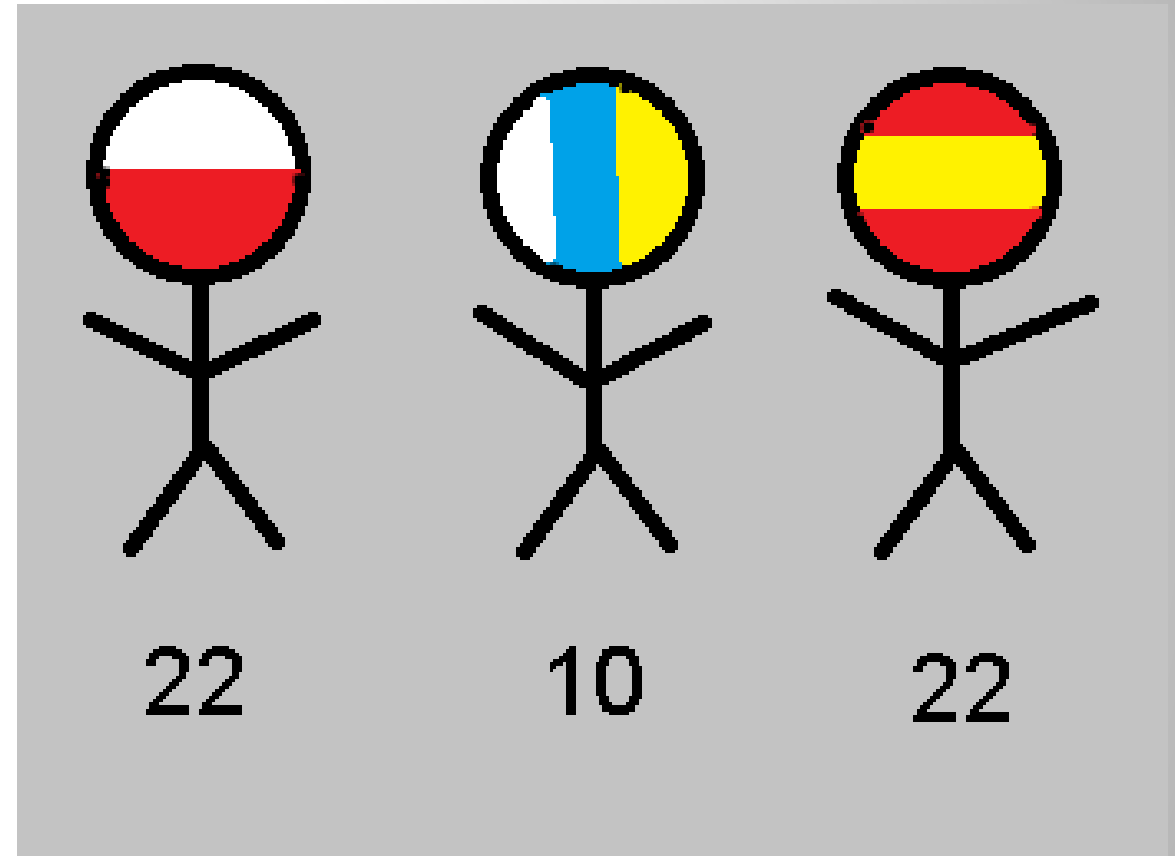
nubes 'clouds'), aprox. 136 ms

Research questions

- What is the minimal duration necessary to perceive word-final aspirated /s/ as a marker of plurality in Spanish?
- How does the native dialect/language of the listener influence word-final aspirated /s/ perception?
- What other factors influence the perception of word-final aspirated /s/?

Participants

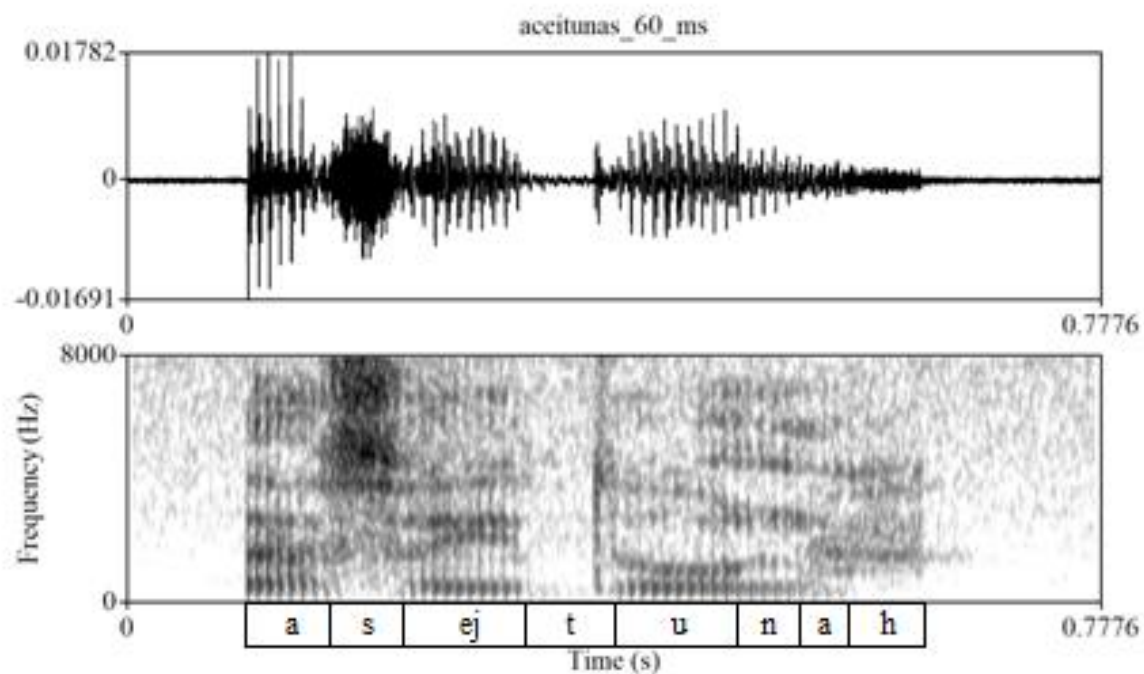
- 54 participants with different native dialect/language divided into three groups:
- Poles:
 - 4 males and 18 females
 - proficiency in Spanish: C1-C2 (self-assessment)
- Peninsular Spaniards:
 - 11 males, 11 females
- Canary Islands Spaniards:
 - 6 males and 4 females



Stimuli

- 8 naturally pronounced words extracted from sentences produced by two native speakers of Canary Islands Spanish
- 4 words per speaker:
 - F: *aceitunas* 'olives', *notas* 'grades', *perros* 'dogs', *zapatos* 'shoes'
 - M: *aceitunas* 'olives', *notas* 'grades', *chocolates* 'chocolates', *postres* 'desserts'
- Each word appears as a continuum (8 variants).
 - Duration of aspiration range: from 105 ms to 0 ms (15 ms intervals)

Procedure



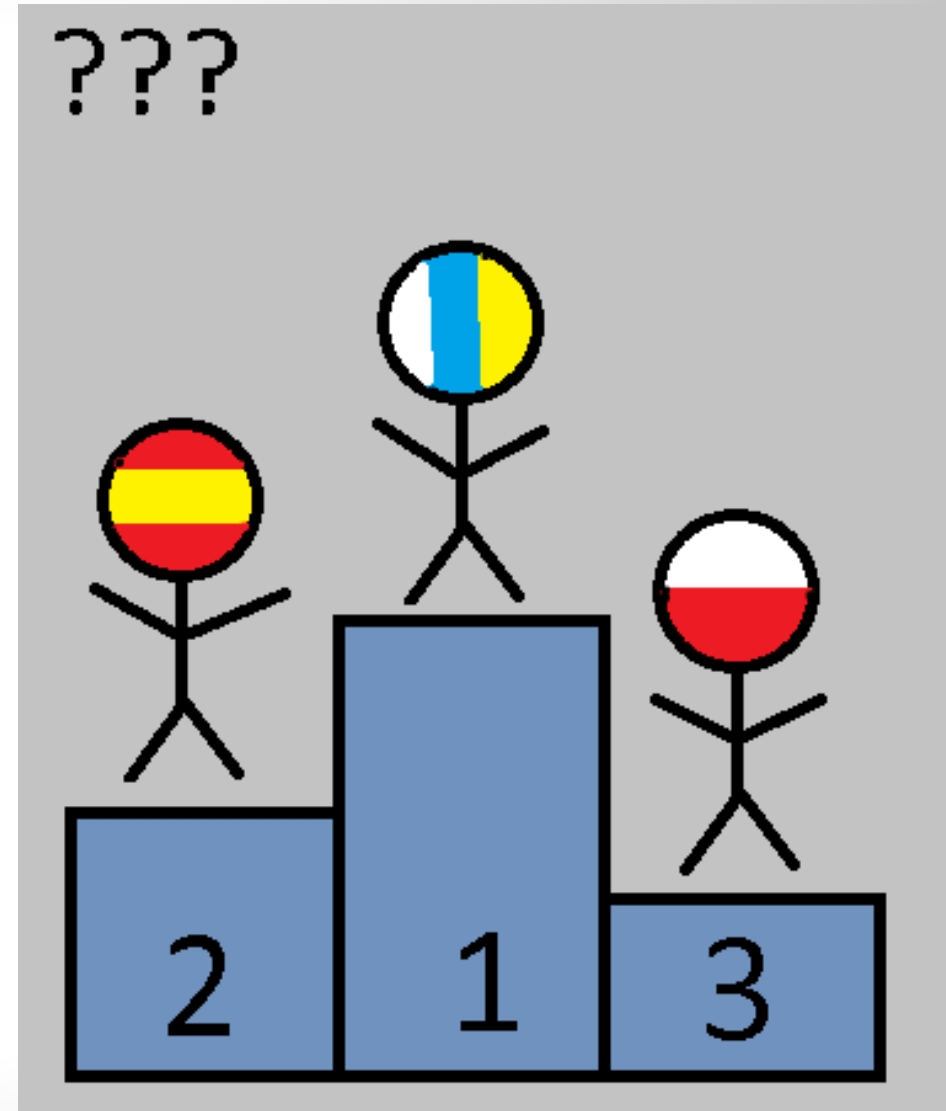
SINGULAR
or PLURAL?

320 randomly presented stimuli in two blocks

Hypothesis

The more exposure to the investigated sound, the better its perception.

Therefore, we expected Canary Islands Spaniards to perform best in our experiment, followed by Peninsular Spaniards and then Poles.



Results

- aspirated /s/ best perceived by Canary Islands Spaniards
- the rest of the Spaniards similar to the Poles
- Peninsular S. ($z = -4.706$, $p < 0.001$) and Poles ($z = -5.545$, $p < 0.001$) are significantly different from Canary Islands listeners in their plurality decisions
- The perception threshold was between 30 and 45 ms for all the three groups.

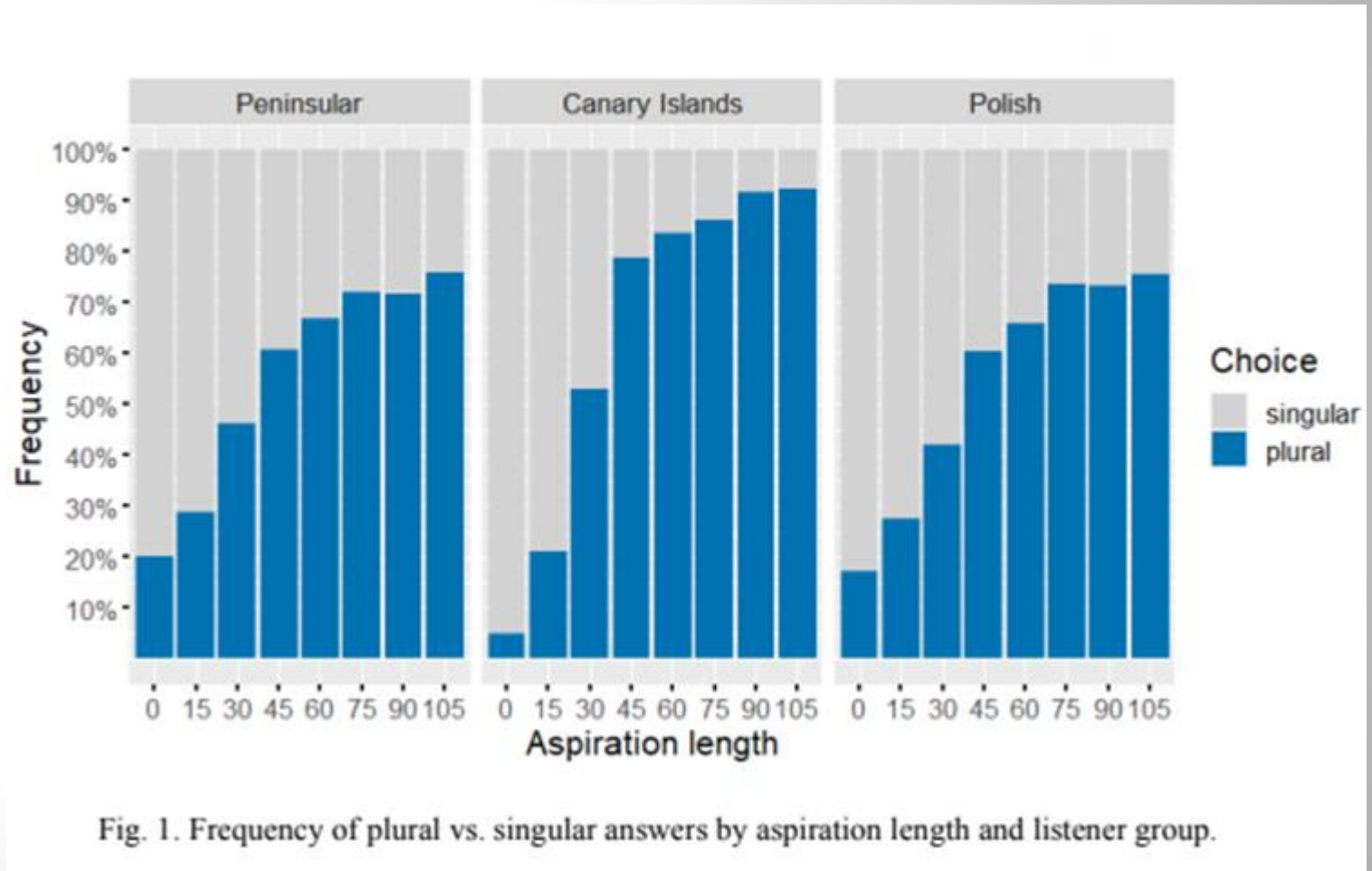


Fig. 1. Frequency of plural vs. singular answers by aspiration length and listener group.

Speaker's gender

The aspirated /s/ was better perceived as a plural marker when pronounced by the female speaker ($z = -13.298$, $p < 0.001$ for male vs. female)

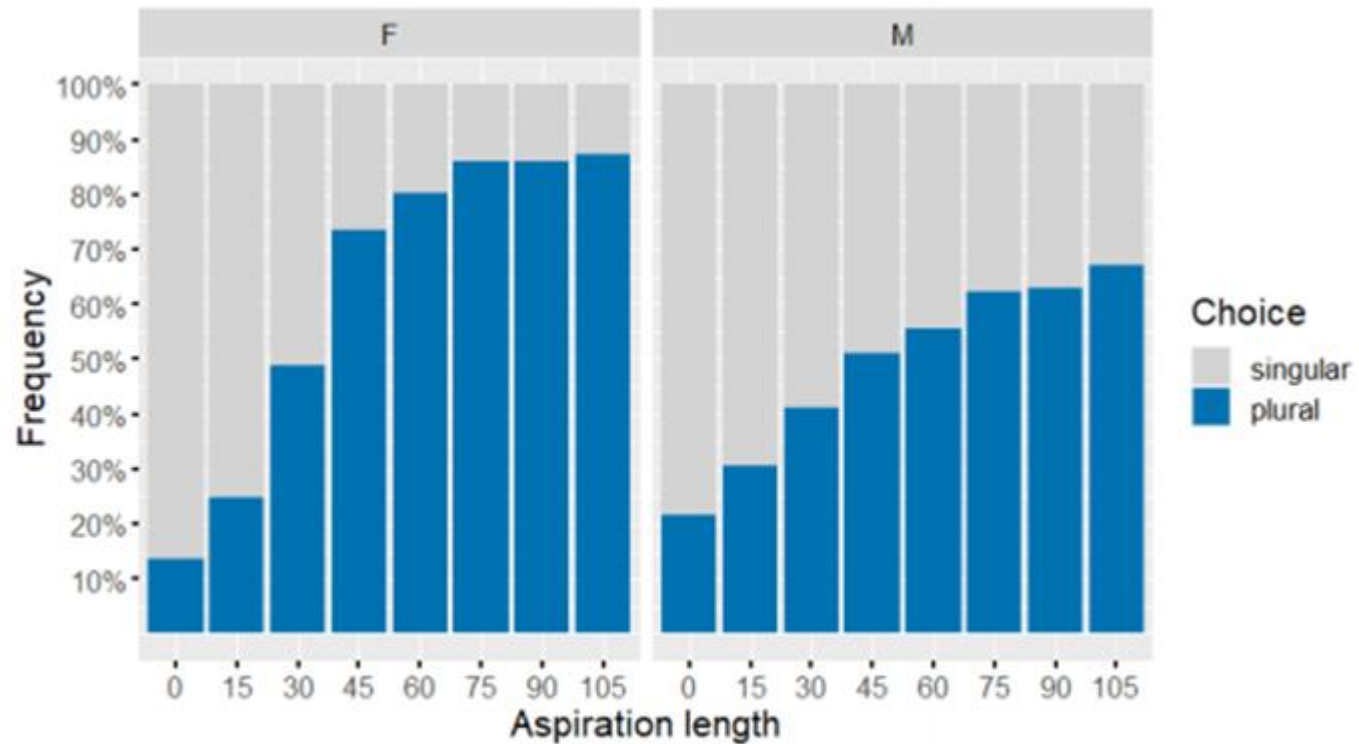


Fig. 2. Frequency of plural vs. singular answers by aspiration length and speaker.

Speaker's gender

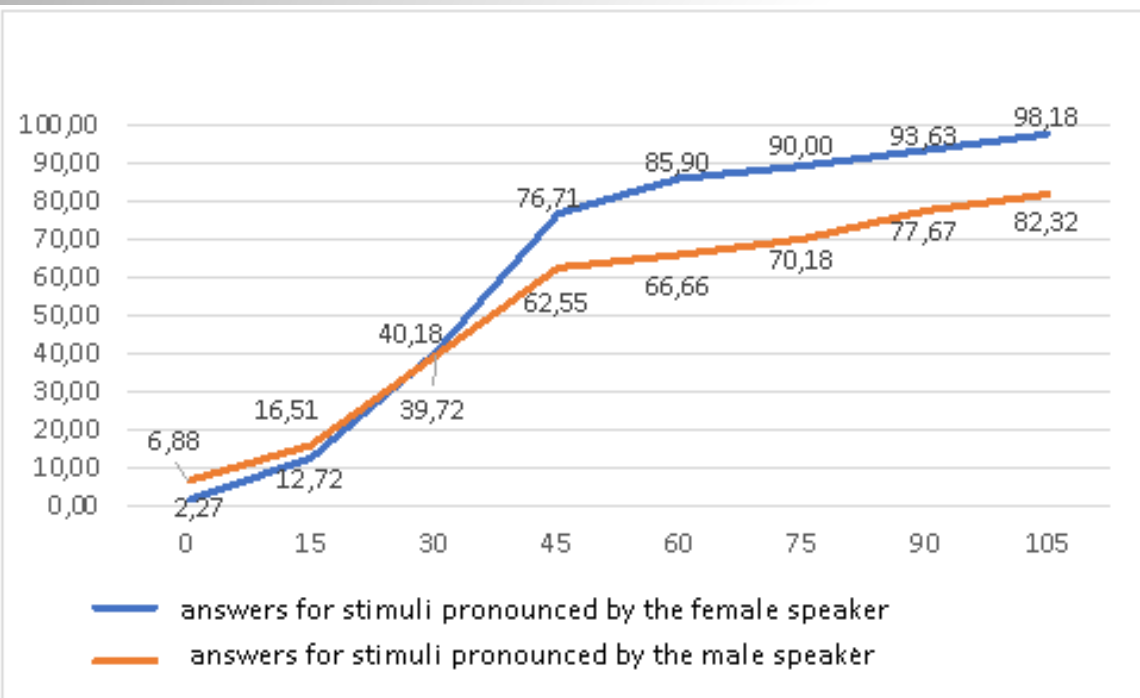


Fig. 3. Frequency of plural vs. singular by aspiration length and speaker in the Canary group

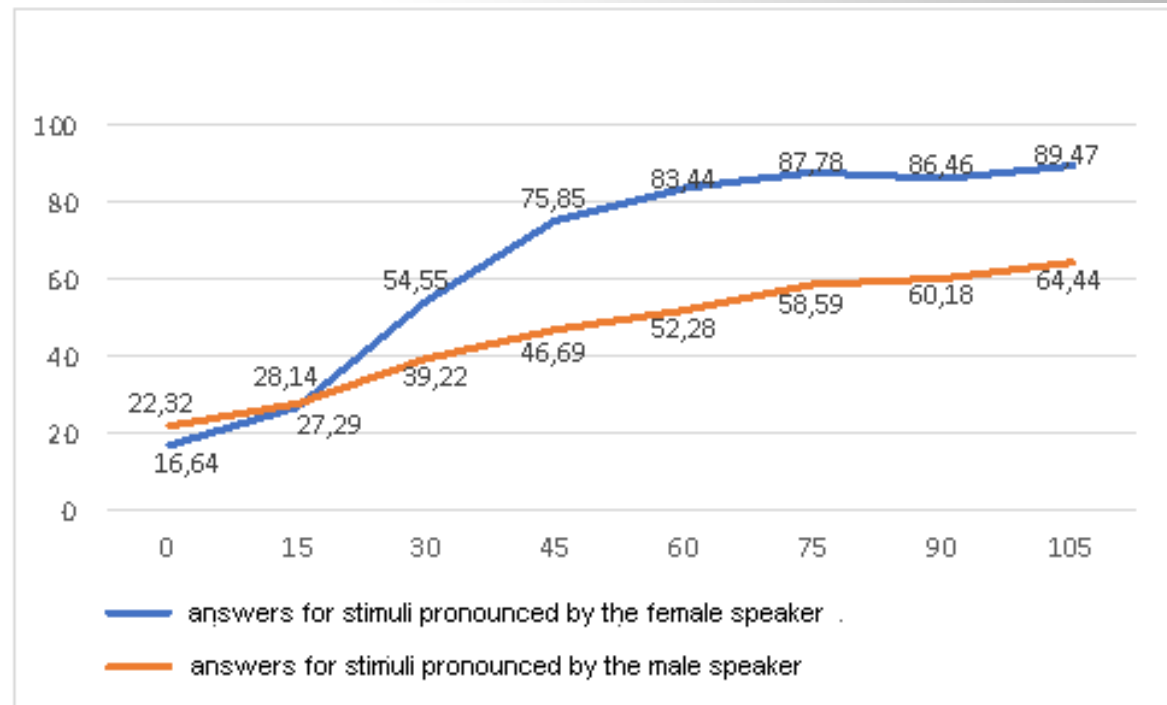


Fig. 4. Frequency of plural vs. singular by aspiration length and speaker in the Peninsular Spanish group

Vowel quality

Significant effect of the vowel [o] as opposed to [a] ($z = -5.698$, $p < 0.001$) no effect of [e]

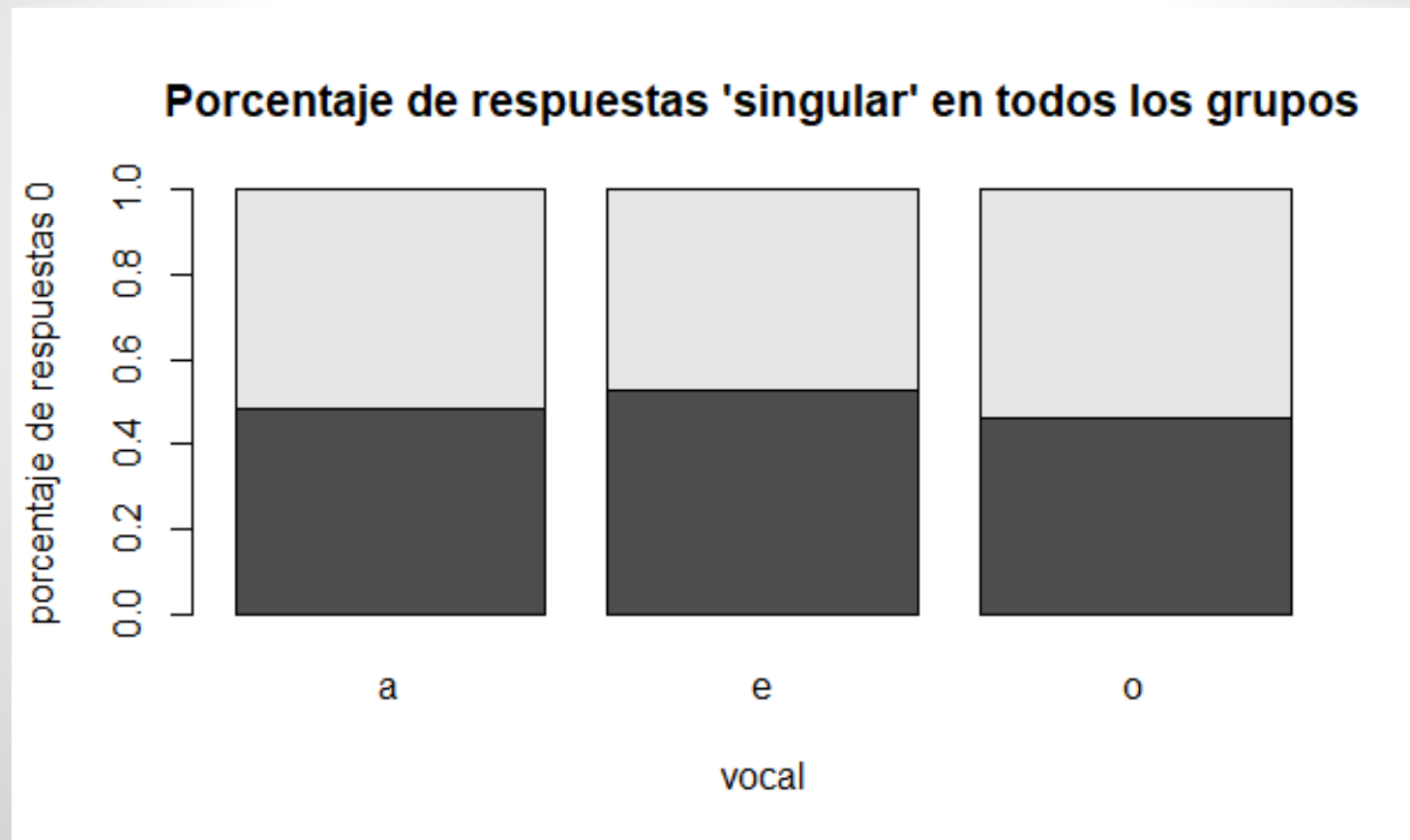


Fig 3. Frequency of singular vs. plural by vowel in all the groups

Reaction time

- reaction times - no statistical differences between groups
- the longest time to decision in stimuli with 0-30 ms of aspiration, and the shortest between 90 and 105 ms.
- plural decisions required less time ($t = -1.986$, $p < 0.05$)
- male speaker's pronunciations required more time (tendency, $t = 1.882$, $p = 0.063$)
- Canary Islands speakers: peak at 45 ms not 30 ms

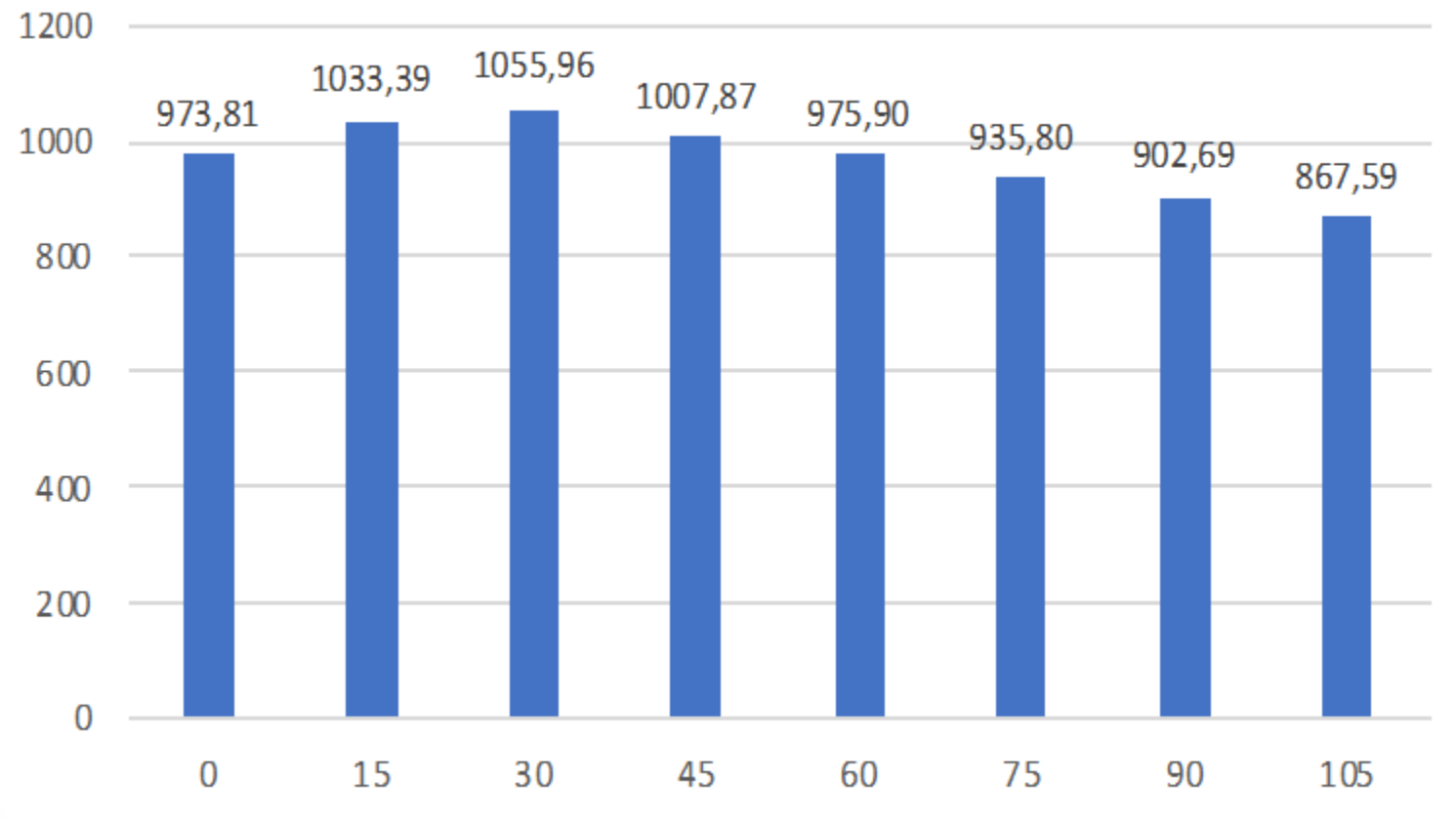


Fig 4. Reaction times of all the groups by aspiration length (in ms)

References

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- González Montero, J. A. (1993). “La aspiración: fenómeno expansivo en español. Su importancia en andaluz. Nuevos casos.” en: *Revista Internacional de Filología, Comunicación y sus Didácticas*. Editorial Universidad de Sevilla: Sevilla.
- Hualde, J. I. (2005). *The Sounds of Spanish*. Cambridge University Press: Nueva York.
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- Lipski, J. (1984). “On the Weakening of /s/ in Latin American Spanish.” en: *Zeitschrift für Dialektologie und Linguistik*, 51:1, Franz Steiner Verlag: Stuttgart.

Thank you for your attention!

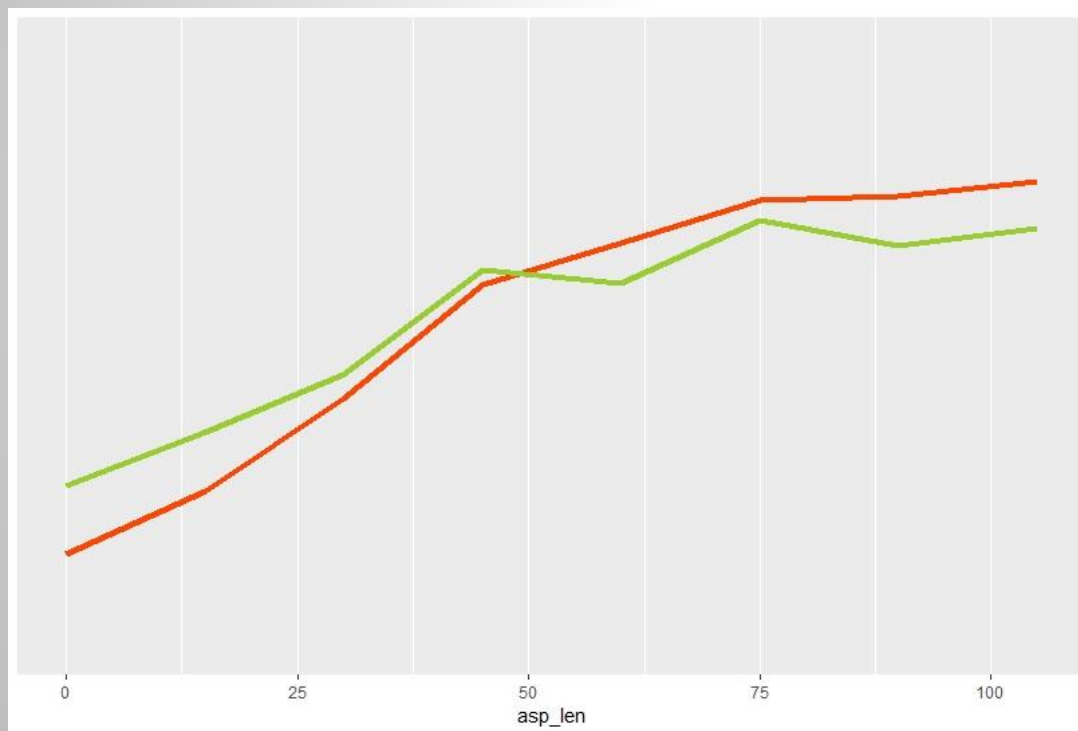
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Technical details

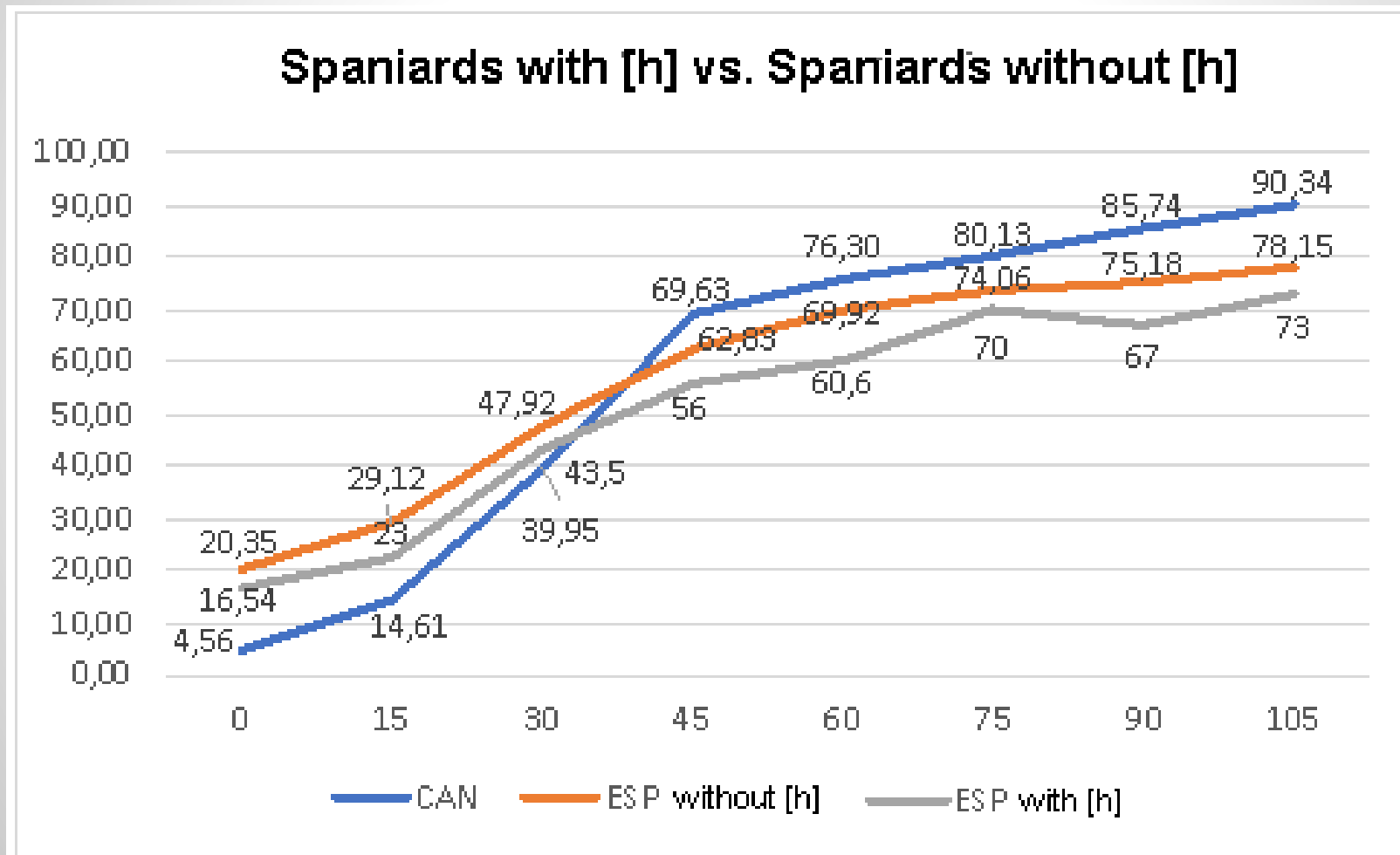
- Laptop: Dell Inspiron 7537
 - CPU: Intel CORE i5-4210U, 1.7 GHz
 - RAM: 8 GB
 - Sound card: Realtek High Definition Audio
- Headphones: Sanako Tanberg Educational SLH-07
- The same volume for all participants throughout the experiment

Poles who lived in a Spanish-speaking country



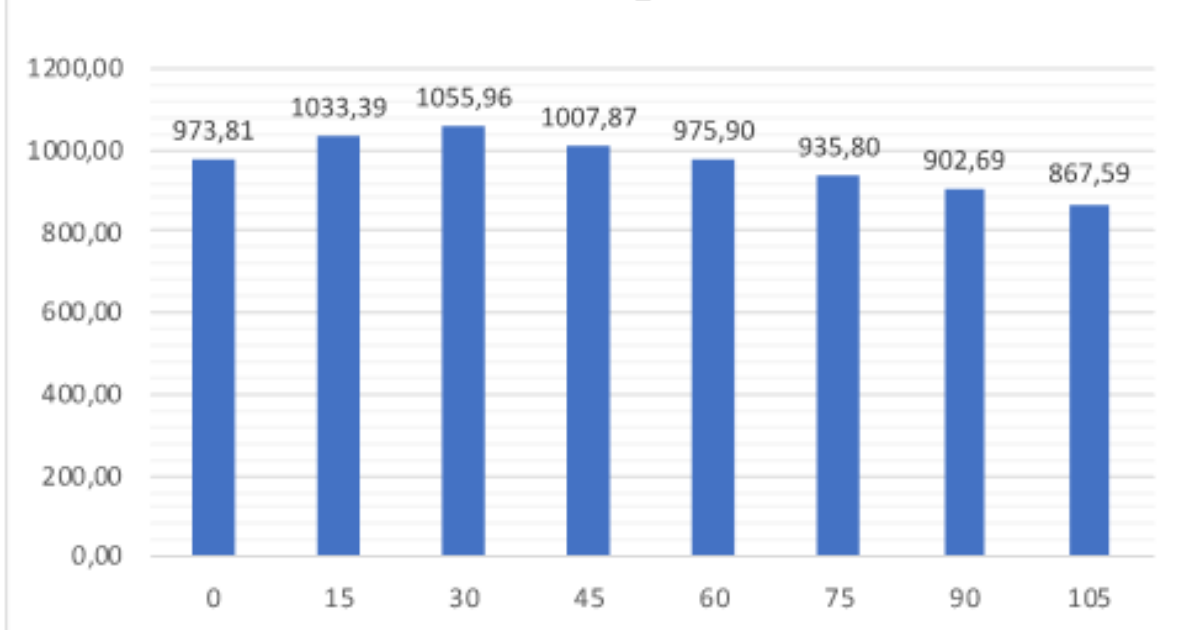
- Red line: abroad
- Green line: not abroad

Spaniards with [h] vs. Spaniards without [h]

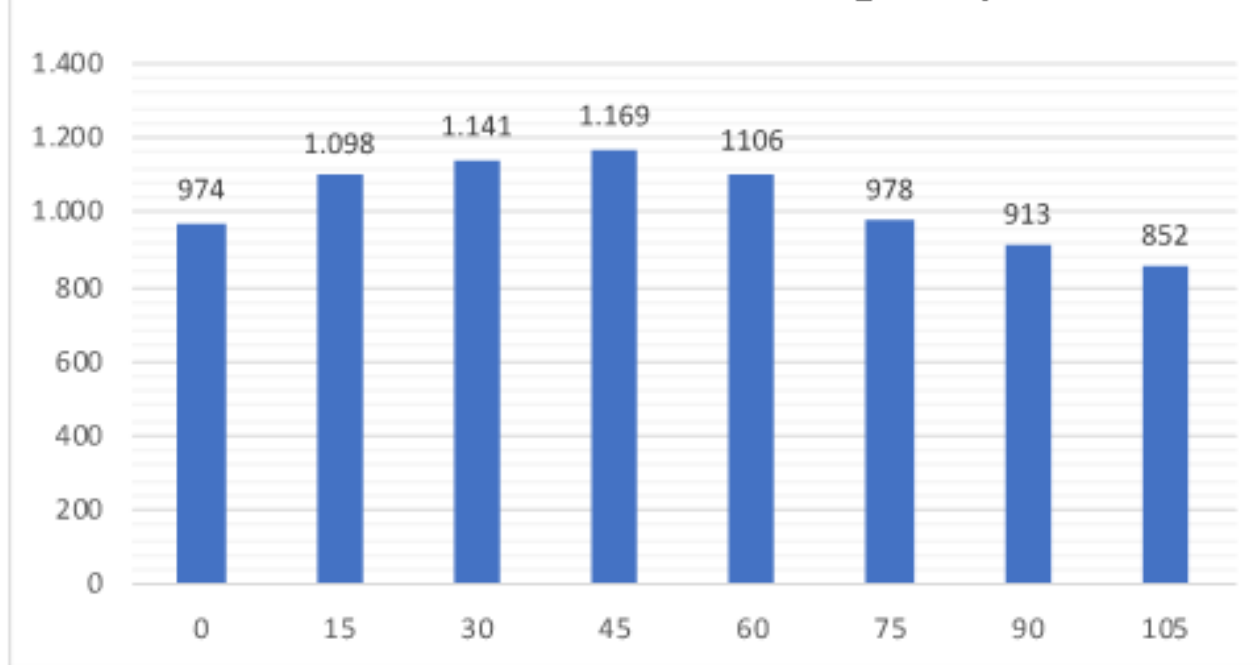


Reaction time - a comparison

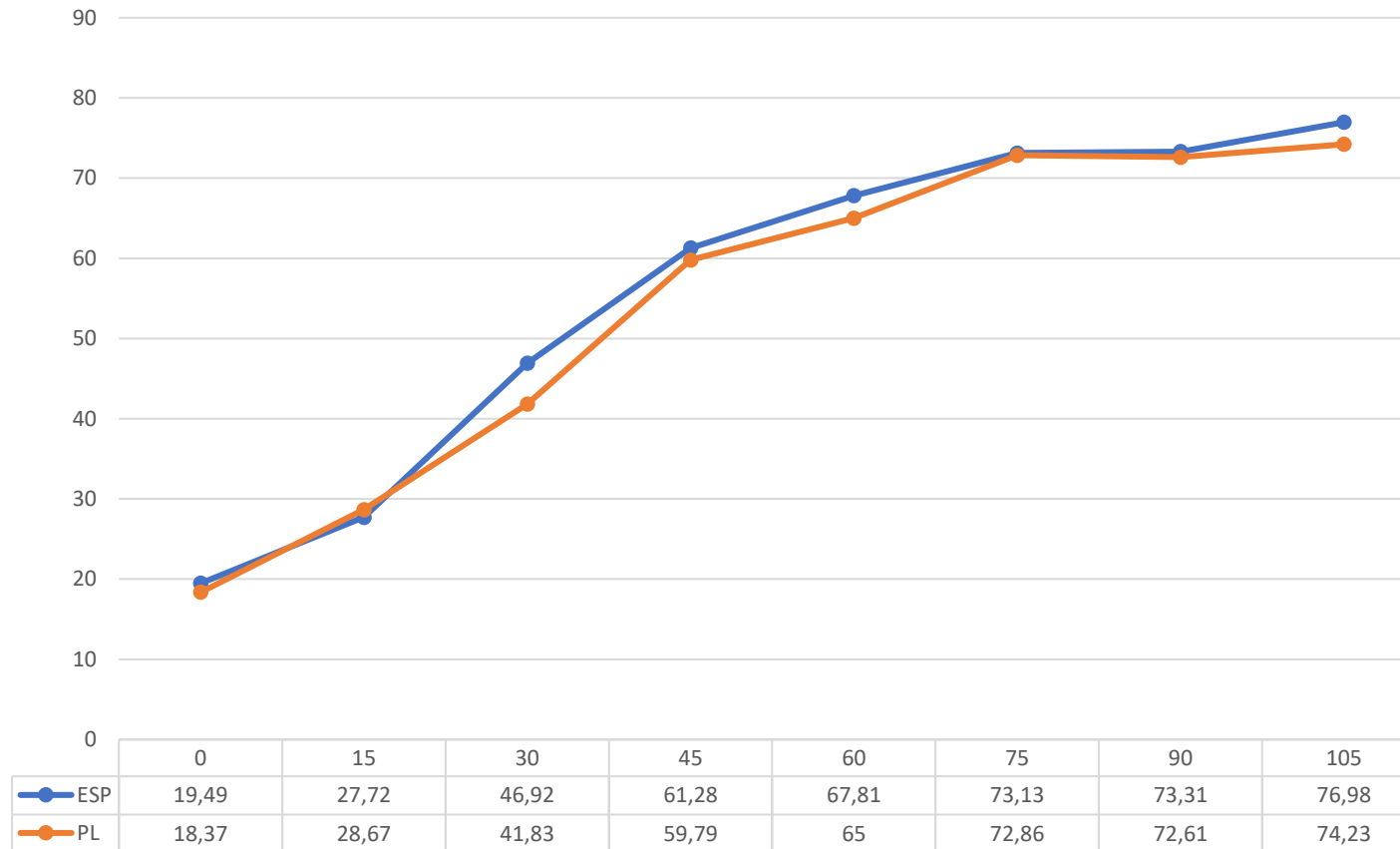
Reaction time: general results



Reaction time: CAN group



Poles vs. Peninsular Spaniards



Frequency of plural vs. singular by aspiration length [h]

Bienvenid@ al experimento!

A continuación vas a escuchar algunas palabras españolas pronunciadas por un hablante nativo en varias versiones.

Ojo! Es un hablante de un dialecto en el cual la /s/ final suele pronunciarse como una jota floja.

plural

Las palabras pueden repetirse varias veces.

Tu objetivo es decidir si la palabra dada está en singular o en plural.

Cada persona puede escuchar las palabras de manera diferente.

Aquí no hay respuestas erróneas.

singular

Aspirated /s/ and its disambiguating function

- Kiparsky's hypothesis :

There are "distinctiveness conditions"
which impose retention of semantically relevant information
in the surface sentence structure (1982: 87).