

Direction of coarticulation in vowel-fricative sequences in L1-German children

1. Introduction

- German /s, ʃ/ are among the last sounds that typically developing L1-German children acquire phonetically [1]
- spectral center of gravity (CoG) is the primary acoustic cue to this contrast
- CoG can vary as a function of vocalic context possibly leading to **progressive assimilation** in postvocalic position, i.e. /s/ → [ʃ, ç]-like / [+rounded] __ , /ʃ/ → [ç, s]-like / [-rounded] __
- the fricatives in turn affect the degree of lip rounding and cause **regressive assimilation**, i.e. /ɪ/ → [ʏ] / __ [ɪ] , /ʏ/ → [ɪ] / __ /s/
- more (e.g. [3]) or less [2] coarticulation in children compared to adults?





Research Questions

1. Is there age grading in the degree and direction of coarticulation in children's productions?
2. Does the amount of coarticulation decrease with age?

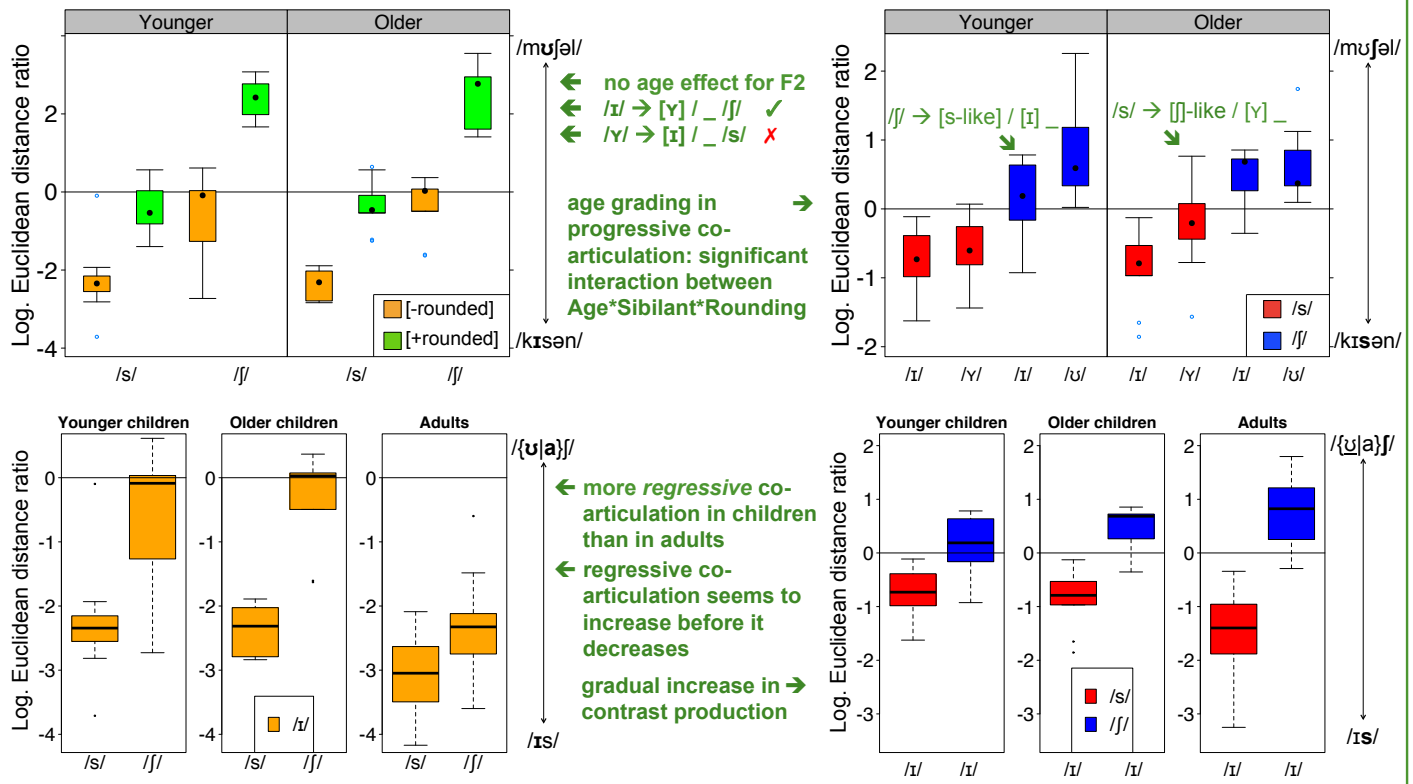
2. Speakers

- 11 **younger** (4;1 – 5;1 years) and 9 **older** (5;4 – 6;3) children
- 22 **female adult** speakers (students at the IPS, Munich)

3. Method and data analysis

- children completed a picture naming task:  → /kɪsən/  → /kɪsən/  → /mɪʃən/  → /muʃəl/
- children's /ɪ/-tokens were compared to /ɪs/ and /ɪʃ/-words produced by adult speakers taken from a corpus of read speech: *wissen* (/vɪsən/, 'to know') – *wischen* (/vɪʃən/, 'to wipe')
- measurement of second formant (F2) at the temporal midpoint of the first vowel and CoG at the temporal midpoint of the fricative
- quantification of coarticulation by means of **log. Euclidean distance ratios**: measurement of relative distance of each vowel and fricative to two speaker specific centroids that were either the mean /ɪ/ and /ʊ, (a)-values or the /s/ and /ʃ/-values in fronting and backing contexts, resp.

4. Results



6. Discussion and Conclusion

- age grading in progressive but not in regressive coarticulation in children's productions → regressive assimilation appears to increase in older children (perhaps due to a decrease in sibilant fronting and the development of a stable /ʃ/) before it decreases in adult speech
- regressive coarticulation more pronounced in children than in adults
- findings support syllable based accounts of speech acquisition

References

- [1] Fox-Boyer, A. (2009). *Kindliche Aussprachestörungen: phonologischer Erwerb, Differenzialdiagnostik, Therapie*. Idstein: Schulz-Kirchner. [3] Kent, R.D. (1983). The segmental organization of speech. In P. MacNeilage (ed.), *The Production of Speech*. New York et al: Springer. [4] Nittrouer, S., Studdert-Kennedy, M., & McGowan, R. (1989). The emergence of phonetic segments: evidence from the spectral structure of fricative vowel syllables spoken by children and adults. *Journal of Speech, Language, and Hearing Research* 32, 120-132.