

# Vowel duration and tongue root advancement in Italian and Polish

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- tongue root advancement (TRA)
  - voicing (Westbury 1983)
  - VOT (Ahn 2015)
  - also *vowel duration*?
- **voicing effect**
  - House & Fairbanks (1953), Chen (1970), Klatt (1973), Lisker (1973)
  - no consensus

- **Italian**

- voicing effect (Farnetani & Kori 1986)

- **Polish**

- no voicing effect (Keating 1984)

→ Assessment of tongue contour using ultrasonography (part of a broader research project)

- **pilot** study (work in progress)
- Italian (2 *males*), Polish (1 *female*, 1 *male*)
- $C_1V_1C_2V_1$ 
  - $C_1 = /p/, V_1 = /a, o, u/, C_2 = /t, d, k, g/$
- frame sentence
  - *Dico X lentamente*, 'I say X slowly'
  - *Mówię X teraz*, 'I say X now'

- **equipment**

- Articulate Instruments set-up with probe stabilisation headset (Articulate Instruments Ltd 2011)

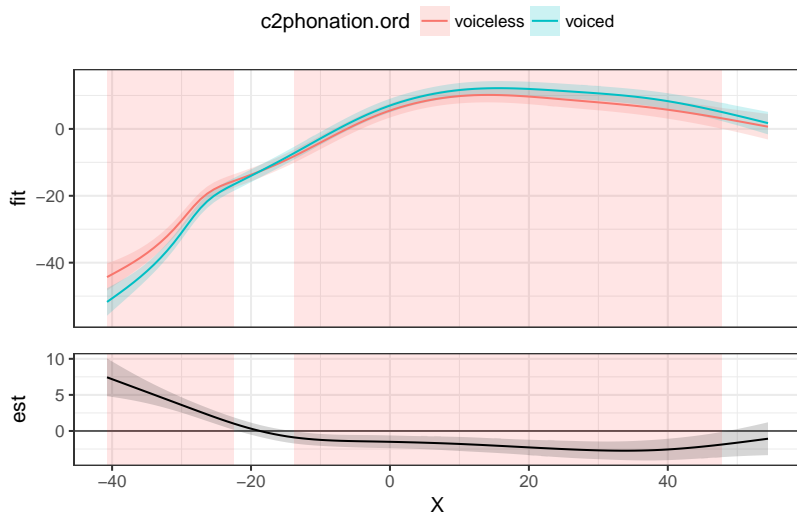
- **data**

- tongue contours at maximum tongue displacement (Strycharczuk & Scobbie 2015) and acoustic closure
- vowel, closure and consonant durations

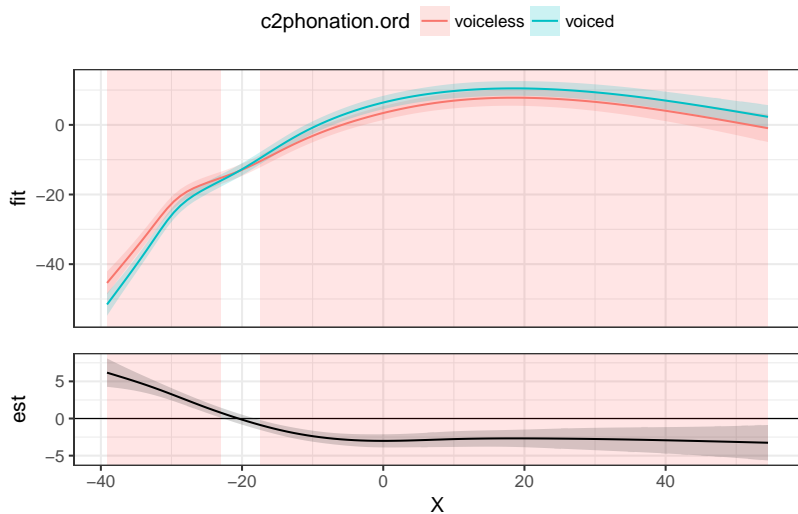
- **analysis**

- generalised additive mixed effects models (Wood 2006)
- linear mixed effects models (Bates et al. 2015)

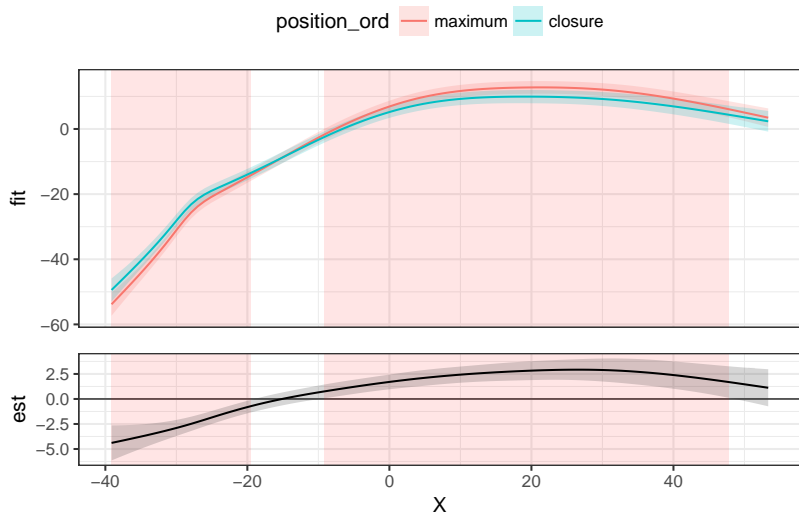
## Results: Italian (maximum displacement)



## Results: Italian (closure)

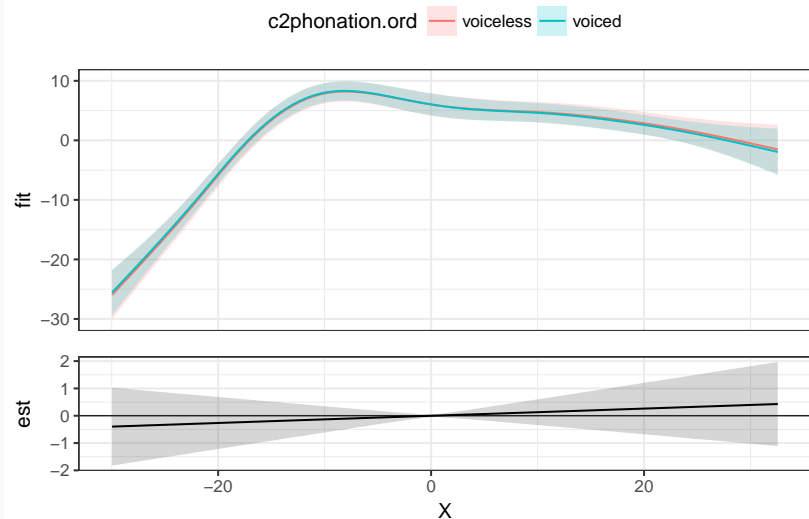


## Results: Italian (closure vs. maximum displacement)

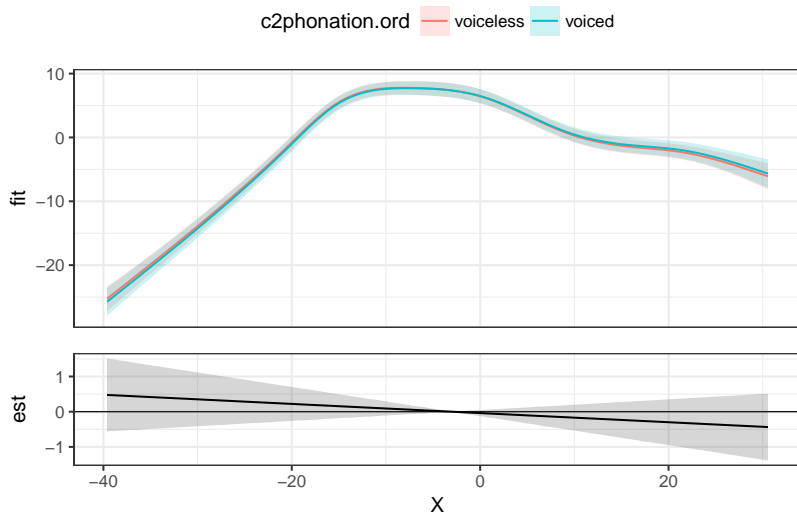




## Results: Polish (maximum displacement)



## Results: Polish (closure)



- Italian: 22 ( $\pm 6$ ) msec voicing effect
  - $\chi^2(3) = 16.61, p = 0.00085$  \*\*\*
- Polish: 8 ( $\pm 3.3$ ) msec voicing effect
  - $\chi^2(1) = 5.4, p = 0.02$  \*

- no TRA in Polish
- **TRA in Italian** (at closure *and* maximum displacement)
  - *increases from closure to maximum displacement*

→ TRA is **initiated before closure** in voiced stops

- time to allow TRA → longer vowel
- cf. Halle & Stevens (1967)

# References

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