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 consesus, but cf. Halle & Stevens (1967)
    - Italian (Farnetani & Kori 1986), Polish (Keating 1984)

- time to allow tongue root advancement → longer vowel
- assessment of tongue contour using ultrasonography (part of a broader research project)

→ H1a: *No TRA in Polish.* → H1b: *TRA in Italian at closure and maximum displacement.* → H2: *TRA in Italian at closure is smaller that maximum displacement.*

- **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)
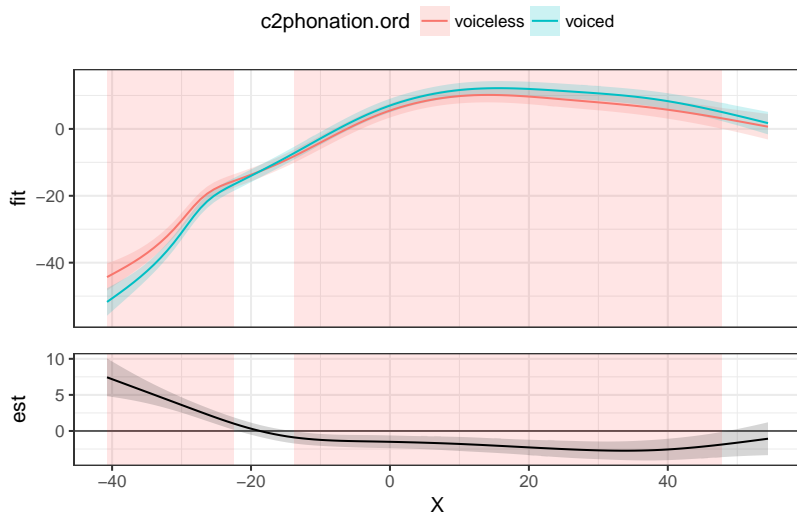- data
    - tongue contours at maximum tongue displacement (Strycharczuk & Scobbie 2015) and acoustic closure
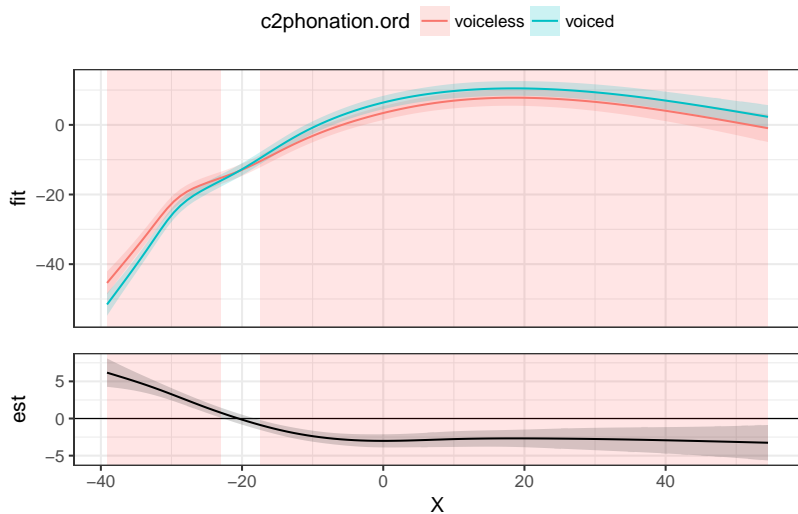   - vowel, closure and consonant durations
- analysis
    - generalised additive mixed effects models (Wood 2006)
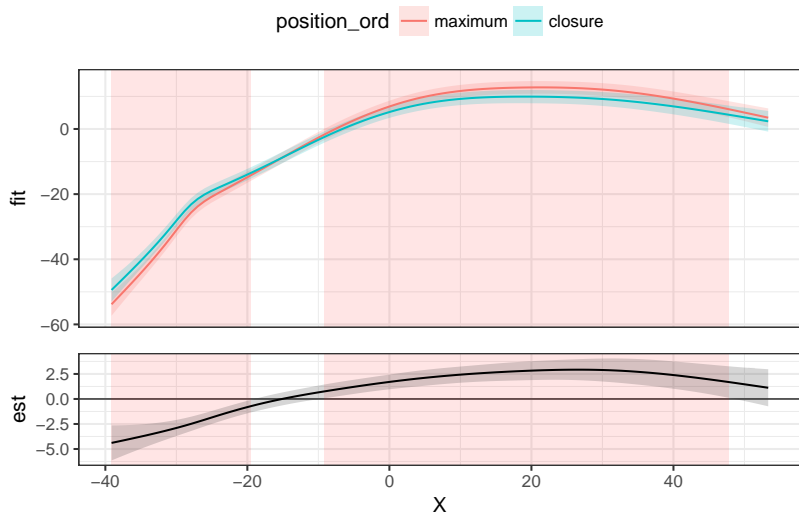   - linear mixed effects models (Bates et al. 2015)
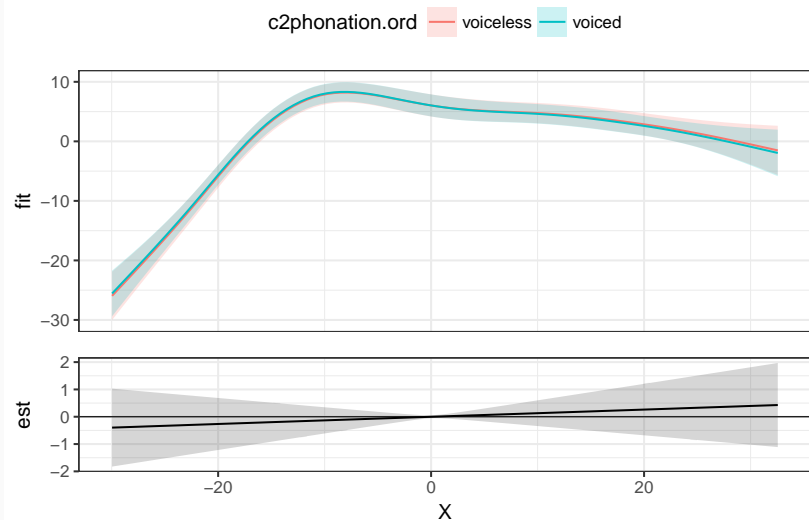
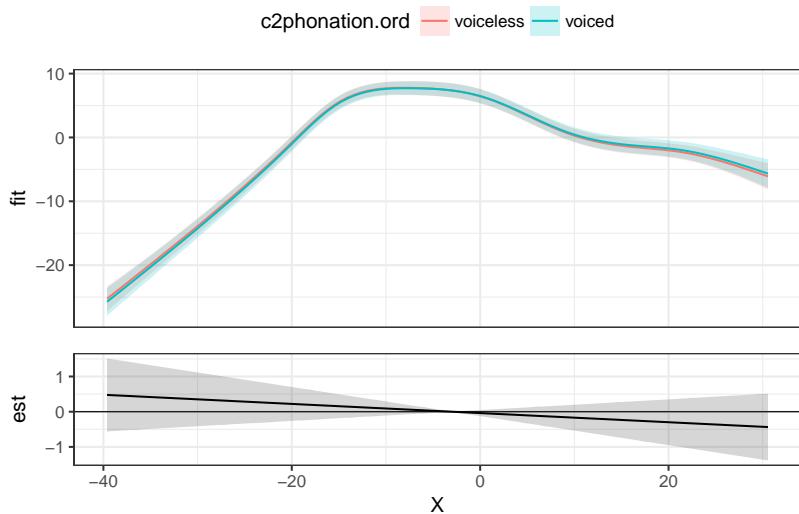# Results: Italian (maximum displacement)

Results: Italian (closure)

Results: Polish (maximum displacement)

- results

  - no TRA in Polish (H1a)
  - **TRA in Italian** at closure *and* maximum displacement (H1b)

    - *increases from closure to maximum displacement* (H2)
    - TRA is **initiated before closure**

- **"time to allow TRA → longer vowel"** is supported by the data

  - *with some caveats*

THANK YOU!

- Italian: **22** (±6) msec voicing effect

    - $\chi^2(3)$ = 16.61, p = 0.00085 ***

- Polish: **8** (±3.3) msec voicing effect

    - $\chi^2(1)$ = 5.4, p = 0.02 *

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