

Vowel duration and tongue root advancement in Italian and Polish

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Background

- ▶ 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 consensual explanation

Background

- ▶ Italian
 - ▶ voicing effect (Farnetani & Kori 1986)
- ▶ Polish
 - ▶ no voicing effect (Keating 1984)

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

Methods

- ▶ pilot study
- ▶ Italian (2 males), Polish (1 female, 1 male)
- ▶ $C_1V_1C_2V_2$
 - ▶ $C_1 = /p/, V_1 = /a, o, u/, C_2 = /t, d, k, g/$
- ▶ frame sentence
 - ▶ *Dico X lentamente*, 'I say X slowly'
 - ▶ *Mówię X teraz*, 'I say X now'

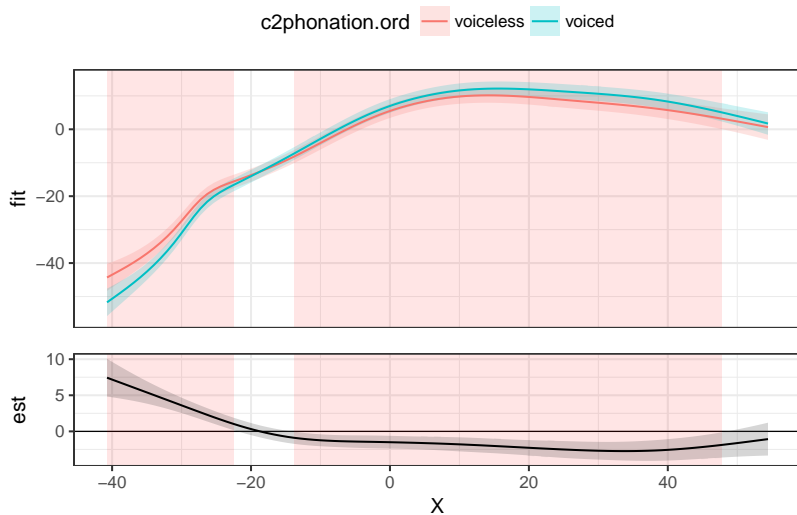
Equipment set-up

- ▶ Articulate Instruments set-up
 - ▶ TELEMED Echo Blaster 128 unit
 - ▶ TELEMED C3.5/20/128Z-3 ultrasonic transducer
 - ▶ Movo LV4-O2 Lavalier Microphone
 - ▶ sync unit
- ▶ probe stabilisation with Articulate Instruments headset
- ▶ Articulate Assistant Advanced (Articulate Instruments Ltd 2011)
- ▶ FRAME RATE

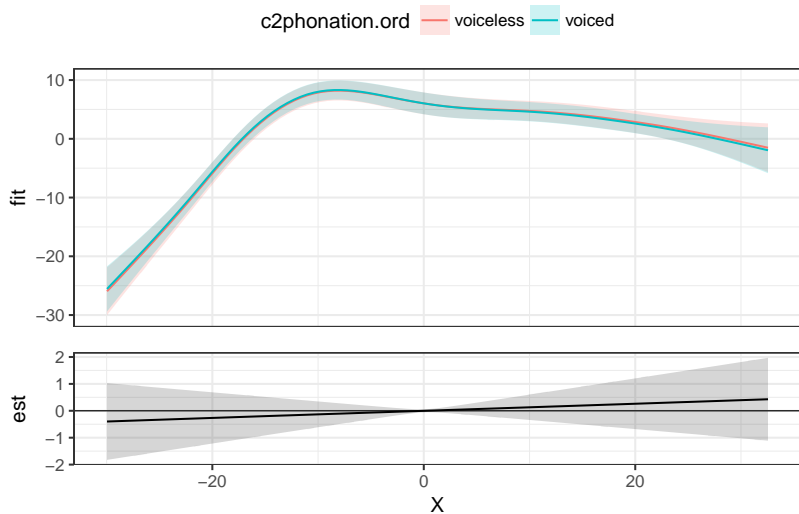
Analysis

- ▶ spline data at maximum constriction (Strycharczuk & Scobbie 2015) and acoustic closure
- ▶ generalised additive mixed effect model (GAMM, Wood 2006)
- ▶ one model per speaker
 - ▶ parametric term γ
 - ▶ reference smooth γ
 - ▶ difference smooth γ by phonation, vowel, place
 - ▶ random smooth by item
 - ▶ cubic regression splines
- ▶ includes first order autoregressive model (AR1)
- ▶ model comparison and visual inspection (Sóskuthy 2017)

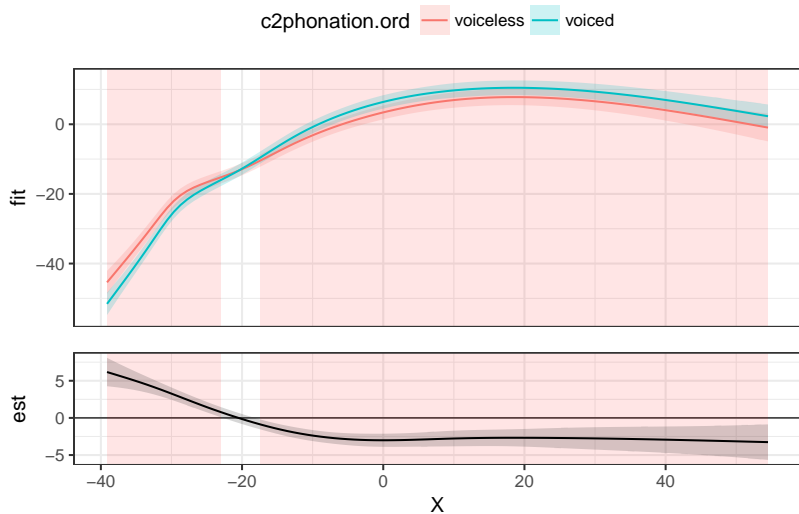
Results: Italian



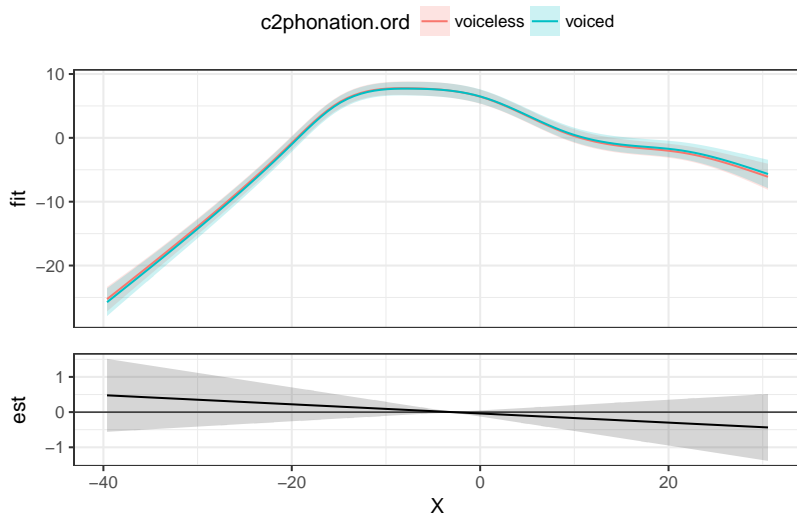
Results: Polish



Results: Italian (closure)



Results: Polish (closure)



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References III

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