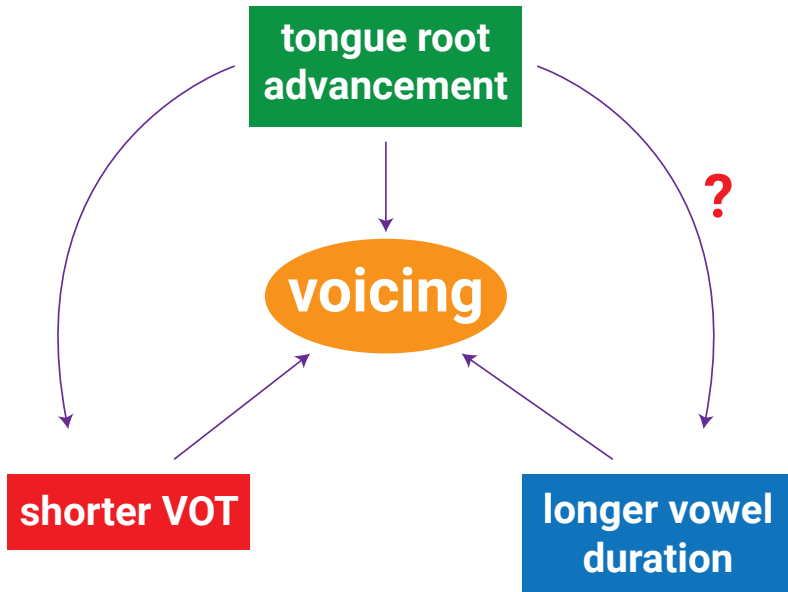


Tongue root advancement and vowel duration: a gradient effect?

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- **voicing effect:** vowels are longer when followed by voiced stops
 - *Italian:* voicing effect of 35 msec (Farnetani & Kori, 1986)
 - *Polish:* mixed results
 - Keating (1984): no effect
 - Nowak (2006): 4.5 msec effect
- part of a bigger project
 - simultaneous UTI + EGG + audio

- **Participants:** 4 Italians (2 F, 2 M), 4 Polish (2 F, 2 M)
- **Procedure:**
 - simultaneous ultrasound tongue imaging and audio recording
 - stabilisation headset (Articulate Instruments Ltd™, 2008)
- **Materials:**
 - $C_1V_1C_2V_1$
 - $C_1 = /p/, V_1 = /a, o/, C_2 = /t, d, k, g/$
 - *pata, pada, paka, ..., poto, podo, ...*
 - stress on first syllable
 - frame sentence
 - *Dico X lentamente*, 'I say X slowly'
 - *Mówię X teraz*, 'I say X now'
 - no pauses between words

Results: vowel duration (Italian)

	Estimate	Std. Error	t value
(Intercept)	10.653173	12.203071	0.8729912
c2_phonationvoiced	17.053722	4.395632	3.8796972
c2_placevelar	-8.731278	2.957343	-2.9524065
vowelo	-7.089707	3.623912	-1.9563683
vowelu	-37.492605	3.623586	-10.3468226
sentence_duration	80.856863	6.695451	12.0763877

Results: vowel duration (Polish)

	Estimate	Std. Error	t value
(Intercept)	21.573882	10.165672	2.122229
c2_phonationvoiced	7.962124	2.696624	2.952627
c2_placevelar	-5.683948	1.971799	-2.882621
vowelo	-11.812646	2.417364	-4.886581
vowelu	-29.462883	2.427963	-12.134814
sentence_duration	72.188213	9.714180	7.431220

Results: summary

	IT01	IT02	IT03	IT04	PL02	PL03	PL04	PL05
TRA [closure onset]	yes	yes						
TRA [within closure]	yes	yes	yes (/a/)					yes

greater TRA in voiced stops ☐ relatively stronger VE

	+ TRA+	- TRA+
+ VE+	<input type="checkbox"/>	<input type="checkbox"/>
- VE+	<input type="checkbox"/>	<input type="checkbox"/>

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- Articulate Instruments Ltd™. 2008. Ultrasound stabilisation headset users manual: Revision 1.4. Edinburgh, UK: Articulate Instruments Ltd.
- Farnetani, Edda & Shiro Kori. 1986. Effects of syllable and word structure on segmental durations in spoken Italian. *Speech communication* 5(1). 17–34.
- Keating, Patricia A. 1984. Universal phonetics and the organization of grammars. *UCLA Working Papers in Phonetics* 59.
- Nowak, Pawel. 2006. *Vowel reduction in Polish*: University of California, Berkeley dissertation.