

Word level effects in Polish laryngeal neutralisation

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CUNY Phonology Forum
Conference on the Word

Introduction

Word-final voice contrast neutralisation in Polish as a word-level phenomenon?

- syllable-based analyses of voicing (Lombardi, 1991; Gussmann, 1992)
- cue-based analyses (Rubach, 1996, 2008)
- incompatibility of the previous accounts with current empirical findings
- any analysis of Standard Polish voice neutralisation must explicitly refer to the Prosodic Word boundary

Voice neutralisation in Standard Polish - data

- Obstruents and obstruent clusters in Polish surface as voiceless word-finally before a pause:

pfɨkwat 'example' cf. pfɨkwadɨ 'examples'
isp 'chamber, GEN.PL' cf. izba 'chamber'

- In standard Polish (north-eastern dialects), all word-final obstruents and obstruent clusters surface as voiceless before a sonorant across a word boundary

pfɨkwat#ruvnaɲa 'equation example'
cf. pfɨkwadɨ#ruvnaɲ 'equation examples'
isp#rolɲitɕix 'agricultural chamber, GEN.PL'
cf. izba#rolɲitɕa 'agricultural chamber'

Word-final obstruent+sonorant clusters

- Obstruents preceding word-final sonorants are reported to surface as voiceless by Gussmann (1992); Rubach (1996, 2008)
mexanizm 'mechanism' mexanizm̥ 'mechanisms'
zupr 'bison' zubr̥ 'bisons'
- The current results show that the voicing contrast *is* preserved in obstruents preceding word-final sonorants

The experiment

- **Aim:** to test the claim that obstruents are devoiced before word-final sonorants
- **Methodology:**
 - ▶ production experiment
 - ▶ 6 female speakers of Warsaw Polish, aged 20-25
 - ▶ reading tokens containing word-final Stop+Son sequences

The stimuli

- words containing final stop+sonorant clusters
- the tokens were paired to correspond in the stop place of articulation, F1 of the preceding vowel and the following sonorant:

/zubr/ /tsɨpr/

/kobr/ /dɲepr/

/kadr/ /vʲatr/

/sxudw/ /zmʲutw/

/ulegw/ /utɕekw/

- The tokens were contextualised within carrier sentences

(1) *Przestępca był wieloletnim pracownikiem działu kadr.*

The criminal had been an employee of the HR for many years.

Prognoza zapowiada silny wiatr.

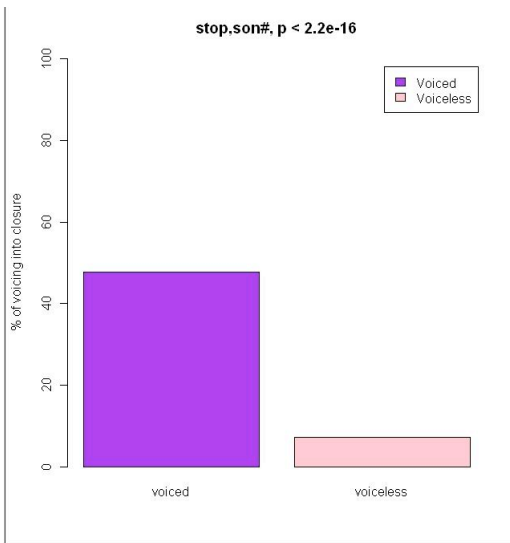
The forecast predicts strong wind.

- The sentences were presented in a random order.
- All the sentences were read twice, non-consecutively.

Method

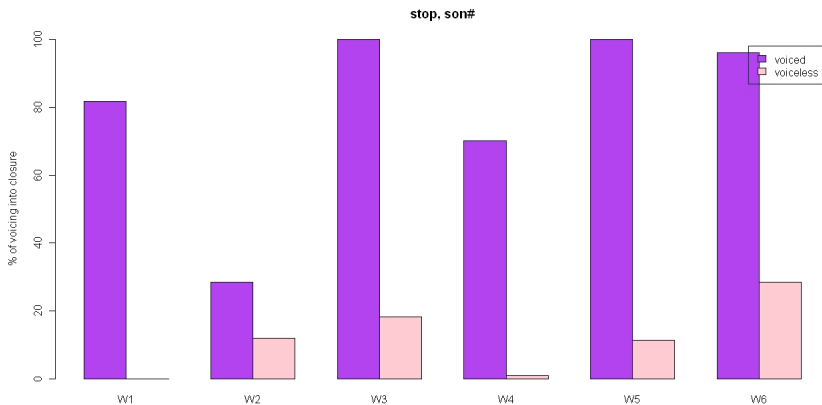
- Recordings analysed in Praat
- Segments labelled upon a visual inspection of the spectrograms (including stop closure and release)
- Periods of voicing labelled
- Measure of voicing: ratio of the voicing duration into the closure, relative to the closure duration.

Results – the population



speakers final.jpg

Results – individual speakers

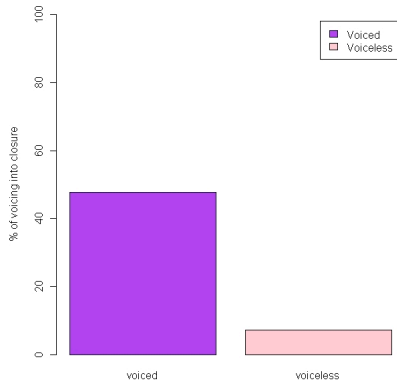


final_pseg

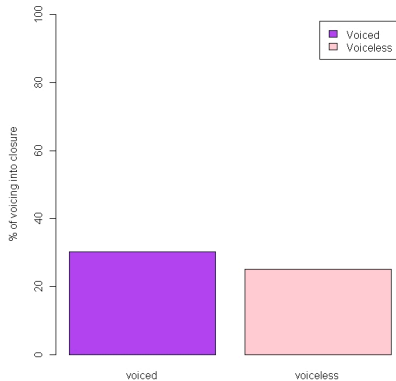
$p < 0.01$ for all subjects except W2 ($p = 0.40$)

- How do we know that the contrast is not an effect of orthography and presenting the stimuli in the written form?
- In the same experiment data on stop-sonorant sequences across word boundaries were collected, including word-final coronal stops followed by a liquid or a glide across a word boundary, e.g.
 /zavud#wovtsi / /deb^jut#wutsk^jego/
 /rozvud#rodzitsuv/ /valut#rosji/
- The procedure was the same.
- The word-final tokens and across-words tokens were pooled together and randomised
- All the subjects neutralised the voicing contrast when a sonorant followed across a word boundary

stop.son#, $p < 2.2e-16$

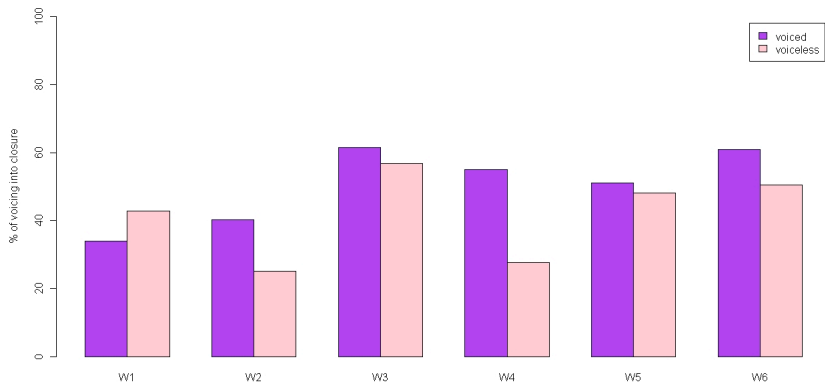


stop#son, $p = 0.1444$



speakers.jpeg

stop#son



p=0.64

p=0.80

p=0.54

p=0.46

p=0.47

p=0.76

medial.jpeg

Results summary

- 5 out of 6 speakers neutralised the voicing contrast in word-final stops before a sonorant across a word boundary (stop#son), but maintained the contrast in word-final stop-son sequences (stop+son#)
- 1 speaker neutralised the contrast in both environments

Previous accounts of voicing

Word-based accounts

FD as a word-final phenomenon

- Bethin (1984)
[+ obstr] → [-voice] / __#
- Booij and Rubach (1987)
[+ obstr] → [- voice] / __]
- FD is also an independent rule in Rubach (1996)

Syllable-based accounts (Lombardi, 1991; Gussmann, 1992; Lombardi, 1999)

- Voicing contrast is neutralised word-finally as a result of voice licensing within the syllable
- Syllable-based approaches define the position for contrast, and not the position for neutralisation
- Voicing is only licensed in some privileged position:
 - ▶ in syllabified obstruents (NB! No obstruents allowed in codas) (Gussmann, 1992)
 - ▶ in an obstruent, if it stands before a [+ sonor] segment in the same syllable (Lombardi, 1991)
 - ▶ in syllable onsets (Lombardi, 1999)
- in other positions, voicing cannot be licensed

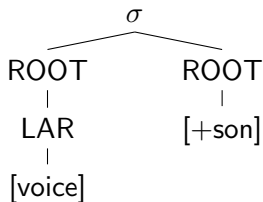
Current results vs. syllable-based accounts

- The position of the stop within the syllable is the same for $d\#$ r and $dr\#$ sequences, whatever the particular theory of Polish syllable structure
- Voicing in $stop+son\#$ sequences presents a problem for Onset Faithfulness (Gussmann, 1992; Lombardi, 1999)

The Laryngeal Constraint

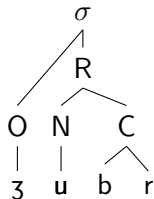
- The data could technically be handled by the *Laryngeal Constraint* if it was assumed that the word-final sonorant was syllabified into the coda.

(2) Laryngeal constraint (Lombardi, 1994)



NB! The Laryngeal Constraint was originally intended for onsets, and it translates into Onset Faithfulness in later OT accounts of voicing, e.g. Lombardi (1999).

(3) Voice licensing in sonority-disobeying codas



Problems:

- The Laryngeal Constraint in its original formulation was applied to strictly sonority-obeying sequences
- The analysis relies on syllabification for which there is no independent evidence (circularity).
- Further complex syllabification cases: [srebrnɨ] 'silver'. srebr.nɨ?? sre.brnɨ? cf. (sreb)_σr(nɨ)_σ (Rubach and Booij, 1990)
- Most of the arguments for syllabification in Polish are based on evidence from voicing, e.g. (Rubach and Booij, 1990), but the voicing data in the phonological literature are impressionistic and some are questionable.
- Even if we assume a syllabification theory under which sonority disobeying codas are allowed word-finally, the analysis must refer to the Prosodic Word.

Cue-based accounts (Rubach, 1996, 2008)

- syllable boundaries are irrelevant to licensing the voicing contrast in Polish, the licensing relationship can be defined segmentally
- voicing contrast in Polish licensed:
 - ▶ in front of prosodified sonorants (Rubach, 1996) (There is still a rule of FD, Word-final sonorants are not prosodified, hence forms like [ʒupr])
 - ▶ Rubach (2008) proposes an OT account using constraints $\text{IDENT}([\text{voi}]_{\text{preson}})$ and $\text{IDENT}([\text{voi}]_{\text{prevoc}})$. Pre-sonorant faithfulness in Polish is sensitive to the sonorant being syllabified (though not necessarily in the same syllable). The cases of stop#son are not explicitly discussed.

Problems

- The reported devoicing pre-sonorant word-finally is a problem for pre-sonorant faithfulness, as it goes against the general prediction that in front of sonorants the voicing contrast is preserved.
- The current data seem to be more in line with the predictions made by cue-based models...
- ... but the model still has to refer explicitly to prosody (word boundary), to account for the difference between stop+son# and stop#son sequences
- Redundancy: Rubach argues for both cue-based licensing of voicing (as proposed by Steriade (1999)), and prosodic conditioning at the level of the syllable, and (in the 1996 paper) at the level of the Prosodic Word.

Summary

- Most of the examined speakers maintain the voicing contrast in front of word-final sonorants, but not in front of sonorants across a word-boundary.
- A distinct word-level final devoicing analysis (specifying the environment for neutralisation) is the simplest available analysis.
- Analyses that rely on defining the [(+)voice] licensing environment (Lombardi, 1991; Gussmann, 1992; Rubach, 1996, 2008) can potentially be sustained, but they must refer to the Prosodic Word level in some way.

Thanks to

Patti Adank

Ricardo Bermúdez-Otero

Peter Jurgec

Yuni Kim

John Kingston

Koen Sebregts

Jarek Weckwerth

The research is funded by the Arts and Humanities Research Council grant no. AH/H029141/1

Special thanks to the experiment participants.

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