

Contrast neutralization results from weak perceptibility: Evidence from a dialect of Polish
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The observation that contrasts tend to be neutralized where they are not sufficiently perceptually salient has recently received considerable support from perceptual experiments and typological studies (Flemming 1995, Jun 1995/2004, Steriade 1997, Boersma 1998, Côté 2000, Blevins 2004, Kochetov 2006, Kochetov & So 2007, Pagdett & Zygis 2007). Data from a dialect of Polish serve to substantiate this claim. Evolutionary Phonology (EP; Blevins 2004) provides a formal framework for the analysis. I work under the assumption that sound change is diachronic, phonetically-based and listener-oriented. Three natural sources of sound change are instantiated: CHANGE, which involves misperception of an acoustic signal, CHANCE, which results from phonological ambiguities in a phonetic signal, and CHOICE, whose source lies in the intrinsic variability of speech along the hyper-to-hypo-articulated continuum. Standard Polish (SP) and the Kurp dialect of Polish (KD) exhibit different realizations of labials with secondary palatal articulation /p^j, b^j, f^j, v^j/ (Friedrich 1955, Zduńska 1965, Czaplicki 1998, 2000, Kochetov 1998, Cavar 2004). While both dialects preserve palatality of labials, it takes a different form. For instance, in SP the palatality of /p^j/ surfaces as the glide [j], producing [pj], and in KD the labial is accompanied by a palatal sibilant fricative [pç]. The different development of palatalized labials in SP and KD can be explained under CHOICE as a gradual shift in the frequency of synchronic variants, leading to restructuring in the grammar: [p^jasek, pjasek, pçasek, pçasek] → [pçasek, pçasek, pjasek, p^jasek] ‘sand’. While in most positions SP realizations mirror KD realizations, there are important differences in the preservation of contrasts between palatalized and plain labials, say /p^j/ vs. /p/ and /f^j/ vs. /f/, in the two dialects:

(1)		_V	_i	_#	ç_
	SP	maintained [pjasek] ‘sand’	lost [pivɔ] ‘beer’	lost [drup] ‘poultry’	maintained [çfjat] ‘world’
	KD	maintained [pçasek]	maintained [pçivɔ]	maintained [drupç]	lost [çfat]

It is claimed that different realizations of the palatal element in the two dialects ([j] and [ç]) bear on contrast maintenance/neutralization. Within EP, contrast neutralization in SP before a homorganic vowel is classified as an instance of CHANCE and results from the difficulty of localizing the source of palatality in a homorganic sequence of glide + vowel: C^{Fi}V^{Fi} → CV^{Fi} (Fi stands for [palatal]). Word-final neutralization in SP is due to the weak perceptibility of the palatal glide in this position (lack of CV transition cues and uninformative release of labials; Kochetov 2004, Kochetov & So 2007) and exemplifies CHANGE (C^{Fi}# → C#). In contrast, the perceptibility of the KD realization [ç] is not compromised in these positions because of the strong internal cues of sibilants (C^{Fi}#) and distinctness from the following palatal vowel (C^{Fi}V^{Fi}). Finally, the loss of contrast after the palatal sibilant [ç] in KD meets the description of CHANCE: C^{Fj}C^{Fj} → C^{Fj}C. Such a reanalysis is correctly excluded in SP because [j] is auditorily distinct from [ç]: C^{Fj}C^{Fj}.

Acoustic and auditory research has shown that it is more difficult to distinguish between different nasalized vowels than between their oral counterparts and that nasalized vowels have a considerably weaker acoustic energy than oral vowels (Wright 1986, Beddor 1993, Delvaux et al. 2002). As a result, the perceptual space of nasalized vowels is shrunk when compared to that of oral vowels. It follows that nasalization of a vowel may give rise to neutralization of contrasts. The Kurp data support this prediction. Mid vowels followed by nasals, irrespective of whether they come from historical nasal vowels or from V+N sequences, show a range of realizations. The realizations of the front /ɛ/ followed by a nasal present a continuum of /aŋ : æŋ : εŋ : eŋ : iŋ/ and the back /ɔ/ accompanied by a nasal is realized as /ɔŋ/, /oŋ/ or /uŋ/; for instance *pręt* ‘rod’ is realized as [præŋt], [prɛŋt] or [prent] and *on* ‘he’ is variably pronounced as [ɔŋ], [oŋ] or [uŋ]. This variability shows signs of contrast neutralization and receives a formal treatment as an instance of CHANGE: the weak acoustic cues of nasalized vowels are subject to various reanalyses. A similar loss of contrast is reported in some dialects of American English, where *pin* and *pen* have merged.

References

- Beddor, P. S. (1993). The perception of nasal vowels. In: M. K. Huffman and R. A. Krakow (eds.) *Nasals, Nasalization, and the Velum*. Academic Press. 171-196.
- Bethin, Christina (1992). *Polish syllables: The role of prosody in phonology and morphology*. Columbus, OH: Slavica.
- Blevins, J. (2004). *Evolutionary phonology: the emergence of sound patterns*. Cambridge: Cambridge University Press.
- Boersma, Paul (1998). *Functional Phonology: Formalizing the Interactions Between Articulatory and Perceptual Drives*. Ph.D dissertation. Amsterdam: University of Amsterdam.
- Ćavar, M. (2004). Auditory factors in the emergence of prepalatal affricates in Polish. *Ohio State University Working Papers in Slavic Linguistics*.
- Côté, M.-H. (2000). *Consonant cluster phonotactics: A perceptual approach*. Ph.D. dissertation. MIT.
- Czaplicki, Bartłomiej (1998). *Palatalization in the Kurp dialect of Polish with reference to English*. Unpublished M.A. thesis, University of Warsaw.
- Czaplicki, Bartłomiej (2000). Soft labials in the Kurp dialect of Polish. *Anglica*. 111-21.
- Delvaux, V., T. Metens and A. Soquet (2002). French nasal vowels: acoustic and articulatory properties. In Proc of the 7th ICSLP, vol. 1. 53–56.
- Flemming, E. (1995). *Auditory representations in phonology*. Ph.D dissertation. UCLA.
- Friedrich, Henryk (1955). *Gwara kurpiowska. Fonetyka*. Warszawa: PWN.
- Jun, Jongho (2004). Place assimilation. In: Bruce Hayes, Robert Kirchner and Donca Steriade (eds.) Cambridge: Cambridge University Press. 58-86.
- Kochetov, Alexei (1998). Labial palatalization: A gestural account of phonetic implementation. *The Canadian Linguistics Association Annual Proceedings*. 38-50.
- Kochetov, Alexei (2004). Perception of place and secondary articulation contrasts in different syllable positions: Language-particular and language-independent asymmetries. *Language and Speech* 47(4). 351-382.
- Kochetov, Alexei (2006). Testing Licensing by Cue: A Case of Russian Palatalized Coronals. *Phonetica* 63. 113-148.
- Kochetov, Alexei and Connie K. So (2007). Place Assimilation and Phonetic Grounding: A Cross-Linguistic Perceptual Study. *Phonology* 24. 397-432.
- Padgett, J. and M. Zygis (2007). The Evolution of Sibilants in Polish and Russian. *Journal of Slavic Linguistics* 15, 291-324.
- Steriade, Donca (1997). Phonetics in phonology: The case of laryngeal neutralization. Ms., University of California, Los Angeles.
- Zduńska, Helena (1965). *Studia nad fonetyką gwar mazowieckich. Konsonantyzm*. Wrocław: Zakład Narodowy im. Ossolińskich.