
**APPROACHES TO PHONOLOGY AND PHONETICS**

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**APAP 2017**

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*APPROACHES TO PHONOLOGY AND PHONETICS*

## PLENARY PAPERS

### THE EMERGENCE OF PHONETIC ENHANCEMENT OF PHONOLOGICAL FEATURES

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It has been shown that phonetic enhancement occurs only for contrastive phonological features. This constitutes a challenge for linguistic modelling: if in speech production the phonology comes first, and phonetic implementation has as its input the output of the phonology, the enhancement seems to be unpredictable. After all, how should the phonetic implementation phase know which of its input features are contrastive and which aren't?

One answer that has been given is that the phonology knows about the phonetics: Stanton (to appear in Phonology) follows Flemming (2008) in claiming that in speech production a part of the phonology (namely, phonotactics) follows the phonetic implementation. My computer simulations show, however, that the same results emerge automatically from learning a bidirectional multi-level grammar in Optimality Theory: if evaluation and learning proceed in parallel in both modules of grammar (Boersma 2007, 2008; Apoussidou 2007; Boersma & Van Leussen 2017), and simultaneously for comprehension and production, the rankings of the relevant faithfulness constraints (phonology) happen to become correlated with the rankings of the relevant cue constraints (phonetic implementation). Neither knowledge of the phonetics by the phonology, nor knowledge of the phonology by the phonetics, nor interleaving of phonological and phonetic submodules, turns out to be needed to account for these facts. I conclude that the specialised devices proposed by Flemming and Stanton are superfluous when it comes to modelling phonetic enhancement.

### EMERGENCE AND UNIVERSALITY IN PROSODIC STRUCTURE

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An *a priori* characterization of the common element in phonological grammars may help us in conceptualizing the emergent elements in phonology, i.e. those that can be the topic of typological research (Bickel 2011). I will identify three structural features which would appear to be inevitable in phonological grammars. None of them are new and all of them minimally enjoy a reasonable level of support.

*Segments*. Vowels, consonants and tones are the three featurally specified, linearly sequenced units providing phonological content. Segments and specific features may form parallel autosegmental tiers (Goldsmith 1977, McCarthy 1985). The universal here is that all languages have segments, but any language's segments and features result from ergonomic conditions in speech production and perception (cf. Ridouane & Clements 2011). If [a] occurs in all languages, it is because ergonomic conditions on its inclusion are highly favourable.

*Prosodic hierarchy*. A hierarchically arranged set of featurally empty constituents, with higher ones encompassing lower ones. They are the containers of the phonological content. This arrangement, not the specific levels, is universal (cf. Schiering et al. 2010).

*Anchoring*. Segments and prosodic constituents are related by alignment and association. Like all linguistic constituents, segments and prosodic constituents are aligned somewhere (McCarthy &

Prince 1993), but only segments may additionally have or acquire an association with constituents in the syllable (Goldsmith 1977).

I will discuss prosodic data from the literature as well as from my own research to illustrate these classic positions, from Tamazight, Malay and Dutch. These data are used to argue that a number of theoretical devices have been overextended (accent, association, stress), while one has been underused (alignment).

## SESSION PAPERS

### LARYNGEAL REALISM VS. MODULATION THEORY – EVIDENCE FROM VOT DISCRIMINATION IN POLISH

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Laryngeal Realism (LR; e.g. Honeybone 2005; Beckman et al. 2013) is a widely accepted perspective on the phonology of voice contrasts. Its appeal is that it directly encodes an easily measurable phonetic property, voice onset time (VOT), which appears to define phonological categories. There are, however, many indications that these categories are not as cut and dried as the laryngeal realism literature would have us believe, including pre-voicing and aspiration in a single language (e.g. Swedish), voiced consonants in voice languages produced without pre-voicing (Dutch), and cross-language differences in the perceptual weight of VOT (Polish vs. English; Keating 1980). In these cases, along with others in which voiceless consonants are phonologically active in voice languages (Wetzels & Mascaro 2001), LR is not as realistic as advertised.

As an alternative to laryngeal realism, Schwartz (submitted) proposes an account of laryngeal phonology within the Onset Prominence (OP) framework. Adopting the tenet of Modulation Theory (MT; Traunmüller 1994) that speech perception entails demodulating a carrier signal that is by nature voiced, it is suggested that [voice] cannot be a true phonological feature. Rather, voicing is an element of the carrier, while the VOT typology is a function of the OP hierarchical level at which the feature [sg] is assigned. Since pre-voicing in stops does not reflect phonological specification, its presence should not be crucial for listeners in the identification of /bdg/ in voice languages.

To test this prediction, an AX discrimination experiment was carried out with Polish listeners, who were presented with four types of stimuli: fully pre-voiced /bdg/, partially pre-voiced /bdg/, unvoiced /bdg/, and voiceless /ptk/. We look at both discrimination accuracy and response time. The two approaches discussed above produce different hypotheses for our study, formulated as in the table below.

| Stimulus pairing | Laryngeal Realism prediction | Modulation Theory prediction |
|---|---|---|
| (1) unvoiced /bdg/ vs. /ptk/ | heard as the same, with slower RTs than pairs with pre-voicing | heard as different, RTs unaffected |
| (2) pre-voiced vs. unvoiced /bdg/ | heard as different, with slower RTs than identical | heard as the same, RT unaffected |

Preliminary results from 18 listeners provide some support for the Modulation approach. The laryngeal contrast is robustly discriminated even in the absence of pre-voicing (1), but with unvoiced

/bdg/ inducing slightly slower RTs. In non-contrasting pairs (2), the absence of pre-voicing affected discrimination accuracy and RT only in the case of coronals, but not labials or dorsals. Additional analysis (with additional listeners) will examine the effects of linguistic experience to investigate if English influence may have increased perceptual acuity to productions of /bdg/ without pre-voicing.

**REFERENCES**

Beckman, J., M. Essen & C. Ringen (2013). Evidence for laryngeal features: aspirating vs. true-voice languages. *Journal of Linguistics* 49 (2), 259-284.

Honeybone, P (2005). Diachronic evidence in segmental phonology: the case of obstruent laryngeal specifications. In van Oostendorp, M. and van de Weijer, J. (eds) *The Internal Organization of Phonological Segments*. Berlin: Mouton de Gruyter, 319-354.

Keating, P. (1980). *A phonetic study of a voice contrast in Polish*. Ph.D. dissertation, Brown University.

Schwartz, G. (submitted). Formalizing modulation and the emergence of phonological heads. Under review at *Glossa*.

Traunmüller, H. (1994). Conventional, biological, and environmental factors in speech communication: A modulation theory. *Phonetica* 51, 170-183.

Wetzels, W. & J. Mascaró (2001). The typology of voicing and devoicing. *Language* 77: 207-244.

## ENGLISH VOWEL PERCEPTION BY POLISH LEARNERS

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This paper examines English vowel perception by Polish learners of English and tests Perceptual Assimilation Model's (Best 1995, Best and Tyler 2007) predictions. Studies devoted to testing Perceptual Assimilation Model's predictions have so far focused solely on second language acquisition in L2-dominant countries and primarily on consonants (with the exception of Tyler et al., 2014 and Faris et al. 2016). There have been very few perception studies of learners in a formal classroom setting. This paper tests how Polish listeners with a simple six-vowel inventory perceive the extensive British English vowel inventory. Furthermore, it is also examined whether it is categorization of foreign language vowels in terms of native or foreign language vowel categories better predicts discrimination results.

The stimuli included 12 British English vowels in /hVbə/ nonce words. Stimuli were prepared on the basis of recordings of carrier sentences: "In hVb and hVber we have /V/". 40 native Polish first year English majors participated in the experiment. Their perception of English vowels was assessed using a categorial ABX discrimination task, and two identification tasks, one with Polish vowel labels and the other with English vowel labels. Participants also rated the goodness-of-fit using a seven-point Likert scale.

Preliminary results suggest that perception of non-native vowel contrasts also in the case of advanced formal foreign language instruction follows PAM's predictions. Five contrasts were predominantly categorized as Two Category assimilation types (/e-æ/, /e-ʌ/, /ʌ-ɒ/, /e-ɪ/ and /iː-ɪ/), two contrasts were categorized as Category Goodness (/ɔː-ɒ/ and /e-ɜː/) and three as Single Category assimilation types (/uː-ʊ/, /æ-ʌ/ and /ɑː-ʌ/). Assimilation patterns with uncategorized sounds were observed for the following contrasts: /iː-ɪ/, /e-ɪ/, /e-ɜː/ and /uː-ʊ/. The results confirm PAM predictions about different discrimination rates for different types of assimilation patterns (TC/UC > CG > SC).

The results also provide data for teaching Polish learners of English about centralized /æ/, centralized /uː/ and /ʊ/, vowel height vs. vowel advancement differences and free vs. checked vowels.

## CLASS NODE-RELATED CONDITIONS AND AFFRICATION EFFECTS IN GERMAN

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Harris's (1994) model of intra-segmental architecture is based on the assumption that phonological elements contributing to the structure of a given melody are organized under the so-called class nodes. The author distinguishes three such units, namely Root, Place and Laryngeal. The sets of primes gathered under each of them exhibit similar phonological behaviour with respect to phonological processes (Harris and Lindsey 1995). Refined as it is, the model of element geometry still calls for further elaboration and adaptation to the language-specific properties of sub-segmental structure. This presentation, therefore, is meant to propose German-specific conditions on node structure. The data we are going to analyze will be related to the consonant affrication process. It will be demonstrated that consonantal melodies which are involved in the process of affrication have to be dominated by positions forming governing domains.

Within the rich array of German consonantal sequences, we can attest strings of segments whose behaviour resembles the English nasal-fricative clusters (e.g. in *prince*). More specifically, Wiese (1996: 233) lists examples of data illustrating stop-insertion inside sonorant-fricative sequences, as in *Gans* [gans] > [gants] 'goose'. The process can be analysed as the affrication of [s]. Harris's model of segment architecture predicts the representation of affricates as contour structures, involving two Root nodes arrayed on the same autosegmental line, each of them dominating a different manner-defining prime. His analysis of the affrication process is based on the Root node fission operation. We shall try to formulate specific conditions that restrict the Root fission mechanism. The analysis will also reveal a special role of the occlusion element.

### REFERENCES

Durand J. and F. Katamba eds. (1995) *Frontiers of phonology. Atoms, structures, derivations*. London: Longman

Harris, J. (1994) *English Sound Structure*. Oxford: Blackwell.

Harris, J. and G. Lindsey (1995) The elements of phonological representation. In J. Durand and F. Katamba (eds), 34-79.

Wiese, R. (1996) *The Phonology of German*. Oxford: Clarendon Press.

## SONORANT OPACITY WITHOUT OPAQUE SEGMENTS

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This paper focuses on the behaviour of sonorant consonants with respect to voicing assimilations in Polish. At face value, they exhibit contradictory characteristics. In some prosodic contexts they appear to be transparent to spreading of laryngeal properties (1a,b), allowing for voicing assimilation between flanking obstruents, while in others, they seem to be opaque and block the spreading / assimilation (1c).

(1) a. CSC
*krtań* [krtaɲ] ‘larynx’
*grdyka* [grdɨka] ‘Adam’s apple’
*mędrek* / *mędrka* [mɛndrɛk ~ mɛntrka] ‘wiseacre, nom.sg. / gen.sg.’
*Jędrek* / *Jędrka* [jɛndrɛk ~ jɛntrka] ‘Andrew, nom.sg. / gen.sg.’

b. CS#C
*wiatr zachodni* [vʲadr zaxɔdɲi] ‘western wind’
*litr wody* [lʲidr vɔdɨ] ‘litre of water’
*metr głębokości* [mɛdr gwɛmbɔkɔɕtɕi] ‘metre in depth’

c. C#SC
*kwiat rdestu* [kfʲat rdɛstu] ‘flower of knotgrass’
*brak rdzy* [brak rdzɨ] ‘lack of rust’
*widok mgły* [vʲidɔk mgwɨ] ‘sight of mist’

C = obstruent, S = sonorant consonant

This behaviour may be derived from two different sources. Firstly, it may be due to some inherent property of sonorants which are part of their representation (features). Alternatively, it may be derived from the nature of the prosodic positions in which a given segment is lodged.

I will provide an alternative view on sonorant opacity suggesting that this phenomenon is representational only in the prosodic sense and hardly in the sense that some active property like feature or element should block voicing assimilation. The two main dilemmas concerning the representation and distribution of laryngeal properties of segments, that is, binarity vs. privativity and syllable-based vs. non-syllable-based will be resolved in favour of a strictly privative and syllable-based account. The proposal in this paper will make no reference to rule ordering, or constraint ranking.

**REFERENCES**

Bethin, Christina. 1984. “Voicing assimilation in Polish.” *Journal of Slavic Linguistics and Poetics*, Vol 29, pp. 17-32.

Bethin, Christina. 1992. *Polish Syllables. The Role of Prosody in Phonology and Morphology*. Columbus, Ohio: Slavica.

Cyran, Eugeniusz. 2014. *Between Phonology and Phonetics. Polish Voicing*. Berlin and New York: De Gruyter Mouton.

Gussmann, Edmund. 1992. “Resyllabification and delinking: the case of Polish voicing.” *Linguistic Inquiry*, Vol. 23, pp. 29-56.

Gussmann, Edmund. 2007. *The Phonology of Polish*. Oxford: Oxford University Press.

Rubach, Jerzy. 1996. “Nonsyllabic analysis of voice assimilation in Polish.” *Linguistic Inquiry*, Vol. 27, pp. 69-110.

Rubach, Jerzy. 1997a. “Polish voice assimilation in Optimality Theory.” *Rivista di linguistica*, Vol. 9, pp. 291-342.

Rubach, Jerzy. 1997b. “Extrasyllabic consonants in Polish: Derivational Optimality Theory.” In: *Derivation and Constraints in Phonology,* ed. Iggy Rocca. Oxford: Clarendon, pp. 551-581.

Rubach, Jerzy. 2008. “Prevocalic faithfulness.” *Phonology*, Vol. 25, pp. 433-468.

Scheer, Tobias. 2015. "A world without voiced sonorants. Reflections on Cyran 2014. *Studies in Polish Linguistics*, 10: 125-151 (Part I) 224-247 (Part II).

Strycharczuk, Patrycja. 2012. "Sonorant transparency and the complexity of voicing in Polish." *Journal of Phonetics*, Vol. 40, pp. 655-671.

## PRE-VOICING SUPPRESSION IN THE SPEECH OF POLISH LEARNERS OF ENGLISH

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Most production studies of laryngeal features in L2 English concentrate on fortis plosives, for which positive VOT encodes a phonological category shift in the target language. Researchers have for the most part been interested in the acquisition of aspiration by L1 speakers of voicing languages. Much less attention is paid to the realization of lenis plosives in terms of the suppression of pre-voicing when L1 is a 'voicing' language.

There are a number of arguments, both pedagogical and phonological, for devoting more research attention to initial lenis plosives in English. First of all, failure to suppress L1 pre-voicing is responsible for the transfer of L1 voice assimilation into medial clusters in English, a salient pronunciation error in words like *Facebook* and *football*, which in Polish-accented English are realized [fejzbuk] and [fudbol], respectively. Zając (2015) found that Polish learners of English converge to a much greater extent with aspirated fortis plosives than unvoiced lenis ones, suggesting equivalence classification (Flege 1987) between unvoiced and pre-voiced /b d g/, but not between plain and aspirated /p t k/. This in turn presents a challenge to the theory of laryngeal realism (LR; e.g. Honeybone 2005; Beckman et al. 2013), in which both /p t k/ and /b d g/ are represented differently in voicing and aspirating languages. LR predicts that Polish learners of English should be equally successful in the suppression of pre-voicing and the acquisition of aspiration, since both represent new phonetic categories for L2 speech learning (Flege 1995).

In light of this discussion, this paper examines the realization of L2 English lenis plosives by L1 Polish speakers. So far, we have looked at initial /b/ produced by L1 Polish speakers at three different proficiency levels, identifying three categories of realization: fully pre-voiced, partially pre-voiced with a clear break in periodicity, and unvoiced. Our preliminary analysis of several hundred items has found that even highly proficient speakers produced unvoiced tokens in less than 40% of the cases, indicating persistent L1 influence in the failure to suppress pre-voicing. We are currently preparing a more thorough production study to confirm these preliminary findings.

Equivalence classification between pre-voiced and unvoiced /b d g/ provides support for a new perspective (Schwartz, under review) based on Modulation Theory (Traunmüller 1994), in which phonetic voicing is part of a carrier signal and does not reflect phonological specification.

### REFERENCES

Beckman, J., M. Essen & C. Ringen (2013). Evidence for laryngeal features: aspirating vs. true-voice languages. *Journal of Linguistics* 49 (2), 259-284.

Flege, J. (1987). The production of 'new' and 'similar' phones in a foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics* 15, 47-65.

Flege, J. E. (1995). Second language speech learning: Theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research*. Timonium, MD: York Press, 233-276.

Honeybone, P (2005). Diachronic evidence in segmental phonology: the case of obstruent laryngeal specifications. In van Oostendorp, M. and van de Weijer, J. (eds) *The Internal Organization of Phonological Segments*. Berlin: Mouton de Gruyter, 319-354.

Schwartz, G. (submitted). Formalizing modulation and the emergence of phonological heads. Under review at *Glossa*.

Traunmüller, H. (1994). Conventional, biological, and environmental factors in speech communication: A modulation theory. *Phonetica* 51, 170-183.

Zając, M. (2015). *Phonetic convergence in the speech of Polish learners of English*. Ph.D. dissertation, University of Łódź

## OCP AND THE SPECIFICITY OF FINAL EMPTY NUCLEI

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**0.** In this presentation, I argue that the periodicity of the skeleton, in the *strict CV* framework introduced by Lowenstamm (1996), results from OCP. I show how this proposal interestingly accounts for some specific features of the word-final position. I base my analysis on three phenomena: **i.** final branching codas; **ii.** Italian Tonic Vowel Lengthening; and **iii.** extrasyllabicity.

**1.** Branching codas seldom occur in word-internal position (e.g. [æp(t)nəs] *aptness*). In order to account for this restriction, Governement Phonology assumes that successive empty nuclei are ill-formed. However, branching codas are very common in *word-final* position (e.g. [æpt] *apt*). Thus, the aforementioned constraint seems to be neutralized in this context. This specificity bore the notion of Final Empty Nucleus (i.e. ungoverned empty V able to govern).

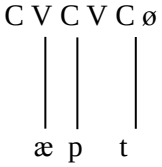
**2.** Another specificity of word-final position can be found in the realization of Italian stress. Italian displays a well-known Tonic Vowel Lengthening in open syllables (e.g. [f**a**ːto] *fate*). Larsen (1998) proposed to account for this phenomenon with a [CV] unit inserted on the right of the stressed nucleus. However, Tonic Vowel Lengthening never applies in final syllable: **i.** in absolute final position, stressed vowels remain short (e.g. [t͡ʃìtt**a**] *city*); and **ii.** before a consonant-initial word, the post-tonic consonant lengthens (e.g. [t͡ʃìtt**a**ːbbellissima] *city*). In sum, the Final Empty Nucleus seems to be inaccessible for Tonic Vowel Lengthening.

**3.** Such an *invisibility* of Final Empty Nuclei is also observed in metrics. Scheer & Szigetvari (2005) assumed that V positions are weight units. However, this is not systematically the case with Final Empty Nuclei. In Lake Miwok (Tranel, 1991), stress targets the rightmost heavy syllable (e.g. ***c'aːdata*** vs. *c'a**kaːt***). Internal codas take part in syllable weight (e.g. ṣi**k'il**li), but final codas have no weight (e.g. do**loː**men vs. *dolo:**men***). This *extrasyllabicity* of final consonants implies that Final Empty Nuclei are unexpectedly weightless in this language.

**4.** In these three cases, Final Empty Nuclei are like ghosts: **i.** they can be invisible in successions of empty nuclei; **ii.** they are inaccessible for Italian Tonic Vowel lengthening; and **iii.** they can be weightless. Now I propose to unify these specific features of the word-final position with a very simple generalization. Following Carvalho (2002), I assume that the CVCV skeleton results from OCP, not from the repetition of a primitive CV syllable. In other words *CC and *VV violate OCP, hence the periodicity of CVCV. Such a hypothesis predicts that words can end with a C-position. Indeed, an absence of final V does not trigger any illicit *CC. Now, it is worth considering that this prediction motivates the specificities of final branching codas (1), Italian Tonic Vowel Lengthening

(2) and extrasyllabicity (3). In these cases, Final Empty Nuclei seem to be absent because they **are** absent. To sum up, this presentation aims to show that: **i.** Final Empty Nuclei are ghosts; and **ii.** ghosts do not exist.

(1)




(2)


(3)


**REFERENCES**

Carvalho (Brandão de), J. (2002) *De la syllabation en termes de contours CV*. HDR dissertation [ms]. EHESS.

Larsen, U. B. (1998) 'Vowel length, Raddoppiamento Sintattico and the selection of the definite article in Italian', in Sauzet, P. (ed.) *Langues et Grammaire II-III: Phonologie*. Paris: University Paris 8, pp. 87–102.

Lowenstamm, J. (1996) 'CV as the Only Syllable Type', in Durand, J. and Laks, B. (eds) *Current Trends in Phonology Models and Methods*. University of Salford: European Studies Research Institute, pp. 419–442.

Tranel, B. (1991) 'CVC Light Syllables, Geminates and Moraic Theory', *Phonology*, 8(2), pp. 291–302.

## STRENGTH IS LENGTH

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**0.** This presentation focuses on the role of Licensing as a strengthening force. Our aim is to point out some of its limits, and to argue that it can be replaced by phonological length.

**1.** In order to account for the contrast between *lenis* and *fortis* realizations, it is often misunderstood that strict CV assumes two different mechanisms: Licencing and length. Licensing as a strengthening mechanism was proposed within Mirror Theory in order to account for the strength contrast between syllabic positions (Ségéral & Scheer, 2001). As for the role of length in strength contrasts, it was pointed out by Lowenstamm (1991) and Scheer (2000) in order to explain the specific inalterability of long vowels and geminates.

**2.** Our claim is that Licensing does not account for the specific inalterability of geminates. Theoretically, post-coda onsets and geminates undergo the same lateral relations: **i.** Government targets the embedded empty nucleus; and **ii.** Licensing targets the onset. However, in some languages post-coda plosives are unexpectedly weaker than geminates (e.g. Tamazight *efθel* vs. *fe**tt**el*, zero and intensive forms of the verb meaning *to roll coucous*).

**3.** We aim to argue that length is more likely to account for strength contrasts than Licensing. Our proposition is that onsets branch to the position of codas. By assumption, branching has a strengthening effect, and position-sharing have a weakening effect. Geminates, which branch to *unoccupied* positions, are the strongest segments. Post-coda onsets, which branch to a position *occupied* by a coda, are weaker than geminates. Codas, which only share their position with the following onset, are the weakest segments. Finally, intervocalic onsets do not branch nor share their

position with any adjacent consonant. They have the most neutral strength (note that they are typologically unmarked).

**4.** From this level of analysis, the question is: what does motivate such an *interconsonant spreading*? We assume, following Harris' (1990) analysis of assimilation, that spreading is motivated by segmental complexity. We will show how this hypothesis of an internal branching structure in consonant clusters sheds light on their syllabic behaviour. We will base our analysis on Sanskrit reduplication (among others). Sanskrit reduplication targets the first component of onsets with *rising* sonority (e.g. **k**an-i-**kr**and *cry out*), but the second component of onsets with *falling* sonority (e.g. **k**an-i-**sk**and *leap*). Steriade (1988) proposed two conditioning factors: length (conditions the amount of reduplicated segments) and extrasyllabicity (conditions the identity of the reduplicated segment). We will show that *interconsonant spreading* accounts for the contrast between /kr/ and /sk/ without referring to extrasyllabicity. Assuming that spreading is driven by segmental complexity, /k/ spreads to /r/ in kan-i-**kr**and, and to /s/ in kan-i-**sk**and. Hence the following generalization: the reduplicated component (/k/ in both cases) is the *longest* segment of the branching onset.

**5.** To conclude, based on Tamazight, Sanskrit, Gothic, and other languages, we aim to propose how phonological length can account for various syllabic phenomena such as strength contrast and behaviour of branching onsets. The long-term objective is to unify the effects of Licensing with more common autosegmental representations.

## REFERENCES

Harris, J. (1990) 'Segmental Complexity and Phonological Government', *Phonology*, 7(2), pp. 255–300.

Lowenstamm, J. (1991) 'Vocalic length and centralization in two branches of Semitic (Ethiopic and Arabic)', in Kaye, A. S. (ed.) *Semitic Studies in Honor of Wolf Leslau on the occasion of his 85th birthday*. Wiesbaden: Harrassowitz, pp. 949–965.

Saib, J. (1974) 'Gemination and spirantization in Berber: diachrony and synchrony', *Studies in African Linguistics*, 5(1), pp. 1–25.

Scheer, T. (2000) *De la Localité, de la Morphologie et de la Phonologie en Phonologie*. HDR dissertation [ms]. University of Nice Sophia-Antipolis.

Ségéral, P. and Scheer, T. (2001) 'La coda-miroir', *Bulletin de la Société de Linguistique de Paris*, 96(1), pp. 107–152.

Steriade, D. (1988) 'Reduplication and Syllable Transfer in Sanskrit and Elsewhere', *Phonology*, 5(1), pp. 75–155.

## A CVCV APPROACH TO 'PROSODIC PROFILING'

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The aim of the paper is to reanalyse the approach to prosodic typology advocated by Auer (1993), Szczepaniak (2007), Reina & Szczepaniak (2014), which rests upon the idea that various languages choose either the syllable or the phonological word as the central phonological category and organize most of its phonological regularities around it. This body of work essentially builds upon older work on syllable-timing and stress-timing (Donegan & Stampe 1983, Dauer 1983), but it denies that the typological division should be based solely on rhythm. The focus is on a wider variety of phonological factors. For instance, the so-called 'syllable languages' tend to have simple syllable structure with

predominantly open syllables, long segments in both accented and unaccented syllables, and no stress-dependent vowel reduction. They also often feature vowel harmony and tone. In contrast, 'word languages' display complex syllable structure, vowel reduction and no long segments in unstressed positions. They usually lack vowel harmony or tone (Auer 1993: 11). Most phonological rules in 'syllable languages' aim at profiling the syllable, in 'word languages' they mostly profile the phonological word. It is beyond doubt that there are no languages which can be unambiguously assigned to only one of these categories (Auer 2014: 3). The typology is rather viewed as a continuum, with each language occupying a given position on the scale, but features characteristic of one type will be usually dominant.

Given the proviso above, it can be safely concluded that the distinction between syllable languages and word languages cannot be a binary parameter in the sense of I-language. However, the strong typological correlation between all of the phenomena ascribed to syllable languages demands an explanation, as well as a similar correlation between 'word language' features. The explanation can be to some extent dependent on UG-related factors.

It will be argued that some aspects of the typology are due to parametric choices regarding syllabification, whereas some other aspects can be ascribed to the necessity of representing lexical contrasts. What may seem a little challenging, we will try to capture the generalization within an unconventional model of phonology which does not recognize traditional units of prosodic organization. In various variants of CVCV (Scheer 2004, Cyran 2010) there are no syllables, with syllabic structure being expressed by a net of lateral relations holding between segments. This is not an obstacle for formulating an explanation, since CVCV allows us to refer to individual parameters governing formation of syllable structure. For instance, in Cyran's (2010) *Complexity Scales* and *Licensing* implementation, possible syllabic configurations (branching onsets/coda-onset clusters/simple onsets) are dependent on the strength of the following licensor (full vowel/reduced vowel/empty nucleus), with various languages choosing various points on the scale. Against this background, we assume that a licensor and its licensing domain (i.e. the preceding consonant or cluster) is a relevant contrastive unit of language. Canonical 'syllable languages' primarily make use of full nuclei as licensors (sometimes supported by empty nuclei domain-finally), in both stressed and unstressed positions. These nuclei, often accompanied by single consonants only, can generate many contrastive CV units and when concatenated, they are able to cover the necessary lexical contrasts without the need to employ more complex syllabic structures. In languages of the other type, i.e. 'word languages', the nuclei of unstressed syllables usually host reduced vowels and cannot express that many contrasts. What follows from licensing scales is that these nuclei can usually license fewer preceding consonants and/or clusters than stressed (full) nuclei. This fact diminishes the contrastive potential of the whole licensing domain projected by an unstressed nucleus. Consequently, the lexical contrastive burden needs to be taken over by the stressed nucleus of the word, which hosts a full vowel and in order to be able to cover all the necessary contrasts, it often has to license more complex consonant structures. The lack of vowel harmony and tone in word languages can be easily explained with reference to the reduced contrastive potential of unstressed nuclei (also expressible in terms of autosegmental licensing): they cannot accept harmonic features spreading from other nuclei, or tone features, since they can only host reduced vowels.

The proposed approach attempts to account for the attested prosodic typology of languages by combining strictly formal concepts (licensing scales as the UG basis) with the extragrammatical concept of the necessity of expressing lexical contrast (which is dependent on the content of the lexicon, hence also on language-specific aspects of language use). It will be argued that this approach has a potential of shedding new light on both the theory of 'prosodic profiling' (by an attempt to

reduce it to more basic mechanisms of cluster licensing and autosegmental licensing) and on licensing scales (by adding an extragrammatical dimension, which explains why e.g. there are few languages in which full vowels in all positions of the word coexist with complex syllabic structures).

## REFERENCES

Auer, Peter. 1993. „Is a rhythm-based typology possible? A study of the role of prosody in phonological typology." *KontRI Working Paper 21*. Universität Konstanz.

Auer, Peter. 2014. „Preface" In: Reina, Javier Caro & Renata Szczepaniak (eds.). *Syllable and Word Languages*. Berlin/Boston: Mouton de Gruyter.

Cyran, Eugeniusz. 2010. *Complexity Scales and Licensing in Phonology*. Berlin/New York: Mouton de Gruyter.

Dauer, Rebecca. 1983. „Stress-timing and syllable-timing reanalyzed". *Journal of Phonetics* 11: 51-62.

Donegan, Patricia J. & David Stampe. 1983. „Rhythm and holistic organization of language structure" In: John F. Richardson, Mitchell Marks and Amy Chukerman (eds.), *Papers from the Parasession on the Interplay of Phonology, Morphology and Syntax, Chicago, 22-23 April 1983*, 337-353. Chicago: Chicago Linguistic Society.

Reina, Javier Caro & Renata Szczepaniak (eds.). 2014. *Syllable and Word Languages*. Berlin/Boston: Mouton de Gruyter.

Scheer, Tobias. 2004. *A Lateral Theory of Phonology. What is CVCV and why should it be?* Berlin/New York: Mouton de Gruyter.

Szczepaniak, Renata. 2007. *Der phonologisch-typologische Wandel des Deutschen von einer Silbensprache zu einer Wortsprache*. Berlin/New York: Mouton de Gruyter.

## VOICING VARIABILITY OF ENGLISH PRE-PAUSAL OBSTRUENTS

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According to numerous studies, the state of voicing of pre-pausal English obstruents is encoded in three types of clues: the duration of the preceding vowel, the amount of voicing-into-constriction and the force of articulation.

Most studies seldom relate the data on clipping to inherent vowel length, and the reader is not advised as to whether certain clipped tense vowels are longer – or shorter – than non-clipped lax vowels. Moreover, a number of sources indicate that manner of articulation is another factor of significant strength that exerts an additional effect on the resulting vowel duration, whereby vowels followed by fricatives are generally longer than those followed by stops. Thus, if one takes manner of articulation into account, the questions will multiply, e.g. are vowels in *bus* and *buzz* significantly longer than, respectively, those in *but* and *bud*? These durational differences are by no means small and they are very well perceived by hearers of English, so such data are not disposable details if vowel duration is to be a relevant cue to the voicing of the following consonant. To make an attempt at providing a more complete picture of English voicing than the simplified textbook descriptions, it will be very instructive to relate the preceding vowel duration data to the amount of voicing-into-constriction and the strength of the articulation of the plosion, and study how they interact.

The present account, based on measurements performed on recordings of native English speech gathered by the author, attempts at presenting a more complete algorithm of voicing control that can also be used by foreign students of English.

## WORD STRESS AND MUSICAL ABILITIES – SENSITIVITY TO DIFFERENT PROMINENCE CUES IN POLISH LEARNERS OF ENGLISH

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Word stress is an essential element of English language learning as it affects the comprehension and intelligibility of spoken English. Yet, it is often a great challenge for Polish learners to master it successfully. Interestingly enough, there seems to be a correlation between the acquisition of English word stress and one's musical experience and/or musical hearing (e.g. Magne et al., 2006; Milovanov et al., 2010; Fonseca-Mora et al., 2011; Połać, 2014; Balčytytė-Kurtinienė, 2015; Jekiel and Malarski, 2016; Gralińska-Brawata & Rybińska, 2016). According to Balčytytė-Kurtinienė (2015: 419), "[E]nhanced musical aptitude and simultaneous musical exposure seems to improve the ability of foreign language learners to distinguish between rapidly changing sounds, stresses, vowel reduction, rhythm and intonation".

As has been noticed in our previous pilot study on teaching English word stress to Polish advanced students (Gralińska-Brawata & Rybińska, 2016), the production of prominence contrasts with the use of "Ooo" visual marks varies among the students and points to their different sensitivity to different word stress cues (either pitch, length or loudness). The current study represents its continuation and aims to compare the production of prominence contrasts through the so-called *baba* sequences with reading out words with stress patterns. Moreover, as our project focuses on the relation between the production of word stress and musical abilities, it will be checked if the musical learners tend to use some cues more often and more consistently than the non-musical ones. The data used for the analysis come from 20 Polish second-year students of the University of Łódź, recorded during November 2016 and January 2017. The results of the acoustic analysis that the recordings underwent (the PRAAT software) will be compared with the information provided by the informants in a questionnaire and a performance music test whose aim was to evaluate the musical skills of the informants in terms of their abilities to imitate rhythm and melody.

### REFERENCES

Balčytytė-Kurtinienė, G. (2015). Musical aptitude and language: activating phonetic skills through music. Paper presented at 8th Conference on fICT in Language Learning.

Boersma, P. & Weenink, D. (2008). Praat: Doing phonetics by computer (verion5.0.29). http://www.praat.org/

Fonseca-Mora, M., Toscano-Fuentes, C. and K. Wermke. (2011). Melodies that help: The Relation between Language Aptitude and Musical Intelligence, *Anglistik International Journal of English Studies* 22, 1: 101-118.

Gralińska-Brawata, A., Rybińska, P. (2016). Teaching word stress to Polish advanced students: musical abilities and word stress. Paper presented on Dec 2nd 2016 at 10th International Conference on Native and Non-native Accents of English ACCENTS 2016.

Magne, C., Schön, D. and M. Besson. (2006). Musician Children Detect Pitch Violations in Both Music and Language Better than Nonmusician Children: Behavioural and Electrophysiological Approaches, *Journal of Cognitive Neuroscience* 18(2): 199–211.

Malarski, K., Jekiel, M. (2016). The acquisition of nonrhoticity in musical and nonmusical advanced Polish students of English. Paper presented on Dec 2nd 2016 at 10th International Conference on Native and Non-native Accents of English ACCENTS 2016.

Milovanov, R., Pietilä, P., Tervaniemi, M., & Esquef, P. A. (2010). Foreign language pronunciation skills and musical aptitude: A study of Finnish adults with higher education. Learning and Individual Differences, 20(1), 56–60. DOI: http://dx.doi.org/10.1016/j.lindif.2009.11.003

Połać, A. (2014). *Investigating the relationship between linguistic aptitude and musical faculty*. Unpublished M.A. thesis. Łódź: Uniwersytet Łódzki.

## MU̶:VING FORWARD: /u:/ FRONTING AND DARK [ɬ] BLOCKING IN BRITISH ENGLISH INDICATES NEED FOR REVISED PHONEMIC TRANSCRIPTION

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It has been observed that most southern British English varieties have experienced a fronting of the high back vowel /u:/ in almost all phonetic environments. While there have been numerous calls to adapt the phonemic transcription of standard British English with respect to various sounds, very few have gained widespread acceptance. This is because, while the IPA symbols currently used for phonemic transcription may not correspond exactly with the sounds actually produced by speakers, the differences do not constitute phonological contrast and hence do not warrant a break away from established convention. However, despite a general fronting of /u:/ in British English, the back variations are still retained when produced before a dark [ɬ]. The fronting of /u:/ in most environments would potentially render the current symbolic representation of the phoneme inaccurate and inappropriate for further use, since it would now merely represent a single allophonic variation of a phoneme which is otherwise produced more frequently as a mid-front vowel. To test the hypothesis that /u:/ is pronounced as a more fronted vowel among native speakers of southern British English, an empirical study was conducted. Subjects were recorded reading aloud a series of monosyllabic words containing vowel sounds currently transcribed as /u:/ in different environments, including before dark [ɬ], among other randomly selected monosyllabic words as distractors. Three independent phoneticians judged the frontness of the vowels in question (results pending). Preliminary results indicate that /u:/ is indeed fronted in all phonetic environments, except when preceding dark [ɬ] in most cases. The results of this study form the basis of the proposition that the symbol /u:/ is currently obsolete as the representation of the phoneme and ought to be replaced by a symbol representing a rounded mid-front vowel. We propose that the symbol [u:] be considered as the representation of allophones of the mid-front phoneme occurring before dark [ɬ], its use within the British English standard variety being restricted exclusively to narrow transcription.

## SYLLABIFICATION OF NONMORPHEMIC AND MORPHOLOGICALLY DECOMPOSABLE CONSONANT CLUSTERS IN GEORGIAN

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In the last decade, a number of studies related to the framework of Articulatory Phonology focused on syllable structure being reflected in the coordination of articulatory gestures. In Articulatory Phonology it is assumed that the organization of consonantal gestures depends on the cluster either forming a complex onset or a simple onset, thus being homosyllabic (CCV) or heterosyllabic (C.CV). Various studies have shown that both types of cluster structures can be observed across languages (e.g. a complex onset coordination for e.g. American English (Browman & Goldstein 1992) and Italian obstruent-liquid clusters (Hermes et al. 2013) vs. a simple onset coordination for e.g. Tashlhiyt Berber (Goldstein et al. 2007, Hermes et al. 2011) and Italian sibilant clusters (Hermes et al. 2013).

A study by Goldstein et al. (2007) provided preliminary evidence that Georgian clusters exhibit complex coordination. However, there was only one cluster analyzed by only two speakers revealing different strategies.

In the present study, we analyzed gestural coordination patterns based on articulographic data (AG501 Electromagnetic Articulograph) from 4 native speakers of Georgian producing lexical nonmorphemic and morphemic decomposable word initial consonantal clusters. The analysis is based on gestural measurements reflecting either a complex (such as the rightward shift of prevocalic C to make room for added consonants) or simple onset coordination (no rightward shift), thus comparing singleton consonants which the consonant clusters in question forming triplets.

As one of very few languages Georgian offers the possibility to compare nonmorphemic word initial clusters, such as ქარი /kari/ (“wind”), მარი /mari/ (“proper name”) and ქმარი /kmari/ (“husband”), which are integral part of a word (i.e. monomorphemic) with morphemically decomposable consonant clusters such as ვაძლევ /v-adzlev/ (“I give to him”), გაძლევ /g-adzlev/ (“I give to you”) and გვაძლევ /gv-adzlev/ (“you give to us”) in a minimal contrast like fashion.

**REFERENCES**

Browman, C.P.; Goldstein, L. (1992). Articulatory phonology: an overview. *Phonetica*, 49 (3–4): 55–180.

Goldstein, L., Chitoran, I., & Selkirk, E. (2007). Syllable structure as coupled oscillator modes: Evidence from Georgian vs. Tashlhiyt Berber. (pp. 241–244). *Proceedings of the XVI International Congress of Phonetic Sciences*, Saarbrücken, Germany.

Hermes, A., Ridouane, R., & Mücke, D. (2011). Gestural coordination in Tashlhiyt syllables. *Proceedings of the 17th International Congress of Phonetic Sciences*, Hong Kong, China.

Hermes, A., Mücke, D., & Grice, M. (2013). Gestural coordination of Italian word-initial clusters: the case of “impure s.” *Phonology*, 30(01), 1–25.

## FLUENCY OF FORMULAIC SEQUENCES IN NATIVE ENGLISH SPEECH

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This study is a cross-sectional analysis of the relationship between productive fluency and the use of formulaic sequences in native British English speech. The main question addressed here is whether formulaic sequences are produced more fluently than non-formulaic compositional speech. The data include recordings and transcriptions of randomly selected samples of British English speech from the Spoken British National Corpus (Audio BNC, Coleman et al., 2012). First, Compleat Lex Tutor’s N-gram Phrase Extractor (Cobb, 2015) was used to extract the most frequent recurring word strings (2-5 words in length) within each sample. Second, two recently compiled lists of the most frequent formulaic sequences identified in the Spoken British National Corpus were used as a point of reference: 100 highest frequency collocations (Shin & Nation, 2008) and 505 most frequent non-transparent multiword expressions (Martinez & Schmitt, 2012). The extracted n-grams, collocations and multiword expressions were then removed from the data. Fluency scores were obtained for the each sample before and after removal of the formulaic material resulting in three types of data: baseline (pre-removal), non-formulaic (post-removal) and formulaic. Breakdown and speed fluency were measured using a set of objective phonetic measurements recently proposed as valid indices of productive fluency (Bosker et al., 2013). The resulting fluency scores were then compared.

Preliminary results show that fluency scores of formulaic sequences are slightly but significantly lower than those of baseline samples for all the types of formulaic sequences.

## REFERENCES

Bosker, H. R., Pinget, A. F., Quene, H., Sanders, T., & De Jong, N. H. (2013). What makes speech sound fluent? The contributions of pauses, speed and repairs. *Language Testing* 30(2), 159–175. http://dx.doi.org/10.1177/0265532214526177.

Cobb, T. (2015). N-Gram Phrase Extractor [computer program]. Accessed 24 October 2016 at http://lextutor.ca/n_gram/.

Coleman, J., Baghai-Ravary, L., Pybus, J., & Grau, S. (2012). Audio BNC: the audio edition of the Spoken British National Corpus. Phonetics Laboratory, University of Oxford, http://www.phon.ox.ac.uk/AudioBNC.

Martinez, R., & Schmitt, N. (2012). A phrasal expressions list. *Applied Linguistics* 33(3), 299–320.

Shin, D., & Nation, P. (2008). Beyond single words: the most frequent collocations in spoken English. *ELT Journal* 62(4): 339–48.

## PHONETIC AND PHONOLOGICAL DEGEMINATION IN DUTCH, GERMAN AND ENGLISH

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Modular generative grammar theories à la Chomsky & Halle (1968) make a strict distinction between phonology and phonetics, and therefore between phonological and phonetic processes: While the former are categorical and obligatory, the latter are gradient. Many Optimality-Theoretic (OT) approaches have rejected this division (see e.g. Flemming 2001), because it allows for the simultaneous existence of phonetic and phonological processes that both result in the same output, which seems to violate the principle of Occam's razor.

In this talk I illustrate with degemination in the West-Germanic languages Dutch, German and English that a simultaneous synchronic existence of almost identical phonological and phonetic processes is exactly what we find in these languages. All three have an obligatory process of degemination within the p(rosodic) word, see e.g. Booij (1995) and Ruys & Trommelen (2003) for Dutch, Wiese (1996) for German, and Halle & Mohanan (1985) for English. This is illustrated with the examples in (1), where brackets indicate p-word boundaries (Note that English usually employs epenthesis to avoid geminates in this context).

| | | | | |
|---|---|---|---|---|
| (1) | Dutch: | /(zɛt+tə)/ | [zɛtə] | 'to put (past)' |
| | | /(vud+də)/ | [vudə] | 'to feed (past)' |
| | German: | /(hat+tə)/ | [hatə] | 'to have (past)' |
| | | /(liːs+st)/ | [liːst] | '(you) read' |
| | English: | /(bɛnd+t)/ | [bɛnt] | 'to bend (past)' |

A similar degemination process occurs in fast speech across p-words, see (2), though here it is optional and shows variable output (for Dutch, see e.g. Martens & Quené 1994, Strycharczuk & Sebregts 2015; for German e.g. Kohler 2001, Bergmann 2014; for English, e.g. Oh & Redford 2012, Kotzor et al. 2016).

| | | | | |
|---|---|---|---|---|
| (2) | Dutch: | /(boːt)(tɔχt)/ | [boːtːɔχt]~[boːtˑɔχt]~[boːtɔχt] | ‘boat tour’ |
| | | /(vɪs)(sup)/ | [vɪsːup]~[vɪsˑup]~[vɪsup] | ‘fish soup’ |
| | German: | /(ʃɪf)(faʁt)/ | [ʃɪfːaʁt]~[ʃɪfˑaʁt]~[ʃɪfaʁt] | ‘shipping’ |
| | | /(bʁoːt)(taɪg)/ | [bʁoːtːaɪk]~[bʁoːtˑaɪk]~[bʁoːtaɪk] | ‘bread dough’ |
| | English: | /(bæŋk)(kɑːd)/ | [bæŋkːɑːd]~[bæŋkˑɑːd]~[bæŋkɑːd] | ‘bank card’ |
| | | /(gəʊst)(taʊn)/ | [gəʊstːaʊn]~[gəʊstˑaʊn]~[gəʊstaʊn] | ‘ghost town’ |

Based on their differences, I argue that the first is a phonological process, whereas the second is phonetic. To formalize these two types of degemination in the three languages, I employ the bidirectional phonetics-phonology model (Boersma 2007). In my analysis, the obligatory phonological process in (1) is triggered by an OCP-like constraint as in (3a), while the optional phonetic process in (2) is due to a speech-rate dependent articulatory constraint given in (3b).

(3a) *GEMω: No geminates within prosodic words
(3b) *[ Cː]: The articulation of a long consonant is penalized

Constraint (3a) applies in the mapping from underlying to surface form (in the phonological module), while (3b) in the mapping from surface phonological form onto a phonetic realization (at the phonetics-phonology interface).

## ON THE RELEVANCE OF THE FOOT IN OT

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In Hayes (1995), and subsequently in metrical theory, for right-headed stress languages, the iambic foot is used. The canonical iambic foot is uneven in nature, that is, a foot consisting of a light unstressed syllable followed by a heavy stressed one (L**H**) (where boldface indicates stress) is preferred, whenever possible, over a (L**L**) one. Typically, iambic languages are characterized by iambic lengthening, that is by an increase of segmental duration to change even (L**L**) feet into uneven (L**H**) canonical iambs, as illustrated in (1) for Chicasaw (data taken from Kennedy 2017).

| (1) Underlying form | Iambic footing left-to-right | Iambic lengthening’ | |
|---|---|---|---|
| /a.bi.ka/ | (a.**bi**).(ka) | (a.**biː**).(**ka**) | ‘S/he is sick’ |
| /a.bi.ka.tok/ | (a.**bi**).(ka.**tok**) | (a.**biː**).(ka.**tok**) | ‘S/he was sick’ |
| /a.sa.bi.ka.tok/ | (a.**sa**).(bi.**ka**).(**tok**) | (a.**saː**).(bi.**kaː**).(**tok**) | ‘I was sick’ |

The forms in (1) show that lengthening is limited to vowels in open, non-final, syllables, by which an even iamb is turned into an uneven one.

The alleged absence of lengthening in left-headed stress languages, trochaic languages, has led to the assumption of a canonical even trochee, syllabic for quantity-insensitive systems and moraic for quantity-sensitive languages, as in (2).

| | | |
|---|---|---|
| | | (x .) |
| (2) | syllabic trochee | σ σ |
| | | (x .) |
| | moraic trochee | μ μ |

Recent experimental work on standard Italian and Northern Italian varieties reported on in Loporcaro (2015) has provided detailed empirical evidence that lengthening, contrary to assumptions underlying (2), is not absent from trochaic languages. Standard Italian has stressed vowel lengthening which, in a way similar to Chicasaw, does not affect the word-final syllable, but does occur in pre-final and in pre-pre-final syllables, as in, for instance, [**dʒo**ˈ.va.ne] 'young man', [**a**ˈ.vi.do] 'greedy' or [**a**ˈ.ra.bo] 'Arab'. Also, contemporary Ligurian and Emilian dialects, such as Genoese and Bolognese, show traces of earlier trochaic lengthening in proparoxytonic words, such as Genoese ['peˈgwa] 'sheep' (< Old Genoese ['peˈguɹa] < *pecora*) and ['laˈgrima] < *lacrima* 'tear' (Loporcaro, 2015: 206). Cremonese too shows it, as in ['taˈvula] 'table' vs. ['fabula] 'tale' (ibid: 87). From a moraic trochee perspective, this lengthening does not seem to make any sense: why would a perfect moraic trochee [(**a**.vi).do] be subject to lengthening?

Increased segmental duration in otherwise perfect moraic trochees reopens the case for the uneven trochee (**H**L) as a relevant metrical constituent in metrical theory. Within standard work on Optimality theory (Prince and Smolensky 1993), the uneven trochee is excluded by the assumption of a universally un-dominated constraint forbidding them: *(**H**L).

For classical Latin, the language from which Italian originated, evidence based on syncope for the uneven trochee, targeting the unstressed vowel in an uneven trochaic foot, was provided by Jacobs (2004), as illustrated by the forms in (3).

(3)

| *post-tonic syncope* | | | *pre-tonic syncope* | |
|---|---|---|---|---|
| (**sŏ**.lĭ).dus | > soldus | 'solid' | (călĕ)(**fa.**ce).re > calf**a**cere | 'to heat' |
| (**ā**.rĭ).dus | > ardus | 'dry' | (ā.rĭ).(**do**).rem > ard**o**rem | 'fire' |
| (**lā**.mĭ).nă | > lamna | 'plate' | | |

However, evidence for an uneven trochee in Latin can easily be circumvented by replacing the constraint ***V in Foot** (avoid a vowel in the weak position of a foot) by a constraint ***Weak-V** ("no open syllable, short, unstressed, non-final" cf. McCarthy, 2007:169). We will argue that this latter modification is unable to correctly describe syncope in cases, such as, (**ba**.li).ne.um > (**bal**.ne).um or (**o**.pi).tu.mus > (**op**.ti).mus, where both under classical OT and under more recent serial versions of OT (cf. McCarthy 2007, 2008) an output form (**bal**).num or (**ba**.li).num would be preferred over actual (**bal**.ne).um. We will show that a foot-based analysis of syncope is required for classical Latin and that the uneven trochee has been a relevant metrical constituent all along, both in Latin and its later successor, Italian.

## REFERENCES

Hayes, Bruce. 1995. *Metrical Stress Theory. Principles and Case Studies*. Chicago: The university of Chicago Press.

Jacobs, Haike. 2004. 'Rhythmic Vowel Deletion in OT: Syncope in Latin' *Probus* 16: 63-90.

Kennedy, Robert. 2017. *Phonology: a course book*. Cambridge: Cambridge University Press.

Loporcaro, Michele. 2015. *Vowel length from Latin to Romance*. Oxford: Oxford University Press.

McCarthy, John. 2007. *Hidden Generalizations. Phonological Opacity in Optimality Theory*. London: Equinox Publishing.

McCarthy, John. 2008. 'The serial interaction of stress and syncope'. *Natural Language and Linguistic Theory* 26. 499-546.

Prince, Alan and Paul Smolensky. 1993 [2004]. *Optimality Theory. Constraint Interaction in Generative Grammar*. Oxford: Blackwell.

## SONORITY SEQUENCING IN POLISH: EXPERIMENTAL AND COMPUTATIONAL IMPLICATIONS FOR UG

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A growing body of behavioral results demonstrates sensitivity to the Sonority Sequencing Principle (SSP) across languages (Daland et al. 2011; Berent et al. 2007; Berent et al. 2008; Ren, Gao & Morgan 2010). Recent modeling studies suggest that for some languages (English, Mandarin, Korean) these SSP-like preferences can be derived from the input (Daland et al. 2011; Hayes 2011), raising questions about whether a universal SSP principle is necessary to explain these consistent findings. However, Jarosz (to appear) shows that the same models fail to predict SSP-like preferences for Polish: the Polish lexicon overwhelmingly favors sonority plateaus. Jarosz also shows that phonological development in Polish nonetheless respects SSP, arguing that reference to SSP is therefore necessary to explain acquisition.

The present paper expands on these results, investigating adult Polish speakers' sensitivity to the SSP experimentally and computationally. We report the results of two online acceptability judgment experiments focusing on initial bi-consonantal clusters and present the results of computational simulations evaluating the abilities of various phonotactic models to predict participants' ratings from lexical statistics of Polish. Our results confirm Jarosz's conclusions that 1) phonological learning in Polish is sensitive to the SSP and 2) existing unbiased computational models fail to derive these preferences.

Contrary to Jarosz's findings for development, however, we find that adults' phonotactic preferences diverge systematically from the SSP. Our first study revealed robust preferences for plateaus ([db]) over small sonority falls ([mz]) over large falls ([wz]) for both attested and unattested initial clusters. However, native speakers did not prefer large rises ([zw]) over plateaus ([zd]) and expressed a slight preference for small rises ([zm]) over plateaus only in unattested clusters. Thus, Polish speakers do not display a consistent increase in their preferences across the sonority sequencing scale. Our second study focused on plateaus, small rises, and large rises, and used an entirely different set of initial clusters, tightly controlled for place of articulation and voicing. We nonetheless replicated the findings of our first experiment: speakers preferred small rises, but not large rises, to plateaus. We present computational models explaining these divergences from SSP, showing they can be derived from lexical statistics given appropriate assumptions about phonological representations. Overall, our results are consistent with a soft SSP bias in phonological learning: learners inherently favor SSP-abiding clusters but exposure to sufficient contradictory evidence can override these inherent biases. Both prior bias and detailed knowledge of lexical statistics shape phonotactic preferences.

# A SPECIAL STATUS OF [r] IN THE (PRE)HISTORY OF GERMANIC, ROMANCE AND CELTIC LANGUAGES

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In the history and prehistory of Germanic, Romance and Celtic languages, a number of weakening/lenition processes involving many consonants took place. Those affected mostly obstruents, although sonorants were not completely immune. In intervocalic position the weakest glides [j, w] were often reduced to zero in Germanic and Celtic (McCone 1996; Jaskuła 2006), [l, n] were dropped between vowels in some Romance dialects, while in the vicinity of other consonants they could all be deleted or lenited but [r] remained intact, except e.g. in Modern German or English (Ségéral and Scheer 2008). In consonant clusters composed of obstruent+[r] and, rarely [r]+obstruent, lenition was also commonplace but its destructive force was practically always directed towards the so-called strong consonants, [r] being left unharmed. From the perspective of Government Phonology (e.g. KLV 1990, Harris 1994) as well as from the viewpoint of some of its daughter frameworks (e.g. Cyran 2003), the strength of segments is expressed in terms of element complexity, i.e. the stronger the segment, the more elements it includes. Consequently, stronger segments can govern the weaker ones, [r] belonging to the latter group (in Scheer's model (2004), liquids could be governors, but only in 'branching onsets'). And yet [r], one of the theoretically weakest speech sounds, survived numerous prehistoric lenitions, while its alleged governors did not. Examples:

(1)

| | |
|---|---|
| Latin **da**c**r**i*ma*/*la**cr**ima* > Spanish *lá**gr**ima* but French *la**r**me* | 'tear' |
| Latin *ma**tr**is* (gen.) > Spanish *ma**dr**e* but French *mè**r**e* | 'mother' |
| Proto-Celtic **da**k**r*** > Old Irish *dé**r*** | 'tear' |
| Proto-Germanic **ta**g**r*** > Old English *tea**r*** | 'tear' |
| Latin *ni**gr**o* > Spanish *ne**gr**o* but French *noi**r***, Italian *ne**r**o* | 'black' |
| Proto-Germanic ****khr**eng-* > Old English ***hr**ing* Modern ***r**ing* | 'ring' |
| Latin *co**rd**is* (gen.) > Spanish *co**r**azón* but Italian *cuo**r**e*, French *cœu**r*** | 'heart' |
| Proto-Germanic **ma**rk**h*- > Old English *ma**r**e* | 'female horse' |

Sonorants are generally less likely to be weakened (Carvalho 2008) and yet [r] seems a singularity among them. Obviously, other sonorants also took part in similar developments but, unlike [r], they sometimes underwent deletion too, e.g.:

(2)

a. sonorant loss

| | |
|---|---|
| Proto-Germanic **fi**mf*** > Old English *fī**f*** | 'five' |
| Proto-Germanic **gha**ns*** > Old English *gō**s*** | 'goose' |
| Old English *ha**lf*** > Modern English *hal**f*** with silent [l] | 'half' |
| Latin *ta**lp**a* > French *tau**p**e* | 'mole' |

b. obstruent loss

| | |
|---|---|
| Old Irish *cla**nd*** > Modern Irish *cla**nn*** | 'family' |
| Old Irish *i**mb*** > Modern Irish *i**m*** | 'butter' |

[r] was apparently never deleted… Why not?

## REFERENCES

Carvalho, Joaquim Brandão de (2008) Western Romance. *Lenition and Fortition*, Berlin: Mouton, 207-233.

Cyran, Eugeniusz (2003) *Complexity Scales and Licensing Strength in Phonology*. Lublin: Redakcja Wydawnictw KUL.

Jaskuła, Krzysztof (2006) *Ancient Sound Changes and Old Irish Phonology*. Lublin: Wydawnictwo KUL.

Harris, J. (1994) *English sound structure.* Oxford: Blackwell.

Kaye, J., J. Lowenstamm and J.-R. Vergnaud (1990) Constituent structure and government in phonology, *Phonology* 7: 193-231.

McCone, Kim (1996) *Towards a Relative Chronology of Ancient and Mediaeval Celtic Sound Change*. Maynooth: St. Patrick's College.

Scheer, Tobias (2004) *A Lateral Theory of Phonology. CVCV and why Should it Be?* Berlin: Mouton.

Ségéral, Philippe and Scheer, Tobias (2008) Positional factors in lenition and fortition. *Lenition and Fortition*, Berlin: Mouton, 131-172.

## ENGLISH SPEAKERS' ACQUISITION OF MANDARIN PLOSIVES: A VOICE ONSET TIME (VOT) ANALYSIS

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This study examines English speakers' acquisition of Mandarin plosives (stop consonants). The phonemic contrast of English plosives is voicing, such as /p/ vs. /b/ (Hillenbrand 2003). On the other hand, the phonemic contrast of Mandarin plosives is aspiration, such as /$p^h$/ vs. /p/ (Duanmu 2007). Despite the difference of contrast, this study argues that it is feasible for English speakers to accomplish complete acquisition of Mandarin plosives. In terms of markedness, voicing contrast is more marked than aspiration contrast (Vaux and Samuels 2005), and there will be no transfer from L1, if the L1 feature is more marked (Ellis 1996). Besides, the voice onset time (VOT) of plosives are prone to change (Flege 1987). Therefore, it is predicted that English speakers can acquire the aspiration contrast of Mandarin plosives (without the influence of voicing contrast in English) and achieve VOTs close to Mandarin speakers over time.

An experiment was carried out for the argument. The participants of the experiment included one group of Mandarin speakers and two groups of English speakers (who had been in a Mandarin-speaking environment for different lengths of time). First, the participants were asked to do a discrimination task to see if they could perceive the aspiration contrast of Mandarin plosives. Then, they were asked to do an imitation task. In this task, they had to repeat a list of Mandarin words and short sentences they heard, each containing a Mandarin plosive at utterance-initial or non-utterance-initial position. The participants' productions were audio-recorded, and the VOTs of the plosives were measured on Praat.

It is found that those English speakers produce aspiration contrasts, instead of voicing contrasts, for Mandarin plosives. The average VOTs are 28 ms vs. 122 ms for utterance-initial position and 26 ms vs. 110 ms for non-utterance-initial position. Such contrast of "short lag" vs. "long lag" indicates "voiceless unaspirated" vs. "voiceless aspirated" (Lisker, Leigh & Arthur S. Abramson 1964). In addition, the group of English speakers who have stayed in a Mandarin-speaking environment longer produces VOTs closer to the Mandarin speakers. Their difference from the Mandarin speakers is only 5 to 16 ms. The two major findings above correspond to the prediction made by markedness and the changeability of VOT: The less marked aspiration contrast is adopted. Longer exposure to a language

environment changes the learners' VOTs. Therefore, the feasibility of English speakers' complete acquisition of Mandarin plosives is supported.

## REFERENCES

Duanmu, San. 2007. *The phonology of standard Chinese*, 2nd edn. New York: Oxford University Press.

Ellis, Rod. 1996. *Understanding second language acquisition*. Oxford: Oxford University Press.

Flege, James Emil. 1987. The production of "new" and "similar" phones in a foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics* 15. 47-65.

Hillenbrand, James M. 2003. American English: Southern Michigan. *Journal of the International Phonetic Association* 33(1). 121-126.

Lisker, Leigh & Arthur S. Abramson. 1964. A cross-language study of voicing in initial stops: acoustical measurements. *WORD* 20. 384 - 422.

Vaux, Bert & Bridget Samuels. 2005. Laryngeal markedness and aspiration. *Phonology* 22(3). 395-436.

## ARTICULATORY PROPERTIES OF THE POLISH LATERAL – A REVISION OF THE CLASSIFICATION OF THE SOUND

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The presentation is a report on a study of the Polish lateral that was conducted with the use the electro-magnetic articulograph (EMA), a technique never before used in the description of this Polish sound. The investigation concerned the production of the lateral in trisyllabic words by 20 native speakers of Polish. The results of the study show, amongst others, that the place of articulation of the examined sound was post-alveolar in 65.71% and alveolar in 35.29% of the analysed cases. The concluding part of the presentation confronts the obtained data with the state of research on articulatory characteristics of Polish /l/ and suggests a revised classification of the sound.

## WHAT CAN OLD CHINESE TONOGENESIS TELL THEORETICAL PHONOLOGY ABOUT SEGMENTS AND TONES?

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Compared to segmental phonology, it appears that phonological theories have more difficulties when handling prosody, especially tonal phenomena. Most theories have to admit that melody and prosody are of different natures (Hyman 2009ab; 2011; 2012; 2014 for surveys) and are far from being able to reduce them to the same primitives. However, there are efforts of unification (linearization of the stress, see Ségéral & Scheer 2007).

Chinese tone is a more complex prosodic system than stress system and level tone system. However, if we consider Old Chinese tonogenesis (Haudricourt 1954; Sagart 1999), we may find some new insights on the relations between segment and prosody.

**Old Chinese tonogenesis, a not so different process**

In his outstanding work, Haudricourt discovered the tonogenesis in Mon-Khmer languages. His model has then been transposed to Old Chinese (OC): the OC glottal stop coda would have given the Mid Chinese (MC) rising tone, the OC glottal fricative would have given the MC falling tone, by transphonologization (Sagart 1999). The opposition of ʔ/h has been transferred onto the nucleus, by the rising/falling tonal opposition.

Let's now consider two other similar processes in two non-related languages.

We first notice a parallelism between OC tonogenesis and Indo-European (IE) laryngeals, that is, the final coda leaves some traces on the nucleus, but with a different strategy. The three laryngeals postulated by Saussure (1878) are:

$eH_1 > \bar{e}$ $eH_2 > \bar{a}$ $eH_3 > \bar{o}$

This means in IE, the coda transphonologization gives different timbres of the nucleus. The OC tonogenesis is thus nothing more special than one of the possible strategies of the transphonologization of the coda opposition.

Another phenomenon which could be compared to the above mentioned ones is the diachronic coda nasalization in French. Prunet (1986) proposes two kinds of nasalization, which he calls lexical one and autosegmental one. The French case belongs to the former one, different from that widely spread in African languages. Ex. bonus > /bon/ > /bõ/.

**C/V segregation**

How to account for the differences between lexical tone resulting from OC tonogenesis and autosegmental tone, widely spread in African languages, parallel to lexical nasality and autosegmental nasality in Prunet (1986)?

In this contribution I will propose a representation based on the C/V segregation (Carvalho 2002), according to which consonants and vowels are universally separated on the two sides of the skeleton. I will then argue that Chinese lexical tone is a consonantal tier element associated to a vocalic position on the skeleton, which blocks it from being mobile, while autosegmental tone is part of the vocalism.

## LEFTWARD AND RIGHTWARD STRESS ITERATION IN UKRAINIAN: ACOUSTIC EVIDENCE AND THEORETICAL IMPLICATIONS

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Most metrical theories are developed to account either for systems with lexical stress (e.g. Alderete 1999) or predictable stress (e.g. Kager 2001; Gordon 2002; Hyde 2002, 2016). In the former, the placement of primary stress is largely unpredictable and secondary stress is either absent (e.g. Russian), or its position is usually lexicalised (e.g. English). In languages with predictable stress, it is common to find primary stress fixed at one edge of the word and a series of secondary stresses iterating either from the peak towards the word's edges (unidirectional systems) or in the opposite direction (bidirectional systems); e.g. Kager 2001. The present study discusses a hybrid metrical system found in Ukrainian, where lexical primary stress can appear anywhere in the word, secondary stresses are placed at both word edges, and additional rhythmic beats intervene between the main and

the secondary stresses. We argue that Ukrainian represents a typologically rare bidirectional stress system with internal lapses, and that its complexity poses a challenge for current theories designed to account for such systems.

The paper reports on an acoustic study of the rightward and leftward rhythmic stress iteration pattern in Ukrainian, conducted in the area of Drohobych (Western Ukraine). The study is based on words with lexical stress at the right or left edges of the word (e.g. ˌσσˌσσσˈσ and ˈσσσˌσσˌσ). The results point to syllable duration as the main exponent of both lexical and subsidiary stress. Statistical analyses confirm that rhythmic stresses in Ukrainian radiate from the edges of the word towards the syllable carrying lexical stress, and not towards the opposite end, which is typical of bidirectional, not unidirectional stress systems. Characteristically, in odd-parity syllable strings, lapses are adjacent to the peak. Based on these findings, as well as descriptive generalisations drawn from traditional grammars (e.g. Nakonečnyj 1969), we show how the Ukrainian data can be accommodated by current metrical theories within the Optimality theoretic paradigm, predicting the existence of bidirectional stress systems (e.g. McCarthy & Prince 1993; Kager 2001, 2005; Gordon 2002; Hyde 2002, 2016; Alber 2005). We argue that these theories can account for either the rightward or the leftward iteration pattern, but are unable to accommodate both patterns at a time. We conclude that the Ukrainian system poses a problem for the theories employing the mechanism of foot alignment and provides support for the licensing theories that appeal directly to the metrical grid.

## INTONATIONAL PHONOLOGY OF STANDARD MALAYALAM

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This paper is an investigation on the intonational phonology of Malayalam belongs to Dravidian language family. The results of this study are derived by adopting the framework of autosegmental-metrical (AM) theory of intonational phonology proposed and advanced through researches mainly in Pierrehumbert 1980, Pierrehumbert & Beckman 1988, Ladd 1996 and the ToBI method of prosodic annotation in Silverman, Beckman, Pitrelli, Ostendorf, Wightman, Price, Pierrehumbert & Hirschberg 1992, Beckman & Ayers Elam 1997, Hayes & Lahiri's 1991, Khan 2008, 2014, and Gussenhoven 2016 among others. There are resemblances to the present finding of Malayalam with other studies on Indian languages mainly, Hindi (Harnsberger 1996, 1999), Tamil (Keane 2007), Bangladeshi (Khan 2014). The analysis mainly focuses on F0 for the description of tones and also evidences are provided on non-tonal characteristics of the phonological characterising such as final lengthening, pause, and initial strengthening. The F0 analysis of the data derives a detail intonational lexicon for the tones of Malayalam. Malayalam intonational system composed of three basic pitch accents – low (L*), high (H*), and rising (L*+H) and boundary tones (L%, H%). All these tones are distributed on three prosodic units higher than word depicted by the proponents of the intonational approach (e.g. Beckman & Pierrehumbert 1986, Pierrehumbert & Beckman 1988, Jun 1993, Beckman 1996) such as: the accentual phrase (AP), the intermediate phrase (ip), and the intonational phrase (IP). A speech corpus is created for the analysis based on the production experiments conducted in sound proof phonetic lab and data has been recorded using high quality digital recorder Roland-07 by keeping 44 kHz, 16-bit sampling frequency. Research participants are mainly from age groups from 20 to 30. Acoustic analysis has been conducted using Praat speech software by Boersma and Weenink (2005). Three types of data have been created for the analysis such as script reading, semi spontaneous and spontaneous production. The results are provided on the simple declarative sentences and question type sentences. According to this study, when Malayalam declarative sentences produce as a new

information, the pre-nuclear accentual phrases realised by pitch accents such as L*, L*+H, L+H*, H* and it is followed by high boundary tone (Ha). When the pitch accent is L* and boundary tone is low (La) on accentual phrases. The nuclear accentual phrase shows H* pitch accent followed by low intonational boundary tone (L%) on Intonational phrase. Same kind of analysis is provided in question type sentences such as Yes-No, Echo, rhetorical and Indirect. This study aims to develop a proper intonational transcription system for Malayalam.

## ACOUSTIC CORRELATES OF SYLLABLE PROMINENCE IN MALAYALAM WORDS: AN INVESTIGATION ON VOWEL QUALITY AND DURATION

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This paper is a result of an investigation on vowel quality and duration in relation with prominence of syllables in Malayalam (belongs to Dravidian language family) words. The previous analysis (Mohanan, 1986) shows duration is a robust acoustic correlate which determines word stress in Malayalam. This study presents the evidence that along with duration, vowel quality (F1, and F2) also plays a significant role to determine syllable prominence in Malayalam. Malayalam doesn't have lexical stress. The result of this study shows the evidence for vowel quality change in stressed and unstressed syllables especially with vowel /a/ (See Figure1) which provide the evidence for eurhythmy in Malayalam. Similar analysis is conducted by taking all Malayalam vowels in different syllable positions within words. The analysis is being conducted in various syllable type of words from disyllabic to polysyllabic words. Our analysis shows, it is possible to predict the primary and secondary stress in Malayalam words with the acoustic evidences of vowel quality and vowel duration. The reason we are considering only vowel quality and duration is for making an in-depth investigation on these aspects in all vowels. Evidences are supported with statistical significant test (ANOVA) between prominent and non-prominent syllables and a detailed vowel chart of Malayalam vowels (IPA) are also provided. The acoustic data is collected through production experiments in phonetic lab by inserting words in neutral context for getting spoken data without extra prominence, list intonation and no prominence (See Example 1). This kind of method is used for getting uniform data and accurate results.

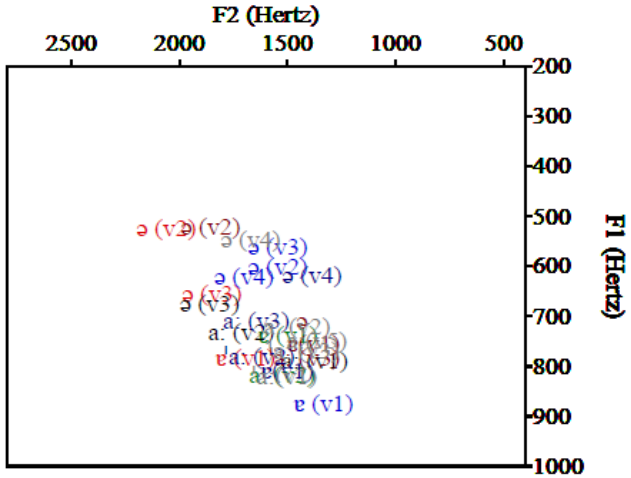

Figure 1: Realization of vowel /a/ in different syllable positions within a word. (V1) for initial syllable, (V2) for second syllable and (V3) for third syllable respectively.

Example 1: kamala told , “Malayalam Malayalam, Malayalam,” three times/kamala, “/mala’jaɭam//mala’jaɭam/ /mala’jaɭam/” ennu munnu tavaɳa paraɲɲnu, /

## VOICING AND TONGUE ROOT COORDINATION IN RUSSIAN WORD-MEDIAL INTERVOCALIC SIBILANTS: AN ULTRASOUND STUDY

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**Background** Voicing contrast in obstruents is cross-linguistically common (cf. Maddieson 1984). However, maintaining vocal fold vibration in obstruents is in fact a very complex process in that it involves laryngeal and supralaryngeal gesture coordination. For example, during the production of voiced stops, speakers often advance the tongue root to expand their pharyngeal cavity, thereby lowering the supraglottal air pressure to maintain voicing (Westbury 1983). The situation is more complex in voiced fricatives, since voiced fricatives, particularly voiced sibilants, must cope with two conflicting aerodynamic requirements; low supraglottal pressure is required to maintain vocal fold vibration, while high pressure is crucial to bring about supralaryngeal frication. For this reason, voicing in fricatives needs more delicate gestural coordination, compared with that in stops (Ohala 1983), which may trigger the emergence of synchronic phonetic variants of voiced fricatives (e.g. Matsui 2016) and diachronic phonological change in voiced fricatives (e.g. Solé 2010). Despite this fact, supralaryngeal gesture control for fricatives has received less attention in comparison with stops.

**Questions** The aim of the current study is to investigate the effect of voicing on tongue root position during the production of Russian fricatives in word-medial intervocalic position. In this position, Russian voiced fricatives, particularly voiced sibilants, can be realized either as fully voiced or partially voiced variants in intervocalic position (Matsui 2016). Given this, the questions to be addressed are: (i) Is tongue root advancement observed during the production of Russian intervocalic voiced fricatives? And if so, (ii) does it correlate with phonetic variation among voiced fricatives (fully voiced vs. partially voiced)?

**Method** Four native speakers produced nonsense words containing alveolar sibilants (/s/ and /z/) in word medial intervocalic position. Ultrasound imaging was used to capture tongue root configuration. Acoustic measurements were also considered to check whether and to what extent vocal fold vibration sustains during frication.

**Results and Discussions** The results showed that speakers advance the tongue root during the production of voiced fricatives, compared with their voiceless counterparts, which is consistent with other languages (Proctor et al. 2010). Also, voiceless sibilants and partially voiced sibilants are different in terms of tongue root position, while there are no differences between fully and partially voiced sibilants. Taken together, the results suggest that in Russian sibilants, phonological specification of voicing mediates between tongue root gesture and phonetic voicing.

### REFERENCES

Maddieson, I. (1984). *Patterns of Sounds*. Cambridge, UK: Cambridge University Press.

Matsui, M. (2016). Phonological symmetry, phonetic asymmetry, and the acoustic consequences of voicing in Russian. In J. Szpyra-Kozłowska and E. Cyran (eds.), *Phonology, its Faces and Interfaces*, 83-102. Frankfurt am Main: Peter Lang.

Ohala, John J. (1983). The origin of sound patterns in vocal tract constraints. In P.F. MacNeilage (ed.), *The Production of Speech*, 189−214. New York: Springer.

Proctor, M., Shadle, C. and Iskarous, K. (2010). Pharyngeal articulation in the production of voiced and voiceless fricatives. *Journal of the Acoustic Society of America*, 127, 1507–1518.

Solé, M. J. (2010). Effects of syllable position on sound change: An aerodynamic study of final fricative weakening. *Journal of Phonetics*, 38, 289–305.

Westbury, J. H. (1983). Enlargement of the supraglottal cavity and its relation to stop consonant voicing, *Journal of the Acoustical Society of America*, 73, 1322–1336.

## WHERE POST-LEXICAL PROSODY MEETS LEXICAL PROSODY: TONAL CLASH AND CONTOUR MODIFICATION STRATEGIES IN TOKYO JAPANESE

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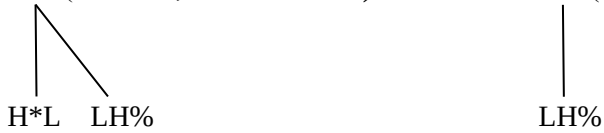
In the framework of autosegmental metrical theory (Goldsmith 1976, Gussenhoven 2004, Ladd 1996), pitch contours can be *compressed* (e.g. Grønnum 1991) or *truncated* (or, *curtailment*, Grice 1995) in the context where tonal events are too dense to manifest themselves. Previous studies have claimed that such contour modification strategies may result in either phonological neutralization or an apparent loss of the contrast in *intonation languages* (e.g. Ode 2005), where pitch functions exclusively to convey post-lexical information. The present study aims to discuss a more complex case of tonal clash, namely, the tonal clash in a *tone language* – where pitch functions to convey lexical as well as post-lexical information. We demonstrate how lexical prosody interacts with post-lexical prosody in a case study of Tokyo Japanese.

Tokyo Japanese (TJ) has a lexical pitch accent H*L (Pierrehumbert and Beckman 1988); lexical properties are distinguished by the presence/absence of H*L (e.g. a'me "rain" vs. ame "candy", where pitch accent is represented as an apostrophe). Also, the words having a pitch accent are further distinguished by the location of the pitch accent within a word (e.g., ha'si "chopsticks" vs. hasi' "bridge"). The final-accented words have potential risk on tonal clash, since boundary tones (e.g. LH% for question) can also be associated to the right edge of the phrase to convey post-lexical information. Interestingly, previous studies described the contrast between final-accented and non-accented words as either neutralized or reduced, unless a particle follows (e.g., Sugiyama 2012).

In this study, we investigate how this suspended lexical contrast is realized in a denser tonal context, namely, the context where LH% are also associated with phrase-final morae, by examining interrogatives such as (1a), as opposed to (1b).

(1) a. *hana?* ("flower", Final-accented) b. *hana?* ("nose", Non-accented)



The results of our acoustic study demonstrate that: (i) in general, TJ prefers *truncation* of H*L as a contour modification strategy in a denser tonal context, resulting in the simple rising contour; and (ii) phonetic details of the contour modification strategies are speaker-dependent, such that some speakers replaced H*L LH% with LH% while others produced a slightly higher F0 peak in word-final accented words than in non-accented words, which is not simply predicted from current autosegmental analysis of TJ. We also describe how lexical pitch accent in turn affects realization of post-lexical prosody by comparing interrogatives (LH%) with declaratives (L%).

**REFERENCES**

Goldsmith, John. (1976) *Autosegmental Phonology*. PhD thesis, MIT. Published 1979. New York: Garland Press.

Grønnum, Nina. (1991) Prosodic parameters in a variety of regional Danish standard languages with a view towards Swedish and German. *Phonetica* 47: 188-214.

Grice, Martine. (1995) *The Intonation of Interrogation in Palermo Italian: Implications for Intonation Theory*. Tübingen: Niemeyer.

Gussenhoven, Carlos. (2004) *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.

Ladd, Robert D. (1996) *Intonational Phonology*. New York: Cambridge University Press.

Odé, Cecilia. (2005) Neutralization or truncation? The perception of two Russian pitch accents on utterance-final syllables. *Speech Communication* 47: 71–79.

Pierrehumbert, Janet B. and Mary E. Beckman. (1988) *Japanese Tone Structure*. Cambridge, MA: MIT Press.

Sugiyama, Yukiko. (2012) *The Production and Perception of Japanese Pitch Accent*. UK: Cambridge Scholars Publishing.

## DERIVED ENVIRONMENT SPIRANTIZATION IN NOVEL DIMINUTIVES IN POLISH

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This paper discusses data pointing to the apparent new pattern in which the underlying stem-final /g/ appears to be surfacing in the post-sonorant context in diminutives in Polish, viz. [dʒ], concurrently with the well-established [ʒ].

The term *First Velar Palatalization* is commonly used in literature on generative phonology to describe the alternation between the (underlying) consonants /k/, /g/, and /x/ and the (surface) consonants [ʧ], [dʒ], and [ʃ], in that order (cf. Rubach 1984 and sources that point thereto, e.g. Łubowicz 2002, Hall 2006, Kula 2006). In addition, [dʒ] derived from /g/ is said to undergo a further change, commonly labelled as *Spirantization* (see the same sources), into [ʒ], unless preceded by /z/.

Interestingly, Rubach (1984: 120) reports that an experiment he had run revealed variation between [dʒ] and [ʒ] in "innovating" diminutives with stem-final /g/. This particular finding of his does not seem to have had much resonance in the literature.

The new data to be discussed do not come from any oral experiment. They were gathered in 2017 through queries in the internet search engine Google Search. A list of known (old, common) or potential (novel) diminutives, each based on an existing stem terminating in /g/, with *–ek* as the diminutive suffix, and in two nominative singular forms, one with <ż> (for an expected [ʒ]), the other

with <dż> (for an expected [ʤ]), was checked against the number of hits returned for a particular string of letters enclosed in quotation marks for exact matches.

Preliminary results appear to indicate the following pattern. For commonly-used diminutives, i.e. whose form with <ż> [ʒ] has a high number of hits, and for words which do not have unambiguous, compositional semantics of a diminutive the number of hits spelled with <dż> (suggesting a [ʤ]) is low or simply zero. For words whose diminutives are not common, i.e. whose form with <ż> [ʒ] has a low (but non-zero) number of hits, a concurrent form with <dż> [ʤ] is found, too.

The paper will demonstrate both the list of forms used in the query and the numbers of hits returned by the search engine, i.e. the final results. The discussion will point to the implications the duality of forms may have for the treatment of Spirantization, viz. if it is a genuine phonological regularity in Polish, a matter of externally-induced consonant replacement (cf. Gussmann 2007), or a dormant morphophonological regularity on its way out.

**REFERENCES**

Gussmann, Edmund. 2007. *The Phonology of Polish*. Oxford: Oxford University Press.

Hall, T.A. 2006. "Derived environment blocking effects in Optimality Theory." *Natural Language & Linguistic Theory* 24: 803–856.

Kula, Nancy C. 2006. "Derived environment effects in GP." *SOAS Working Papers in Linguistics* 14: 95–108. (https://www.soas.ac.uk/linguistics/research/workingpapers/volume-14/file37819.pdf; doa: 28 Feb. 2017)

Łubowicz, Anna. 2002. "Derived environment effects in Optimality Theory." *Lingua* 112: 243–280.

Rubach, Jerzy. 1984. *Cyclic and Lexical Phonology: The structure of Polish*. Dordrecht: Foris Publications.

## THE VARIABLE LOWERING OF MID VOWELS /e/ AND /o/ IN TONIC AND PRETONIC POSITIONS IN A POLISH DESCENDANT COMMUNITY IN BRAZIL

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In Brazilian Portuguese (BP), mid vowels /e, ɛ/ and /o, ɔ/ are phonologically distinct in tonic position (s/e/co ('dry') x s/ɛ/co ('I dry'); s/o/co (' punch') x s/ɔ/co ('I punch')), but in pretonic position, [e,o] varies mainly with [ɛ,ɔ] in the northern and northeastern varieties (as in p[e]pino ~ p[ɛ]pino ('cucumber') and c[o]ruja ~ c[ɔ]ruja ('owl')), and [e,o] varies mainly with [i,u] in the southern and southeastern varieties (as in p[e]pino ~ p[i]pino ('cucumber') and c[o]ruja ~ c[u]ruja ('owl')), in this case according to a variable regressive assimilation process (Bisol, 1981) called vowel harmony.

In the variety of Polish-BP contact spoken in the south, however, /e,o/ are variably produced as [ɛ, ɔ] both in tonic position (as in d[e]do ~ d[ɛ]do ('finger'); s[o]pa ~ s[ɔ]pa ('soup')) and in pretonic position (as in p[e]gou ~ p[ɛ]gou ('he took'); p[o]lonesa ~ p[ɔ]lonesa ('Polish woman')) (Druszcz, 1983; Vieira, 1998; Mileski, 2013).

These two processes are examined in this study in the light of the Sociolinguistic Quantitative Theory (Labov, 1972) in a sample of Brazilian Portuguese spoken by 48 Polish immigrant descendants, men and women, all of them adults, with varying degrees of bilingualism. The hypothesis is that the lowering variable process in tonic and pretonic position in this sample is caused by the

influence of the Polish vowel system described in these communities (Mileski, 2017), in which [e,ɛ,o,ɔ] are present in these positions, although only /ɛ,ɔ/ are reported in Polish by Gussmann (2007).

The results show that there is considerable interindividual variation concerning the lowering taxes both in tonic and pretonic position, which can be explained by the frequency of use of the Polish language by these speakers. The lowering taxes are higher for tonic position in relation to pretonic position and they are more frequent for /e/ in both processes. The preceding context is also a statistically relevant conditioner in tonic position.

Concerning the pretonic position, the statistical results show that the lowered vowel in tonic position is the stronger conditioner for the production of low mid vowels in pretonic position, characterizing a variable assimilation process (vowel harmony). As phonological low vowels in tonic position does not trigger this vowel harmony process in pretonic position, it is concluded that the lowering processes analysed in this study, absent in other southern varieties, are the direct result of crosslinguistic influences that remain in the community of Polish descendants.

**REFERENCES**

Bisol, L. (1981). *Harmonização vocálica: uma regra variável*. PhD thesis. Universidade Federal do Rio de Janeiro, Brazil.

Druszcz, A. M. (1983). *O bilinguismo em Araucária: a interferência polonesa na fonologia portuguesa*. Dissertation (Master) – Universidade Católica do Paraná, Brazil.

Gussmann, E. (2007). *The phonology of Polish*. New York: Oxford University Press.

Labov, W.(1972). *Sociolinguistic patterns*. Philadelphia: University of Pennsylvania Press.

Mileski, I. (2013). *A elevação das vogais médias átonas finais no português falado por descendentes de imigrantes poloneses em Vista Alegre do Prata – RS*. Dissertation (Master) – Pontifícia Universidade Católica do Rio Grande do Sul, Brazil.

Mileski, I. (2017). *Abaixamento das vogais médias tônicas e pré-tônicas em uma comunidade de descendentes de poloneses*. PhD thesis. Pontifícia Universidade Católica do Rio Grande do Sul, Brazil (forthcoming).

Vieira, M. Z. (1998). *Ecos da colonização polonesa: estudo histórico-social e linguístico das colônias Moema, Taquari e Dourado*. Ponta Grossa: UEPG.

## THREE TYPES OF LINKING /R/

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Linking /r/ in the General British pronunciation of English is frequently taken to be an obligatory formation, which often leads to the suggestion that r-links should always be made. There seem to exist, however, two difficulties with this approach. The first one concerns the large body of observable data which challenges the view that linking /r/ is obligatory. The second one refers to the meaning of the concept of linking /r/ itself: maintaining that linking /r/ is obligatory presupposes the existence of one kind of linking /r/. Postulating the existence of several types of linking /r/ surmounts the two interrelated difficulties.

The primary aim of this paper is to present three different types of r-linking usages, which are: linking /r/ within a word, linking /r/ within a phrase and linking /r/ within a sentence. The three linking-r types suggest a gradation of "r-linkingness", with the first type being obligatory (linking-r

always pronounced), the second one being very common (linking /r/ often pronounced) and the third one being relatively common (linking /r/ usually pronounced). Even though the third type of linking /r/ is not obligatory it does not appear to be totally optional either. There exist semantic factors governing its usage, which preclude its total optionality. The secondary aim of the paper is to elaborate on the non-use of linking /r/ to express additional meaning.

The evidence for the proposal is based on the data collected from several British television series. The evidence as well as the statistical comparisons of r-linking usages appear to confirm both the validity of the proposal that there exist three different /r/-linking types and the validity of the proposal that the non-use of linking /r/ within a sentence is not entirely optional and serves a semantic purpose.

## DURATION AND PHONOLOGICAL COMPLEXITY: COMPARING EUROPEAN PORTUGUESE (EP) NASAL VOWELS AND ORAL DIPHTHONGS

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Nasal vowels are a complex topic both for phonetic description and phonological analysis. This study aims to bring additional evidence for the hypothesis that Portuguese nasal vowels are bipositional, by comparing its duration to that of oral vowels and diphthongs. As far as I know, duration of EP nasal vowels had never been compared to that of complex nuclei.

Phonologically, it's been proposed that nasality is directly associated (a) to the vowel /Ṽ/ (Hall Jr 1943, Rogers 1954); (b) with an underlying nasal consonant in coda position /VN/ (Câmara 1953, Bisol 2013); (c) with a vocalic position in a complex nucleus /VṼ/ (Parkinson 1983, Carvalho 1988). A closer look on nasal vowels behaviour allows to eliminate proposals (a) and (b). First, nasal vowels behave as heavy rhymes; secondly, the fact that nasality is not resyllabified in external sandhi (e.g. *lã azul* [lɐ̃.ɐ.zul], not *[lɐ̃.nɐ.zul] 'blue wool') makes it different from closed syllables, whose coda is resyllabified (e.g. *mais ou menos* [mai.zo.me.nuʃ] 'more or less'). This leads to proposal (c), since both nasal vowels and oral diphthongs are heavy rhymes, and are not resyllabified. Accordingly, nasal vowels and oral diphthongs should have a similar length.

Phonetically, previous studies on the properties of Portuguese nasal vowels vis-à-vis oral monophthongs have shown that nasal monophthongs have a diphthong-like acoustic pattern (Teixeira, Vaz & Príncipe 2000, Teixeira & Vaz 2001, Hajek & Watson 2007), although the nasal murmur seems to partially occupy the time allotted to the following consonant (Moraes & Wetzels 1992, Medeiros 2011).

To assess the respective length of nasal vowels and oral diphthongs, I compare the duration of oral vowels (V), nasal vowels (VN) and oral diphthongs (VV) in three contexts: word-finally (_#), before plosive (_t) and before fricative (_s). Results show that in final context oral vowels are statistically shorter than oral diphthongs, which have the same duration as nasal vowels. In non-final contexts, both oral diphthongs and nasal vowels are longer than oral vowels, but nasal vowels are also longer than oral diphthongs. Interestingly, when we add the duration of the following consonant, the difference between nasal vowels and oral monophthongs disappear. I propose that the difference between VV and VN is the result of the interaction of nasality with the following consonant.

By way of concluding, the results clearly show that the proposed /VṼ/ representation for Portuguese nasal vowels is phonetically grounded in terms of timing.

## IS THERE A SEMI-RHOTIC VARIETY OF HUNGARIAN-ACCENTED ENGLISH?

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The claims the present paper puts forward have their roots in Plag's (2009) interlanguage hypothesis, according to which different types of intermediate language systems such as creoles and interlanguages display parallel characteristics. The phenomenon to be brought under examination is (non)rhoticity in varieties of English. In addition to the two main types of R-systems in English (rhotic accents, in which all historical or orthographic R's are pronounced, and non-rhotic ones, in which only prevocalic R's are pronounced), intermediate systems also exist, in which historical R is consistently pronounced in certain non-prevocalic environments but it is consistently lost in others. Such varieties are termed semi-rhotic (Wells 1982: 221).

Native varieties of semi-rhotic English accents emerge under dialect contact: either a traditionally non-rhotic accent is shifting towards rhoticity (documented cases include the Jamaican basilect and Boston English) or vice versa (e.g. Southland New Zealand English and North Yorkshire English). As far as the presence or absence of non-prevocalic R's is concerned, the factors supporting the realisation of R include a preceding NURSE (and/or LETTER) vowel and a word-final and/or stressed phonological position.

The present paper claims that non-native pronunciation varieties of English (i.e., English-based interlanguages, in this case Hungarian-accented English, henceforth "Hunglish") display similar systematic semi-rhotic patterns to those found in native ones, albeit with considerable intra- and inter-speaker variation. The empirical study to be presented examines the degree and manner of rhoticity of advanced-level Hungarian speakers of English (the exact number to be specified). The paper proposes that learners speak a semi-rhotic variety of Hunglish, on which (in addition to the factors influencing native semi-rhotic varieties) a number of factors peculiar to the non-native context (e.g., the length of a word, the source the speaker learnt a particular vocabulary item from, etc.) also have an effect.

### REFERENCES

Plag, Ingo (2009) Creoles as interlanguages: Phonology. *Journal of Pidgin and Creole Languages* 24(1), 119–138.

Wells, John C. (1982) *Accents of English*. Cambridge: Cambridge University Press.

## VOWEL EPENTHESIS IN ONLINE ADAPTATION OF POLISH CCC ONSET CLUSTERS BY NATIVE SPEAKERS OF ENGLISH

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It is well known that vowel epenthesis is one of the most common repair strategies used in loanword adaptation to nativize foreign consonant clusters (e.g. Kang 2011). Given an illicit CCC onset sequence, in principle, it is possible to insert an epenthetic vowel before the cluster, between $C_1$ and $C_2C_3$ or between $C_1C_2$ and $C_3$.

This paper examines the patterns of vowel epenthesis in the nativization of Polish CCC onset clusters by native speakers of Southern British English. We report on the results of an online loanword adaptation study in which 15 native speakers of Southern British English reproduced Polish words with CCC consonant clusters not permitted in English.

The results of the study demonstrate that the CCC sequences in which $C_1C_2$ constitutes an ill-formed English onset are adapted with an epenthetic vowel between $C_1$ and $C_2C_3$. On the other hand, those CCC clusters where $C_1C_2$ is a permissible English onset are variably nativized with an epenthetic segment inserted either between $C_1$ and $C_2C_3$ or between $C_1C_2$ and $C_3$.

We argue that the patterns of vowel epenthesis revealed in the data reflect a straightforward application of the native English constraint ranking. In particular, the outputs of adaptation maximally conform to the universal syllable markedness constraints, i.e. *COMPLEX, ONS and *CODA (Prince and Smolensky 1993/2004). Variation in the epenthesis site in those CCC clusters where $C_1C_2$ constitutes a licit English onset is argued to stem from the fact that several adaptations are equally well-formed in terms of the universal syllable structure constraints. The results of the study thus lend support to a claim that there is no need for a separate loan phonology component as loanword phonology is mostly 'native phonology in action' (e.g. Ito and Mester 1999).

**REFERENCES**

Ito, J. & A. Mester (1999) The phonological lexicon. In Tsujimura, N. (ed.) *The Handbook of Japanese Linguistics*. Oxford: Blackwell. 62-100.

Kang, Y. (2011) Loanword phonology. In Van Oostendorp, M., Ewen, C. J., Hume, E. & K. Rice (eds.) *Companion to phonology*. Oxford: Blackwell. 2258-2282.

Prince, A. & P. Smolensky (1993/2004) *Optimality Theory: Constraint Interaction in Generative Grammar*. Oxford: Blackwell.

## SPEEDED IDENTIFICATION AND DISCRIMINATION OF CORRECT WORD STRESS IN ENGLISH BY POLISH LEARNERS

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The production of correct word-stress patterns in English is one of the most difficult learning challenges for Polish learners. Polish uses a metrical structure that predominantly assigns stress to a penultimate syllable, whereas English word stress is less predictable. Previous research has demonstrated that Polish learners use complex strategies to locate stress in English and those strategies combine the elements of L1 transfer and Universal Grammar (Waniek-Klimczak 2002). Using the classification of 'stress deafness', which predicts the difficulty of cross-linguistic perception of stress based on the listeners' phonological representations in L1, speakers of Polish are reported to exhibit and intermediate pattern of 'stress deafness'. (Peperkamp et al. 2010). While previous studies with Polish learners relied on simple identification or indication of stressed syllables, in the current study we propose a more elaborate methodology of perceptual speeded identification and discrimination. Both tasks differ significantly in that speeded identification is the most challenging task which requires rapid access to the metrical representation of a word, while discrimination is the least challenging task which allows the comparison of correctly and incorrectly stressed tokens. We also look into how proficiency of listeners influences the performance in the two tasks.

Forty-one Polish learners of English participated in the two experiments, assigned to both lower-proficiency and higher-proficiency groups. The stimuli were pairs of words with a correct and incorrect stress pattern. Special care was put to maintaining all other parameters stable so that the pairs would only differ in stress location. The speeded identification task was run in E-Prime and the

discrimination task was run in Praat. The results revealed that the performance differed depending on both the task type and the proficiency level.

**REFERENCES**

Peperkamp, S., I. Vendelin and E. Dupoux. 2010. Perception of predictable stress: A cross-linguistic investigation. *Journal of Phonetics* 38: 422-430.

Waniek-Klimczak, E. 2002. How to predict the unpredictable: English word stress from a Polish perspective. In *Accents and Speech in Teaching English Phonetics and Phonology*, eds. E. Waniek-Klimczak and P. J. Melia, 221-241, Frankfurt: Peter Lang.

## THE RELATION BETWEEN SEMANTIC (NON)-COMPOSITIONALITY AND PHONETIC PROMINENCE: A PRODUCTION STUDY ON NON-LEXICALIZED ADJECTIVE-NOUN UNITS IN AMERICAN ENGLISH

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The current paper aims at analyzing novel/non-lexicalized adjective-noun (AN) combinations in American English and asks whether one specific factor, namely semantic (non)-compositionality, has an influence on their stress pattern. It is hypothesized that non-compositional semantics trigger a higher degree of initial stress, i.e. stress on the adjective, than compositional semantics. The second question to be addressed is whether stress is placed differently if another device that emphasizes non-compositionality, namely *called so*, is used together with non-compositional constructions.

Six native speakers of American English participated in a production study that investigated six disyllabic AN constructions and the independent variable SEMANTIC COMPOSITIONALITY (within-subject/item), which had the following three levels:

(1) Compositionality (= C): *Thomas took a black tram again, which has a color he likes*.

(2) Non-compositionality (without *called so*) (= N): *Thomas took a black tram again, which is a tram that runs only during the night.*

(3) Non-compositionality (with *called so*) (= S): *Thomas took a black tram again, which is called so because it is a tram that runs only during the night.*

In each condition, subjects (1) read the sentence silently, (2) had to answer a question referring to the sentence in order to ensure that they had understood the meaning (e.g. *Is a black tram a tram that goes to the graveyard*? (Correct answer: No)) and (3) read the sentence aloud and were recorded with Praat. In each condition, an item occurred in the same phonetic environment as in the other conditions. The ratio and difference of the durations/intensities/F0s of the vowel of the adjective (e.g. *black*) and the vowel of the noun (e.g. *tram*) of each complex item was created in each of the three conditions. It was assumed that a greater ratio/difference signaled a higher degree of initial stress. N triggered, in terms of duration and F0, a significantly higher degree of initial stress than C and S, which, in turn, did not cause any significantly different degree of initial stress. The results show that non-compositionality triggers a higher degree of initial stress than compositionality. However, if another device that indicates non-compositionality is used (*called so*), the degree of initial stress drastically decreases because the non-compositional semantics are already signaled by means of *called so*.

# BACKNESS ASSIMILATION CONSPIRACY IN OLD ENGLISH: BACK UMLAUT AND BREAKING

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**Problem.** The two processes diphthongise front vowels (/i e æ/ → [io eo æɑ]) in divergent [+back] contexts: back umlaut (a type of vowel harmony) operates before back vowels, while breaking – before back consonants. Due to the difference in the triggering context, back umlaut and breaking have been traditionally studied as independent processes. Standard descriptions include Luick (1921), Campbell (1959), Lass & Anderson (1975), and Hogg (1992). Unfortunately, the notoriously elusive vowel spellings led some of the grammarians to believe that the separation of back umlaut from breaking was additionally confirmed by what modern generative phonology would rather consider exceptions or accidental gaps in the data.

**Data.** A crucial difference between the two processes can be seen when the low vowel /æ/ undergoes backness assimilation. There, back umlaut results in retraction (/æ/ → [ɑ]), while breaking – in diphthongisation (/æ/ → [æɑ]), see the data below.

| Back umlaut of /æ/ | Breaking of /æ/ |
|---|---|
| before /u/: *fæt* ‘vessel’ ~ *fatu* (nom. pl.), *hvæt* ‘active’ (nom. sg.) ~ *hvatum* (dat. sg./pl.);<br><br>before /ɑ/: *hvæle* ‘whale’ (dat. sg.) ~ *hvalas* (nom. pl.), *fære* ‘go’ (imp. sg.) ~ *faran* (inf.). | before /r/: Pre-OE **hærd* > OE *heard* ‘hard’;<br><br>before /l/: Pre-OE **æll* > OE *eall* ‘all’;<br><br>**before /ʋ/**: Pre-OE **þæʋ* > OE *þēav* ‘custom’;<br><br>before /x/: Pre-OE **sæh* > OE *seah* ‘he saw’,<br><br>Pre-OE **næh* > OE *nēah* ‘near’. |

**Goals.** The paper accounts for the difference between the back vocalic context, such as [u], and the consonantal one, such as [ʋ]. Thus, the paper argues at the same time for the [+consonantal] specification of the OE [ʋ], which constitutes a new representational proposition for the sound. Moreover, the two processes are analysed as participants in a backness assimilation conspiracy, thus simplifying the overall account.

**Methodology**. Two complementary phonological models are adopted: Optimality Theory (Prince & Smolensky 1993; McCarthy & Prince 1995) and Feature Geometry (Sagey 1986; Halle 1992, 1995). To account for the assimilation, the analysis makes use of the AGREE constraint family (Lombardi 1999; Bakovic 2000). However, a simple $\text{AGREE}_{[\pm bk]}$ ‘Adjacent segments agree in backness’ would be unable to differentiate between the outputs of back umlaut and breaking. Hence, the paper introduces two derivative constraints:

1. $\text{AGREE}_{[\pm bk]V\text{-}V}$ ‘A vowel must agree in its value of the feature [±back] with the following heterosyllabic vowel’;

2. $\text{AGREE}_{[\pm bk]VC}$ ‘A vowel must agree in its value of the feature [±back] with the following [+continuant] consonant’.

## IN SEARCH OF A PRONUNCIATION TEACHING MODEL: UNDERGRADUATE STUDENTS' PERCEPTIONS OF SELECTED BRITISH ENGLISH ACCENTS

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In most English departments at Polish universities the teaching of phonetics has a long and well-established tradition. The model that is used for teaching British English pronunciation to the students almost invariably amounts to Received Pronunciation. However, with the unprecedented accessibility of English in numerous media and the relatively small number of RP speakers, but also with regional accents gaining more widespread recognition, both on linguistic and social grounds, and the emergence of World Englishes and ELF, the choice of Received Pronunciation as the pedagogic model may be dubious. This paper addresses the relevance of teaching RP to undergraduates at English departments. In doing so, we conduct a study with 58 participants with a view to determining their attractiveness ratings of selected British English accents. Using the recent YouGov survey as a basis, we seek to investigate whether the perceptions of the undergraduate students are in line with the YouGov findings. The English varieties in question are: two types of Received Pronunciation - General and Refined (Cruttenden, 2001), Estuary English (Coggle, 1993), West-Midlands, West Country, Scouse, Mancunian and Geordie accents. Also in the analysis we include two non-native speaker varieties so as to attend to what is commonly referred to as ELF. In order to seed out the possible interferences with the variables other than attractiveness, we also investigate the potential intertwining of other dependent and independent variables such as gender, age, intelligibility, pace of speech and tone of voice. The study demonstrates that RP appears to be the most attractive variety of British English irrespective of the possible interaction with other variables. Interestingly, the study also reveals that student perceptions of attractiveness deviate from those of native speakers'.

## PHONETICS AND POLITICS. THE ASSESSMENT OF POLITICAL AND RELIGIOUS LEADERS' NONNATIVE ENGLISH PRONUNCIATION BY POLISH LISTENERS

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The global spread of English has made it the language of international politics, which means that many political and religious leaders use it when addressing audiences different than their fellow countrymen. Their speeches, due to the media and the Internet in particular can reach millions of people who assess not only their content, but also form, including the quality of the leaders' English pronunciation. The latter might affect significantly the listeners' judgements and attitudes as accented speech is known to be more negatively evaluated than native speech, also in terms of the speakers' professional competence and personality traits (e.g. Derwing & Munro 1995, Abelin & Boyd 2000, Lev-Ari & Keysar 2010, Beinhoff 2013).

The present study belongs to the growing body of research on foreign accent perception and evaluation. It examines Polish students' assessment of samples of English pronunciation used in selected official speeches by 11 internationally known and influential politicians, i.e. Vladimir Putin (Russia), Angela Merkel (Germany), Donald Tusk (Poland), Silvio Berlusconi (Italy), Nelson Mandela (Republic of South Africa), Narendra Modi (India), Shinzo Abe (Japan), Ban Ki-moon (South Korea). We also included samples of English speech of two religious leaders: Pope Francis (Argentina) and Dalai Lama (Tibet). The speakers' English pronunciation was evaluated by the participants in terms of the degree of foreign accentedness, comprehensibility and acceptability. The assessors, a group of 20 intermediate learners and a group of 20 advanced learners, were also asked to describe their attitude to

the speakers (positive, negative and indifferent). We examine whether these nonlinguistic attitudes affect the listeners' assessment of the quality of the speakers' pronunciation and whether the participants' level of English proficiency is a significant factor in their judgements. According to the obtained results, the participants' attitude does not influence their evaluation of the samples' comprehensibility and accentedness, but has an impact on their opinion on the pleasantness of accented speech, but only in the case of well-liked and strongly disliked speakers. The level of English proficiency affects the students' assessment of the samples' comprehensibility, but not accentedness and pleasantness.

**REFERENCES**

Abelin, A. and Boyd, S. (2000) Voice quality, foreign accent and attitudes of speakers. *Proceedings of FONETIK 2000*. Hogskolan & Skovde, 21-24.

Beinhoff, B. 2013. *Perceiving identity through accent: Attitudes towards non-native speakers and their accents in English*. Frankfurt: Peter Lang.

Lev-Ari, S. and Keysar, B. 2010. Why don't we believe non-native speakers? The influence of accent on credibility. *Journal of Experimental Social Psychology* 46: 1093–1096.

Munro, M. and Derwing, T. 1995. Processing time, accent, and comprehensibility in the perception of native and foreign-accented speech. *Language and Speech* 38: 289–306.

## VARIATION OF /l/ ACROSS AGES IN LATVIAN (AN ACOUSTIC STUDY)

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There are two lateral consonant phonemes in Standard Latvian – /ʎ/ and /l/. Speaking about the latter it is commonly considered that it has been subjected to a qualitative change during the last decades. Although at the mundane level most of Latvian speakers are aware of this shift in quality of /l/ from "softer"/ "more clear" to "harder"/ "darker" and associate the former variant with some kind of old-fashioned, age-specific pronunciation manner, it has never been thoroughly studied before, except for a rather recent EPG study of /l/ that suggested change in its place of articulation from alveolar (traditionally indicated in the literature, see, e.g., Laua 1997, 45–48, 54) to dental (Grigorjevs 2012, 275).

The primary goal of this paper is to examine the acoustic variation of /l/ produced by native Latvian speakers of different ages and to trace differences in acoustic properties that can be attributed to the phonetic change in question. Position-specific (initial vs. final consonant) and contextual differences have been taken into account as well. The additional objective is to research into how the Latvian data on the varieties of /l/ correspond to those reported for other languages, with special regard to the degree of darkness (see, e.g. Recasens 2011; 2012).

For the study, which is currently in progress, speech recordings from 40 informants (20 male and 20 female speakers covering the total age range from 5 to 80 years) without any speech disorders or notable dialectal traces in their pronunciation have been analysed. Both initial and final laterals in closed symmetric [l]V[l] sequences have been examined (V — one of the vowels [i(ː); e(ː); æ(ː); ɑ(ː); ɔ(ː); u(ː)]; each sequence produced three times by every speaker). Speech recordings were made within the project "Acoustic characteristics of the Latvian sound system by age groups (5–15, 16–39, 40–59, 60–80)" (No. 148/2012, funded by the Latvian Council of Science). During the analysis, the focus is put mainly on the F1 and F2 frequencies. Additionally, the F2 loci of adjacent vowel have been

examined to determine the degree of CV and VC coarticulation in [l]V[l] sequences, since differences in vowel coarticulation between clear and dark varieties of /l/ have been indicated in other languages (Recasens 2012).

**REFERENCES**

Grigorjevs, Juris (2012). Acoustic characteristics of the Latvian sonorants. *Baltistica*, 47(2), 267–292.

Laua, Alise (1997). *Latviešu literārās valodas fonētika*. Rīga: Zvaigzne ABC.

Recasens, Daniel (2011). Linguistic phonetics: a look into the future. *Proceedings of the ICPhS XVII*, (Hong Kong), 44–51.

Recasens, Daniel (2012). A cross-language acoustic study of initial and final allophones of /l/. *Speech Communication*, 54(3), 368–383.

## STRENGTH RELATIONS AND COMPLEXITY ACROSS MORPHEME BOUNDARIES. AN ELEMENT-BASED ACCOUNT OF CONSONANT ASSIMILATIONS IN YAKUT

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While Yakut vowel harmony has received an element-based analysis within Government Phonology (Charette & Göksel 1996, 1998), the language's intriguing consonant assimilation processes across morpheme boundaries have been largely ignored by the adherents to this theoretical model.

Yakut exhibits both progressive and regressive assimilation, frequently up to the point where a geminate is formed. The following examples are taken from Stachowski & Menz (1998: 419): *at* + *-LAr* → *attar* 'horse, PL'; *at* + *-BIt* → *appɯt* 'horse, POSS1PL'; *at* +*-GIt* → *akkut* 'horse, POSS2PL'; *böloχ* + *-LAr* → *böloχtör* 'group, PL'; *böloχ* + *-BIt* → *böloχpüt* 'group, POSS1PL'; *böloχ* +*-GIt* → *böloχχüt* 'group, POSS2PL'. While the regressive process only affects the place of articulation of the root-final t and n, progressive assimilation is more intricate. Based on the data extracted from standard descriptions of Yakut, my aim is to present an element-based analysis of the assimilations within the strict CV model (e.g. Cyran 2010). More specifically, my claims will be as follows:

(a) regressive place assimilation that affects *t* and *n* in $C_1$ involves reinforcement that $C_1$ receives from $C_2$; this will follow from the assumption that the former is characterized by empty resonance, which seeks to be filled;

(b) progressive assimilation involves reinforcement that $C_2$ receives from $C_1$ in view of the empty V between them, as long as $C_1$ is itself strong enough.

Strength will be assumed to be correlated with complexity (the number of elements in the melodic representation in accordance with Cyran (2010).

**REFERENCES**

Charette, Monik & Asli Göksel (1996). Vowel harmony and switching in Turkic languages. – Kardela, Henryk, Bogdan Szymanek (eds), *A Festschrift for Edmund Gussmann*, 29–56. Lublin: University Press of the Catholic University of Lublin.

Charette, Monik & Asli Göksel (1998). Licensing constraints and vowel harmony in Turkic languages. – Cyran, Eugeniusz (ed), *Structure and Interpretation. Studies in Phonology*, 65–88. Lublin: Folium.

Cyran, Eugeniusz (2010). *Complexity Scales and Licensing in Phonology*. Berlin: Mouton de Gruyter.

Stachowski, Marek & Astrid Menz (1998). Yakut. – Johanson, Lars & Eva Csató (eds.), *The Turkic Languages*, 417–433. London: Routledge.

## /OBSTRUENT + LIQUID/ CLUSTERS IN WESTERN NORDIC

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Some /Obstruent + Liquid/ clusters (henceforth OL) have a peculiar behaviour in Western Nordic (WN – Icelandic and Faroese): phonetically they are realized as the succession of two distinct consonantal segments, but phonologically, they behave like singletons. More precisely, they do not block vocalic length on their left, as expected from clusters. In the languages under investigation here, vocalic length is positional: a vowel is long if it is stressed and followed by one consonant at most, or when it is final (1a, 2a). If one of these requirements is not met, the vowel will appear short (1b, 2b) (Adams and Petersen 2014; Árnason 2011; Þráinsson et al. 2012).

(1) Vocalic quantity in Faroese
(a) ˈV → [V:] / _ C
*lin-ur* [l**i**:nʊɹ] ‘soft.NOM.M.SG’
*frek-ur* [fɹ**e**:ʰkʊɹ] ‘greedy.NOM.M.SG’
*tol-a* [tʰ**o**:la] ‘endure.INF’

(b) ˈV → [V] / _ CC
*lin-t* [l**ɪ**n̥t] ‘soft.NOM.N.SG’
*frek-t* [fr**ɛ**ʰkt] ‘greedy.NOM.N.SG’
*tol-di* [tʰ**ɔ**ldɪ] ‘endure.IND.PST.SG’

(2) Vocalic quantity in Icelandic
(a) ˈV → [V:] / _ C
*fín* [f**i**:n] ‘fine.NOM.F.SG’
*las-in* [l**a**:sɪn] ‘sick. NOM.F.SG’
*fög-ur* [f**oe**:ɣʏr̥] ‘beautiful. NOM.F.SG’

(b) ˈV → [V] / _ CC
*fín-t* [f**i**n̥t] ’fine.NOM.N.SG’
*las-nar* [l**a**stnar] ‘sick.NOM.F.PL’
*fög-rum* [f**oe**ɣrʏm] ‘beautiful.DAT.F.PL’

As the data in (3) show, in Faroese, stressed vowels surface long when they precede /pɹ, pl, tɪ, kɪ, kl/ (but vowels are short before /tl/). In Icelandic, here in (4), stressed vowels are long before /pr, tr, kr/ (but vowels are short before /pl, tl, kl/). Also worth noting is the realization of the rhotic in Faroese: while its default realization is [ɹ], it surfaces as a trill when it is included in a OL cluster with a fortis ([pr, tr, kr]).

(3) Vocalic length before OL in Faroese
*vøkru* [ˈv**ø**:ʰkrʊ] ‘beautiful.NOM.F.PL’
*jøklar* [ˈj**ø**:ʰklaɹ] ‘glacier.NOM.PL’
*fepri* [ˈf**e**:ʰprɪ] ‘fever.DAT.SG’
*epli* [ˈ**e**:ʰplɪ] ‘potato.NOM.SG’
*setrið* [ˈs**e**:ʰtrɪ] ‘seat.NOM.SG.DEF’

(4) Vocalic length before OL in Icelandic
*dýpri* [di:prɪ] ‘deep.NOM.M.SG.COMP’
*glitra* [glɪ:tra] ‘shine.INF’
*akri* [a:krɪ] ‘field.DAT.PL’

Previous works in Government Phonology (Lowenstamm 2003; Scheer 2014) have pointed out the ambiguity of OL clusters. Two proposals are classically defended: (i) OL clusters are a strict succession of an obstruent and a liquid and have the same status as /obstruent+obstruent/ clusters (bipositional hypothesis), (ii) OL clusters are a specific configuration which makes them comparable to affricates. In other words, OL clusters are obstruents with a liquid reflex, which can be dropped with no consequence on the obstruent (monopositional hypothesis).

For the particular case of WN, both hypotheses seem not completely satisfying: if the rhotic in OL clusters is exactly the same as a singleton /ɹ/, we expect the rhotic to have only one reflex, with no consideration for its left environment. The monopositional hypothesis implies that languages have two

kinds of obstruents: [p,t,k] and [$p^r$, $t^r$, $k^r$, $p^l$, $k^l$]. Although it could correlates with the present data, such an analysis makes consonantal inventories particularly heavy. In this talk, I argue that a third option is possible: OL clusters are indeed clusters and not complex obstruents – liquids are not only reflexes of the stops but full-fledged segments that can settle into the slot of another segment, whence the "affricate-like" behaviour. This analysis is couched within the *Government Phonology 2.0* framework (Pöchtrager 2006), whose principal contribution is to give segments a *structured* internal layout with a head and complement positions. While in obstruents the head can project up to two levels, sonorants are *adjunction structures*, i.e. although they contain several nodes, they do not project. This peculiar status allows them to be taken as complements by the head of a stop. Hence OL clusters do contain two distinct segments which receive each an interpretation, but since both segments are hosted in the same onset, the preceding vowel 'detects' only one consonantal structure at its right. I further argue that the Faroese rhotic's interpretation depends on its position within the chain: if /ɹ/ is hosted in the structure of another onset and counts as a complement, it surfaces as a trill, if /ɹ/ stands on its own, then the approximant surfaces.

**REFERENCES**

J. Adams and H. P. Petersen. *Faroese: a language course for beginners*. Tórshavn: Stiðin, 2014.

K. Árnason. *The phonology of Icelandic and Faroese*. Oxford; New York: Oxford University Press, 2011.

J. Lowenstamm. "Remarks on mutæcum liquida and branching onsets". In: *Living on the edge: 28 papers in honour of Jonathan Kaye*. Ed. by S. Ploch. Berlin; New York: Walter de Gruyter, 2003, pp. 339–363.

M. A. Pöchtrager. "The structure of length". PhD thesis. Université de Vienne, 2006.

T. Scheer. "Muta cum liquida in the light of Tertenia Sardinian metathesis and compensatory lengthening Latin tr > Old French Vrr". In: *Variation within and across Romance Languages. Selected papers from the 41st Linguistic Symposium on Romance Languages (LSRL)*. Ed. By M.-H. Côté and E. Mathieu. Amsterdam: John Benjamins Publishing, 2014, pp. 77–100.

H. Þráinsson, H. P. Petersen, and J. í. L. Jacobsen. *Faroese: an overview and reference grammar*. Tórshavn: Føroya Fróðskaparfelag, 2012.

## WHEN IS SOUND CHANGE 'PHONETIC' OR 'PHONOLOGICAL'? THE CASE OF DUTCH /e,ø,o/

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The vowel system of Dutch is traditionally analyzed as consisting of three high vowels /i,y,u/, four tense vowels /e,ø,o,a/, four lax vowels /ɪ,ʏ,ɔ,ɑ/, three diphthongs /ɛi,œy,ɑu/, and two 'stragglers' /ɛ,ə/ (e.g. [1,2]). For the past 100 years, however, the tense mid vowels /e,ø,o/ have slowly begun to change into diphthongs [ei,øy,ou] ([3,4,5]). What has until recently ([6,7]) not been noticed, however, is that this sound change has a contextual restriction: the tense mid vowels are realized as the original monophthongs (or, for some speakers, even as short lax vowels; [6]) when preceding coda /l/, any realization of /r/ ([2]), or a semivowel ([8]). It just so happens that this contextual restriction on the diphthongal realizations of /e,ø,o/ is identical to a pre-existing restriction on the realizations of the original diphthongs /ɛi,œy,ɑu/: just as [ei] is realized as [e:] when preceding coda /l/, so is [ɛi] realized as [ɛ:] in the same environment.

Is the diphthongization of /e,ø,o/ a phonetic or a phonological change? According to [9], once the new realizations adopt the allophonic pattern of a pre-existing phonological category, they have

merged with that category and should hence be analyzed as members of that category (reanalysis by rule inversion). On these grounds [ei,øy,ou] should be diphthongs underlyingly. This is attractive on rule-theoretical grounds, because the diphthong-blocking environment of /l,r,ʊ,j/ suggests that there is a phonological rule 'diphthong → monophthong / _ [+approx]', whereas the reverse 'monophthong → diphthong / ?' is impossible to formalize. At the same time, the environment of /l,r,ʊ,j/ is obviously phonetically motivated (cf. [2]), as is the original diphthongization ([10,11]). In addition, situating diphthongization in the phonetic implementation automatically explains why [ei,øy,ou] do not attract stress, whereas /ɛi,œy,ɑu/ do.

The analysis of a large-scale corpus originally reporting on the areal stratification of the diphthongal realizations helps to clarify in which theoretical module the diphthongizations should be localized. The corpus, composed by [12], consists of 5,407 tokens of 21 monosyllabic words, stratified over eight regions in the Netherlands and Belgium. Data show that the sound change is still in full progress and has not made it through either (a) the full vowel system (/e/ seems to be ahead of /ø,o/) or (b) the full geography. This suggests that an analysis in terms of *scattered rules* ([13]) is appropriate: the changes are *in the process* of being phonologized, and are hence currently both in phonetics *and* in phonology.

**REFERENCES**

[1] van Oostendorp, M. (2000). *Phonological projection: A theory of feature content and prosodic structure*. Berlin: Walter de Gruyter.

[2] Booij, E. E. (1995). *The phonology of Dutch*. Oxford: Oxford University Press.

[3] van der Harst, S. (2011). *The vowel space paradox: a sociophonetic study on Dutch*. Utrecht: LOT.

[4] Van de Velde, H. & van Hout, R. W. N. M. (2003). Diftongering in het Standaard-Nederlands. In: T. Koole, J. Nortier, & B. Tahitu (Eds.), *Artikelen van de vierde sociolinguïstische conferentie* (pp. 486–497). Delft: Eburon.

[5] Van de Velde, H. (1996). *Variatie en verandering in het gesproken Standaard-Nederlands (1935-1993)*. PhD dissertation, Radboud University Nijmegen.

[6] Berns, J., & Jacobs, H. (2012). A first glance at the role of length in production and perception of diphthongs before Dutch coda l. *Linguistics in the Netherlands* 29(1), pp. 15-26.

[7] Botma, B., Sebregts, K., & Smakman, D. (2012). The phonetics and phonology of Dutch mid vowels before /l/. *Laboratory Phonology* 3(2), pp. 273-297.

[8] Mees, I., & Collins, B. (1982). A phonetic description of the consonant system of Standard Dutch (ABN). *Journal of the International Phonetic Association* 12(01), pp. 2-12.

[9] Hyman, L. M. (1976). Phonologization. In: Juilland, A. (Ed.). *Linguistic Studies Offered to Joseph Greenberg* (pp. 32-43). Saratoga: Anima Libri.

[10] Labov, W., Yaeger, M., & Steiner, R. (1972). *A quantitative study of sound change in progress*. Philadelphia: University of Philadelphia.

[11] Labov, W. (1994). Principles of language change: Internal factors. Oxford: Blackwell.

[12] Adank, P. M. (2003). *Vowel normalization: a perceptual-acoustic study of Dutch vowels*. Katholieke Universiteit Nijmegen.

[13] Bermúdez-Otero, Ricardo. 2015. Amphichronic explanation and the life cycle of phonological processes. In: Honeybone, P. & Salmons, J. C. (Eds.). *The Oxford handbook of historical phonology*. Oxford: Oxford University Press.

## POLISH SANDHI-VOICING – PROSODIC IMPLICATIONS

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Pre-sonorant *sandhi*-voicing in dialectal Polish has challenged phonologists for years. Traditional accounts (Gussmann 1992; Rubach 1996) hold that sonorants 'acquire' a [voice] specification that spreads only across word boundaries, but not word-internally. In other words, the sonorant is assumed to behave like a voiced obstruent. For Cyran (2014), pre-sonorant voicing is left to the 'phonetics' and is distinct from pre-obstruent voicing, which is compatible with Strycharczuk's (2012) phonetic results. Each of these phonological proposals misses an intuitive aspect of the process: pre-sonorant voicing implies a weaker word boundary, so any phonological analysis must have a way of capturing boundary strength.

Schwartz (2016) proposes an analysis within the Onset Prominence framework, wherein pre-sonorant boundary strength is a function of sonorant promotion, a strengthening process that yields stronger boundaries in standard Polish. Assuming *sandhi*-voicing indicates boundary weakening, the OP perspective makes phonetic predictions for prosodic features that should be expected to co-occur with the voicing process, as well as the nature of the process itself. These predictions may be formulated as follows.

1.Although initial syllables typically bear phonetic prominence in standard Polish (Dogil 1999, Newlin-Łukowicz 2012), weaker boundaries in *sandhi*-voicing dialects should go hand in hand with less prominent initial syllables, manifest in the strength of the sonorant consonant relative to the following vowel, or the relative prominence of the initial vowel to the stressed penultimate vowel.

2. Since in the OP environment 'sonorant' is not a feature, but rather a product of prosodic configurations, different types of word-initial sonorant consonants with different configurations should be expected to facilitate voicing to different degrees. In particular, nasals containing an active Closure node produce a stronger boundary and should induce less voicing than other sonorants.

We compare acoustic data from a group of mostly teenagers from Oborniki Wielkopolskie (N=11), with non-dialect speakers (N=11). The relative strength of initial sonorants is measured by means of duration ratios with the following vowel. The relative strength of initial vowels is measured as duration, intensity, and pitch ratios with respect to stressed penults. Closure voicing and duration of final obstruents are also measured and the ratios between them calculated.

With regard to Prediction 1, Oborniki speakers show less prominent initials in the pitch and intensity ratios (Intensity Ratio: b=-.011, S.E. = .003, t=-3.439, p=.001; Pitch Ratio: b=-.06, S.E. = .024, t=-2.485, p=.013), but not in sonorant-based and vowel-based duration ratios. With regard to Prediction 2, initial /m/ induced a lower voice ratio than the other sonorant types for the non-dialect speakers (/j/: reference level; /m/: b=-.09, S.E. = .041, t=-2.176, p=.03) . These results provide support for the hypothesis that the Wielkopolska *sandhi*-voicing process is a function of prosodic organization, which in the OP framework is unified with the representation of manner and sonority.

### REFERENCES

Cyran, E. 2014. *Between phonology and Phonetics – Polish Voicing*. Berlin: Mouton.

Dogil, G., 1999. The phonetic manifestation of word stress in Polish, Lithuanian, Spanish, and German. In: van der Hulst, H. (Ed.), *Word Prosodic Systems in the Languages of Europe*. New York: Mouton, 273-311.

Gussmann, E. 1992. Resyllabification and delinking: the case of Polish voicing. *Linguistic Inquiry* 23, 29–56.

Newlin-Łukowicz, L., 2012. Polish Stress: looking for phonetic evidence of a bidirectional system. *Phonology* 29 (2), 271-329.

Rubach, J. 1996. Non-syllabic analysis of voice assimilation in Polish. *Linguistic Inquiry* 27, 69–110.

Schwartz G. 2016. Representing non-neutralization in Polish sandhi-voicing. In: Szpyra-Kozłowska, J & Cyran, E. (eds.), *Phonology, its Faces and Interfaces*. Bern: Peter Lang, 103-122.

Strycharczuk, P. 2012. Phonetics-phonology interactions in pre-sonorant voicing. Ph.D. dissertation, University of Manchester.

## REALISATION OF /r/ IN THE SPEECH OF POLISH LEARNERS OF ENGLISH: AN EXAMINATION OF L1 AND L2 PRODUCTIONS

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The study concentrates on the production of /r/ in L1 and L2 pronunciation of Polish speakers of English. In Standard Southern British English and in General American, the two accents of English that are commonly used as pronunciation models for L2 learners, /r/ is classified as an alveolar or post-alveolar approximant [ɹ] (e.g. Ladefoged and Maddieson, 1996) which, in the case of SSBE, is only pronounced prevocalically. The Polish rhotic, on the other hand, is typically described as an alveolar trill [r] (e.g. Ostaszewska and Tambor, 2000; Wierzchowska, 1980) or an alveolar tap [ɾ] (e.g. Biedrzycki, 1978; Dłuska, 1983). Also, as opposed to nonrhotic varieties of English such as SSBE, Polish /r/ is pronounced whenever it is spelled.

Given the differences in the realisation of /r/ in Polish and English, one might expect the speech of Polish learners to be characterised by rhoticity and trilled or tapped productions of /r/. Polish speakers themselves seem to consider this feature a key element of a stereotypical Polish accent in English. Contrary to this popular belief, the results of a recent pilot study on the realisation of postvocalic /r/ by Polish learners of English showed that the most frequent variant of /r/ was an approximant and that some of the /r/ sounds were realised as non-rhotic. Tap realisations were extremely rare and no trill realisations were found.

The purpose of the current study was to expand on previous findings by examining and comparing the realisation of /r/ in L1 and L2 pronunciation of Polish speakers of English. The subjects were 26 Polish learners of English, who were required to read two sets of sentences, one in Polish and one in English. The English and Polish target words contained /r/ in different phonetic environments and were arranged into pairs that corresponded to each other in terms of phonetic structure, e.g. EN *cry* and PL *kraj* ‘country’. Acoustic analysis of the data was conducted in order to address the following research questions: 1. What are the variants of /r/ in the investigated phonetic contexts in Polish and English? 2. Does realisation of /r/ in Polish and English vary as a function of phonetic context? 3. Is there a correlation between the realisations of /r/ in Polish and English words of equivalent phonetic structure? Analysis of the collected data allows us to draw conclusions concerning the realisation of /r/ in Polish and Polish learner English, and to determine the extent of L1 influence on the pronunciation of English /r/ by Polish speakers.

**REFERENCES**

Biedrzycki, L. (1978) *Fonologia angielskich i polskich rezonantów*. Warszawa: Państwowe Wydawnictwo Naukowe.

Dłuska, M. (1983) *Fonetyka Polska. Artykulacje Głosek Polskich*. Kraków: Państwowe Wydawnictwo Naukowe Warszawa.

Jaworski, S. and Gillian, E. (2011) On the Phonetic Instability of the Polish Rhotic /r/. *Poznań Studies in Contemporary Linguistics* 47(2), 2011, 380–398.

Ladefoged, P. and Maddieson, I. (1996) *The Sounds of the World's Languages*. Oxford: Blackwell Publishing.

Ostaszewska, D. and Tambor, J. (2000) *Fonetyka i Fonologia Współczesnego Języka Polskiego*. Warszawa: Wydawnictwo Naukowe PWN.

Stolarski, Ł. (2013) Articulation of the Polish /r/ in the intervocalic position. In Kuczyński, M. and Szymański, L. (eds.), *Language, Thought and Education: Across Systems*, Zielona Góra: Oficyna Wydawnicza Uniwersytetu Zielonogórskiego, 21-35.

Stolarski, Ł. (2015) Further Analysis of the Articulation of /r/ in Polish – the Postconsonantal Position. *SKY Journal of Linguistics* 28, 349-379.

Wierzchowska, B. (1980) *Wymowa Polska*. Warszawa: Państwowe Zakłady Wydawnictw Szkolnych.

## COUNTERBLEEDING OPACITY IN POLISH RESULTATIVE PARTICIPLES

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Polish verbs in *-e-* and *-ej-* display an alternation between /a/ and /e/ in the masculine-personal forms, e.g. *wyłysiał - wyłysieli* 'he has gone bald - they have gone bald, m-pers.'. Traditionally, vowel /e/ has been assumed to undergo the rule of Backing and Lowering if it is followed by a non-palatal consonant (here *-ł-*). The rule must be ordered after the rule of Palatalization that derives *-l-* from *-ł-* (see Gussmann 1980). Thus Palatalization should bleed Backing and Lowering.

This does not happen in participles related to verbs in *-ej-*, where *-l-* follows /a/, c.f. *wyłysiali starsi panowie* 'elderly gentlemen that have gone bald'. What we observe in such cases is counterbleeding opacity: Palatalization is expected to bleed the rule of Backing and Lowering. Nevertheless, the rule seems to apply.

I will argue that the alternation of the thematic vowels /a/ and /e/ is not due to the working of the rule of Backing and Lowering in Polish. Firstly, the analyses that rely on Backing and Lowering require assuming that Polish has an underlying [+/-tense] contrast which is absolutely neutralized. Secondly, Backing and Lowering encounters several sets of counterexamples, the most productive of which is the set of participles of *ej*-verbs.

I will show that the said counterbleeding effect is the consequence of cyclic spell-out (see Embick 2010). The insertion of /e/ is conditioned by the availability the feature [masculine-personal]. The feature may be referred to in the exponence of the verb but is not available in the case of the participle. As opposed to verbs such as *wyłysieli*, the participle contains the categorizing head Adj(ective), which triggers the interpretation of its complement. Since feature [masculine-personal] is introduced above the Adj-head, it is not present at the point of the derivation where the thematic suffix is realized. As a result, the default thematic vowel /a/ is inserted.

**REFERENCES**

Embick, David. 2010. "*Localism vs. Globalism in Phonology and Morphology*." Cambridge, MA.: MIT Press.

Gussmann, Edmund. 1980. "*Studies in Abstract Phonology*." Cambridge, MA.: MIT Press.