Abstract booklet

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Pitch accent in Tokyo Japanese: an L-based analysis
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There is a growing awareness that phonological information is shared between segmental structure and prosodic structure. While it is agreed that words are identified primarily by their segmental properties, there is also evidence that a word’s prosodic structure contributes to its perceptibility, making it more easily recognisable to listeners. Indeed, the psycholinguistics literature demonstrates that listeners process continuous speech more efficiently if they are able to recover information about where prosodic (e.g. word) domains begin and end. They do this by associating strong prosodic positions, such as domain boundaries, with strong segments – or more precisely, with particular marked properties contained in such segments. These marked properties vary from one language to another, but in all cases they serve the function of identifying the (usually, left) edge of a prosodic domain such as foot or word. Listeners intuitively pay attention to marked properties, which helps them identify domain boundaries and, in turn, process speech more efficiently. Marked properties, which are usually consonantal, include aspiration (English), ejective (Maidu) and true (obstruent) voicing (Wiyot).

It is a reasonable assumption that all languages make use of boundary markers of some kind. In the case of Japanese, however, it is not immediately obvious from its segmental patterns what that marking property might be. In this paper we propose that the prosodic marking property in Tokyo Japanese is tonal rather than segmental – specifically, a low tone which marks the left boundary of prosodic word domains. This is apparent in unaccented words, where an initial low tone is followed by a succession of high tone syllables; for example, *hi ‘sun’ (L), *hashi ‘bridge’ (LH), *kuruma ‘car’ (LHH). The picture is complicated by the fact that Japanese also has lexical tone (assigned to accented syllables, i.e. a pitch accent system). Traditionally (Haraguchi 1991), both L and H are thought to be phonologically active in the Japanese system. However, it is equally possible to analyse the pitch accent system of Japanese by referring to just a single active property, namely L. This reflects the central role played by L in the phonology of Japanese: L functions not only as a prosodic boundary marker but also as the active tonal property, and in addition, as the marked laryngeal property in fully voiced obstruents.

It is conventionally thought that pitch accent patterns can only be accounted for if both H and L are employed as active properties. But in this paper we will demonstrate how pitch in native (Yamato) Japanese words can be captured successfully by referring to L alone. For example:

\[
\begin{align*}
& \text{i. ‘edge’} & \text{ii. ‘bridge’} & \text{iii. ‘chopsticks’} \\
& \text{ha.si-ga} & \text{ha.si-ga} & \text{ha.si-ga} \\
& L & L & L \\
& H & H & H \\
& L \quad H \quad H & L \quad L \quad L & L \quad L \quad L \\
& (* L \quad L \quad H) & & \text{Phonetic manifestation}
\end{align*}
\]

An interesting pattern emerges in the case of (iii), where we observe an interaction between prosodic boundary tones and lexical tones: in order to express the lexical low tone, which is assigned to the second nucleus, the first nucleus must be realised on a high pitch, thereby overriding the low tone prosodic boundary marker.

References
Turkish Word Structure and the Morphological Structure of Suffixes

Semra Baturay

Aim: This study offers a new constituent structure for Turkish suffixes in the light of Kaye’s (1995) analytic vs. non-analytic morphology distinction. Different from Denwood (1998) and Charette (2004) who base their proposals -all suffixes are analytic in Turkish- on domain final p-licensing without considering parsing cues or other phonological processes, my proposal -some suffixes are analytic and some others are non-analytic- is based on different morphological behaviors of suffixes, and phonotactics.

Theoretical Background: According to Kaye (1995), the compound [[black][board]] [[A][B]] and a regular verb with past tense suffix [[seep]ed] [[A][B]] are examples of analytic morphology where morphological domains can be represented in phonology. In non-analytic morphology, the phonology reacts there were no morphology due to the absence of different phonological domains as in [kept] [A B].

Problems of Denwood (1998) and Charette (2004): (i) They take all the suffixes as analytic without questioning their morphological behavior and phonotactics (consonant sequences), (ii) Developing a template model, they interpret vowel final stems analytic, i.e. words such as kedi ‘cat’ are assumed to consist of two domains [[ked][i]] in that ‘i’ behaves like a suffix in analytic morphology. This misleads phonology in the structure of kedi. kedi is a well formed word in that neither phonotactics nor stress prevents kedi from occurring in a single domain. Therefore, their template model lacks enough motivation.

Claim 1: Contra Denwood (1998) and Charette (2004) who claim that Turkish has four position templates/domains for morphological structure, I propose that there can be any number of onset (O) nucleus (N) pairs in a single domain unless there is something against parsing cues or regular stress assignment.

(1) a. O₁ N₁ O₂ N₂ ‘house’ b. O₁ N₁ O₂ N₂ O₃ N₃ ‘lid’
   [x x x x x] [x x x x x]
   e v p-licensed k a p a k p-licensed

(2) a. O₁ N₁ O₂ N₂ O₃ N₃ ‘door’ b. O₁ N₁ O₂ N₂ ‘head’
   [x x x x x] [x x x x]
   k a p [i] p-licensed k a f a

Claim 2: Stems and suffixes always keep their structure the same. If a word consists of three pairs of ON before suffixation (2a), it must have three pairs of ON after suffixation (3).

(3) O₁ N₁ O₂ N₂ O₃ N₃ O₄ N₄ O₅ N₅ ‘doors’
   ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ shader would be a non-existent structure *kaplar given that N4 is domain finally p-licensed and N3 properly governs N2 as a result of which N2 remains silent (4).

(4) O₁ N₁ O₂ N₂ O₃ N₃ O₄ N₄ ‘doors’
   ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ ʃ shader would be a non-existent structure *kaplar given that N4 is domain finally p-licensed and N3 properly governs N2 as a result of which N2 remains silent (4).
Claim 3: Contra Denwood (1998) and Charette (2004) who start out with the assumption that all suffixes are analytic in Turkish, some suffixes are analytic while some others are non-analytic as a result of my analysis. There are three types of suffixes:

Type I suffixes that are consonant initial such as the plural marker -lAr (ev-ler ‘houses’) have analytic morphology and the support comes with phonotactics. In Turkish, three consonants can be phonetically adjacent in cases where a consonant initial suffix is attached to a word-final consonant cluster. Balci (2006) points out that in kurtlar ‘wolves’, the end of the stem can easily be identified by considering the number and the nature of consonants. kurt ‘wolf’ is a stem, and -lar ‘Pl.’ is a suffix since there cannot be three consonants in stem-medial position. Therefore, the plural suffix in Turkish has an analytic structure [[kurt]lar].

Type II involves consonant initial suffixes such as the first person possessive marker (FPP) -m (kedi-m ‘my cat’) in that vowel appears in the stem final empty nucleus position if p-licensing fails as in (ev-im ‘my house’). Type II suffixes have non-analytic morphology given that the reverse analysis leads to ungrammatical outputs. Consider (5a-b).

(5) a. O₁ N₁ O₂ N₂ O₃ N₃ ‘house’+FPP
   [ x x x x ] x x
   e v m
   p-licensed

   b. O₁ N₁ O₂ N₂ O₃ N₃ ‘house’+FPP
   [ x x x x x x ]
   e v m
   p-licensed

In (5a) the FPP marker (Type II) is assumed to have analytic morphology. N₂ and N₃ are domain finally p-licensed and remain silent. The output is *evm, which is not grammatical. Thus, analytic morphology for FPP leads to an ungrammatical output. In (5b), the Type II is analyzed as having non-analytic morphology. N₃ is p-licensed and cannot properly govern N₂. The element I spreads into N₂. Stress falls on N₂, which is the final non-p-licensed nucleus.

Type III suffixes are vowel initial and involve a floating consonant (Charette, 2004) which can stick to the onset when added to a vowel ending stem such as the dative -yA (ev- ‘to house’ vs. kapı-ya ‘to door’). I claim that Type III suffixes are morphologically analytic. Analytic vs. non-analytic morphology analyses of a Type III suffix are given in (6a-b), respectively.

(6) a. O₁ N₁ O₂ N₃ N₃ house+dat
   [ x x x x ]
   e v (y) A
   p-licensed

   b. O₁ N₁ O₂ N₂ O₃ N₃ house+dat
   [ x x x x x x ]
   e v (y) A
   p-licensed

In (6a), the N₂ is domain finally p-licensed and remains silent. Since N₂ is followed by an onset without a skeletal point and they are not in a single domain, reduction is possible (Gussman & Kaye, 1993) as a result of which no room is available for the floating consonant ‘y’. This gives us the grammatical output, ev. However, the non-analytic morphology treatment brings an ungrammatical output. In (6b), N₃ is not lexically empty. Thus, N₃ can properly govern N₂. Since reduction is not possible in a single domain, the floating ‘y’ has an onset position (O₃) to attach. The output is *evye which is not grammatical.

Conclusion: (i) There can be any number of ON pairs in a single domain. If a stem or suffix ends in a high vowel, we must add an extra ON pair to save the domain final p-licensing parameter which is set to ON. (ii) A stem or a suffix must look the same in structure. (iii) Turkish suffixes can be grouped as Type I suffixes having analytic morphology, Type II suffixes having non-analytic morphology, and Type III suffixes having analytic morphology.

Quantifying metrical easiness  
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**Summary and background.** Generative metrics, the study of prosodic patterning in verse, has been primarily concerned with the formal properties of representations, rules, and constraints, i.e. the nature of metrical grammars. While it is commonly recognized that extragrammatical factors also contribute to the structure of particular metrical systems, such factors have received little attention in formalist metrics.

Hanson & Kiparsky (1996) proposed a parametric theory of meter where two such external factors were spelled out: **Fit** and **INTEREST**. The principle of **Fit** dictates that metrical rules/constraints should be selected in such a way as to maximize the proportion of the vocabulary that is usable in the meter. **INTEREST**, as Hanson & Kiparsky put it, maximizes the "esthetic interest" of the verse, by making the verse sufficiently distinct from prose.

Intuitively, a metrical system should be neither too difficult nor too easy to use. To put it more precisely, given a string of prose of the right length, the probability that it fits the meter should be neither too low, making the meter too challenging, nor too high, making the meter indistinct from prose.

In this talk I quantify this notion of metrical easiness implicit in Hanson & Kiparsky's **Fit** and **INTEREST**. I will show how it contributes to the shape of metrical rules. Furthermore, I will argue that not all aspects of meter are derivable from such external factors.

**Metrical easiness.** The notion of metrical easiness relates to the probability that some random string of text is metrical. Assume that a meter is a template consisting of a series of slots, or metrical positions (MPs). A metrical grammar defines (a) what kind of unit—syllable, mora, foot, etc.—may occupy a MP, and (b) the metricality conditions on the text-template correspondence. Further, assume, with idealization, that the question of metricality is always decidable—any given structure is either metrical or not in every MP of a given meter (i.e. there is no gradient metricality).

Apart from the properties of the meter itself, the probability that a random string of text is metrical is correlated with the length of the line, as longer strings are less likely to satisfy the meter than shorter strings. Intuitively, the notion of the easiness should not depend on length: a meter can be "easy" but have long lines, or "hard" and have short lines. Easiness thus must be normalized by length. Given a meter of length $n$ MPs, its easiness is given by the formula (1), where $p$ is the probability that a string of text of length $n$ satisfies the meter's constraints. Prose has the easiness of 1; an impossible meter has the easiness of 0.

(1) \[ e = \frac{1}{n} \]

**Easiness in English iambic meters.** Measuring easiness precisely is impossible, because the probability of metricality depends on the frequencies of stressed and unstressed syllables in natural text, which is not a precisely measurable value. However, easiness can be reliably estimated.

In the following, I will use data from Hammond 2012, a dictionary containing information on stress as well as on frequency. I use the following strategy to estimate metrical easiness. The token frequency of all stress patterns (prosodic types) is first calculated based on dictionary data. A perl script then generates random sequences of "words", where words are prosodic types selected with a probability proportional to their frequencies. The script checks the resulting "line" against a template, and reports how many tries it took to generate a given number of metrical lines. Easiness can then be calculated from these data.
Consider English iambic pentameter. Its template is given below in (2a), in terms of S(trong) and W(eak) positions. More concretely, given the standardly assumed rules of English iambics, all but the last S of the line are indifferent, i.e. may contain either stressed or unstressed syllables. The last S must be stressed. The W positions may contain either unstressed syllables or stressed monosyllabic words. The first W of the line is indifferent. All of this information is given to the script generating random lines.

(2)  

a. W S W S W S W S W S  
b. S W W S W W S W W S  

For this meter, a typical trial generating 10,000 lines requires about 100,000 attempts. In other words, the probability that a string of ten syllables fits the meter is about 0.1, resulting in metrical easiness of 0.1^{10} ≈ 0.79.

Next, consider ternary meters, such as the dactylic tetrameter (2b). If, just as in iambic meters, the W positions in (2b) can be filled with unstressed syllables or with stressed monosyllables, the meter's easiness is 0.66, significantly lower than iambic pentameter. Such a meter is too strict (and too monotonous), and rarely used in the English tradition. In actual English ternary meters, there is a further allowance: the first in each of the sequences of two Ws can be filled with a stressed syllable.

Clearly, this allowance raises the meter's easiness. An interesting question is, why is the meter's rule relaxed at the first and not the second W? There are formal explanations for this fact (e.g. Kiparsky 1977, Prince 1989). An alternative explanation may have to do with metrical easiness: due to the structure of the English lexicon (e.g. predominance of trochaic over iambic words), allowing the first of two Ws to contain a stress might raise the easiness more than doing so for the second W. This, however, turns out not to be the case. The easiness in both cases rises to about 0.71, regardless of which of two Ws is allowed to contain a stressed syllable.

Thus, while the factors measured by metrical easiness have some role to explain the choice of meters in the English tradition (e.g. the relative lack of strictly ternary meters with unstressed Ws), it cannot explain the choice of particular rules.

I also discuss other rules of English meters, e.g. the so-called "initial inversion" in English iambic meters—the indifference of the first W in (2a). I show that easiness cannot explain this and other rules.

Extensions. In the talk I also discuss work to estimate the metrical easiness in other languages, such as Latin and Russian. Preliminary results suggest that while Russian meters have easiness in a range similar to English, easiness in Latin meters is much lower. For example, using a corpus of Cicero's speeches to estimate the frequency of prosodic types in Latin, I calculated the easiness of Latin iambic tetrameter (a meter similar in its role in the tradition to iambic pentameter in English) as 0.55—much lower than any usable English meter. I speculate that the absence of rhyme in the Latin tradition compared to newer European literatures makes it possible to use relatively stricter meters.

Conclusion. Metrical easiness as measured here is no doubt one of the factors shaping meters. It relates to the notions of Fit and Interest proposed by Hanson & Kiparsky. However, formal factors have their place in the theory as well; easiness cannot explain the details of metrical constraints, such as the structure of English ternary meters. Metrical systems arise as a result of complex interplay between structural and external forces.

Selection Strategy in the Acquisition of Place in Brazilian Portuguese  
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Early production in child language has long been the focus of phonological studies which aim to establish the patterns through which language is acquired and outline the order of acquisition of phonemes. These studies have shown that in order to overcome problems of production in place or manner of articulation not yet acquired, the child makes use of common processes such as consonant reduction and deletion, substitution and reduplication, and assimilations such as consonant harmony (Fikkert & Levelt, 2008; Gormley, 2003). However, phonological processes are not the only move the child resorts to. They may also turn to a selection strategy by which they actively select words with sounds and syllable structures that they are capable of producing and avoid words with sounds and structures that they cannot (Ferguson & Farwell, 75; Schwartz and Leonard, 82; Stoel-Gammon and Cooper, 84; Storkel, 06).

The present study is, thus, aimed at analyzing how active this latter strategy may be in the phonological development of three children acquiring Brazilian Portuguese during the period of 1;4 to 2;4 (year;month). Making use of 1.566 tokens, all of which disyllable productions, we have delimited our analysis to the acquisition of labial, coronal and dorsal consonants in onset position in order to investigate how the order of acquisition of place of articulation can affect the lexicon selection of their productions. The collected data were classified into three different categories: i) productions which were faithful to the target word with non-harmonized consonants; ii) productions which were faithful to the target word with harmonized consonants; and iii) productions which suffered the phonological process of consonant harmony. Grounding our study on the hypothesis that children’s intakes are determined by the phonological features they have acquired, we expect that they are more likely to select from the input target words which are more consistent with the place of articulation they have a good domain of. This hypothesis joined with the child’s developing ability to coordinate multiple articulatory gestures within a short sequence is expected to yield a more articulatory consistent output. That being so, we suppose that the children’s corpora analyzed in this study should consist of a considerable number of harmonized intakes. Indeed, the results of our calculations have shown that word targets with harmonized consonant segments correspond for up to 34% of their productions (530/1566) during the 1-year period. More specifically, we have observed that by 1;10, when most labials, coronals and dorsal stops and fricatives are still being acquired in onset position (Lamprecht, 2003; Mota, 1996), the harmonized forms add up to 49%, decreasing to 32% in the age period from 1;11 to 2;4. Moreover, the fact that consonant harmony was not seen as a highly active strategy to adapt the target word (3% out of the 1566 data analyzed) has also led us assume that these children show a particular tendency of favoring harmonic targets. Also, we have seen that non-harmonized targets attempted by the children ranges from 38% of their overall production up to 1;10 to 64% when they are 2;4. We have also certified that the input the children were exposed had not biased the results. Thus, the amount of harmonized words produced by the caretaker was also measured adding up to a total of 20% in three sessions of 30 minutes each.

The results of our analysis have additionally shown that word targets with harmonized coronals correspond for up to two-thirds of their production (64%), followed by labials (18%) and dorsals (9,3%) which respect the fact that dorsals are acquired later than coronal and labials (Lamprecht, op. cit). It may also suggest that the number of harmonized intakes for coronals, labials and dorsals mirrors what is more frequent in the input. Indeed, we have found out that the caretakers' harmonized forms are made up of 64% of coronals, 24% of labials and 12% of dorsals.

In conclusion, these findings suggest that there is, indeed, a tendency for these children to select words which are harmonized in place of articulation and consistent with the order of acquisition of this phonological feature up to the period when they have mastered the three places of articulation discussed here and that this result may not be influenced by the input they receive once the amount of harmonized words in the children’s and caretakers’ output is relatively different. Moreover, we have found out that these children tend to favor segment strings with harmonized coronals over labials and dorsal, which my be a reflexion of what is more common in the language.
References:


Contrastive Parallelism in European Portuguese: Prosodic Features of a Cohesion Mechanism

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The main goal of this paper is to analyze structures of parallelism that convey contrast – contrastive parallelism – in European Portuguese, discussing how contrast is prosodically encoded in this context and relating it with previous results for other languages.

From a discourse / syntax point of view, parallelism is defined as a cohesion mechanism involving grammatical features, word order and syntactic structure (Duarte, 2003). From a prosodic point of view, parallelism is traditionally defined as tonal copy between consecutive nuclear pitch accents (e.g., Crystal, 1969; Bolinger, 1989). However, Wichmann (2000), by analyzing data from spontaneous speech, points out the possibility of parallelism involving different tones (based on phonetic properties) and non-consecutive tonal units. Regarding contrast, the literature often identifies intonation patterns associated with the semantic-pragmatic value of contrast. For instance, Bolinger (1989) argues that contrast reflects on intonational range and on intonational profile, which is often an abrupt fall in or from the stressed syllable (associated with assertiveness). Pierrehumbert & Hirschberg (1990), on the other hand, establish a relation between L+H* and contrast. More recently, the gradient or categorical nature of contrast has been debated, namely in what concerns structures of contrastive focus and topic and also emphasis. Considering European Portuguese, H*+L and ^H*+L are associated with contrastive focus (Frota, 2000) and L+H* and ^H* were found in correction and / or emphasis contexts (Viana et al., 2007). On the other hand, studies for other languages (e.g., Braun & Ladd, 2003; Torregrossa, 2012) stress the role of higher values of f0 range and of f0 peak height in contrast marking.

Considering the initial goal, a corpus of structures of contrastive parallelism was extracted from a political debate opposing the two candidates to Prime Minister of Portugal in 1975. Contrastive parallelism was defined as a grammatical structure that expresses a proposition denying or restricting the truth-value of another proposition in the same “contextual set” (Reinhart, 1982). Phonetic and phonological correlates were analyzed in 405 major and minor intonation phrases: 231 intonation phrases constituting target structures (structures of contrastive parallelism) and 174 constituting control structures (neutral declarative sentences with no marked word order). The prosodic annotation included local measures (f0 values of high and low targets of pre-nuclear and nuclear pitch accents and of boundary tones) and global measures (duration; maximum and minimum of energy; maximum, minimum, and range of f0 of each major and minor IP). Pre-nuclear and nuclear pitch accents as well as boundary tones were also annotated.

The results show the role of global and local values of f0 in the prosodic realization of contrast. Hence, range and maximum values of f0 are crucial in contrast marking, as has been shown for other languages. Additionally, higher energy values can be related with emphasis and, therefore, contribute to marking contrast. On the other hand, our data reveal the absence of a categorical relation between pitch accents and boundary tones and contrastive parallelism, which points to the gradient nature of contrast. Nevertheless, there is a tendency for contrast to be associated with (L+)H*, (L+)^H*, and ^H*+L.

On a par with these results, contrastive parallelism can also be characterized by phrasing and melodic strategies that highlight the role of syntax-prosody mapping (cf. figures below). In this regard, we verified the possibility of parallelism on a syntactic level can also be reflected on prosodic phrasing and intonation. For instance, it is worth mentioning that tonal copy and similar phrasing were found not only between consecutive intonational phrases, but, more interestingly, between constituents with the same syntactic function in the
same utterance (e.g., tonal copy affecting subjects, on the one hand, and predicates, on the other hand, of two or more parallel clauses). Furthermore, and contrarily to what has been described in previous literature, tonal copy was also identified not only in nuclear pitch accents, but also in pre-nuclear pitch accents.

In conclusion, we can say that contrastive parallelism in European Portuguese has melodic and phrasing characteristics that play an important role in the production of cohesive argumentative speech. Moreover, its prosodic features allow us to draw a comparison to what has been stated for other languages in terms of the gradient nature of contrast.

References
The origin of voicing co-occurrence restrictions: The case of Afrikaans

Many languages restrict the co-occurrence of laryngeal features in morphemes. These restrictions take many forms – examples are given in (1). Additionally, these restrictions are found across wide geographical areas and in languages that are unrelated to each other. The examples in (1) include languages from Asia, Africa, and South America, for instance.

(1) Japanese  At most one voiced obstruent per stem (Lyman’s Law)
[kaze]  ‘wind’  vs.  *[gaze]

Zulu     All plosives in a root must have the same value for [ejective] (Hansson 2001)
[k’ap]   ‘spit’  vs.  *[k’ap]

Quechua  At most one aspirated segment per root (Parker 1997)
[pʰatay]  ‘explode’  vs.  *[pʰatʰay]

Given the ubiquity of this type of restriction, an explanation for its origin needs to be found. A widely accepted explanation places the origin in perception. Laryngeal articulations are what Ohala (1993) calls “stretched out” features; features with acoustic consequences well beyond their sponsoring segments. A listener presented with a morpheme that contains acoustic evidence of laryngeality is faced with ambiguity. Since even a single laryngeal feature has a large temporal footprint, the listener cannot rely on the localness of the acoustic laryngeality to decide whether there are only one or two laryngeal features present in the word. Laryngeal restrictions such as those above may arise when listeners either assign all evidence of laryngeality to only one laryngeal feature (resulting in languages like Japanese and Quechua where a morpheme has maximally one laryngeal feature), or else assign the laryngeality to all potential sponsors (resulting in languages like Zulu where all potential sponsors for the laryngeal feature must carry that feature).

In this talk, I present evidence of another way in which laryngeal co-occurrence restrictions can arise, focusing on a new (still developing?) co-occurrence restriction in Afrikaans. I show that, in Afrikaans, a series of unrelated but phonetically well-motivated sound changes have conspired to create a lexicon that accidentally contains evidence for a laryngeal co-occurrence restriction. Afrikaans speakers are noticing this pattern in the lexicon, and are elevating it to the level of a grammatical constraint. Rather than originating in mis-assigning the acoustic laryngeality during perception, the Afrikaans restriction arises from the lexicon.

The specific laryngeal co-occurrence restriction in Afrikaans is stated in (2). The Afrikaans restriction is directional, similar to the restriction in, for instance, Ngizim (Hansson 2001). The observed and non-observed CVC-morpheme types of Afrikaans are given in (3) – all examples are singular–plural noun pairs. (Note that Afrikaans is a final devoicing language.)

(2) *TVD: In CVC forms, a voiceless obstruent cannot be followed by a voiced obstruent.

(3) a. Observed  

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<td>DVD</td>
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<td>DVT</td>
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b. Not observed  

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<td>TVD</td>
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In this talk, I will establish the truth of the claims in (2) and (3), and then trace the sound changes from Dutch to Afrikaans that resulted in creating this pattern in the Afrikaans lexicon.

Evidence for the existence of the restriction in Afrikaans. (i) Lexical corpus evidence. A corpus of over 800 CVC morphemes in Afrikaans was consulted to confirm the underrepresentation of TVD-type morphemes. The number of each of the CVC-type morphemes in the corpus is presented at end of each line in (3). The one example of a TVD type root (the verb /fud/ ‘feed’) is a very marginal word in Afrikaans, present only in formal, mostly medical, discourse.
(ii) Wug-type testing. A wug-type experiment was conducted with Afrikaans speakers, in which they were asked to rate the acceptability of singular–plural noun pairs. Statistical analyses of the results confirm that TVD-paradigms (e.g. [tat]–[tada]) were rated significantly less well than DVD-paradigms (e.g. [dat]–[dada]). The figure to the right shows the results of the rating for these two classes of paradigms on a 7-point scale. Although the difference is small, it is a statistically significant and robust difference.

(iii) Corpus of non-standard Afrikaans. The restriction against morpheme-final voiced obstruents in CVC-morphemes has developed further in some non-standard varieties of Afrikaans. Not only are TVD-morphemes absent in these varieties, but even DVD-morphemes are avoided. To confirm this, I consulted a large corpus of transcribed sociolinguistic interviews with speakers of Griekwa Afrikaans (Van Rensburg 1984). This corpus confirms that many of the DVD-words in Standard Afrikaans are being replaced by their DVT counterparts in Griekwa Afrikaans. In Griekwa Afrikaans, the restriction is hence expanding to exclude all voiced obstruents in morpheme-final position.

The origin of the Afrikaans restriction. In the second part of the talk, I show how the pattern in the Afrikaans lexicon came about. This is done by comparing all Dutch TVD-type morphemes with their Afrikaans cognates. This comparison shows that all of these Dutch morphemes have undergone some change in Afrikaans so that they are no longer of the type TVD. These changes are varied and often unrelated to each other, although they are all phonetically well-motivated sound changes. A sample of these changes is given in (4).

(4) a. Loss of voicing on some obstruents: Afrikaans has lost /z/ from its sound inventory

Dutch: /kaːz/ [kaːs] (sg.) [kaːzən] (pl.) ‘cheese’
Afrikaans: /kaːs/ [kaːs] (sg.) [kaːsə] (pl.) ‘cheese’

b. Inter-vocalic gliding of /d, t/: /VdV/ → [VjV] and /VtV/ → [VjV]

Dutch: /teːd/ [teːt] (sg.) [teːdən] (pl.) ‘time’
Afrikaans: /teːt/ [teːt] (sg.) [teːtə] (pl.) ‘time’

Through this conspiracy of unrelated, but phonetically motivated sound changes, the Afrikaans lexicon came to lack TVD-morphemes. This lexical pattern is currently in the process of being elevated to a grammatical constraint by Afrikaans speakers, possibly via a statistical learning mechanism such as those proposed by Hayes and Wilson (2008).

This paper documents a laryngeal co-occurrence restriction in Afrikaans at the moment of its birth. It also shows that there is more than one possible way for the same type of restriction to arise in different languages. It therefore cautions against overly simplistic explanations for the origin of cross-linguistically recurrent sound patterns and restrictions.

References


Metaphony between phonology and lexicon
R. D’Alessandro (Leiden) & M. van Oostendorp (Meertens Instituut)

1. Background
Pöchtrager and Kaye (ms) claim that Germanic umlaut and Romance metaphony are not phonological, but should rather be generated by a new module of grammar, a paradigm generator, which produces lexical items which are related in form (and possibly meaning).

The issue of which phonological regularities are generated by synchronic grammar and which are stored in the lexicon, being perhaps the result of a diachronic regular change, is of course almost as old as the discipline of phonology itself. In this talk we discuss the issue based on one particular metaphony pattern, viz. the one of Arielli Abruzzese. We argue that current metaphony in this dialect has to be understood in phonological terms, i.e. as a regular phonological response to putting together certain morphemes, because it interacts with an unquestionably phonological process, vowel harmony, and because it is clearly not (just) a historical residue. It can therefore not be purely lexical, nor can it be generated by an external module such as a paradigm generator. At the same time, the phonological process has interacted with lexical specification in an interesting way.

2. The dilemma
Like many other Italian dialects, Ariellese (a dialect spoken in the province of Chieti in Abruzzo, Italy), has a productive pattern of metaphony, for instance in the plural of nouns and in the 2nd singular form of finite verbs. It also has reduced final vowels to schwa, which makes the process opaque:

(1) a. matte - mitt (“madman” sg-pl); mbrellə - mbrrille (“umbrella” sg-pl); waglionə - waglionə
b. wardə - wîrde (“I-look”- ‘you-look’); sîndə - sində (“I-hear” - ‘you-hear’);
d. wrme - durmə (“I-sleep” – ‘you-sleep’)

Historically, the pattern derives from (masculine) singular - plural patterns in which the singular ending was -e or -o, and the plural was -i, and in which presumably the height feature of the plural suffix spread to the stressed vowel of the stem [AIS, Rohlfś 1966, Giammarco 1979, Maiden 1987, 1991a, b, Savoia & Maiden 1997):

(2) e> /i/ mese-mesi > mese-misi > mesə-misə (“month”-‘months’, masc)

In order to say that the process as it is in the present stage, exemplified in (1), is due to phonology, our phonological theory needs to have the following machinery: (i) floating features or elements should be able to spread towards and dock onto the stressed vowel; (ii) high vowels together should be able to form a natural class (we need something like a feature [high]). Pöchtrager and Kaye (ms.) deny the phonological status of the process because they believe that phonology does not have this power. Instead, they propose that all the forms in (1) are stored in the lexicon. Their regularity is to be accounted for by an extragrammatical device called the paradigm generator.

This analysis is reminiscent in a surprising way of Hooper-Bybee (1976)’s analysis of Granada Spanish. In this dialect, like in many other varieties of peninsular and Southern American Spanish, word-final plural -s spirantizes or disappears altogether. The difference between singular and plural is expressed instead by harmony of [RTR] across the board.
(3) Orthography | Singular | Plural | Gloss
---|---|---|---
pedazo | [peˈðaθo] | [peˈðaθo] | ‘piece’
alto | [alte] | [alte] | ‘tall’
cabeza | [kaβeθa] | [kaβeθa] | ‘head’
selva | [selva] | [selva] | ‘forest’

Also for Natural Generative Phonology, this property cannot be phonological, because phonology does not have the power expressed in (i). It therefore proposes that all singular and plural forms have to be stored in the lexicon; their regularity has to be expressed by an independent device (called lexical redundancy rules in NGP).

We object, however, that handing over the power of (i) to an external mechanism, whether we call it lexical redundancy or paradigm generator, does not make the overall linguistic model more powerful. We are thus faced with a dilemma: either assign power to an extra module outside of phonology proper, or extend the explanatory power of phonology proper.

3. Analysis

We argue that for the Arienlrese case only the second path is tenable. The reasons are twofold: first, this phenomenon interacts with a process that is undeniably phonological, viz. vowel harmony (Maiden 1988). For certain roots, the [high] feature does not just spread to the stressed vowel, but to the whole word (4). Crucially, these words are new formations (i.e. metaphony could not have applied when endings were still present, around the XII-XIIIc):

(4) Təlɛvəsjoʊə vs tɪlɪvɪsjoʊə (‘TV set’ sg-pl); telefəʊə - tɪlɪfəʊə (‘phone’ sg-pl)

Second, this process has generalized for plural formation of words that historically did not undergo metaphony:

(5) a. neru-neri-nera-nere (‘black’ ms-mpl-fsp-ffpl)> neru-niri-nera-nere> nero-nire-nera-nere

has extended to b. nero-nire-nera-nire (ms-mpl-fsp-ffpl) [Giammarco 1973:40-45]

The fact that the lexicon is still partially the locus of metaphony is illustrated by the difference between (5), where metaphony has extended to the feminine plural form, and (6), where feminine plural has retained its original non-metaphonic form:

(6) surellə-surellə (‘sister’ sg-pl) but not *surillə [see fratellə-fratillə] (‘brother’ sg-pl)

It appears that the lexical category ‘adjective’ is thus more prone to productive metaphonic processes than ‘nouns’. In this sense, the lexicon (or possibly the Morphology) is also involved in deciding when metaphony applies, but certainly not as a storage of frozen word paradigms.

Selected references

Revisiting Georgian Obstruent Clusters
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Introduction
Georgian, a South Caucasian language, is notable for its extensive consonant clusters (Aronson, 1990). This work, building on Ritter’s (2006) account of Georgian consonant clusters in the Government Phonology (GP) framework (Kaye et al, 1990), will further explore the nature of government/licensing relations to account for the complex distribution of attested consonant sequences. While ‘(almost) anything goes’ type of a description seems not very far-fetched for two-consonant clusters, the clusters with three members exhibit interesting distributional restrictions that might as well help us understand the universal characteristics of government/licensing relations.

Problem
The GP framework effectively restricts the available constituent structures in the grammar. Binarity Theorem which maximally allows binary branching for each Onset and Rhyme makes it impossible to posit a representation for the word $ptxili$ ‘careful’ where all three members of the initial cluster sits under the same Onset. Empty Category Principle (ECP), on the other hand, requires phonetically empty nuclei between Onsets be licensed by means of the subsequent non-empty nucleus or the inter-onset government. If inter-onset government were not available, the theory would predict *$p[V]t x ili$. Therefore, these constraints of the GP force us to look for phonological evidence for proposing inter-onset government in the clusters with minimally three members.

Drawing mainly from the data in Butskhrikidze (2002), Ritter (2006) does exactly what GP calls for and develops an analysis of Georgian clusters that employs two types of inter-onset relations. One type is the inter-onset government that holds from a labial/coronal obstruent to a dorsal obstruent. In GP terms: An onset which has U or A element governs the subsequent onset with no melody/element provided that in-between nucleus is empty. The long-noted distinctive properties (e.g. laryngeal sharing) of harmonic clusters (Chitoran, 1998) in Georgian make it convincing to entertain the possibility of inter-onset government for all attested cases of $C1_{labial/coronal}C2_{dorsal}$ clusters.

The second type of inter-onset relation Ritter (2006) proposes is licensing, which supposedly explains the ‘dissimilation effects’ in the CCC clusters. (e.g. A licenses non-A.)
However, not all CCC clusters that Ritter’s government + licensing account would predict are attested in Georgian. Moreover, there is a CCC cluster that is not predicted but does occur.

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<th>C1</th>
<th>C2</th>
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<th>C1</th>
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<tr>
<td>U</td>
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<td>0 K</td>
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<td>[A-]</td>
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<td>A</td>
<td>*</td>
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<td>[U-]</td>
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*predicted & attested*  
*predicted & unattested*  
*not predicted but attested*

From the charts above, it is quite clear that the *attested* CCC obstruent cluster types are those where the harmonic cluster is a \(C_{\text{coronal}}+C_{\text{dorsal}}\). Although Ritter’s account points to this observation, it does not attempt to give a principled explanation for why A can license U while U cannot license A.

**Proposal**

Adopting the proposal in GP 2.0 (Kaye & Pöchtrager, 2009), I will assume that the extraordinary governing/licensing property of the element A to be understood as a manifestation of its true nature, which is not being an element. Pöchtrager (2006, 2010) replaced A with an adjunction structure (i.e. extra space; bigger structure). Briefly, this work will assume these two possibilities for government/licensing:

a) Structural Dominance [bigger structure governs smaller structure]  
b) Melodic Dominance [iff structures are equal, melody governs no melody]

If we understand government/licensing phenomena in the structural (and melodic) dominance sense, we can also explain the fact that only A-headed harmonic clusters can license another adjacent consonant and form a CCC cluster. As the inter-onset licensing relation proposed in Ritter (2006) over-generates and predicts many unattested forms, instead, I will propose an ‘A-governs-non-A’ type of a leftward licensing relation employed for coda-onset clusters and argue that it is responsible for the majority of the CCC obstruent clusters attested in Georgian.

**References**

Hidden boundaries in Turkish words: evidence from vowel raising in Uighur and Turkish

Ann Denwood

In an agglutinative language like Turkish or Uighur, we expect to find many words made up of a stem plus one or more suffixes. Where the “join” occurs is not necessarily obvious as many boundaries blur over time. Some remain visible, such as those which produce a sequence of consonants, e.g. Turkish gençiler “young person (plural)” where ç followed by l would not usually occur in a morphologically simplex word. Other joins, especially those involving a stem-final or suffix-initial vowel, can be harder to identify. In this paper it is proposed that a forgotten parsing cue may remain in certain modern Turkish compounds.

Turkish and Uighur have several devices which signal some kind of boundary. For example, vowel harmony binds many suffixes to the preceding stem, and stress is typically word-final. Disharmony and non-final stress are often signals for internal morphology, e.g. Turkish ka’ra “black” plus yel “wind” is ka’rayel “north west wind”.

Uighur has another device which signals word-building: the last low vowel of a word is raised before a following suffix, provided that no more than one consonant separates the last vowel of the stem from the first vowel of the suffix.

(1) bala “child” + lar (pl.) balilar kime “ship” + ler (pl.) kimiler
    + si (poss.) balisi + si (poss.) kimisi
tamaq “food” + lar (pl.) tamaqlar bilek “arm” + ler (pl.) bilekler
    + i (poss.) tamiği + i (poss.) biliki

Vowel raising takes place every time a further suffix is added (2a), if the conditions are met, producing a cyclic effect. It also happens when compounds are formed (2b).

(2) a. alma “apple” almi-lar (pl.) almi-lir-i (poss.) almi-lir-i-da (loc.)
    almi-lir-i-di-qi “(the thing) that is in his apples”
    b. ana “mother”, bala “child” anibala “mother and child”
    başqa “different” başqibaşqa “completely different”

The alternation can be used as evidence to show whether a word-internal vowel belongs to the stem or to the following suffix. Suffixes with vowel-initial -a, e.g. the gerundive suffix, do not trigger the alternation. An example is shown in (3a). This fact prompts the hypothesis that certain suffixes, e.g. the present habitual “-idu”, are actually formed by adding -du to the gerundive verb stem ending in -a, and that the addition triggers raising of the final vowel, shown in (3b). In other words, -i is in fact an underlying -a belonging to the preceding stem and not to the following suffix. This explains why in this case a suffix apparently beginning with -i does not affect the preceding vowel. In (3c), the adverbial -ip is added to the same verb root, qal “stay”, triggering the predicted alternation.

(3) a. qal + a qala “stay (gerundive)” *qila
    b. qal + a + du qalidualu “stay (present habitual 3. sing.)” *qilidu
    c. qal + ip qilip “stay (adverbial)”
Nadzhip (1971) and Hahn (1991) confirm the formation of compounds with the gerundive stem, but do not discuss in detail all the phonological changes involved.

Extending the hypothesis to Turkish, it is proposed that a similar phenomenon can demonstrate where a verb stem ends and the following suffix begins: specifically, looking at the present continuous -i/u/iü/yor and potential -abil-ebil. There is no doubt that these suffixes were formed historically as compounds. Disharmony and non-final primary stress remain as evidence for this. In (4) the suffixes follow verb roots gel “come” and kal “stay”.

(4) ge'liyor-um “I am coming” ge'lebil-irim “I can come”
    ka'liyor-um “I am staying” ka'labil-irim “I can stay”

Kumbaracı (1966) discusses vowel raising in the context of the consonant y. I suggest that stress and disharmony show where the first part of the compound, i.e. root plus suffix -a/e, actually ends. In the case of the present continuous, the initial consonant of the following auxiliary -yor triggers A-loss in the preceding vowel, the gerundive form of the verb.

Vowel-raising in Uighur produces cyclic effects, providing evidence for analytic morphology, according to the Kaye (1995) definition of cyclicity. Although there are many historical examples of raising in Turkish, it is not a regular synchronic phenomenon, as it is in Uighur. This means that it is not visible to modern Turkish phonology as a signal for the end of a morphological domain, although vowel harmony and stress may still clearly mark the joining places. The question is: can some phonological cues tell us that a word is morphologically complex, even though the combination may be synchronically a single non-analytic phonological domain? The continual introduction of borrowed words over time, which often do not conform to typical Turkic patterns, e.g. harmony and stress, has made these unreliable as evidence for present day morpho-phonological complexity. The domains of harmony and stress often conflict. We may never be sure if a complex word is combined analytically or not. On the other hand, evidence such as vowel-raising in Turkish and Uighur may help us to understand what the original components of a word were.


Segment Length and Stress in Livonian
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0. Livonian, a Fennic language which was spoken in Latvia, is known to show a regular consonant gradation between the first (always stressed) and the second syllables (1). Strong grade is defined by the presence of more consonantal material after the stressed vowel (ex: su'ggɔ), and weak grade is defined by less consonantal material (ex: suguud). The strong grade involves two phonetic phenomena: overlength and « stod » (a falling tone + glottalization, noted here by «?») (see 1).

(1) Strong grade forms appear in grey cells: the stressed vowel is underlined

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<th>a.</th>
<th>Names</th>
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<th>Verbs</th>
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<td>relative</td>
<td>fish</td>
<td>to swear</td>
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<tr>
<td>NomPl</td>
<td>suguu-d</td>
<td>kaalaa-d</td>
<td>1/3SgPres</td>
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<tr>
<td>PartSg</td>
<td>su'ggɔ</td>
<td>kallɔ</td>
<td>Infinitive</td>
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These data are at first sight problematic since: (i) strong grade is manifested either by stod or by overlength, and (ii) most phonological frameworks suppose a two-way length contrast, only. My aim in this paper is to argue that stod and overlength in strong grade forms are in complementary distribution and result from a unique non-phonemic phenomenon: stress (contra Wibk, 1989 and Kiparsky, 2006).

The data discussed in this paper are taken from Kettunen’s dictionary (1938). Their analysis joins the CVCV framework (introduced in Lowenstamm, 1996), which assumes (following Larsen, 1998) phonological length and stress to be both represented as a [CV] unit.

1. There are three main kinds of grade alternation in Livonian. (2a) involves stod and (2b-c) involve overlength. I show that stod and overlength are in complementary distribution (this occasionally implies that overlength is not an underlying feature):

- Stod is found only in strong grade forms, the weak grade forms of which show a single consonant between the first and the second syllables (2a).
- Overlength is found only in strong grade forms, the weak grade forms of which show a short geminate or a cluster between the first and the second syllables (2c).

The only exception concerns some single sonorants alternating with long geminates in strong grade (2b). I argue that these single sonorants are underlying geminates patterning as in (2c) (e.g. [p voxel]: [pallap]: (i) they are etymologically coda consonants (finnish: palvon); (ii) Livonian doesn’t have any phonetically short sonorant geminates (except preceded by stod); and (iii) they are, as coda sonorants, always preceded by a branching nucleus.

(2) Weak grade | Strong grade | Exemples | concerned consonants |
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<tr>
<td>b. C</td>
<td>C:C</td>
<td>pœlalə [to pray] : palə [to pray]</td>
<td>sonorants</td>
</tr>
<tr>
<td>c. CC</td>
<td>C:C</td>
<td>tappœlə [to kill] : tappœ [to kill]</td>
<td>obstruants, sonorants</td>
</tr>
</tbody>
</table>
2. The systematic lengthening of a consonant in strong grade forms (see 2) leads me to the assumption that the strong grade (i.e. overlength or stød) is defined by an additional [CV] space. Moreover, since stød and overlength are found only after stressed syllables, I suppose that this additional [CV] is inserted by stress (following a proposal by Larsen (1994) for Danish).

3. The presence of this stress' [CV] is confirmed in weak grade forms by an isochrony phenomenon noted by Viitso (2007): in Livonian, either both the first and the second nuclei are not branching, and we have a strong grade form (3a), or one of the nuclei is branching, and we have a weak grade form (3b-c). This means that the overall length of the word template remains stable, and it includes the [CV] site mentioned above.

![Table]

<table>
<thead>
<tr>
<th></th>
<th>Strong grade</th>
<th>Weak grade</th>
<th>Weak grade</th>
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<tbody>
<tr>
<td></td>
<td>V V</td>
<td>V V</td>
<td>V V</td>
</tr>
</tbody>
</table>

ex: lu’ggā infinitive “to read”

ex: puugā infinitive “to blow”

ex: kalaa NomSg “fish”

Since this [CV] site is a constant and is not lexically linked to a segment which is not associated to another [CV] site, it follows that it is a prosodic or/and a morphological unit.

4. In conclusion, overlength and stød are two allophones of the [CV] site characteristic of the strong grade. I assume that this [CV] is a word stress. According to this analysis, the consonant gradation result from a templatific condition on the realization of stress: this one is determined by the length of the vocalic segments.

It contrasts with the traditional metrical analysis (assumed in Wiik, 1989; Kiparsky, 2006 and Viitso, 2007) in which unstressed vowels are shortened after the formation of the strong grade.

Selected References:
Why Icelandic and Faroese tonic lengthening is not a lengthening

The purpose of this paper is to provide an alternative representational analysis of Icelandic and Faroese tonic lengthening. The framework developed for this purpose combines the insights of two representational theories of phonology: Strict CV (Scheer 2004, 2012) and CSL (Cyran 2010).

Scheer’s (2004) explanation of tonic lengthening is based upon the idea that stress provides an additional empty CV slot, into which the melody from the preceding nucleus can spread, on condition that the former is licensed. It will be argued that this proposal has several drawbacks; hence an alternative account is necessary. Two major modifications will be introduced. First, lengthened vowels will no longer be viewed as bipositional. Second, the status of various consonant clusters following the nucleus will be reviewed, and the mechanisms known from Strict CV (Infrasegmental Government and Proper Government) will be replaced by Rightward and Leftward Interonset Government.

Abandoning the bipositional analysis of lengthened vowels stems from both empirical and theory-internal facts. For instance, cross-linguistically stress produces very different effects on nuclei, which often do not have anything to do with length, but with pitch, loudness etc. The question which arises is why stress should modify the skeletal representation in some languages, but not in others. Saying that length is a language-specific phonetic implementation of stress is a way out, since it gives lengthening an equal status as e.g. pitch changes in languages with musical accent.

A problem of a purely theory-internal nature stems from that it is not clear what happens to the empty CV in closed syllables, i.e. when the melody from the preceding nucleus fails to colonize it. If it stays in the representation, it calls for government (according to the ECP), but there is no nucleus to govern it, since the following nucleus is governed itself. If it is removed from the representation, the process of ‘removing’ should somehow be formalised and justified. Such a move, however, would be of a dubious nature since it would diminish the restrictiveness of the theory (it should not be possible to remove CV slots from the representation whenever one finds it convenient).

Also, a monopositional analysis solves several representational difficulties. In systems of tonic lengthening alternations are not always purely quantitative. In Faroese short vowels alternate with both long vowels and diphthongs, e.g. [e] alternates with both [e:] and [ei:], [o] with [o:] and [ɔː], [a] with [ea:]. It is difficult to derive the [ea:] diphthong from an [a] vowel by means of sheer element spreading, especially when one assumes that the latter consists of a sole {A} element.

The motivation for disposing of IG and PG is the clash between the lengthening and vowel-zero alternations. Sometimes the job of licensing the CV provided by stress is done by a vowel alternating with zero. When it is vocalized, it can licence the additional CV, but when it is governed, it cannot and the stressed vowel emerges short. This is evidenced by such pairs of forms as Icelandic hamar [ha:mar] ‘hammer, nom.sg.’ and hamri [hamri] ‘hammer, dat.sg.’, the behaviour of which Scheer’s account correctly predicts. However, there are also examples like vetur [ve:tyr] ‘winter, nom. sg.’~ vetri [ve:tri] ‘winter, dat. sg.’ or akur [a:kyr] ‘field, nom. sg.’ ~ akrí [a:krí] ‘field, dat.sg.’ The “branching onsets” present in these two words cannot be seen as domains of Infrasegmental Government, since they host an alternation site. Hence, they are bogus clusters and as such they should block lengthening.

The above mentioned examples clearly show the surface-based nature of lengthening in Icelandic, which takes place before surface ptk+s+jv clusters (and ptk+l in Faroese), rather
than any underlyingly specified domains of Infrasegmental Government. This is a challenge for all GP-based theories, since any rule ordering is out of the question.

The present account proposes reinterpreting the vowel-zero alternations as not dependent on PG, but on Interonset Government which is contracted by flanking consonants. There are two types of Interonset Government: Rightward and Leftward (in the spirit of Cyran 2010), which (unlike in Cyran 2010) can be established across a floating vowel. Also, LIO will no longer be so much constrained with respect to the melodic structure of participating consonants; nevertheless, it does not mean that every pair of consonants may contract this kind of relation. Length is only a phonetic effect caused by the combination of two factors: stress and licensing. Scheer & Žiková (2010) in the new formulation of the Coda Mirror point out that vowels in open syllables are licensed, which is responsible for the bigger range of contrasts found in open syllables. It will be argued that this suffices to account for lengthening, with no need to postulate any additional CV slot. Underlyingly, nuclei are equipped with a full elemental structure, which gets fully phonetically implemented only when the nucleus is stressed and licensed. Otherwise, it is only partially interpreted. This accounts for both quantitative and qualitative alternations.

This mechanism is combined with Cyran’s principle of Onset Licensing: every nucleus licences the preceding onset and the preceding nucleus. Proper Government is done away with, with clusters arising as an effect of RIO (Rightward Interonset Government) and LIO (Leftward Interonset Government), with the proviso that RIO silences the nucleus, but does not deprive it of its licensing abilities, whereas LIO silences it and disallows it to license the preceding nucleus. The existence of the floating vowel between the consonants is not a problem for any kind of government: vetri (hosting a vowel ~ zero alternation) patterns with non-alternating betri, and hamri with senda. In forms vetur and hamar the vowel is pronounced, since the domain-final empty nucleus is not strong enough to government-license any consonant to contract Interonset Government across a floating vowel.

The discrepancy between the effects of RIO and LIO on the intervening nucleus is responsible for open syllable vs. closed syllable effects. Unlike in Scheerian Strict CV, it is irrelevant whether this nucleus is a floating vowel or is truly empty. This appears to neatly correspond to the Icelandic data.

![Diagram of vowel-zero alternations](image-url)
Tonal representations in Wanga verbs

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Michael R. Marlo  
University of Missouri

Most Bantu languages have one of two types of verbal tonal systems: (i) ‘conservative’ or (ii) ‘predictable’ (Marlo 2012, Odden 1989). Conservative (or ‘etymological’) tone systems contrast two tonal types of verb roots, /H/ vs. /L/ or /H/ vs. /Ø/ (toneless). Predictable languages have eliminated the lexical tone contrast in verb roots, so all roots are underlyingly toneless. A second feature of ‘predictable’ tone systems is that all verbal forms are inflected with a grammatical tone. In ‘conservative’ systems, by contrast, some verbal contexts are not inflected with grammatical tones.

These differences can be seen by comparing the forms in (1) from Tiriki and Tura, two Kenyan varieties of the Luyia macrolanguage. Tiriki has a contrast between /H/ and /Ø/ verbs, and the Near Future tense is not inflected with grammatical tone. Thus, /H/ verbs have a H on the stem-initial vowel (stem boundaries are indicated with brackets), and /Ø/ verbs surface toneless ([L]). Tura forms, however, are inflected with a grammatical H, which surfaces from the second syllable of the stem to the stem-final syllable. Tura has a single toneless class of verb roots, so there is no contrast between roots whose cognates in Tiriki belong to two different tonal classes.

(1)  

<table>
<thead>
<tr>
<th></th>
<th>Conservative [Tiriki]</th>
<th>Predictable [Tura]</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>H</em> verbs</td>
<td>a-la[vúkul-a] 3SG-FUT[take-FV]</td>
<td>a-lá[ụkúl-á] ‘he will take’</td>
</tr>
<tr>
<td><em>Ø</em> verbs</td>
<td>a-la[pulux-a] 3SG-FUT[fly-FV]</td>
<td>a-lá[ụrúx-á] ‘he will fly’</td>
</tr>
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</table>

The focus of this talk is the Wanga dialect of Luyia, which exhibits a third type of tonal system, labeled ‘reversive’, which is relatively rare across Bantu (van Spaandonck 1971, Hyman 2001, Marlo 2012). Like languages with predictable systems, all Wanga verbal forms are inflected with a tonal suffix, known as a ‘melodic H’, whose effects on neighboring tones make the determination of the underlying tonal values of morphemes an analytical challenge. Like conservative languages, ‘reversive’ systems maintain a contrast between two tonal classes of verbs. However, the basis for the ‘reversive’ label is that Wanga has reversed the historical *H* vs. *Ø* tonal contrast such that *H* roots are synchronically /L/-toned and *Ø* roots remain /Ø/.

The main aim of this presentation is to elucidate several complexities of the tonal representations of verbal morphemes in Wanga which support the /L/ vs. /Ø/ analysis of verb roots, and an analysis of Wanga as having an underlying three-way /H/ vs. /L/ vs. /Ø/ contrast. The /L/ vs. /Ø/ contrast in roots is observed somewhat transparently in some verb tenses on the stem-initial syllable, which is the site of underlying tonal contrasts in verb roots in Bantu languages. As shown in (2), /L/ verbs surface entirely [L] in the Hodiernal Perfective tense, while /Ø/ verbs surface with a melodic H on the first two moras of the stem. We analyze these forms as having a rule of Melodic H Assignment (MHA) which assigns the melodic H to the stem-initial mora. In /Ø/ verbs, the stem-initial mora is free, so MHA is successful, and the melodic H subsequently undergoes a rule that spreads the melodic H by one mora to the right (Doubling). The melodic H fails to be realized in /L/ verbs because MHA requires the target to be free, but this position is occupied by a L tone in /L/ verbs, so the rule fails to apply.
Similarly, as shown in (3), the stem-initial position of /L/ verbs is [L] in the Present tense, while in /Ø/ verbs, this position has a [H] contributed by the melodic H. In /L/ verbs, the melodic H is realized on the first mora of the second stem syllable (as well as the two following moras). We analyze this tense as having a rule that assigns the melodic H to the left-most free mora, from which it undergoes subsequent rules of Doubling and Decontouring.

(3) \[ \text{L verbs} \quad a[\text{Bukul-\text{a}ng-a}] \quad \text{‘he is taking’} \quad [\text{Wanga}] \\
\text{Ø verbs} \quad a[\text{Purux-aang-a}] \quad \text{‘he is flying’} \quad [\text{Wanga}] \]

The transparency of /L/ is obscured in other tenses by the interaction of the root tones with other lexical tones. For example, object markers and some tense prefixes are associated with /H/s, which regularly shift to the following mora, thereby masking the underlying properties of the verb and the prefix. In some instances, the /H/s of prefixes are also deleted before the melodic H, thus adding to the complexity of tonal realization in some tenses. Such complexity is seen in the Near Future Tense, as in (4), where the two tonal types of verbs remains distinct, but there are significant surface differences in the two classes of verbs: in /L/ verbs, the tense prefix la- surfaces [L], and two Hs are realized on the stem, one on the stem-initial syllable, and one on subsequent syllables; in /Ø/ verbs, a single H appears from the tense prefix lá- to the stem-final vowel. We attribute the stem-initial H in /L/ verbs to the preceding tense prefix /lá/ and propose that the H of this prefix is deleted in /Ø/ verbs. Surface patterns result from the assignment of the melodic H to the stem-final position and the leftward spread of the melodic H across toneless moras in both classes of verbs.

(4) \[ \text{L verbs} \quad a-la[\text{Bukul-\text{kul-á}] \quad \text{‘he will take’} \quad [\text{Wanga}] \\
\text{Ø verbs} \quad a-lá[púru há] \quad \text{‘he will fly’} \quad [\text{Wanga}] \]

As the examples in (2) – (4) demonstrate, establishing the underlying tonal values of verbs requires consideration of data from across the tense system of Wanga and determining the behavior of the melodic H suffixes. The main pieces of evidence for /L/ in Wanga are the fact that this tone (i) blocks the association of the melodic H in several tenses (as in (2)), (ii) “pushes” the melodic H to the second syllable (as in (3)), and (iii) blocks the leftward spread of the melodic H in yet other verbal forms (as in tenses such as the Near Future in (4)).

**References**


In the literature the prosodic properties of contrastive focus, discourse new and given constituents have been investigated extensively and the analyses are divided into two lines in that focus is analyzed to have an effect either on phonetic prominence (Fery and Ishihara 2009, Selkirk and Katz 2011, Ishihara 2011) or on phonological phrasing (Truckenbrodt 1995, Frascarelli 1997). In this study, we will show that in Turkish, contrastive focus constituents are not marked as phonetically more prominent than discourse new constituents but the prosodic properties of structures with contrastive focus constituents are in line with rephrasing analysis.

This experimental study explores how information structure is mapped onto prosody of Turkish comparing structures within sets of minimal contexts (1-2). The target structures are embedded in dialogues and elicited from 6 native speakers of Turkish. discourse new constituents are elicited as answers to wh- questions while contrastive focus constituents are elicited as answers to alternative disjunctive questions or through corrective statements both of which assert the truth-value of one of the members in the set.

(1) Target structures
a. given-discourse new-given
b. given-contrastive focus-given
c. contrastive focus-given-given

(2) Control structures
a. discourse new-discourse new-discourse new
b. given-given-given

In order to compare discourse new and contrastive focus in medial position the peak value of the pitch accents and the minimum pitch value of the following and preceding syllables were measured to find out pitch excursion. With the aim of determining whether discourse new and contrastive focus constituent in medial position has a prosodic effect on the pre-nuclear domain, the peak value of the H- boundary tone is chosen as target measurement point. Finally, in the final post nuclear domain the minimum pitch value of the initial syllable of the verb is measured to find out post-focal deaccentuation pattern. We have found out that when surrounded by given constituents in medial position (i) in terms of the pitch height of the accented syllable, discourse new constituents have higher pitch value than contrastive focus constituents, (ii) in terms of pitch excursion, the rise ratio before the accented syllable is higher with discourse new constituents but the fall ratio following the accented syllable is larger with contrastive focus constituent, (iii) in the initial domain the peak value of the accented syllable of the given constituent and the pre-nuclear H- boundary tone is higher when followed by discourse new constituents in the medial domain and finally (iv) the pitch value at the beginning of the verb in the final domain is lower when followed by contrastive focus constituents.

These findings indicate that contrastive focus has compression effect not only in the post-focal domain but also in the initial domain. When contrastive focus constituent is in utterance initial position followed by given constituents (1c), the measurement points are the peak of the accented syllable and the minimum pitch value of the preceding and following syllables. In medial position the same points are measured namely the height of the accented syllable and the minimum pitch values of the preceding and

Figure 1: pitch track of a given-contrastive focus-given sentence, speaker OG

These findings indicate that contrastive focus has compression effect not only in the post-focal domain but also in the initial domain.
following syllables and in the final VP domain the minimum pitch value of the first syllable of the verb is measured. We have found out that when contrastive focus is in initial position, the initial domain shows the prosodic properties of nuclear domain suggested by Kamali (2011) in that (i) H-boundary tone at the right edge of the initial domain which appears in all pre-nuclear domains does not surface, (ii) when contrastive focus constituent is lexically accented the fall starts earlier as in figure 2 and when it is finally stressed word the fall starts with the beginning of the new domain.

Figure 2: pitch track of a contrastive focus-given-given sentence, speaker ET

Finally, one of the control structures of given-given-given context (2a) induced focus on the predicate and the domains preceding the verb show the prosodic properties of pre-nuclear domain and surface with H- boundary tone at the right edge as illustrated in figure 3 below.

Figure 3: pitch track of a sentence in given-given-given context with predicate focus, speaker Nİ.

To conclude we suggest that when contrastive focus is in medial position, phonetically it is not more prominent than discourse new information but yields compression in the initial and final domains, but when contrastive focus is in initial or final position rephrasing applies and contrastive focus forms the nuclear domain irrespective of its position in the sentence.

References

Segmental anchoring and coping with vowel loss
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Recent research on intonation has seen an increasing interest in intonational variation (e.g., Auer, Gilles, Peters & Selting 2000, Grabe & Post 2002, Kaminskaïa 2010). Inter-dialectal differences on tonal target alignment have given rise to a debate on whether segmental anchoring includes a phonologically specified secondary association of the tonal targets with the edges of syllables/segments (Ladd, Mennen & Schepman 2000, Prieto & Torreira 2007), or the precise alignment pattern is specified at the phonetic level by dialect/language-specific phonetic implementation rules (Ladd 2006, 2008:176, Schepman et al. 2006, Arvaniti & Garding 2007, Ladd et al. 2009). The present study aims at shedding some light on this issue by investigating the alignment of the L*+H prenuclear pitch accent in the intonation system of a Northern Greek (NG) dialect.

In Standard Modern Greek (SMG) L*+H pitch accents, the L tone appears near the onset of the stressed syllable consonant, and the H is consistently aligned just after the onset of the first post-accentual vowel (Arvaniti et al. 1998). Assuming a similar co-ordination of the L*+H with the segmental string in NG, the exploration of these pitch accents in NG becomes particularly interesting: the process of unstressed high-vowel deletion in NG (e.g. /ma'loni/ → [ma'lon] “scold”; see Kontosopoulos 2000, Topintzi & Baltazani in print) can delete the first post-accentual vowel, i.e., the anchor point for the H tone, providing a test bed for observing the anchoring behaviour of the H in adverse segmental environments.

Thirty minutes of semi-spontaneous speech from three NG female speakers (65-75 years old) were analyzed. Speakers were shown pictures on a computer screen and were prompted with questions containing words with penultimate stress ending in a high vowel in environments (Arvaniti et al. 1998).

Overall, a rather clear picture emerges with respect to (a) the typical realization of L*+H in NG and (b) the difference between L*+H and L*+H with deletion of the first post-accentual vowel (L*+Hdel). Specifically, NG L*+H was found to have similar alignment to that in SMG; its tonal targets align within the same segments as in SMG but somewhat later (mean distance of L to onset of stressed consonant: 18ms in NG vs. 5ms in SMG; mean distance of H to onset of post-accentual vowel: 18ms, or else at the 28% of the post-accentual vowel in NG vs. 10ms for SMG, see Atterer & Ladd 2004, Arvaniti & Garding 2007).

Focusing on the L*+Hdel productions, the L aligns on average 21ms into the stressed syllable consonant and the H much earlier than the L*+H, specifically within the accented vowel (mean: 98ms from the vowel’s onset, or else at the 77% of its duration). This difference in the alignment of the H in L*+Hdel when compared to its alignment in L*+H correlated for several vowels with an increase in the duration of the stressed vowel and of the post-accentual consonant (all stressed vowels from L*+H mean: 88ms and L*+Hdel mean: 98ms, post accentual consonant L*+H: 45ms and L*+Hdel: 64ms).

The interaction that has been unveiled between the segmental and the intonational component of the NG dialect offers new and exciting insights into the connection of these two components cross-linguistically. This interaction leads to a number of hypotheses regarding the association of the pitch accent to specific phonological landmarks in the segmental level, which we will address in this paper. Primarily, we discuss a tentative interpretation of the data as the reflex of compensatory lengthening (cf. Kavitskaya 2002) - note that NG does not have a vowel length distinction. If the docking site of the H tone is a mora following the stressed syllable (cf. Ishihara 2003), deletion of the post-accentual vowel in the NG phonology presumably links its unassociated mora to the immediately preceding...
vowel which becomes bimoraic, i.e., lengthened. An observable effect of this mora reassociation is the different alignment pattern of the H tone in the L*+Hdel pitch accent, compared to that in L*+H, which in the former pitch accent consistently aligned past the midpoint of the stressed vowel.

Overall, our results showed a clear effect of segmental phonological structure on the alignment of the pitch accent, providing further evidence in favour of the existence of segmental anchoring seen from a completely different perspective (i.e., deletion of the docking segment). Given that the present results could be interpreted either as phonologically defined segmental anchoring, or as the reflex of segmental changes, we will discuss ways to address this distinction experimentally, as well as possible phonological and phonetic interpretations of the data.

References
Topintzi, N. & Baltazani, M. (in print). The acoustics of high-vowel loss in a Northern Greek dialect and typological implications. In Clusters and structural complexity, Phil Hoole et al. (eds.), Interface Explorations series, Mouton de Gruyter.
Accentless Words and Recursive Phrasing: A case study in Turkish

Beste Kamali
ZAS

Turkish has been argued to be a pitch accent language (Levi 2005), but this has not been incorporated into the few existing intonational analyses (Özge and Bozşahin 2010, Kan 2009). I present an analysis of the phrasing with the pitch accent typology in mind. First I show how true accentlessness is observed in the intonation of regularly (=finally) stressed words in Turkish. Then I propose an analysis whereby main prominence lies in a conspiracy between recursive phrases and rightward tone spreading.

Turkish has two accent classes: regular (final) and lexical (non-final). Regularly stressed roots transfer stress under suffixation whereas lexically accented roots have fixed accent placement regardless of suffixation. Such ‘culminativity’, is a common characteristic of pitch accent languages (Levi 2005).

(1) a. kitap-lk-lr-muz-dá regular stress/accent kitáp ‘book’
   book-der-pl-poss1pl-loc
   ‘on our bookshelves’
b. pást-a-cl-lr-muz-da lexical accent pústa ‘cake’
   cake-der-pl-poss1sg-loc
   ‘among our cake chefs’

This and other evidence leads Levi (2005) to conclude that Turkish is a pitch accent language like Japanese and varieties of Basque. Specifically, Levi’s measurements lead to the conclusion that fundamental frequency is the sole determiner of pitch accent in Turkish, not duration or intensity. First I show that just like Lekeitio Basque (Jun and Elordieta 1997) Turkish exhibits true accentlessness in its intonation.

The first relevant observation is that a uniform H- marks all prenuclear phrases in Turkish, irrespective of accent status (intonational data from Kamali 2011). In Figure 1, left panel, both preverbal words are prenuclear (as is the case with most negative sentences). These phrases are comprised of a regularly stressed word (initial), and a lexically accented word (middle). Since a H- tone is present in both cases, it must be independent from accent and this precludes the possibility of a H* at the right edge of the regularly stressed word. Thus, in the prenuclear position, true accentlessness is observed in Turkish.

![Figure 1: Left: Sentence in falsum focus. Right: Sentence in wide focus.](image-url)
As nuclear items, too, regularly stressed words appear amenable to a description as accentless. The middle word in Figure 1, right panel, is nuclear this time, and fails to show a significant pitch bump corresponding to the stressed final syllable, replicating Levi’s (2005) and Kan’s (2009) observations. This fairly general picture points in the same direction: namely that regularly stressed words are in fact accentless.

However insignificant this final syllable is pitch-wise, it is where the sentence accent is felt to be. This arises from the placement of the final fall, which in such wide focus sentences fall on the transition from the preverbal item to the verb. Without accent, one way to make this juncture tonally significant is to assume a boundary. However, to keep the prenuclear and nuclear boundaries distinct (one requires a H- and the other expressly rejects a H tone), the nuclear phrase is proposed to be recursively embedded inside another PhP including the verb. The H-tone is triggered by a following left bracket, which is not found after a nuclear element due to this recursion (à la Truckenbrodt 1999).

\[
\begin{align*}
(p) & \quad \left( L_-(\text{Bunalanlar})_{H-} \right) \\
& \quad \left( L_-(\text{limonluya}) \text{ yönendlirmeli} \right)
\end{align*}
\]

Notice that the verb in Figure 1, right panel, is placed on a lower reference line than the nuclear and prenuclear phrases. This is a crucial component of the nuclear stress configuration and requires explanation. In the proposed phrase-based analysis, the lower reference line of the verb comes for free. Assuming all phrases start with a L-, the verb onset must then start lower than the previous level of the nuclear plateau, yielding the terracing pattern found in Figure 1, right panel. Finally, rightward tone spreading ensures retained heights we observe throughout with the predicted exception of lexically accented words. The proposed bracketing in the nuclear domain as opposed to the phrased out prenuclear phrases mirrors the syntactic structure.

In conclusion, Turkish exhibits true accentlessness in its sentence intonation. This is the case in both prenuclear and nuclear occurrences, rendering ‘final stress’ in Turkish most likely a perceptual default. More crosslinguistic support is lent to recursive bracketing in phonological phrasing, in the spirit of (Truckenbrodt 1999, Féry 2010 among others). If correct, a syllable that is not a metrically designated tonal target can bear sentential main prominence.

References


Modeling Positional Neutralization in an Exemplar Framework  
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Exemplar models of sound patterns differ from traditional generative phonology in that words and other phonological units are represented by clouds of exemplars (each corresponding to an actual production of that unit), rather than by abstract underlying forms; broader sound patterns emerge from regularities over exemplars. A number of studies have demonstrated that an exemplar framework can model many phenomena that have traditionally been explained in rule- or constraint-based frameworks, including categorical patterns and category dispersion (e.g., Wedel, 2004). However, the phenomenon of positional neutralization seems not to have been investigated in a working exemplar model. The present study implements such a model and shows that the stem alternations associated with positional neutralization pose difficulties for the exemplar framework.

Positional neutralization is a common phenomenon in natural language; well-known examples include final neutralization of laryngeal contrasts in German (Lombardi, 2001) and neutralization of /t/ and /d/ to [r] in English. Thus, an exemplar framework must be able to model positional neutralization in order to be a viable account of the full range of attested phonological phenomena.

However, some of the crucial components of exemplar models seem to be at odds with the requirements of modeling positional neutralization. In particular, exemplar frameworks are successful at modeling broad phonological patterns insofar as they require new productions to resemble generalizations that hold true across the existing exemplar set. This ‘analogical pressure’ on new productions is crucial for the emergence and maintenance both of phonological patterns (such as static phonotactic constraints) and of paradigm uniformity effects (because surface forms in the same paradigm are under pressure to resemble each other; McCarthy, 2001). Positional neutralization, however, often has the result that stems are not uniform within a paradigm. In German, for example, the final [t] of the noun [tot] (Tod, ‘death’) corresponds to a [d] in the plural, [toda]. The problem, then, is this: analogical pressure between members of the same paradigm must be weak enough to allow this type of alternation, but the pressure must simultaneously be strong enough to ensure that paradigms are otherwise as uniform as possible.

The present study implements a single agent who has a randomly generated lexicon consisting of ten distinct stems of the shape C₁VC₂, where C₁, C₂ ∈ {p, b, t, d, k, g} and V ∈ {i, a, u}. Each stem is realized in two wordforms, a ‘nominative’ (the bare stem) and an ‘accusative’ (stem plus [-a]). The agent is seeded with a lexicon containing one wordform for each stem-case combination (e.g., [pat] and [pata]); stems initially have identical forms in the two cases. In each round of the simulation, the agent randomly selects one wordform as the base for a new utterance. This wordform is then compared to another randomly chosen wordform; if that wordform is in the same paradigm (i.e., shares the same stem), each C of the production has a 90% chance of acquiring the voicing of the corresponding C in the comparison wordform. Finally, each C of the production is subject to a small amount of noise (a 5% chance of having its voicing changed). This modified wordform is then stored in the appropriate cell of the agent’s exemplar map. Each exemplar’s activation level is reset to 1 when it is added to the lexicon or used as the base of a new production; activation decays exponentially, and exemplars are removed from the lexicon if they have not been accessed for 200 iterations.

This simulation was run 100 times, each run with 100,000 iterations; the outcome of a representative simulation is given in (2). The degree to which a given segment in a wordform is likely to be realized as voiced at the end of the simulation – its ‘voicing bias’
$B$ – is defined as in (1). Under these conditions, wordforms have ‘wandered’ far enough from their seeds that agreement between voicing of the final C of a wordform and the original voicing of its seed is at chance: the voicing bias of originally voiced Cs is not significantly different from the voicing bias of originally voiceless Cs, as measured by a Wilcoxon test ($p > .05$ for all cases and positions in the wordform). However, there is still fairly good agreement at the end of the simulation between the nominative and accusative realizations of stem-final consonants: final Cs have the same voicing in both cases in 90% of stems. Thus, this basic model simulates paradigm uniformity.

A second simulation added production bias: word-final Cs had a 20% chance of becoming voiceless during production. In this scenario, 74% of nominative wordforms had final voiceless Cs by the end of the run. However, stem-final Cs were also voiceless in 71% of the accusative wordforms, despite the fact that the suffix rendered these Cs non-word-final. (Agreement in voicing within stems was 86%.) In other words, the combined pressures of paradigm uniformity and the bias towards final devoicing caused final Cs in the nominative to devoice, and ‘dragged’ the corresponding Cs of the accusative forms along with them. This is paradigm leveling, but not of the kind we should expect; on the contrary, the base for paradigm leveling in cases of neutralization is typically the most informative member of the paradigm (Albright, 2010): the one not subject to neutralization.

A series of further simulations showed that it was not possible to produce more realistic results by changing the strength of the bias towards paradigm uniformity. When the bias was weakened, stem-final Cs in the accusative were less likely to be voiceless, but the overall uniformity of the paradigm decreased even for initial Cs, which were not subject to production bias.

Thus, modeling positional neutralization and concomitant alternations within paradigms poses a challenge for exemplar models of phonology. The present study does not prove that it is impossible for exemplar theory to handle such alternations; rather, it demonstrates that doing so is not trivial. Further research should investigate whether, and under what conditions, an exemplar framework can model these phenomena.

(1) \[ B_{w,p} = \frac{\sum_i v_p(a_{i,w})}{\sum_i a_{i,w}}, \]

where $B_{w,p}$ is the voicing bias of the $p$th consonant in wordform $w$, $a_{i,w}$ is the activation of the $i$th exemplar of wordform $w$, and $v_p(a_{i,w}) = a_{i,w}$ if the $p$th consonant is voiced and 0 otherwise.

At the end of a simulation, consonants are considered ‘voiced’ if their voicing bias is greater than .5, and ‘voiceless’ otherwise.

(2)

<table>
<thead>
<tr>
<th></th>
<th>Nom.</th>
<th>Acc.</th>
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<tbody>
<tr>
<td>pat</td>
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<tr>
<td>kab</td>
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<td>bup</td>
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<td>tib</td>
<td>tiba</td>
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<tr>
<td>dap</td>
<td>dapa</td>
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<tr>
<td>gat</td>
<td>gata</td>
<td></td>
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<tr>
<td>pik</td>
<td>piga</td>
<td></td>
</tr>
<tr>
<td>dut</td>
<td>duta</td>
<td></td>
</tr>
</tbody>
</table>

Sample lexicon after 100,000 iterations

References


For the representation of long segments (geminate consonants and long vowels), two separate views have been advocated. Under the syllabic weight analysis of Hyman (1985), McCarthy & Prince (2001), Hock (1986), Hayes (1989), and others, geminates are inherently heavy, represented as having a single segmental node \((\mathcal{C})\), as in \((1a)\), associated with a mora unit \((\mu)\) on the weight tier; length then is encoded with respect to weight. In contrast, under the segmental length analysis of Selkirk (1990) and others, geminates are inherently long, represented as having double nodes \((\mathcal{C} \, \mathcal{C})\), but without inherent moraic affiliation, as in \((1b)\). Most recently, Ringen & Vago (2011) drew evidence from languages such as Selkup, Taz, Ngaklan, Leti, and Thurgovian Swiss, and argued for the representation in \((1b)\) as an invariant, universal structure for geminates; pre- or post- vocalic geminates are heavy then, if they are, via weight-by-position. Long vowels are unquestionably heavy, thus having inherent moraic affiliation in either analysis as in \((2a)\) and \((2b)\). The difference between the two analyses is on a par with how they represent geminates; i.e., long vowels have a single segmental node \((\mathcal{V})\), as in \((2a)\), with length encoded with respect to weight, whereas in \((2b)\) they are represented as having double nodes \((\mathcal{V} \, \mathcal{V})\); length of long vowels is then read from the double nodes, in addition to it being encoded with respect to weight.

The purpose of this paper is to postulate yet a third view that will be referred to as the moraic weight analysis, as in \((1c)\), in which the inherent syllabic \((\sigma)\) affiliation is entirely eliminated. Under this analysis, CV together as a unit is weight-bearing, syllabified under the mora node, as in Katada (1990). Geminates are inherently heavy, like \((1a)\), thus their first part by itself is assigned a mora unit. Unlike \((1a)\), however, its associated segmental slot is left unspecified, represented as \((\_\_\_\_)\). The unspecified empty slot will be filled in, perhaps post-lexically, by a leftward spread of melodic materials \((a_t)\) of the second part of the geminates, designated by \((\mathbb{K})\). Length then is encoded with respect to weight underlingly, and length represented as having double nodes after the empty slot is filled in is a post-lexical phenomenon. Unlike the other two analyses, the moraic analysis handles long vowels on a par with geminates uniformly, except that, instead of a leftward spread for geminates, a rightward spread of melodic materials of the preceding \(V\) \((a_t)\) takes place, as designated by \((\mathbb{K})\) in \((2c)\).

Evidence for the above postulation comes from superior performance in ludling \((<\text{Latin ludus} \text{ ‘game’} + \text{lingua} \text{ ‘language’})\) demonstrated by the subject KT, a Japanese male born with Williams syndrome, which is a rare genetic disorder caused by microdeletion of 26-28 genes from chromosome \#7 \((7q11.23)\). KT instantly renders words (both real and unreal) backward as soon as he hears them. His response time averages 300ms, measured by praat. Examples are given in \((3) - (5)\). In \((3c)\) a syllabic nasal \([N]\) is treated as a separate unit: \([\text{yu.ki.o.N}.\text{na}] \rightarrow [\text{na.N.o.ki.yu}]\), rather than as a coda consonant forming a syllable with the preceding \(V\): \(*[\text{yu.ki.o.N}.\text{na}] \rightarrow [\text{na.o.N.ki.yu}]\). This shows in the first place that the operating unit on the backward ludling is a mora, rather than a syllable.

Data crucial to the present issue are given in \((4)\) and \((5)\) involving long vowels and geminates, respectively. In \((4)\) melodic materials of long vowels, underlined, are not only altered: \([\epsilon:] \rightarrow [\text{u}], [\text{do}] \rightarrow [\text{u}], [\text{o}] \rightarrow [\text{a}],\) but the positions of their associated moraic units appear in a mirror image between the input and the output; i.e., the second position in the input changes into the penultimate in the output, and vice versa: \([\text{do.o.bu.tu}](1.2.3.4) \rightarrow [\text{t'.u.bu.y.do}](4.3.2.1); [\text{te.ba.gyo.o.za}](1.2.3.4.5) \rightarrow [\text{za.gy.o.ba.te}](5.4.3.2.1)\).

The exact operation likewise applies to geminates. \((5a)\) is straightforward: \([\text{ki.t.te}](1.2.3) \rightarrow [\text{te.k.ki}](3.2.1)\). \((5b)\) is supposedly: \([\text{ga.k.ko.u}](1.2.3.4) \rightarrow [\text{u.ko.g.ga}](4.3.2.1);\) KT, however, yielded \([\text{u.go.k.ka}](4.3.2.1)\), having exchanged the \([\text{voice}]-\text{feature} \) value between \([k]\) and \([g]\). This seems to be to avoid the constraint on *voiced obstruent geminates in Japanese. Finally, \((5c)\) is also supposedly:
[ya.pa.ri]1, 2, 3, 4 → [ri.pau ya]4, 3, 2, 1; KT, however, yielded [ri.paa ya] (4, 3, 2, 1). It seems that KT had taken the rightward spread of the preceding [a] in the output structure, rather than the supposed leftward spread of [y], either mistakenly or simply to avoid gemination of the half-vowel [y].

In any case, the structure which potentially allows for either of the long segments should receive recognition for the Japanese-based ludling, hence for the Japanese language itself (cf.: Bagemihl, 1987; 1989 for the status of ludling in linguistic theory). This speaks for the moraic weight analysis, rather than the syllabic weight analysis or the segmental length analysis.

(1) Geminates
a. The syllabic weight analysis b. The segmental length analysis c. The moraic weight analysis

(2) Long vowels
a. The syllabic weight analysis b. The segmental length analysis c. The moraic weight analysis

(3)a. [toriwasa] → [sawarito] b. [senatomiya] → [yamitonase] c. [yukioNna] → [naNokiyu]


(5)a. [kitte] → [tekki] b. [gakkou] → [ugokka] c. [yappari] → [ripa:ya]

<References (partial)>
Effects of L2 experience on the development of L1 phonological processes

Shinsook Lee (Korea University) & Mi-Hui Cho (Kyunggi University)

The influence of L1 on the acquisition of sound perception and production in L2 is well attested (Flege 1995, Best 1995, Zampini 2008). However, it is found that L2 experience also influences L1 perception and production (Major 2001, MacKay and Flege 2004). For instance, MacKay and Flege found that L1 Italian L2 English early bilinguals took more time to produce English sentences than Italian sentences. Guion et al. (2000) also reported that Korean-English bilinguals’ accent in L1 and L2 was negatively correlated. Yet, Guion et al. compared mostly early bilinguals with late bilinguals and thus their results may have been influenced by factors like age and learners’ different degree of L2 exposure. Importantly, only a few studies have investigated whether different L2 learning experience has any effect on the development of L1 phonological processes. Further, not many studies have examined the relationship between perception and production in sentential contexts.

Thus, this study explores the development of Korean phonological processes among three groups of children (mean age: 9 years) with different L2 experience; 20 Korean children who learned English only in EFL settings, 21 returnees enrolled in an English-immersion program and 19 bilinguals who learned English in the ESL environment in the U.S. The participant groups were significantly different from each other with regard to the initial age of English learning and years of English education received. To investigate the influence of L2 experience on L1 phonological acquisition in sentential contexts, 2 obligatory phonological processes in Korean were tested: 6 sentences each for t-palatalization (/t/ and /tʰ/) are realized as [c] and [cʰ] before heteromorphic /i/, respectively and h-merger (heteromorphic sequences of /h/ plus /p, t, k/ and /p, t, k/ plus /h/ surface as aspirated [pʰ, tʰ, kʰ]), as shown in (1). The same 12 sentences were also used in the perception test. For production, the children read the sentences orthographically presented to them on big flash cards. Their productions were transcribed by 3 trained native Koreans. The perception test was administered using e-prime 2.0., and all the stimuli were only aurally presented. The children were asked to press 1 if the given sentence sounded correct and 2 if it sounded incorrect on the keyboard. In particular, both correct and incorrect pronunciations of the target processes were presented to the children and only when they chose correct pronunciations rejecting incorrect pronunciations, it was coded as 1 (i.e., a correct response). The same number of filler sentences was also included in both perception and production tests.

The overall production ability (67.9%) was ahead of the perceptual ability (49.6%) and a significant correlation was not found across all the groups, thus demonstrating that perceptual and production abilities may not develop in parallel (Pater 2004) and even perceptual ability may lag behind production ability. Importantly, the results of the production test showed the influence of L2 experience on L1 phonological processes as the EFL children outperformed returnees and the ESL children in order. Even though the ESL children’s reading comprehension was poor compared to that of the EFL and returnee children, all the children performed better on h-merger than on t-palatalization, hence showing that not all obligatory processes are acquired at the same time. Further, error patterns in production varied with the children’s L2 experience. As for the perception test results, the effect of L2 learning on L1 phonological processes was also noticeable given that the EFL children and returnees outperformed the ESL children although the difference did not reach significance. However, the EFL children’s reaction time was significantly faster than that of the other two groups. Similar to production, perception accuracy of h-merger was much higher than that of t-palatalization even though the EFL children showed a somewhat different pattern. This is of theoretical importance in that it seems to indicate that there may be a different learning path among obligatory phonological processes due to the inherent nature of the processes, similar to the acquisition of segments. That is, the non-application of /h/ merger sounds more awkward relative to that of t-palatalization. This is because /h/ merger violates Korean
phonotactic constraints in that /h/ cannot occur in syllable-final position while t-palatalization seems to be in the restructuring process for some speakers so that the non-application of the process might be tolerable. Implications of the results are further discussed in terms of the suppression hypothesis (MacKay & Flege, 2004) and L2 perception/production models (Flege 1995, Best 2005).

(1) Stimuli list of Korean words for t-palatalization and h-merger

<table>
<thead>
<tr>
<th>t-palatalization</th>
<th>h-merger</th>
</tr>
</thead>
<tbody>
<tr>
<td>put^[h]i+ko ‘paste+causative+connective’ [puc^[h]igo]</td>
<td>mak+hi+σ ‘block+causative+connective’ [mak^[h]σ]</td>
</tr>
<tr>
<td>mit^[h]i ‘bottom+nominative [mic^[h]i]</td>
<td>coh+ta ‘like+declarative’ [cot^[h]a]</td>
</tr>
<tr>
<td>pap+so^[h]i+ ‘rice+pot+nominative [pap’s’oc^[h]i]</td>
<td>anc+hi+σla ‘sit+causative+imperative’ [anc^[h]ara]</td>
</tr>
<tr>
<td>hae+tot+i ‘sun+rise+noun suffix [hædoji]</td>
<td>kilk+hi+σ ‘scratch+causative+connective’ [kilk^[h]σ]</td>
</tr>
<tr>
<td>pat^[h]i ‘field+nominative [pac^[h]i]</td>
<td>manh+ta ‘many+declarative’ [manh^[h]a]</td>
</tr>
<tr>
<td>kat^[h]i ‘exterior+nominative’ [kac^[h]i]</td>
<td>silh+ta ‘dislike+declarative’ [silt^[h]a]</td>
</tr>
</tbody>
</table>

Selected References


Prosodic cues in the disambiguation of structurally ambiguous sentences: Evidence from Greek

Maria Martzoukou, Despina Papadopoulou & Anthi Revithiadou / AUTh

There is an ongoing debate on whether non-expert speakers make use of disambiguating prosodic cues in order to resolve various types of structural ambiguities (Kraljic & Brennan, 2005; Millotte et al., 2007). The purpose of the present study is to explore whether native speakers of Greek use prosody as an important informative cue, apart from morphosyntax (Papadopoulou & Tsimpli, 2005), in order to process subject/object ambiguities of the type presented in (1). More specifically, the pivotal goal is to find out, first, to what extent pitch accents and boundary tone constellations contribute to sentence disambiguation and, second, whether their effect varies depending on the type of construction (i.e. Subject-Verb or Verb-Object). For this purpose, a production and a comprehension experiment were conducted.

(1) a. Kaθos erave ta kubja γλίστρεσε στο πατόμα. While was-sewing-3sg the buttons-pl slip-past.3sg on-the floor ‘While (s)he was sewing the buttons (s)he slipped on the floor.’

b. Kaθos erave ta kubja γλίστρησαν στο πατόμα. while was-sewing-3sg the buttons-3pl slip-past on-the floor ‘While (s)he was sewing the buttons slipped on the floor.’

The production experiment consisted of 24 test texts, each consisting of 3 sentences with a temporarily ambiguous one in the middle. Half of the temporarily ambiguous sentences were disambiguated towards the subject and the other half towards the object reading. Only one reading was favored in each text. (24 filler texts were intertwined for destruction purposes.) 30 participants took part in the experiment and were instructed to silently read each of the 48 texts, to memorize it and to produce it in the most natural way. The experimental sentences were codified and prosodically analyzed with the help of Praat (version 5.1.35, Boersma & Weenink, 2005) and the Greek ToBI system (Arvaniti & Baltazani, 2000). The analysis of the results revealed that participants use the expected prosody (i.e. L* + H L* H-) in order to render the object reading (97%) but, crucially, employ to a lesser extent the appropriate prosody (i.e. L* H- L* + H) for the subject reading (54%) (Graph 1). The use of prosodic cues to distinguish the two meanings of the locally ambiguous sentences was found to be at chance level (52%).

Given the split between the subject/object reading, the next step was to investigate whether Greek speakers rely on prosodic cues in processing object/subject ambiguities in comprehension tasks. The comprehension task consisted of 24 sentence-onset test fragments containing local syntactic ambiguities. The prosody of half of them was in favor of the object reading (i.e. L* + H L* H-) and the other half was in favor of the subject reading (i.e. L* H- L* + H). Sentence-onset fragments were extracted from passages produced by participants of the first experiment. The recordings of two participants (a male and a female one) with the most correct sentence productions, as far as prosody is concerned, were chosen as inputs. Sentences were cut off prior to the point of ambiguity resolution, i.e. the main verb. Thus, the participants would hear the fragment “While she was sewing the buttons…” twice, once produced with a prosody favoring the interpretation of “the buttons” as the subject of the verb “was sewing” and once as its object. 24 experimental items and 24 fillers were used in the experiment. 30 participants were instructed to give a sensible continuation of these fragments as fast as possible. The results revealed that participants were able to perceive the prosodic cues at 89%. However, they were significantly more accurate (F(1,28) = 11,911,
p<0.005) at perceiving the prosodic cues that disambiguated the sentence towards the object reading (95%) rather than the subject reading (83%) (Graph 2). This finding couples the results of previous studies in Greek (e.g. Papangeli & Marinis, 2009), which give a clear advantage to the processing of elements within the VP domain.

Graph 1. The scores (%) of responses pronounced with the expected intonation patterns, presented per condition (exp.1)

Graph 2. The accuracy scores (%) of sentence comprehension per condition (exp. 2)

To sum up, the results of our experimental investigation clearly suggest that prosodic cues are more systematically exploited in language comprehension than in language production. Moreover, it supports the claim that speakers prefer a general processing pattern that promotes the parsing of the verb with its complement, that is, the element with which it also forms a prosodic unit, namely the phonological phrase (Selkirk, 1978 et seq.; Nespor & Vogel, 1983).

Selected references


A chain shift paradox for classic OT and Harmonic Serialism
Joan Mascaro - Universitat Autònoma de Barcelona-CLT

In many Romance varieties of Italy a seven vowel system [a, e, e, i, o, u] is subject to a process of vowel reduction that raises unstressed mid open vowels to mid close, and to two harmonic processes gradually raising mid stressed vowels before a final high vowel, and raising pretonic mid vowels before a stressed high vowel. They are illustrated with Servigliano (Camilli 1929, Mascaro 2011, Walker 2011), but the same processes are also present in the dialects of Grado and Cervara:

(1) Vowel Reduction in unstressed position  
\( e \rightarrow e, o \rightarrow o \)

\( \text{pêl-o} \rightarrow \text{nel-á} \) 'I cool down/to cool down'

\( \text{gêl-o} \rightarrow \text{gol-á} \) 'I fly/to fly'

(2) Metaphonic Raising

\( /e/ \rightarrow [\dot{e}], /o/ \rightarrow [\dot{o}]; /e/ \rightarrow [i], /o/ \rightarrow [u] / \ldots i, u \# \)

\( \text{pêd-e} \rightarrow \text{pêd-i} \) 'foot-SG/PL/footprint'

\( \text{pór-a} \rightarrow \text{pór-u} \) por-ét-a 'poor (prenom.)-F.SG/M.SG/(postnom.)F.SG'

\( \text{mêt-e} \rightarrow \text{mít-t} \) 'he puts/you put'

\( \text{fôn-n} \rightarrow \text{fûn-u} \) 'deep-F.SG/M.SG'

(3) Pretonic Raising, e, o

\( /é/ \rightarrow [i], /ó/ \rightarrow [u] / \ldots i, ú \)

\( \text{vérd-e} \rightarrow \text{vird-ú} \) 'green-SG/deep green-M.PL'

\( \text{fjór-e} \rightarrow \text{fjûr-í} \) 'flower/to flower'

(4) Pretonic Raising, e, o

\( /é/ \rightarrow [i], /ó/ \rightarrow [u] / \ldots i, ú \)

\( \text{fjônn-e} \rightarrow \text{fjûnn-í} \) 'he extends/to extend/extend

\( \text{fjôr-a} \rightarrow \text{fûr-ité} \) 'poor (prenom.)-F.SG/(postnom.)-M.SG/F.SG'

These three processes appear summarised in (5):

(5) a. Vowel Reduction  
\( /e/ \rightarrow [e], /o/ \rightarrow [o] \)  
(Stressless Raising)

b. Metaphonic Raising  
\( /e/ \rightarrow [i], /ó/ \rightarrow [u] / \ldots i, u \# \)  
(One-step raising)

\( /é/ \rightarrow [é], /ó/ \rightarrow [ú] / \ldots i, u \# \)  
(One-step raising)

c. Pretonic Raising  
\( /e/ \rightarrow [i], /ó/ \rightarrow [u] / \ldots i, ú \)  
(One-step raising)

\( /e/ \rightarrow [i], /ó/ \rightarrow [u] / \ldots i, ú \)  
(Fell-swoop raising)

Since in pretonic position we get both fell-swoop raising and vowel reduction, the correct generalisation appears to be that \( /e/, /o/ \) raise to \( [i], [u] \) because in the absence of a metaphonic trigger they would have reduced to \([e], [o] \). In other words, under a standard derivational rule-based approach we would have a general Raising rule covering (5b) and (5c), and order Vowel Reduction before Raising; this would derive /por-itt-u/ (Vowel Reduction) \( \rightarrow \) por-itt-u (Raising) \( \rightarrow \) [por-itt-u]. But in a classic OT approach such a generalisation is, in principle, inexpressible. For one-step raising in /por-u/ \( \rightarrow \) [por-u] the constraint preventing fell-swoop raising, Id(hi)&Id(ADR) (Walker 2011) must dominate the constraint favoring harmony (AGREE, or LICENSE(hi)), since otherwise we would get *[púru]. But in order to get the fell-swoop raisings in unstressed position in (4) we need the reverse ordering.
Consider now the situation in Harmonic Serialism. Notice first that the input-output constraint $\text{ID(high)}\&\text{ID(ATR)}$ makes no sense in HS: since GEN makes only “one change at a time”, a minimal violation of faithfulness, no candidate will differ in both [high] and [ATR] from the input at each step. The fell-swoop pretonic raising is easily obtained through the serial mapping /pǿr-itt-u/ $\rightarrow$ por-itt-u $\rightarrow$ [pur-itt-u]. In the first step we get vowel reduction because a constraint requiring faithfulness in stressed position, $\text{IDENT-STRESS(Vowel Features)}$, dominates the constraint disallowing faithfulness in stressed position, *[-low, -high, -ATR]. In the second step we get further raising, o $\rightarrow$ u.

But now the one-step raising in stressed position becomes impossible. As pointed out by McCarthy (2000:7) an analysis of chain shifts based on constraint conjunction "is crucially parallel." Assume however that there is a mechanism to prevent fell-swoop raising in HS. We still need to derive both /ø/ $\rightarrow$ o (/pǿr-u/ $\rightarrow$ pór-u) and /ø/ $\rightarrow$ u (/fǿnn-u/ $\rightarrow$ [fũnn-u]). But if the constraints hierarchy derives /fǿnn-u/ $\rightarrow$ [fũnn-u], then, for /pǿr-u/, the output of the first step pór-u will be the input to the second step and it will be impossible to prevent the illicit mapping pór-u $\rightarrow$ *púru.

In the second part of the presentation I will consider the possibility that the fact that there is no fell-swoop raising is a result of preservation of lexical contrasts (Flemming 2004, 2006, Ni Chiosáinn and Padgett 2009, Lubowicz 2003). Whenever there is no Pretonic Metaphony or Pretonic Raising all seven underlying vowels are preserved in stressed position and two contrasts are lost in unstressed position (/e/-/e/ and /o/-/ø/). Under metaphonic influence, in stressed position four contrasts are lost (20a), but underlying /i/-/ɛ/ and /u/-/ʊ/ are kept distinct; if fell-swoop raising would take place, we would loose two additional contrasts. In unstressed position six contrasts are lost (20b), as a result of loss of contrast in non-prominent positions via Vowel Reduction. If preservation of the /e/-/e/ and /o/-/ø/ contrasts is the effect of a constraint, then there would be a principled reason (underlying contrast preservation) to allow this this constraint to refer to lexical structure.

References
Dogon grammatical tone at the phonology-syntax interface
Laura McPherson, UCLA

Data from tonal languages have consistently contributed to the development of theories of the phonology-syntax interface. To take one example, prosodic phonology (Selkirk 1978, Nespor and Vogel 1986) has greatly benefitted from Bantu phrasal tonology, in such work as Bickmore (1990) or Hyman (1990). However, much of this work examines tonal processes where the syntactic category of the constituents involved does not make a difference, and the theory has a difficult time accounting for data where it does.

In this paper, I present a complex system of grammatical tone found in Dogon noun phrases, which, I argue, requires that the phonology be sensitive to both syntactic structure and category. I present a Harmonic Grammar (Legendre et al. 1990) analysis wherein constraints determine the precise tonal changes brought about by NP elements, but where the scope of each tonal change is determined by the syntax in the form of c-command. The constraints serve both as a bridge between syntactic structure and phonology and as a way to resolve conflicts between competing tonal processes. Harmonic Grammar is used in place of strict OT to account for variation in several of the Dogon grammars. A particular strength of this analysis is that re-weighting by and large the very same set of constraints produces the microtypology of tonal systems found in the Dogon language family.

The Dogon languages are spoken in Mali’s central Mopti Region by around one million people. Though there are approximately twenty languages in the family, this paper focuses on original data from a sample of nine languages gathered by the author and colleagues in Mali since 2004. These nine languages share the same basic form of grammatical tone, but no two languages work exactly the same way in the details of how the system is implemented. What sets Dogon tone apart from the tonal systems of many other African languages is the heavy of use of overlays or replacive tone; in any given construction, a word’s lexical tone may be completely replaced with a grammatically controlled tonal overlay. Consider the following examples from Tommo Soa, where a pronominal possessor imposes H tone on a following inalienably possessed noun:

(1) émémé bábéH (cf. /bábé/ ‘uncle’)
    1PL.PRO uncle
    ‘our uncle’

In this example, the lexical /LH/ tone of ‘uncle’ is replaced with a H overlay (shown with the superscript H) when preceded by a pronominal possessor. The same noun followed by an adjective will take a L overlay in Tommo So:

(2) bábéL kómmó
    uncle skinny
    ‘skinny uncle’

The question arises as to whether the possessor’s H overlay or the adjective’s L overlay will win if both are present with the noun. In Tommo So, we find that the noun takes the adjective’s L tone but the possessor retains its lexical H tone: [émémé bábéL kómmó] ‘our skinny uncle’.

Other Dogon languages respond differently. In Yorno So, for example, both the
possessor and the possessed noun are overwritten with the adjective’s L tone (PossL N L Adj), whereas in Najamba, both the possessed noun and the adjective are overwritten with the possessor’s tonal overlay, in this case L (Poss N L Adj L).

The theory proposed here encapsulates these tonal changes in constraints. These constraints can be thought of as a way to phonologically implement morphological constructions or schemas, in the sense of Construction Morphology (Booij 2010). Thus, in construction morphology, we could schematize inalienable pronominal possession in Tommo So as [Poss NP ] (where Poss = inalienable pronominal and NP = the possessed material c-commanded by the possessor). In the theory presented here, this would translate into a constraint Poss(IP) > H, which assesses a violation for any candidate in which an inalienable pronominal possessor does not assign H tone to c-commanded material to its left. Competing with this constraint is a constraint L < Adj encapsulating the adjective’s schema, [NP L Adj] (where NP = the material c-commanded by the adjective). To determine which material is c-commanded by each element, let us assume the following structure:

![Diagram](image)

Both the possessor and the adjective c-command the noun, putting their tonal requirements in direct competition. Setting the weight of L < Adj higher than the weight of Poss(IP) > H yields the result wherein the adjective’s L overlay wins. The fact that the possessor, also c-commanded by the adjective, does not also take a L overlay can be modeled using a faithfulness constraint such as Ident(T, Poss).

In summary, this paper lays out a theory of phonology-syntax interface that allows us to account for difficult data such as that found in the Dogon languages, where other theories have fallen short.

References


A Lengthy Note on Labial Harmony Triggers: evidence from Tungusic and Mongolian languages
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The most common type of trigger of labial harmony is that of a segment that is specified for the harmonising feature (i.e., labiality), which, as such then results in the presence of that feature on a varying alternant. Consider data from Solon (Vaux 1993; Li 1996):

(1) a. эрэт-өө “grass-DEF.ACC.”
   b. өөр-өө “tree-DEF.ACC.”

(1) shows that the presence of the relevant feature (round) on the trigger suffices to display labial harmony. Specifically, configurations involving a trigger that is a short vowel (single or multiple) or a long vowel both result in labial harmony.

The second type of trigger is observed in Classical Manchu and Oroqen, where there is a restriction on the size of trigger (Zhang & Drescher 1996, Walker 2001):

(2) a. to-ŋa (*to-ŋə) ‘few, rare’ (Classical Manchu; Walker 2001)
   b. gosi-ŋa (*gosi-ŋə) ‘loving, compassionate’
   c. botə-ŋə ‘colored’

A single vowel fails to show harmony (2a), but two successive round vowels do (2c).

The third type of trigger can be found in Baiyinna Orochen (Li 1996):

(3) a. əл ‘fire’
   b. goəl-jə (*goəl-jə) ‘policy-INDEF.ACC.’
   c. əл-xən-mə ‘fish-DIM-DEF.ACC.’

Short vowels trigger harmony (3a); long vowels do not (3b) but they do let it through (3c).

The model I assume is Radical cv Phonology (RcvP; van der Hulst 2005, 2012), which is based on Dependency Phonology (Anderson & Ewen 1987) and Government Phonology (Kaye, Lowenstamm & Vergnaud 1985). Crucially, the phonological representation of segments involves a small set of (unary) elements (cf. binary features). Relevant here is the element [U], which represents ‘labiality/roundedness’.

In RcvP, vowel harmony alternations are represented by a variable element, “(U)” for labial harmony. This variable can be licensed by an immediately adjacent instance of [U]; when licensed, an element is phonetically realised. In particular, vowel harmony involves lateral licensing, which refers to an immediately adjacent element licensing a variable element (lateral licensing is indicated by “”) (data from Baiyinna Orochen, Li 1996):


In (4a) the initial vowel contains [U] and licenses the variable element, resulting in əлə-jə. In contrast, in (4b) the initial vowel does not contain [U]; the variable remains unlicensed.

In addition, a vowel needs to be ‘activated’ to be able to initiate lateral licensing (i.e., it must become a trigger); this is captured by positional licensing in van der Hulst (2012): “A variable element X is licensed in position P (where P is the first/last syllable in domain D, where D is a Word or Stem/Root)”.

Here, I propose that position P is not limited to the syllable but is sensitive to various levels identified in the prosodic hierarchy (Selkirk 1978, 1986; Nespor and Vogel 1986). Specifically, I argue that positional licensing can be operative at different prosodic levels. Dependency Phonology derives hierarchical notions by appealing to headship (Harris 1994); consider a representation for wisdom (rhyme and nucleus both correspond to ‘syllable’; the skeletal level roughly corresponds to moras):
To account for the three types of triggers, I argue that the garden-variety labial harmony (1) involves positional licensing (indicated by subscript \( p \)) at the level of the Rhyme:

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In (6a), initial R is licensed successfully, and as such lateral licensing proceeds as well.

Regarding the type that requires a bisyllabic sequence to trigger labial harmony (2), positional licensing operates at the level of the Foot. Furthermore, lateral licensing is always operative at the Rhymal level ("//" indicates failure of potential lateral licensing).

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In (7a), the Foot is activated as a trigger since its head contains \([U]\); concomitant lateral licensing proceeds at the Rhymal level. In (7b), the Foot is again activated as a trigger, but lateral licensing is blocked since the second syllable violates locality by lacking \([U]\).

In (7c), the trigger by itself does not form a Foot: positional (and lateral) licensing fail.

Finally, the type where long vowels fail but short vowels do trigger labial harmony (3) is accounted for by positional licensing at the level of the skeletal tier:

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In (8a), positional licensing occurs at the level of the skeletal tier, with concomitant lateral licensing at the Rhymal level. In (8b), however, positional licensing is blocked (\( \ast \)) since the head of the long vowel is already involved in the licensing of \([U]\): the head of the long vowel \((x^1)\) licenses its dependent \((x^2)\). In particular, a position cannot bear two markings for segmental licensing. (cf. (6b) where positional and head-dependent licensing are on separate positions, the Rhyme and skeletal position, respectively.)
Prosodic markers under parametric control
Kuniya Nasukawa (Tohoku Gakuin University, Sendai, Japan)

Prosodic domains (e.g. foot, word) for speech processing and acquisition are defined not only by suprasegmental properties such as stress and tone, but also by the distribution of prosodic boundary markers such as aspiration, ejective release and obstruent voicing (Backley 2002, Backley and Nasukawa 2009, Nasukawa and Backley 2012). For example, aspiration operates as a boundary marker in English, where it marks the left-edge of a foot/word (Backley and Nasukawa 2009). Segments which contain prosodic marking properties like aspiration are often referred to as structurally strong positions. In structural terms, the aspirated consonant and the following vowel form a syllable where the former is licensed by the latter. Since a syllable which includes aspiration is regarded as the ultimate head of a given domain, the foot in English is considered to be left-headed (Harris 1994, 1997). In languages which exploit ejective release (e.g. Cuzco Quechua) or obstruent voicing (e.g. Northern Tohoku Japanese) as prosodic boundary markers, these properties typically appear at the left-edge of the relevant domain (Backley and Nasukawa 2009, 2012). This cross-linguistic tendency leads us to assume that the structure of prosodic domains for speech processing and acquisition is left-headed in the unmarked case.

In this paper we consider the marked case of right-edge marking, which is rarely discussed in the literature. The language which exhibits right-headed structure, which we focus on here, is Kaqchikel, a K’iche’an language of the Mayan family. In this language, aspiration appears domain-finally (i.e. in word-final position and the first consonant of word-internal consonant clusters) but never domain-initially (i.e. in word-initial position or the second consonant of word-internal consonant clusters).

The existence of languages which show right-headed structure should at least be theoretically possible (Kaye 1990 and Harris 1994) where the direction of head-dependent relations (direction of nuclear projection licensing) is parametrically determined: left-headed or right-headed. According to the literature, this parametric setting is assumed to be a property of levels higher than the syllable (the levels of nuclear projection) while the direction of head-dependency relations within a syllable is thought to be universal: e.g. the onset which is the dependent of the nucleus is phonetically followed by its head (nucleus). However, stress-assignment in Kaqchikel reveals that the parametric setting functions not only above the syllable level but also within the syllable: the right-most aspirated onset is phonetically preceded by its head nucleus, which bears primary stress. The discussion concludes that there exists no universally-fixed prosodic/syllabic structure: all aspects of prosodic dependency relations are parametric in terms of directionality.
**Geminates and syllabification in Japanese**
Hitomi Onuma (Tohoku Gakuin University, Sendai, Japan)

In the phonology literature at least two different representations have been proposed for geminates: (i) a geminate is a coda-onset sequence; (ii) a geminate is a sequence of two onsets flanking a silent nucleus. The first is widely accepted (Abe 1987; Kubozono and Ota 1998; Kubozono 1995, 1998; Yoshida 1996; Tsujimura 1996; Vance 2008) while the second is less well established. Nevertheless, this second approach is employed in the framework of Dependency/Government Phonology (Nasukawa 1998, 2005, 2010; cf. Scheer 2004). It is also the position defended in this paper, for the three reasons outlined below.

First, the structure (ii), which makes no reference to the syllable coda (CV.CV, *CVC.CV), corresponds to the basic CV syllable structure of Japanese. For example, *kappa* (*raincoat*) is syllabified as *ka.p∅.pa* (rather than *kap.pa*), thus conforming to the basic CV.CV pattern. In the structure (i), on the other hand, there is no explanation as to why geminates are the only consonant sequences to consist of a coda and an onset.

Second, employing the structure (ii) requires no resyllabification in order to derive geminate consonants. For example, *ki.ru* (*cut*) + -*ta* (past tense suffix) is syllabified as *ki.∅∅.ta* rather than *kit.ta* in verb inflection, and *ko.ku* (*nation*) + *ki* (*flag*) is syllabified as *ko.∅∅.ki* rather than *kok.∅* in noun compounding. It may be argued that, by eliminating structure-changing processes such as resyllabification, we achieve a higher degree of restrictiveness since we impose a greater control over what the phonology is permitted to do. This view is consistent with the recent theoretical trend towards a monostral view of phonological derivation (Harris 2004, Nasukawa 2010).

Third, with structure (ii), which allows consonants only in onsets, no ‘beat’ is detectable in consonantal positions. A ‘beat’ in Japanese is presumably attributed to the presence of a (audible/inaudible) nucleus (where an inaudible nucleus separates the two consonants which form a geminate). In a coda-onset approach to the structure of the Japanese geminate, on the other hand, whether a beat is detectable in consonants or not depends on a given type of prosodic position to which a consonant is affiliated: if it occurs in an onset then a beat is not detectable, but if in a coda then it is detectable. The link between the coda-onset distinction and the presence/absence of a ‘beat’ must be explained in theoretical terms. In Moraic Phonology, the relation is represented by the prosodic category ‘mora’, which never appears in an onset but can occupy a coda. However, there is still no clear account of why moraicity is associated with codas. On the other hand, the geminate structure (ii) does not need to refer to this kind of problem since a beat (moraicity) is a by-product of the existence of a nuclear position.

For these reasons, in this paper I proceed to represent geminates using structure (ii), which employs a sequence of two onsets flanking a silent nucleus. I then go on to analyze Japanese pitch accent patterns involving geminates, focusing on the accentuation pattern of foreign words in Tokyo Japanese; in most cases, this assigns an accent to the antepenultimate mora (Kubozono 1995). However, if the antepenultimate mora is the first part of a geminate, then the accent is assigned to the preceding mora (e.g., *derakkusu* ‘deluxe’ → *de.ra.k.ku.su*). That is, the first member of a geminate cannot bear an accent – even though it is presumed to be linked to a mora, which is supposed to be an active structural unit in the phonology of Japanese. In order to describe this formally, Kubozono (1995) claims that an accent is assigned to the nucleus of the syllable which includes the antepenultimate mora, in which case it is necessary to refer to two prosodic categories, mora and syllable. By contrast, the onset-onset approach to geminate structure employs only a single category ‘nucleus’, referring neither to mora nor to syllable: if an antepenultimate nucleus is featureless and is preceded by the first part of a geminate, the nucleus does not attract an accent since it has insufficient capacity to be a docking site for accentuation. In this case, an accent is assigned to the preceding melodically-filled nucleus, which is the head of the foot domain in which it appears.
References
What is universal and language-specific in cluster formation?

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Key words: phonotactics, Germanic and Slavic languages, preferences, universals

This paper addresses the issue of language specific parameters which govern the formation of consonant clusters in two Germanic languages (English, German) and two Slavic languages (Polish, Russian). Up till now two major criteria which were used consistently in the description of phonotactics in world languages, namely cluster size, defined as the number of adjacent segments forming a cluster (Greenberg 1978) and cluster phonological structure, determined on the basis of - for instance - sonority (Vennemann 1988; Clements 1990; Ladefoged 1993). Some more recent accounts proposed to top the parameter of manner of articulation with place of articulation and voicing (Dziubalska-Kołaczyk 2009) and distinguish extra-phonological factors, such as morphology, in cluster formation (Dressler and Dziubalska-Kołaczyk 2006).

This contribution should be viewed as an alternative to the sonority hierarchy and to other approaches used in determining degrees of cluster goodness or preferability. The method discussed in this paper is the extension of the model proposed by Orzechowska and Wiese (2011). The authors make use of four properties in search of factors which are universal or language specific: complexity (COMP), place of articulation (POA), manner of articulation (MOA) and voicing (VOI). The method is empirically-based in the sense that it allows to discover language-specific preferences by a systematic analysis of phonological properties recurring across all clusters in a language. This analysis, in consequence, allows to establish parameters representing each of the mentioned properties.

The data that was analysed contained 56 German, 62 English, 423 Polish and 210 Russian word-initial clusters. The selection of the languages was motivated by the fact that all of them are phonotactically elaborate, according to the World Atlas of Linguistic Structures (Maddieson 2011), but to various degrees. English and German allow the maximum of 3 consonants in the word-onset position, while Polish and Russian permit 4-consonant onsets. The procedure applied in the analysis of clusters involved the following steps. Firstly, with the help of the IPA categories a description of clusters was provided. On its basis, 14 parameters for all the properties were identified. Exemplary parameters involve: cluster size and compositionality for the COMP property, number of labial / coronal / dorsal segments in a cluster for the POA property, articulatory distances between consonants forming a cluster and sonority for the MOA property and voicing agreement between adjacent consonants for the VOI property. Next, clusters adhering or not adhering to each parameter were counted, which made it possible to come up with point values for each cluster. Finally, a ranking of clusters was proposed for each language.

The method allows to trace language specific preferences in cluster formation. The tentative analysis revealed that some parameters hold relevant in the two Slavic languages, while others play a greater role in cluster formation in the Germanic languages. Generally, the place of articulation and voice feature are more important in the phonotactics of Polish and Russian than in Germanic languages. In contrast, English and German prefer sonority-based clustering (i.e. the manner of articulation feature).
References:
/a/ introduction in the Southern Dialects of Italy: phonology, morphology, syntax or the lexicon?
Diana Passino Università di Bologna

1. Introduction
This study presents new, freshly collected data and advances a new proposal concerning a sandhi phenomenon characterizing many Dialects of Italy spoken in the Upper Southern part of the peninsula, among which Abruzzese and Apulian. The phenomenon is known as /a/ introduction, described in detail below and previously analysed in the Prosodic Phonology framework (Nespor and Vogel 1986). The proposal advanced here suggests to consider /a/ introduction as two different processes according to whether inserted /a/ is etymological or non-etymological. By the label etymological /a/ I refer to the thematic vowel of class 1 verbal stems, to the final vowel of some prepositions and adverbs like supra ‘under’, and, disregarding strict etymology, also to the inflectional morpheme spelling out the morphosyntactic features fem.sg. in all feminine nouns with no class distinction, due to metaplasm). In the former case a vowel, whose content is lexically defined, resists reduction when it finds itself in a metrically strong position. The latter case, on the other hand, is a case of true insertion of an epenthetic vowel, which phonologically interprets a morphosyntactic boundary. Setting apart the surfacing of etymological /a/ from that of non-etymological /a/ as two different phenomena allows to make sense of what looks as inconsistencies in the empirical data and to achieve a better definition of the morphosyntactic contexts where both phenomena take place.

2. Description of the phenomenon and previous accounts
The Upper Southern dialects of Italy are characterized, among other things, by a generalised reduction of word-final vowels to schwa, or in some cases a complete deletion. Nevertheless, word-final /a/ resists deletion in what has been pretheoretically defined as the “first member of a syntactic cluster” (Rohlfs 1966:177), as shown in (1) with data from Abruzzese (Rohlfs 1966:177), on which this study focuses:

(1) a. na fërmenn b:ellò “a beautiful woman” b. na fërmenn “a woman” < FEMINA(M)

As can be observed in (1), /a/ only surfaces when phrase-internal in the first member of the phrase (1a), whereas the same vowel is reduced to schwa in phrase-final position (1b). Interestingly enough, in the same dialects the surfacing of /a/ is also documented counteretymologically, as shown in (2):

(2) a. li kina mi “my dogs” b. li kina “the dogs” < CANE(S)

Among the descriptive literature on Abruzzese, De Lollis (1901) provides a detailed study. As for the theoretical literature, Maiden (1995) and Vogel (1997), basing their claim on a restricted and non uniform amount of data, have described the phenomenon in Prosodic Phonology. More specifically Vogel (Vogel 1997:63) defines /a/ introduction as a rule introducing /a/ at the end of a non-final Clitic Group in a Phonological Phrase. The collection and analysis of a larger amount of data carried out for this study, among which compounds, nominal reduplicative constructions and loanwords, allows to question Vogel’s account for several reasons, among which are the following:

- /a/ surfaces inconsistently instead of schwa in the same syntactic configuration, which should arguably lead to the same phonological phrasing. This is shown in (3):

(3) a. lu kane nere “the black dog”

b. la fãtta nere “the black cat”

- /a/ surfaces inconsistently between members of compounds which fall into the same group in Scalise and Bisetto (2009) classification, and should therefore get the same prosodic phrasing. This is exemplified in (4):

(4) Attributive endocentric compounds

a. akwara’ matè “copper bisulfite” vs. fìna ‘rikè “Greek hay”

water coppered hay Greek
Indeed Ledgeway (2009), commenting on final vowels resisting deletion in Neapolitan, (a similar but slightly different phenomenon), argues that syntactic constituency is not sufficient in order to predict the surfacing of final vowels in adjacent words, suggesting that the alternation of reduced/unreduced vowels may be determined by a lexical specification of a restricted set of items.

3. Splitting /a/ insertion

Notwithstanding the possibility of lexical specification of some items, the analysis advanced for Abruzzese, crucially sets apart the surfacing of etymological /a/ from that of non etymological /a/. I argue that etymological /a/ surfaces as an effect of the metrically strong position of the vocalic nucleus in a metrically strong position: it precedes the head of a licensing domain. Indeed, /a/, in contrast to all other vowels, resists deletion in protonic position word-internally in the same language. Here, the resistance of pretonic lexical /a/ to reduction is claimed to actually concern a chunk bigger than the word. This proposal does not sensibly detach from the spirit of Maiden’s and Vogel’s account, and also matches quite well Bafile’s (1997) proposal concerning a similar phenomenon of Neapolitan. Crucially, however, it restricts it to the surfacing of “etymological /a/”.

The insertion of non etymological /a/, on the other hand, is argued to boil down to the phonological interpretation of a morphosyntactic boundary. I assume here that word-final nuclei of inflected and non inflected forms which do not end in etymological /a/ are lexically empty and can optionally be phonetically realised as schwa. I also follow the idea that a morphosyntactic boundary which impacts phonological computation may appear in phonology as syllabic space, i.e. the boldfaced empty CV unit under (6) below (cf. Direct Interface, Scheer 2012). Finally, the representations under (6) are couched in Strict CV (Lowenstamm 1996, Scheer 2004). In (6a), where a nominal reduplicative construction is exemplified, the empty CV that represents morpho-syntactic information triggers insertion of a word-final epenthetic vowel in sandhi: the first vowel of the second word under (6) needs to govern the empty V of the sandhi-CV. Being governed, this empty V cannot govern the word-final empty V of the first word which therefore acquires featural content via epenthesis (epenthetic /a/ is attested elsewhere in the language-other reasons for the surfacing of a vs. œ are also explored):

(6) marœ marœ [maramaro] C V C V C V C V C V

“through the sea”

In adjectival reduplicative constructions, on the other hand, no CV is projected and non etymological epenthetic /a/ is not attested (i.e. tsuλ em sullœ “truly small”).

4. Summary

The analyses of /a/ insertion in the Upper Southern dialects of Italy have so far conflated the surfacing of etymological and non etymological /a/, leading to some limits in the analysis proposed. Disentangling the two phenomena provides greater insight into this sandhi phenomenon and a better definition of the morphosyntactic contexts where both phenomena take place (i.e. non etymological /a/ is inserted only in exocentric compounds, only in DPs involving postposed possessives but not other postposed adjectives, in reduplicative nominal and verbal contractions but not in the adjectival and adverbal ones).

References


Nevins (2010) has proposed that phonology possesses an operation homologous to syntactic Agree, applying in harmony and assimilation processes. In this vein I investigate the consequences of a stronger homology between phonology and Minimalist syntax. I propose that phonological features realised by the phonetics are not introduced by an underlying lexical form but are the result of a derivation building structure directly from complexes of features in the phonological inventory. This maps to morphosyntactic and phonetic interfaces. To implement this I introduce a new category of phonological feature analogous to the uninterpretable features of syntax. Agree applies to mark these features for deletion at the interface with morphosyntax.

This phonological architecture makes strong predictions for the interaction between Agreement processes and deletion/reduction processes. Since deletion removes features that are present at the morphosyntactic level, it must occur after the derivation transfers to the interfaces, during the mapping to the phonetic realisation. Agreement, however, must occur before transfer. The result of this is that deletion must always counterfeed or counterbleed Agreement. I examine two cases of such an opaque relation in Newar, one where consonantal deletion counterbleeds assimilation of a following vowel (eg. \(b^\text{\textsc{as}}\text{V} > b^\text{\textsc{ae}}\) ‘language.\textsc{abs}’), where the front feature of the sibilant is realised on the following vowel, which would otherwise undergo total vowel harmony with what precedes. In the other case, vowel deletion counterbleeds a height harmony process between stem and suffix (eg. \(p\text{\textsc{l}}u\) ‘roof’ + \(e: \text{\textsc{loc}}\) > \(p\text{\textsc{l}}\text{i}\) ‘on the roof’).

I then discuss three apparent exceptions to this generalisation, in Chukchi (Odden 1994), Newar, and Karok (Bright 1957, Kenstowicz and Kisseberth 1977, 1979). In all three cases, I argue, what is at issue is not deletion but segmental insertion, which should occur before Agree applies. In Chukchi, deletion of a vowel appears to feed nasal harmony between consonants (eg. \(r\text{\textsc{ta}}n\) ‘tooth’ but \(r\text{\textsc{mma}}-\text{nt}\) ‘teeth’), but the fact that the deleted vowel is always an unmarked schwa suggests that its features are never present at the morphosyntactic interface, and whether a vowel is inserted is determined by conditions in the mapping to the phonetic realisation.

In Newar, we see deletion apparently feeding harmony between a deleted consonant and surrounding vowels, and bleeding Agreement between vowels and preceding glides (\(b^\text{\textsc{wod}}\text{-}\text{\textsc{b}}\) ‘feast-\textsc{abl}’ but \(b^\text{\textsc{w}}\text{e}\) ‘feast.\textsc{abs}’ shows both). I present evidence that what is at issue is not the deletion itself, but the insertion of a deletion-triggering segment, an analysis which accounts for both phenomena.

In Karok, we see vowel deletion feeding or bleeding palatalisation in sibilants (eg. \(a\text{\textsc{psi};h}\) ‘leg’ but \(n\text{\textsc{ani}}-\text{\textsc{pfi};h}\) ‘my leg’). I argue that this is not true deletion but allomorph selection, and present evidence that such a morphological alternation really exists in the language,
noting that alternants lacking the initial vowel frequently occur in isolation (eg. iʃpʊk ~ ʃpʊk ‘money’). Again, the segment that appears to be deleted is simply never inserted.

To conclude I argue that although the predictions made by a naïve, strong homology between phonological and syntactic architectures appear to be falsified, closer examination of certain exceptional cases throw doubt on the validity of this falsification, which lends some plausibility to the hypothesised homology. Further investigation of predictions made will demonstrate the degree to which it can be held or whether it must be scaled back. The results of this paper demonstrate that such an investigation may well be fruitful.

References


The Sound of Subject Pronouns in Porteño-Spanish
Andrea Pešková

1. Aim
The present study investigates the overt realization of pronominal subjects (PS) in Spanish on the syntax-discourse-phonology interface based on spoken language corpora. The aims are twofold: first, to provide evidence for correlation between different discourse functions of overt PS and their syntactic and prosodic properties, and, second, to show that prosody plays an important role in interpreting the use of overtly realized PS in languages such as Spanish.

2. Background
As a point of departure, the following assumptions are made: (1) Spanish is a pro-drop language (e.g. Ø canto = ‘I sing’). Whereas the grammarians assume that the overtly realized PS are either focus [F] or contrastive topics [Tc] (see e.g. Luján 1999; RAE 2010), empirical (spoken) data show that the overt PSs are used even in non-focal and non-contrastive contexts. These PS can be interpreted as familiar topics [Tf] or aboutness-shift [Ta] topics (see Frascarelli/Hinterhölzl 2007). (2) Focused subjects (as full DP) are syntactically prominent (shifted to the rightmost position in declaratives with transitive verbs in Spanish) and/or prosodically prominent (i.e. bearing nuclear stress) (see e.g. Gabriel 2010; Zubizarreta 1998). (3) Subjects as topics are left-dislocated or right-dislocated elements (see e.g. Alexiadou/Anagnostopoulou 1998; Bosque/Gutiérrez-Rexach 2009). As for prosody, Frascarelli (2007) found a correlation between the three types of topics and their prosodic realization in Italian: Familiar topics are prosodically realized by low tones, contrastive topics by high tones and aboutness-shift topics by rising tones. My hypothesis is that Frascarelli’s finding is valid beyond Italian and applicable also for Spanish.

3. Methodology & Data
The studied dialect in this paper is the so-called Porteño-Spanish, a variety spoken in Buenos Aires. The examined data are based on three one-hour-long free interviews, recorded in 2009 in Buenos Aires. The acoustic analysis was carried out using Praat (Boersma/Weenink 2010) and applying the Spanish ToBI labelling system for the prosodic annotation (as suggested by Aguilar et al. 2009; Estebas Vilaplana/Prieto 2009; Gabriel et al 2010). The analysis comprises of 1632 sentences in which 311 PS were overtly realized.

4. Results
First results support the hypothesis and show that the discourse function of PSs is reflected in prosody as well as in syntax:

• **Focused** PS may be marked semantically (focusing adverbs), syntactically (right-shifted position; cleft constructions) and/or prosodically. The tonal realization of the focused pronominal subjects is mostly a L+H*+L (see Fig. 1), a typical pitch accent realization marking focus and emphasis in the observed variety (see Gabriel et al 2010).

• PS as **Topics** are left-dislocated elements (or right-dislocated elements in a few cases). Their prevailing tonal realization is a rising tone with its peak located within the accented syllable (L+H*) (see Fig. 2). The **contrastive** topics prefer also a high tone (H*) (see Fig. 3), whereas the **aboutness-shift** topics may be realized as a rising tone with its F0 peak aligned with the posttonic syllable (L+>H*) or as a low tone (L*). The **familiar** topics are realized predominantly by a low tone (see Fig. 4), and less by a L+(>)H*. The deaccentuation (low contour, low intensity) of the PS contradicts the grammarians who state that the overt subject pronouns must be always stressed (see e.g. Zagona 2002).

• Moreover, the data indicate that an overt (and obligatory) PS as focus is the most prominent constituent (the highest pitch), whereas an overt (and omissible) PS as a
familiar topic is the less prominent constituent within one prosodic unit. Interestingly, the frequency of the PS (with the four different discourse functions) as a “highlighted” element within its prosodic unit has been observed thus: [F] 93% > [Tc] 68% > [Ta] 39% > [Tf] 26%

5. Implications for further research
The tonal analysis of PS can (1) give us more certainty and precision about the interpretation of its discourse function in contexts where the pragmatic argumentation may cause disputes or doubts; (2) fill the gap in the investigation regarding the meaning of realized pronominal subjects in Spanish.

References
Learning Phonological Alternations with Online Constraint Induction
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In Optimality Theory (Prince and Smolensky, 2004) and Harmonic Grammar (Legendre et al., 1990; Smolensky, 2006; Pater, 2009), the constraint set is generally taken to be universal. Universal Grammar (UG) thus contains GEN, CON, and EVAL. However, recent work in phonology has explored the possibility that the phonological learning problem may be tractable even if UG only contains GEN, EVAL, and the means with which to induce a constraint set. Thus far, these explorations have been fruitful, but there is still much ground to be covered.

First, most constraint inducing phonological learners developed so far (Hayes and Wilson, 2008; Adriaans and Kager, 2010; Moreton, 2010; Alderete et al., 2012) have focused on modeling phonotactics, and thus have not induced faithfulness constraints. They generate categorical or probabilistic grammaticality judgments, not input-output mappings. This is an important part of the role of the constraint set, but a full theory of an induced CON must address the learning of faithfulness constraints and model alternations. The Minimal Generalization Learner (Albright, 2002) learns alternations by inducing rules, not constraints. The model presented here focuses on learning alternations through the use of markedness and faithfulness constraints in order to address this gap.

To further test the feasibility of constraint induction as a replacement for an innate CON, this model employs online rather than batch learning. Hayes and Wilson (2008) uses batch learning, in which all of the training data is taken into account while the learner chooses the constraints (or rules) to put into the grammar. However, learning can also be done in an online fashion, in which constraints are induced as the learner sees new data points. This type of learning requires less working memory and can respond to new data as it comes.

The present model maps underlying forms to surface forms, inducing markedness and faithfulness constraints one at a time when an error is made. The learner is tested using a set of Turkish words, drawn from the Turkish Electronic Living Language (TELL) database Inkelas et al. (2000) by Becker et al. (2011), that display word-final devoicing and vowel harmony. This allows for a test of both local and long-distance alternations.

Vowel harmony in particular poses a challenge to the learner. Simulations test how powerful the constraints need to be in order to capture the generalizations of Turkish vowel harmony. Some markedness constraints are selected by the learner to apply over a featural tier, such as the vowel tier, in order to aid generalizations across vowels that ignore intervening consonants. Some faithfulness constraints are selected to apply only to the stem of the word, in order to help the learner discover that suffix vowels change to agree with stem vowels rather than the reverse.

In order to learn alternations, underlying forms were generated for the words in the corpus following a set of assumptions about word-final devoicing and vowel harmony. For each resulting input-output mapping, other mappings were then generated that have the same input but ungrammatical outputs, producing tableaux with only one correct output. For each iteration of learning, the tableaux are divided randomly into a training set and a testing set. The learner chooses a winner from each tableau in the training set, stopping
after each incorrect choice to either induce a new constraint or adjust the constraint weights, so as to lower the chances of making similar errors in the future. The constraints and their weights are then frozen as the learner chooses winners from each tableau in the testing set. The performance on the testing set shows how well the learner found the generalizations in the Turkish data.

Simulations consisting of 20 learning iterations for each condition were run in order to compare the accuracy of learning as well as the size and generality of the constraint set when allowing or disallowing tier-based and stem-specific constraints. The results show that both of these types of constraints significantly improve the learner’s performance on vowel harmony. Furthermore, some conditions have average testing accuracy rates as high as 97%, indicating that online constraint induction is a feasible approach worthy of further study.

References


Consonant cluster phonotactics in Pazar Laz
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Introduction. Clusters in Caucasian languages have a rather daunting size and phonotactic complexity, cf. Hewitt (2004) for an overview. This talk focuses on Pazar Laz (PL; NE Turkey), whose clusters are relatively restricted in size, compared to other Caucasian languages. Yet they challenge formal models of phonology, which are usually tailor-made for Indo-European languages. This is the first attempt to analyse PL clusters within Government Phonology (GP; Kaye, Lowenstamm & Vergnaud 1985, 1990); for Georgian clusters cf. Ritter (2006), Demirok (2011). Here I will look at initial clusters, simply because final clusters do not occur and medial clusters are relatively “banal”. I will restrict myself to clusters not straddling morpheme boundaries, as prefixation can lead to sequences otherwise unattested.

Analysis. Two statements characterise PL clusters. Firstly, adjacent obstruents have to agree in laryngeal properties (voiced/voiceless/ejective). This is generally assumed to be the case in Indo-European languages, too. This is one indication that there are phonotactic restrictions, but a rather unsurprising one. Secondly, and more importantly, PL clusters are restricted in size. I submit that (1) sets the upper limit.

(1) Initial clusters contain maximally three members (henceforth C₀C₁C₂).

Words such as msk ‘va ‘beautiful’ (the apostrophe marking an ejective), with four consonants in a row, seem to violate (1). However, it can be argued that k ’v forms one unit, i.e. that PL has labiovelars. Otherwise, (1) would only ever be violated by sequences of velar stop+v, a somewhat arbitrary exception.

The majority of clusters contains two members only, using two of the three positions: C₀C₁ or C₁C₂. The difference between these two options will become clear shortly. They both make use of position C₁, which I will call the head of the cluster. Two-member clusters are not random in their phonotactics: we have bgara ‘funeral’ or pkveri ‘flour’, but the reverse, gb/kvp, does not occur, suggesting clear phonotactic restrictions. The choice of C₀C₁ or C₁C₂, together with a theory of government, will generate (most of) the attested patterns.

Consider first C₁C₂. I propose that C₁C₂ is a so-called “bogus cluster” (straddling an empty nucleus), where a relationship of government holds, with C₁ governing C₂. This is the structure underlying the majority of PL two-member clusters, e.g. bgara ‘funeral’ (3a). From a GP point of view, it is unsurprising that bg is a bogus cluster, as it could neither form a coda-onset cluster (C₂ is not an alveolar, cf. Pöchtrager 2012), nor a branching onset (because C₂ is a stop).

What kind of consonants can occupy C₁C₂? For obstruent-obstruent clusters of this type, C₂ has to be (labio)velar, while C₁ cannot be (labio)velar. This correctly excludes both members being (labio)velar (*gy, *gy, *kwx). This does not mean that velars can never be heads (i.e. in C₁): They can govern following nasals, as in the C₁C₂-clusters xmr, gn etc. (xmareri ‘used’, gnaperi ‘understood’), with x/g in C₁ and m/n in C₂. This suggests a hierarchy of government:

(2) non-velar > velar > nasal (where ‘>’ = ‘governs’)

Postulating such a hierarchy does not yet explain why it looks that particular way. Kaye, Lowenstamm & Vergnaud (1990) assumed that government relationships are subject to a requirement that the governor be no less complex than the governor in terms of the number of elements. While it is true that velars contain less elements than alveolars or labials according to Kaye (2000), it is not clear that that labiovelars or nasals have the required complexity differential. The notion of glue (Pöchtrager...
2012), which requires certain elements to be present for government relationships to hold (e.g. nasality), seems to fare better, at least in some respects.

Consider now the option C₀C₁: C₁, the head, is on the right; the governee, C₀, on the left. This is the structure of kteri ‘indirect’, kife ‘white’, kseri ‘rotten’ (if its are single units), mk’oli ‘grasshopper’, ygola ‘plateau’ etc. These clusters follow the hierarchy in (2), only with reversed directionality, i.e. right to left: a non-velar governs a velar (kt), a velar governs a nasal (yg).

The two types (C₀C₁ vs. C₁C₂) are thus mirror images of each other, pivoting around C₁, the head. However, the mirror images are not perfect, the right-headed relationship between C₁ and C₀ is both (i) more and (ii) less restrictive. For (i) cf. kteri ‘indirect’, where a non-velar governs a velar; but this non-velar has to be an alveolar, excluding *kp etc. For (ii) cf. when C₀ is a nasal: both a velar and a non-velar can sit in C₀, suggesting that the difference velar vs. non-velar plays no role here.

From what we have seen so far, the phonotactics of three-member clusters (C₀C₁C₂) can now basically be derived. The head (C₁) is in the middle, and it has to be an alveolar. The flanking consonants will be lower in the hierarchy in (2). In fact, C₀ is usually a nasal (with one exception), while C₂ is a (labio)velar. This is illustrated by ndiga ‘day’, msk’va ‘beautiful’, nfxoro ‘9’ etc.

While C₁C₂ is an onset-onset cluster, it is somewhat unclear what C₀C₁ is. The requirement that C₂ be alveolar if C₁ is velar is reminiscent of English (French, German etc.) obstruent-obstruent clusters. They require the head to be alveolar, actor (*acor), chapter (*chatper), and are all coda-onset clusters; cf. Pöchtrager (2012) for the special role of alveolars. One could suggest that PL kteri ‘indirect’ is also a coda-onset cluster. (For initial coda-onset clusters cf. Kaye 1992.) However, mk’oli ‘grasshopper’ or malik’a ‘wheat’ shows that a nasal in C₀ does not have to be homorganic with C₁, which is usually nasal in C₀ (Engl. send, *send etc.) and therefore suggests two separate onsets, also here. Two attempts at representing ndiga ‘day’ are given in (3b–c). Standard tests (proper government, government licensing) to separate the two types, all relying on the presence/absence of a following nucleus, are inappropriate in PL since there will always be an audible nucleus following.

The distribution of /r/ and its influence on vowels in English: a CV analysis
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In this talk I analyse pre-/r/ vowels in English. I develop the idea proposed by Harris (1994) that postvocalic /r/ exerts influence on preceding vowels, because it resides in a branching nucleus, and I follow Nádasdy (2006) in distinguishing breaking from broadening. I identify the cause of /r/’s behaviour in its change from a consonant into a glide, because of which it is no longer allowed in non-prevocalic position (i.e. preceding an empty nucleus).

Data. (1) presents the vowel system of Received Pronunciation (RP) (Nádasdy 2006).

<table>
<thead>
<tr>
<th>(1) lax</th>
<th>(2) lax</th>
<th>(3) broad lax</th>
<th>(4) tense</th>
<th>(5) broken tense</th>
</tr>
</thead>
<tbody>
<tr>
<td>broad lax</td>
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</tbody>
</table>

The table below shows the distribution of the four types of stressed vowels preceding a (historical) /r/ vs. preceding any other consonant, within monomorphemic forms (see e.g. Wells 1982). Both the RP and the General American (GA) forms are given (in that order), when they differ from each other. (Note that coronal clusters and sC-clusters can occur in (b) and (d), indicated by the — sign, instead of an *)

<table>
<thead>
<tr>
<th>(a) _ $CV</th>
<th>(b) _ C$CV</th>
<th>(c) _ C#</th>
<th>(d) _ CC#</th>
<th>(a,r) _ SrV</th>
<th>(b,r) _ r$CV</th>
<th>(c,r) _ r#</th>
<th>(d,r) _ rC#</th>
</tr>
</thead>
<tbody>
<tr>
<td>’sgti</td>
<td>’prlegtis</td>
<td>stgm</td>
<td>galp</td>
<td>’kãri</td>
<td>*</td>
<td>stg# / stgr</td>
<td>*</td>
</tr>
<tr>
<td>’sgm</td>
<td>—</td>
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<tr>
<td>’dēpta</td>
<td>—</td>
<td>tgm</td>
<td>—</td>
<td>’věãri / ’věri</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>’mplásí / ’mplâși</td>
<td>—</td>
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</table>

Generalisations. Comparing the pre-/r/ contexts (a-d.r) with those preceding other consonants (a-d), the following patterns arise. G1. Tense (4) and broken tense (5) vowels are clearly complementary: tense vowels never precede /r/, while broken tense vowels only occur in this context (except for a few examples, indicated by the + sign, resulting from Smoothing of a tense vowel plus /s/ sequence, as in [r1æl] from [iæl] in (5c)). G2. The case of lax (2) and broad lax (3) vowels is less clear-cut. We find complementarity in the pre-/r/ context: lax vowels can only precede /r/ followed by a vowel (2a,r), whereas broad lax vowels only occur before non-prevocalic /r/ (3b-d.r) (except for a handful of recent loans like [sɔ’lãri] (3a.r)). But we also find broad lax vowels in non-pre-/r/ contexts (3a,c), unlike their broken tense peers. G3. In a non-rhotic system like RP, /r/ itself only surfaces prevocally (a.r), resulting in word-final /r/–Ø alternation, called Linking /r/ (c.r) and Intrusive /r/.

Analysis. In this talk, I aim to provide a unified explanation for all three generalisations. I propose that their common source lies in the weakening of non-prevocalic /r/ from a consonant to a glide (around the end of the 16th c.). The glides /j,w/, however, are prohibited in this position in English (*’prlegtis, *’staj), cf. (2b,c)), and /r/, now itself a glide, has to conform to this phonotactic restriction. Essentially, there are two ways to achieve this: either the /r/ forms a diphthong with the preceding vowel, or it disappears. Both solutions are exemplified in the history of English.

The first can be best demonstrated by the GA forms containing pre-/r/ broad lax vowels (6b). Evidence for diphthongal status of broad lax vowel plus /r/ sequences is provided for example by Spoonerism, as in [pɑ: r pɑ:t] for pie party (Harris 1994).

My analysis uses strict CV representations (in terms of Lowenstamm 1996), utilising trochaic
(left-to-right) proper government (PG) (following Rowicka 1999). I represent rising diphthongs as in (6a): V₁ governs V₂, and because in English glides must be followed by a filled V position, the melody of the underlying off-glide spreads to the following V position. I propose the same representation for forms in (3b-d.r), as (6b). The merger of /i, e, u/ into /ɔ/ (Broadening) in words like *bird, herd, and turn* can now be attributed to the influence of /r/ within the diphthong. The V positions are connected by the PG relation, which is manifested in phonotactic restrictions in rising diphthongs as well (although there of a less clear nature).

In recent versions of Element Theory, /i, ɔ, ʌ/ are represented melodically as the expression (A) (e.g. Backley 2011). The merger can thus be captured as delinking of I and U from a non-A-headed vowel, and spreading of A from a following /r/ within the diphthong. Meanwhile, A-headed vowels, [o, æ], are not merged with the rest, but they also change.

In RP, broadening is shared with GA, but instead of a diphthong we find a long vowel (6c), *[maːsi]*. Here thus the solution is not spreading of the melody of /r/ to the following V position, but delinking it, followed by compensatory lengthening of the preceding vowel. In forms like (2a,r), *[ˈkɛri]*, /r/ precedes a filled V position, therefore no quality or quantity changes apply in either system (but note examples like *[ˈhɛri]* in GA, which I will explain separately). Broad lax vowels in non-pre-/r/ positions (3a,c), like *[pʊm]*, not resulting from pre-/r/ broadening, must be present lexically. In fact, I argue that broadening is no longer an active process, it is rather a completed historical change, accounting for the gap in (2b-d.r).

**Conclusion.** Examining /r/ not by itself, but as a member of the class of glides, can shed light on its seemingly peculiar behaviour, which can be analysed in an elegant way in a strict CV framework, utilising recent developments in Element Theory.


About the underlying representation of words starting in VsC- in Catalan and the opaque character of morphophonological alternations by prefixation
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(claudia.pons@ub.edu, mrosa.lloret@ub.edu)

1. Uncertainty in URs. The structure present in underlying representations is not challenging when productive morphophonological alternations shed light on it, and when there is a clear and systematic phonological condition in the language that justifies the differences between the underlying representation that has to be established and the corresponding surface representation. The challenge, or the uncertainty, appears in those cases in which such morphophonological alternations do not exist, when they are not fully productive, and also when alternative interpretations are possible.

2. Vowel epenthesis in Catalan. In Catalan, vowel epenthesis has often been invoked to explain the presence of a vowel (typically [a] in Eastern dialects and [e] in Western dialects) in those situations where its absence would entail the occurrence of a structure defying some kind of syllabic constraint (Mascaró 1976, Wheeler 1975, DeCesaris 1987, Lloret 2002). In few of these cases, though, the postulation of epenthesis is fully legitimate by truly productive morphophonological alternations, so that other interpretations of the vowel are available (Wheeler 2005). For instance, word-initial epenthesis has been adduced in words like escriure ‘to write’, esperar ‘to wait’, estructura ‘structure’, esport ‘sport’ and estona ‘while’, as a strategy to avoid word-initial sC- clusters. But the epenthetic nature of the vowel is only justified in words like escriure or esperar, by alternating prefixed forms without the vowel like in[Ø]escriure ‘to register’, des[Ø]criure ‘to describe’, pro[Ø]esperar ‘to prosper’, exa[Ø]esperar ‘to exasperate’, which in fact are dubiously productive, as recent prefixed forms, with a vowel ([a]) preceding the stem, show (regescriure ‘to rewrite’; desesperar ‘to despair’).

Words like estructura or estona, or loanwords like esport, lack such alternations, and in fact the vowel systematically appears in the resultant prefixed forms (cf. macroestructura ‘macrostructure’, Interesport ‘commercial name’, antiesportiu ‘un sporting’, poliesportiu ‘sports center’).

3. Goal. In this paper we focus on these cases with a word-initial vowel followed by a consonantal cluster (escriure, esperar, estructura, esport, estona), which, as seen, has typically been interpreted as epenthetic, although there is unsubstantial empirical evidence to do it. On the basis of the casuistry related to the phenomenon of underapplication of vowel reduction in Majorcan Catalan, however, we provide some empirical arguments for an underlying representation of the words starting in VsC- without the initial vowel, and we show how the alternations motivated by prefixation are undoubtedly opaque.

4. Empirical focus and analytical proposal. In Majorcan Catalan, the process of vowel reduction of the mid front vowels to schwa in unstressed position (carr[é]r ‘street’ ~ carr[ə]rt ‘street dim.’; cont[έ]st ‘(I) answer’ ~ cont[ə]st[á]m ‘(we) answer’) underlies a) in productive derived forms with an unstressed vowel located in the initial syllable of the stem which alternates with a stressed mid front vowel in the stem of the primitive (f[é]sta ‘party’ ~ f[ə]ssa ‘party augm.’); b) in verbal forms with an unstressed vowel located in the left syllable of the stem which alternates with a stressed close mid front vowel in another verbal form of the same inflectional paradigm (p[é]ga ‘(s/he) hits’ ~ p[ə]ga ‘(we) hit’); c) in learned words and loanwords with an unstressed e located in the left syllable of the stem and generally preceded by a labial consonant (f[ε]tix[ɪ]sme ‘fetishism’; v[ε]d[ε]t ‘vedett’). These facts are accounted for in
Pons (2012, in press) by resorting to a set of output to output positional faithfulness constraints relativized according to the position of the vowel within the stem (cases a, b), and by a contextual markedness constraint against a schwa in stem-initial position (cases c). Interestingly enough, as seen in (1) and (2), the initial vowel in word-initial VsC- clusters behaves as «invisible» to these output output positional faithfulness, and it is unaffected by the contextual markedness constraint against a schwa in the initial syllable of the stem. And this can be taken as positive evidence that the initial vowel, realized as a schwa, is actually an epenthetic vowel. If this were not the case, the second vowel would not be affected by these constraints, because it would occupy a position other than the initial within the stem. On the other hand, we are going to illustrate how the fact that native Majorcan Catalan speakers show some vacillations between realizations with [e] and [a] in cases where the morphological structure of the words is uncertain regarding to its prefixed character (empr[ə]nyar ‘to bother’, engr[ə]ixar ‘to gain weight’, al[ə]grar) corroborates the opaque character of morphophonological alternations by prefixation.

5. The theories about the determination and acquisition of the underlying representations in the light of our data. We show how these data is also relevant in order to test the different theories about the determination and acquisition of the underlying representations in cases of lack of morphophonological alternations. Our data does not allow both a Richness of the Base approach and a Lexicon Optimization approach (Prince & Smolensky 1993/2004), in that if we depart from an underlying representation with the schwa (/ssC/) we obtain inexistent forms with vowel reduction to schwa of the second vowel. Indeed, the output-output faithfulness constraints relativized according to the position of the vowel within the stem, adduced to explain the cases in a and b, or the contextual markedness constraint against a schwa in the initial syllable of the stem, adduced to explain the cases in c, would be innocuous (they would not have effects) for the words starting in VsC-, in that the vowel would not be placed in the initial syllable of the stem. Vowel reduction would then apply erroneously in these cases: *Esp[ə]yet, *esp[ə]ram and *esp[ə]cial. Only the radical version of Richness of the Base (McCarthy 2005), which predicts a single underlying representation without the vowel (/ssC/), can handle the data. Given the lack of real morphophonological alternations in the cases dealt with in this paper, moreover, we argue for a radical version of Richness of the Base in which morphophonological alternations are not strictly necessary in order to project unfaithful mappings of the type /Ø/ → [a], but just the predictable character of the mapping between the underlying and the surface representation, along the lines of classical generative phonology.

Data

(1) Productive derivative forms and verbal forms with initial schwa + sC

| [ə][s]p[ə]ra | ‘(s/he) waits’ | [ə][s]p[ə]r[ə]u | ‘(you) wait’ |
| [ə][s]f[ə]n | ‘(s/he) tends’ | [ə][s]f[ə]nem | ‘(we) tend’ |

(2) Loanwords and learned words with initial schwa + sC

Stress in Greek is lexically-encoded on morphemes and is assigned on the basis of a grammar-specific principle: *stem accent* prevails over *inflectional suffix accent*: /buyáð-ôn/ [buyáðon] ‘laundry-GEN.PL.’ (Ralli & Touratzidis 1992; Revithiadou 1999). A trisyllabic window confines stress to the last three syllables of the word yielding (ante(pen))ultimate stress (1) (Drachman & Malikouti-Drachman 1999). Moreover, there is a split in the accentual behavior of nouns and verbs in the sense that verbs mainly opt for APU stress.

(1)  
<table>
<thead>
<tr>
<th>a.</th>
<th>0álasa</th>
<th>/0alas-a/</th>
<th>accentless stem</th>
<th>‘sea-NOM.SG’</th>
</tr>
</thead>
<tbody>
<tr>
<td>b.</td>
<td>kopéla</td>
<td>/kopél-a/</td>
<td>accented stem</td>
<td>‘girl-NOM.SG’</td>
</tr>
<tr>
<td>c.</td>
<td>0álasón</td>
<td>/0alas-ôn/</td>
<td>accented suffix</td>
<td>‘market-GEN.PL’</td>
</tr>
</tbody>
</table>

On the basis of the above, it has been claimed that APU stress represents the *phonological default*, i.e., the non-lexically inflected stress (cf. Malikouti-Drachman & Drachman 1989; Revithiadou 1999). However, recent psycholinguistic studies reveal that (a) APU stress is not the preferred stress pattern in reading tasks (Protopapas et al. 2006), (b) it is marginal in suffixless words, e.g. acronyms (Revithiadou et al. 2011; Topintzi & Kainada 2011) and (c) even within nouns, it is confined to more fossilized morphological classes, e.g. nouns in -os (Apostolouda 2012).

Under the *Stress Deaf Hypothesis* on acquisition (Peperkamp & Dupoux 2002; Dupoux & Peperkamp 2002, et seq.), speakers of morphology-oriented stress systems are expected to have richer representations of stress in their mental lexicon because they are exposed as infants to more stress contrasts compared to speakers of purely phonological stress systems. On the basis of this assumption, therefore, it is expected Greek speakers to predominantly rely on their stress encoding mechanism when confronted with stress decisions on lexical items of unknown accentual properties, thus producing mainly lexically-inflected stress patterns, and not the phonological default (=APU stress). In order to explore which stress pattern Greek speakers opt as their default/preferred choice, we designed and conducted two perception experiments.

Two hundred pseudowords were constructed to be used in the perception experiments on the basis of real words from 5 major morphological classes: nouns in -os, -o, -a, -as, -i(fem), and were all of specific size and syllable type: CCV.CV.CV, CV.CV.CV, CCV.CV, CV.CV. Each pseudoword was checked for (a) bigram frequencies and (b) neighborhoods & cohorts which ensured that it would be close to existing Greek words but, at the same time, not too distant to be perceived as non-Greek by Greek speakers. More specifically, the mean values of the aforementioned variables were calculated on a modified version of the CLEAN corpus (version: ignoring stress, http://speech.ilsp.gr/iplr, 200.000 lemmas) which only contained nouns of the same morphological classhood and segmental make-up as our pseudowords. For each word category (e.g., CV.CV.CV nouns in -os, CV.CV.CV nouns in -as, etc.), we performed a statistical analysis in order to find out the mean value and standard deviation of all variables at hand (bigram frequency, etc.) according to the *NumTool* – a component of the ILSP PsychoLinguistic Resource set of tools and data (http://speech.ilsp.gr/iplr/NumTool.aspx). Only those pseudowords that fell within the mean value of the +/-1SD range were used.

Our final perceptual stimuli contained 260 pseudowords spoken by a male native speaker of Standard Modern Greek in his thirties. The pseudowords were recorded in a carrier sentence in post-focus position (lit. ‘To ELDERLY Lena *pseudoword* is speaking’) which ensured that they remained unaccented, i.e., the intonation contour after the focused
item was flat (Arvaniti 2007). Of those pseudowords, 60 served as fillers (i.e., they retained their original stress) and 200 were manipulated so that no syllable would be detected as stressed by the listeners. In the first experiment, the pseudowords were manipulated as follows: The speaker read two (or three in the case of trisyllabic pseudowords) versions of each pseudoword, one with the stress on the first syllable and one on the second syllable (and one with the stress on the third syllable in the case of trisyllabic pseudowords). The unstressed syllable of the first version was then replaced with the stressed syllable of the second version (this replacement was done two times in the case of the trisyllabic pseudowords). The new pseudowords thus contained syllables with only full (i.e., non-reduced) stressed vowels. The syllables were then normalized to have the same duration and intensity contour. This was done by averaging the duration and intensity of the two (or three) vowels and applying the average duration and intensity values to both (or to all three) vowels using Praat scripts (Boersma & Weenink 2012). In the second experiment, the same manipulation procedure was followed but this time the new pseudowords contained syllables with only unstressed (reduced) vowels.

Twenty native speakers of Standard Modern Greek (11 female, 8 male) with a mean age of 31 years (range = 18-56 years) participated in the experiments. The second experiment was run one week after the first one using the exact same methodology. Participants were tested individually in a quiet room using a laptop computer and high-quality headphones. Participants heard a pseudoword in random order and chose, by clicking on a label on the screen, between three (or four in the case of the trisyllabic pseudowords) options, namely “Stress on the first (syllable)”, “Stress on the second (syllable)”, “Stress on the third (syllable)”, and “It is not clear where the stress falls”. Participants could hear each stimulus twice if they wanted by clicking on a repeat button. A practice task with 20 stimuli preceded the experiment.

The results of the first experiment (pseudowords containing only stressed syllables) showed that even when the acoustic correlates of stress are equated across syllables, Greek speakers can still ‘hear’ stress on the pseudoword (only 15% of the times they chose the “It is not clear where the stress falls” option), a finding that is confirmed by the initial results of the second experiment (pseudowords containing only unstressed syllables). Moreover, our results clearly indicate a strong preference for PU stress, which was predominantly the preferred choice in most noun classes, with the exception of trisyllabic nouns in -os and -o, where APU stress was opted (55% and 56%, respectively). We take these results to provide support for our original hypothesis: Greek speakers employ an inherent stress encoding mechanism in order to compute the stress pattern of a given word even when there is no audible prominence peak. In doing so, however, they seem to also rely on morphological cues such as classhood and, possibly, on frequency effects (e.g., preponderance of APU-stressed nouns in -os, -o in the Greek lexicon).

Selected references
Syllables, Templates and Third factor: why your baby is neither a bird, nor a whale and even less a cotton-top tamarin

Tobias Scheer (U. Nice, CNRS 7320) & Sophie Wauquier (U. Paris 8, CNRS 7023)

The minimalist program seeks to reduce UG to the bare minimum of what is unique to human language (Chomsky, 2005). Given results in ethology and animal cognition, phonological representation and computation are considered to lie outside the Faculty of Language in the Narrow sense: rather, they result from more general human and non-human cognitive faculties (“third factor”) that are not specific to language. These faculties may have been separately observed in animals and are “recruited” by humans for the purpose of externalizing language (Samuels, 2011). In this perspective, we expect that 1) the same general cognitive constraints used in language and elsewhere produce the same structural patterns wherever they are in place, i.e. in language, in other areas of human cognition, and in non-human animals (e.g. primates, whales and birds); 2) non-human and human animals acquire these cognitive constraints in the same way. We also expect that “animal phonology” is possible and that other species are able, as human babies do very early on and very easily without any explicit learning, to group the sounds by natural classes, to compute statistical distributions from transitional probabilities, to learn arbitrary patterns of distribution, and to segment a linear speech signal into syllables, feet, words, phrases and to combine them hierarchically in production. From what we know, many species (and especially mammals) are able to recognize and even produce patterns resulting from “grouping patterns”: cotton-top tamarins are able to chunk the speech signal into strings of alternating consonants and vowels (Samuels, 2011), while birds and whales produce branching-structured songs (Doupe & Kuhl, 1999). Neither primates nor birds or whales, however, seem to be able to either perceive or produce syllabic patterns.

Syllables are built on the basic binary onset/nucleus structure and the most important distinction is between closed and open syllables, i.e. ones that do vs. do not bear a coda. A consonant is a coda iff it occurs either string- (word-)finally, or before another consonant (further sonority-related intricacies left aside). The coda pattern thus identifies as the disjunction __{#,C}. We also know that the coda is a marked structure universally, which is acquired by every child after the onsets (Fikkert et al., 2004). In order to show that animals are equipped to do human phonology, it would need to be shown that, given two sets of items A and B (A being consonants in phonology, B vowels), they either naturally produce or are able to extract from a linear stimulus, and without any explicit learning, those A-tokens that occur before another A and string-finally (A₂ and A₅ in #A₁BA₂A₃BA₅#), to the exclusion of all other As. This very basic coda pattern is a little more sophisticated, and foremost non-linear, than what cotton-top tamarins have supposedly been found to be able to do, i.e. to segment for example a linear stimulus into "CVCVCV" units. The same is true for what is quoted in the literature regarding bird- or whalesongs: these do group patterns that are made of series of notes bordered by silences produced in repetitive motives by copy (Samuels, 2011). But these patterns are not akin in any way with syllabic patterns produced by humans: they do not exhibit anything that could be interpreted as an onset, a nucleus or a coda. Note that it cannot be argued that the coda pattern is an adaptation of the more general cognitive capacities mentioned to the specific environment of human language that issues specific demands due to vocal tract properties or the human perceptual system. The first focus of the talk will be to support that syllable structure is purely grammatical/cognitive: it is not predictable from the phonetic signal (all attempts in this direction are unsuccessful, e.g. Steriade 1999, and the syllable is not a category for phoneticians). Therefore whatever being or cognitive system possesses these faculties should produce and be able to perceive syllabic patterns independently of their physical or other environmental properties. This supports Pinker & Jackendoff’s (2005) view on the matter: phonology cannot be considered as an executive residual module of linguistic competence made only of third factor capacities, since major characteristics of phonology are specific to language, uniquely human and discretely infinite.

The second focus of the talk is on the acquisition of syllable structure. It also claims that children use specifically human and specifically phonological faculties in the acquisitional process. Their output does not exhibit the kind of grouping patterns that are reported in the literature on non-human animals, but rather reflects a templatic organization which allows them to ultimately build syllable structure from the linear input. The templatic hypothesis (Macken, 1992; Vihman, 2001) refers to a general behavior of children which is very frequently observed in production. From the 50 words-stage on, and whatever the input language, each child seems to begin with a few systematic structural shapes built on the basis of a small inventory of features, as if s/he had to match her/his incomplete segmental content onto a predefined
number of prosodic (syllabic?) positions. For example, in the data under (i) below, Sacha tends to  
generalize on two main templates (CVC and CVCVC) with either a velar or a labial consonant melody  
and two vowels [a, u]. In this perspective, templatic activity is a structural (phonological) response of the  
babies that enables them to be linguistically active, i.e. to extract relevant linguistic information from the  
linear input, in a situation where necessary grammatical and lexical knowledge is still missing. Templates  
thus facilitate production and help babies to interpret their own output as a structured input; this in turn  
supports a looping learning mechanism: the stabilization of their own phonological representations is  
reinforced.

The talk proposes a modelization of such a template in French from the very early stages towards  
the adult target shape. The developmental scenario exposed is supported by three sets of data: a corpus of  
six children aged 17-29, longitudinal data of a child from 25 to 30 months, and a corpus of elicited and  
semi-elicited production from 38 three- to five-year-old. It is based on a flat, non-branching model into  
which children systematically and gradually add CV units. The analysis traces a developmental course from  
early to later word forms and demonstrates that children begin with open CV and VCV structures,  
systematically avoid codas and deploy in parallel planar segregation between consonantal and vocalic  
melodies to progress by the addition of internal CV units towards the adult target shape of the words.  
It will also raise the following question: where templates in acquisition come from? It may be argued that  
they are a "spontaneous" response of each individual child facing the overwhelming input that s/he  
cannot make sense of (yet). Alternatively, templates may be considered as a part of a hard-wired, i.e.  
genetically coded tool kit that children are equipped with in order to face the acquisitional task. The latter  
scenario implies that similar templates will also be found in other areas of human cognition, and in  
relevant non-human animals. Nothing of the kind has been reported as far as we can see, and the animal  
grouping patterns mentioned are objects that have quite distinct properties. But even in the former  
scenario, the avoidance of codas shows that templates are not just arbitrary sequences of Cs and Vs:  
constraints on codas known from adult grammar are also active before proper syllable structure is  
available.

(i) Sacha’s data, 16.5 months (French, 2009).

<table>
<thead>
<tr>
<th>kak</th>
<th>sac / bag</th>
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<tr>
<td>mak</td>
<td>masque /mask</td>
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<td>gagak</td>
<td>dessert /dessert</td>
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<td>kukuk</td>
<td>poule / hen</td>
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<tr>
<td>papum</td>
<td>chapeau / hat</td>
</tr>
<tr>
<td>bam</td>
<td>ballon / balloon</td>
</tr>
<tr>
<td>dam</td>
<td>dame / lady</td>
</tr>
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Phonetic evidence for VO specification in Polish initial vowels
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In a CV sequence, the initial portion of vowels contains an inherent perceptual ambiguity with regard to the traditional categories of “consonant” and “vowel”. Acoustically, this transition is characterized by the high amplitude periodicity and robust formant structure associated with vowels. Yet listeners rely on acoustic cues at vowel onset for the identification of the previous consonant (e.g. Wright et al. 1997). In other words, a single portion of the acoustic signal may be shared by more than one “segment”. Researchers have been aware of the “linearity problem” in speech perception for decades, yet for the most part phonological analyses continue to be expressed in terms of a linear string.

In the Onset Prominence representational environment (OP; Schwartz 2010), “segments” emerge from the hierarchical prosodic constituent depicted in (1). The nodes of the tree represent the inherent sequence of phonetic events in an initial stop-vowel (CV) sequence. In the primitive ‘CV constituent’, vowels are split into two layers: Vocalic Onset (VO) and Vocalic Target (VT). This configuration captures the ambiguity of VO with regard to the consonant-vowel distinction. The VO may or may not be contained in higher-level obstruent trees (2), or it may itself dominate vowels containing the VT node (3).

<table>
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<tr>
<th>Closure</th>
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<tr>
<td>Noise</td>
<td>/k/</td>
<td>/k/</td>
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<td>VO</td>
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<td>VO</td>
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1. Primitive CV constituent
2. Stop with or without VO
3. Vowel with or without VO

VO specification in vowels (as in (3)) is a language-specific parameter in the OP environment, accounting for the ambiguous behavior of “onsetless syllables”. Prosodically inert onsetless vowels lack VO specification and may be invisible for prosodic processes such as stress and reduplication (e.g. Downing 1998), while those that are prosodically active contain the VO node. VO-specified vowels may thus be thought to contain a “built-in” or “empty” consonant (cf. Marlett & Stemberger 1983). In Polish, vowel-initial syllables may occur word internally and they can bear stress, so we assume that they contain specification for the VO node. Data from Polish dialects (Dejna 1993) illustrate that this “built-in” consonant may be realized as a glide. This paper will present further evidence, in the form of glottalization, in support of the representational claim for Polish vowels.

We should expect Polish VO specification to be marked phonetically, so glottalization of initial vowels should more consistent in Polish than in e.g. English, where it tends to be dependent on higher-level prosodic structure (Dilley et al. 1996). 19 native speakers of Polish recorded sentence lists containing vowel hiatus at word and morpheme boundaries. In total,
646 tokens of hiatus were analyzed. On the basis of variable realization of glottalization (Redi and Shattuck-Hufnagel 2001), a “Glottalization Score” was assigned to each token. The scale ranged from 3 points for full and measurable closure, 2 points for noticeable creak or laryngealization, 1 point for visible drops in pitch or amplitude (Hillenbrand and Houde 1996), and 0 points for no visible signs of glottalization. For word-boundary hiatus, some degree of glottalization (score of 1 or more) was observed in nearly 76% of the tokens (91% for nouns, 68% for adjectives, 59% for prepositions). Further analysis of the tokens assigned a Glottalization Score of 0 suggests that vowel hiatus in Polish may also be marked by changes in spectral balance (Sluijter & van Heuven 1996) that are not visible on an unfiltered acoustic display.

The results of the glottalization study are consistent with the VO parameter setting proposed for Polish initial vowels. VO specification is compatible with their prosodic status LQWKHODQJXDJHDQGILWVLQQLFHOZLWK'RJLO¶V (1999) finding that initial syllables in Polish are marked by secondary stress. Additionally, VO parameters provide an insightful way of drawing a contrast in Polish between initial vowels and certain vowels (inerary, the nasal vowels, and the yer that alternates with zero) that cannot appear in word-initial position.


Learnability is a function of the perceived phonetic distance between two sounds: Phonetics-phonology interface

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Affricates are combination of stop and fricatives. There is always some frication involved in the release phase of stops (Ladefoged & Maddieson, 1996). If the contact area between active and passive articulator is wider, the articulators take longer than normal time in separation. Thus the stops which are produced with the blade of tongue touching the alveo-palatal zone (i.e. which are [+distributed]) create long frication. That is why, phonetically speaking, the difference between stops and affricates produced at the same place of articulation is only of the frication duration (Ladefoged & Maddieson, 1996). Both have different frication durations in the release phase.

English has affricates /ʃ ʒ/ and Saraiki, a language of Indo-Aryan family spoken in Pakistan, has stops /c ɟ/ on the same place of articulation (Shackle, 1976). The difference noted between Saraiki stops and English affricates is that of frication duration in the release phase. In the production of English affricates, the average time for frication duration of /ʃ/ and /ʒ/ is 120 and 45 msec. respectively. In Saraiki the duration in the release phase of stops /c/ and /ɟ/ is 70 and 40 msec. respectively. Phonomatically, English affricate /ʒ/ is closer to Saraiki /ɟ/ whereas the difference between English /ʃ/ and Saraiki /c/ is comparatively bigger.

The speech learning model (Flege, 1995) claims that learnability of an L2 sound is a function of the perceived phonetic distance between the L2 and the closer L1 sound. This means if the difference between an L2 and the closest L1 sound is smaller, there will be less probability for L2 learners of acquiring the L2 sound. And if the phonetic distance between the L2 and the closest L1 sound is bigger, there is more probability for L2 learners to acquire the L2 sound. The SLM also predicts that the learners relate sounds of L2 and L1 at phonetic rather than phonemic level. The SLM is a model which is considered suitable for advanced/experienced learners (Best & Tyler, 2007).

In light of these predictions of the SLM, we hypothesize that adult Saraiki learners of English will be able to perceive the difference between English /ʃ/ and Saraiki /c/ and will develop a phonetic representation for English /ʃ/ different from their L1 /c/. However, since the distance between English /ʒ/ and Saraiki /ɟ/ is very small, the Saraiki learners will face difficulty in the acquisition of English /ʒ/. They will rather develop an equivalence classification between English /ʒ/ and Saraiki /ɟ/ and transfer the phonetic characteristics of the L1 /ɟ/ to the L2 /ʒ/. As a result, they will have the same phonetic representation for L1 /ɟ/ and L2 /ʒ/.

To test these hypotheses two groups of participants each comprising of 30 participants were selected for a perception and production test. One group was from Pakistan and another from London. Perception and production tests were arranged with the two groups of learners. In the production test, the learners were asked to produce English words ‘cheat’ and ‘jeep’ each three times. The frication durations of word initial affricates were taken using Praat (Boersma & Weenink, 2012). A group of nine native speakers of English were also included in the test as a control group.

In the discrimination test, English affricates spoken by a female native speaker of English and the corresponding Saraiki stops spoken by a female native speaker of Saraiki were played in Saraiki-English sound pairs each three times along with some control sounds and the participants were asked to determine whether the consonants in the pairs were the same or different.
The results show that the Pakistan-based group of participants were significantly different from the native speakers of English in the production of affricates. The former had transferred L1 frication duration for both voiced and voiceless affricates. However, the UK-based Pakistani learners had only transferred the frication duration of voiced stops from L1 for English /dʒ/ but they had produced English /ʃ/ with native-like accuracy. In the production of /ʃ/, the frication duration of the UK participants was the same as that of native speakers of English. In the production of English /dʒ/, the UK participants were significantly different from the native speakers of English but not from the Pakistan-based participants. This shows that the Pakistani group had transferred L1 frication duration for both affricates of English whereas the UK group developed equivalence classification for English /dʒ/ but they developed a new category for /ʃ/ which was native-like.

The results confirm that the learners can perceive the difference between L2 and L1 sound if the phonetic distance between the two is bigger; and if the phonetic distance is smaller between L2 and L1 sounds, learners develop equivalence classification between the sounds. Only the performance of the UK group was according to the predictions of the SLM, which confirms the idea that the predictions of the SLM are for advanced/experienced learners only.

However, the perception test results do not accord with the predictions of the SLM. The learners of both groups did not discriminate between L2 affricates and L1 stops. They rather equated both voiced and voiceless affricates of English with the corresponding sounds of Saraiki. The SLM would predict that these learners would discriminate between English /ʃ/ and Saraiki /ʃ/ but equate English /dʒ/ with Saraiki /ʒ/. The perceptual assimilation between English /ʃ/ and Saraiki /ʃ/ by the UK participants shows that at perceptual level the learners relate phonemes of L2 with those of the corresponding L1 although they can perceive (and maintain in production) the phonetic difference between the two sounds. These findings pose a possible challenge for the SLM which predicts a correspondence between the perception and production of L2 sounds. Another challenge that these data pose to the SLM is that the model predicts that the L2 learners relate sounds of L2 with the L1 sounds at phonetic level but the results of the current experiment show that the UK-based learners related the sounds of L2 at phonetic level in production and at phonological level in perception. Thus a revision in the SLM is suggested to account for these findings.

References


Prosody drives alternations: evidence from a 61 million word corpus of Brazilian Portuguese film subtitles

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Keywords: Phonology, Corpus Linguistics, Psycholinguistics

Token frequency is widely claimed to be a conditioning factor in alternations in the lexicon (Bybee 1995, 2001, Huback, 2007; Coetzee & Kawahara, 2010): lexical items that are used more often are more likely to undergo phonological processes. In this paper we examine the plural morphology of Brazilian Portuguese, and show that the correlation between token frequency and alternations are epiphenomenal, and in fact depend on prosodic shape.

Brazilian Portuguese nouns ending in -Vw, e.g. [ˈsaw] “salt”, [ʒur.ˈnaw] “newspaper”, [ˈmɛw] “honey”, [ˈsew] “sky”, [ʃu.ˈpɛw] “hat”, often, but not always, show an alternation in the plural, whereby the final glide becomes palatal, e.g. [ˈsaiʃ], [ʒur.ˈnaiʃ], [ˈmɛwʃ], [ˈsewʃ] and [ʃu.ˈpɛʃ] / [ʃu.ˈpɛwʃ]. In Becker, Clemens, & Nevins (2012) it is proposed that the conditioning factor determining whether a noun will participate in such alternations is prosodic: monosyllables are preferentially protected, a trend confirmed in large-scale nonce word tasks. In the present study, we set out to test whether token frequency would also be a predictor of alternation rates for existing words in the lexicon, given the claim in Huback (2007) that frequent words alternate more often in Brazilian Portuguese.

In order to execute such a study we constructed a corpus of spoken Brazilian Portuguese, as no extant corpora of a reasonable size were available. We did so by extracting the subtitles from 12000 movies, following the research in Keuleers, Brysbaert, & New (2010) that this is one of the best reflections of spoken word frequency. Subtitle files were screened for duplicates using the Kullback–Leibler divergence (Kullback & Leibler, 1951) and the K-means clustering algorithm (MacQueen & others, 1967). The resulting corpus contained 61 million tokens and 130 thousand types.

We performed a statistical analysis using glm() in R and model comparisons using ANOVA between a superset model and subset models. Three models were created: a superset with three predictors, monosyllabicity, laxness and token frequency; and two subsets: excluding a) token frequency and b) monosyllabicity. For all 381 w-final words in the corpus, model comparison revealed that while shape, a two-level variable encoding monosyllables, and polyphones (iamb/trochees) made significant improvement, \( \chi^2(1) = 55.709, p < .0001 \), token frequency makes no significant improvement, \( \chi^2(1) = 0.15367, p > .1 \). Further modeling showed that while token frequency was significant on its own, \( p < .05 \), it became irrelevant once monosyllables were taken out, \( p > .1 \). Together they suggest that token frequency makes no significant improvement in prediction above and beyond the simple binary shape variable.

In sum, this study adds to the growing body of work suggesting that frequency-tracking alone is unlikely to condition learners’ generalizations about the patterns governing morphophonological alternations, perhaps because learners have an implicit knowledge that usage frequencies may come and go with the wind, while prosodic shapes are more stable.
References

Positional Markedness by Correspondence
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It is widely recognized that prosody-segment interactions are asymmetrical in nature. While the distribution of a large number of segmental features is stress-sensitive, only a subset of those features drive stress assignment, namely quantity, tone, and vowel quality (Blumenfeld 2006).

To illustrate this point, consider aspiration. Whereas stress-driven aspiration is attested (/pata/ → (pʰa.ta)), no language seems to exhibit aspiration-driven stress, with foot-reversal patterns induced by positional markedness (/pata/ → (pʰa.ta), but /patʰa/ → (pa.tʰa)). Attested unidirectional prosody-segment interactions in which featural contrasts are lost in prominent metrical positions require the use of positional markedness constraints (de Lacy 2000). However, positional markedness constraints can be satisfied either by fixing the output structure, or by modifying the prosodic environment specified in the constraint, predicting bidirectionality. The latter strategy is unattested but predicted in parallel Optimality Theory (OT) under a ranking in which a positional markedness constraint involved in unidirectional prosody-segment interactions, and a context-free faithfulness constraint dominate the metrical constraint responsible for an otherwise regular stress pattern (see 1 for unattested aspiration-driven stress predicted in parallel OT). This ranking schema thus poses a too-many-solutions problem for parallel OT.

(1) Unattested aspiration-driven stress in parallel OT (based on Blumenfeld 2006:18)

<table>
<thead>
<tr>
<th></th>
<th>Unaspirated</th>
<th>Dep.</th>
<th>Trochee</th>
<th>Iamb</th>
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<tbody>
<tr>
<td>a.</td>
<td>Unaspirated</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td>W</td>
<td>L</td>
<td>* W</td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td>W</td>
<td>L</td>
<td>* W</td>
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In order to discard unattested bidirectional prosody-segment interactions, a theory of positional markedness in Harmonic Serialism (HS) will be proposed: Positional Markedness by Correspondence (PMC) (see Jesney to appear; Staroverov 2010; Staub to appear for similar ideas). In PMC, positional markedness is violated when a structure x in the output appears in a prosodic position y iff y is in correspondence with a prosodic position Y in the input (see 2 for a definition of *Unaspirated/σ_corr).

(2) *Unaspirated/σ_corr(*Unasp/σ_corr)

Let σ_x in input string S_1 ⇒ σ_y in output string S_2. Assign one violation mark iff (a) σ_x in S_1 is stressed, and (b) the onset of σ_y in S_2 is not aspirated.

PMC is only possible in derivational/serial versions of OT, in which prosodic structure is gradually built in harmonically-improving steps (Pruitt 2010). Given that intermediate inputs contain metrical structure inherited from previous derivational steps, standard input-output correspondence faithfulness relations between metrical structure at different levels of representation may be formalized. Consider the derivation in (3). At step 1, candidate (a) is the winner because it satisfies Trochee. This candidate vacuously satisfies *Unaspirated/σ_corr because, in the absence of metrical structure in the input, condition (a) in (2) is not met, that is, there is no input stressed syllable in correspondence with the output stressed syllable. At step 2, candidate (c), the fully faithful candidate, fatally violates *Unaspirated/σ_corr because the stressed syllable in the input is not
in correspondence with a stressed syllable in the output containing an aspirated onset. Only stress-driven aspiration is then predicted in PMC even under a constraint hierarchy that predicts pathological aspiration-driven stress in parallel OT.

(3) Aspiration-driven stress excluded in HS

Step 1

<table>
<thead>
<tr>
<th></th>
<th>*UNASP/*σCORR</th>
<th>PARSE-σ</th>
<th>DEP-h</th>
<th>TROCHEE</th>
<th>IAMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td>i</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* W</td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td>* W</td>
<td></td>
<td>L</td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
<td>* W</td>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

Step 2

<table>
<thead>
<tr>
<th></th>
<th>*UNASP/*σCORR</th>
<th>PARSE-σ</th>
<th>DEP-h</th>
<th>TROCHEE</th>
<th>IAMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td>* W</td>
<td></td>
<td></td>
<td>L</td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td>* W</td>
<td></td>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

Those positional markedness constraints involved in bidirectional prosody-segment interactions such as STRESS-TO-WEIGHT (*σLight/σ), which derives stress-driven quantity, or WEIGHT-TO-STRESS (*σHeavy/σ), which derives quantity-driven stress, must not be of the CORR type. Thus, both types of positional markedness constraints are needed: standard positional markedness and positional markedness by correspondence.

PMC aims to contribute to understanding how prosodic positions are defined and computed during HS derivations. PMC will also be confronted with previous proposals dealing with the too-many-solutions problem in OT and HS. All typological claims of TMC will be tested using the software OT-Help 2.0 (Staubs et al. 2010).

References


One grammar fits all. The representation of variation in Dutch, German, and Yiddish
Marc van Oostendorp (Mertens Instituut / Leiden University) & Björn Köhnlein (Leiden)

The concept. The division of labor between representation and computation is a central question in phonology. The issue also extends to language variation: the ‘traditional’ assumption is that languages vary in terms of representations as well as in the language-specific application of grammatical processes, or that representations are universal and only the computation differs (the latter seems the point of view of CVCV phonology). Based on a comparison of phonological processes affecting the distribution of plosives in three related languages (Dutch, German, and Modern Northeast Yiddish (MNY)), we set a first step in exploring the idea that cross-linguistic phonological variation arises from representational diversity only; all languages share the same grammar, but differ in the representations which are subject to this grammar. (This idea is the phonological equivalent of the Chomsky-Borer hypothesis in syntax.)

The issue. There is an ongoing debate on the phonological treatment of Final Devoicing (FD), in particular concerning two questions: there is no consensus as to whether the process should be regarded as weakening or fortition, and it is under discussion to which degree the phonetic realization of the contrast should be reflected in the phonology, viz. the difference between phonetically voiced and plain obstruents (VOT languages) vs. one between plain and aspirated obstruents (aspiration languages, ASL); see e.g. Wetzels & Mascaró 2001; Honeybone 2005; Iverson & Salmons 2007, 2011; Van Oostendorp 2008; Harris 2009, among many others.

We argue that different monovalent features are phonologically active in the VOT languages Dutch and MNY ([voice], FD is weakening) and the ASL German ([spread glottis], FD is fortition): as we show, the differences between the languages can be understood in terms of different representations while the grammar is the same for all of them. A child only has to learn the representations for each language; the grammar follows automatically.

The data. Dutch and German show FD, while the process does not occur in MNY. Examples are provided in (1); throughout this abstract, we indicate the presence of the feature [spread glottis] with the IPA symbol for aspiration:

(1) (Non-)application of FD in Dutch, German, and MNY

<table>
<thead>
<tr>
<th>Languages</th>
<th>Type</th>
<th>Status of FD</th>
<th>‘wheel, stem’</th>
<th>‘wheel, sg.’</th>
<th>‘wheel, pl.’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>VOT</td>
<td>FD</td>
<td>/rød/</td>
<td>[ræt]</td>
<td>[rædred]</td>
</tr>
<tr>
<td>German</td>
<td>ASL</td>
<td>FD</td>
<td>/raːt/</td>
<td>[raːtʰ]</td>
<td>[ɾeɾte]</td>
</tr>
<tr>
<td>MNY</td>
<td>VOT</td>
<td>No FD</td>
<td>/rød/</td>
<td>[ɾød]</td>
<td>[ɾedɛɾ]</td>
</tr>
</tbody>
</table>

The languages also differ in the application of a process usually referred to as Regressive Voice Assimilation (RVA), requiring plosives in clusters of the type VP.PV to agree in voicing: while Dutch and Yiddish (VOT) show RVA for both underlyingly voiced (VO) and voiceless (Ø) coda plosives, coda consonants in German are always specified for [spread glottis] (SG), independent of the context, as shown in (2):
(2) RVA in Dutch, German, and MNY

<table>
<thead>
<tr>
<th>Language</th>
<th>Type</th>
<th>Underl. voicing</th>
<th>Surface voicing</th>
<th>Surface form</th>
<th>Excluded</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>VOT</td>
<td>VO + Ø</td>
<td>Ø + Ø</td>
<td>[zoeyt.pol]</td>
<td>*[zoeyd.pol]</td>
<td>‘south pole’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø + VO</td>
<td>VO + VO</td>
<td>[froeyd.bom]</td>
<td>*[froeyt.bom]</td>
<td>‘fruit tree’</td>
</tr>
<tr>
<td>MNY</td>
<td>VOT</td>
<td>VO + Ø</td>
<td>Ø + Ø</td>
<td>*[frai.krai.yz]</td>
<td>*[fraib.krai.z]</td>
<td>‘writing circle’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ø + VO</td>
<td>VO + VO</td>
<td>[bag.bein]</td>
<td>*[bark.bein]</td>
<td>‘cheekbone’</td>
</tr>
</tbody>
</table>

As can be deduced from (1) and (2), only in Dutch, FD as well as RVA are both visible on the surface while German (only FD) and Yiddish (only RVA) provide evidence for one of the two processes, respectively. Our claim is, however, that FD and RVA are active in all three languages.

**Universal rules.** The computational tenets can be summarized in the shape of three universal rules, which hold in all languages, except that they will apply vacuously if e.g. the language does not have the relevant features of syllabic constituents (we formulate these rules informally):

(3) \[ \text{VOICE} \not\to \text{ONSET} \]: Delete the feature [voice] if it is not licensed in the onset

(4) \( \text{Coda} \not\to \text{[spread glottis]} \): Specify a coda consonant for [spread glottis]

RVA can be understood a requirement of laryngeal features to be aligned with the left edge of a prosodic word:

(5) \( \text{Spread (Laryngeal, L)} \): Spread laryngeal features from right to left

**Language-specific representations.** a) Dutch: word-final plosives undergo FD, since they are syllabified as codas and are thus subject to \( \text{VOICE} \not\to \text{ONSET} \). Yet coda voicing is obligatory in cases where a coda plosive is followed by a voiced plosive in the onset: this is caused by \( \text{Spread (Laryngeal, L)} \). Syllable-final plosives only devoice when followed by a voiceless plosive, again due to \( \text{VOICE} \not\to \text{ONSET} \).

b) German: this language does not have [voice], but it does have [spread glottis], so FD is enforced by \( \text{Coda} \not\to \text{[spread glottis]} \). Similar to Dutch, final consonants are obligatorily syllabified as codas. Since the German representational phonology does not include a feature [voice], RVA cannot occur in disyllabic VP.PV clusters with a plain plosive in the onset: it does not carry any laryngeal specification, and no feature can spread leftwards. \( \text{Spread (Laryngeal, L)} \) predicts that [spread glottis] spreads leftwards in clusters with an aspirated plosive in the onset of the second syllable. This may certainly be the case; yet no phonetic effect can be visible on the surface, as \( \text{Coda} \not\to \text{[spread glottis]} \) would enforce devoicing anyway.

c) MNY: there is no FD in word-final position; we argue that this is due to a difference in the (underlying) syllabification between MNY and Dutch / German, for which we provide independent evidence. While word-final plosives are codas in the latter two languages, MNY syllabifies them as onsets of empty-headed syllables. Consequently, \( \text{VOICE} \not\to \text{ONSET} \) applies vacuously. In word-medial VP.PV clusters, however, FD can occur: when a voiced plosive is followed by a voiceless one, the voiced plosive is syllabified as a coda, which violates \( \text{VOICE} \not\to \text{ONSET} \).
The head-complement relation at the syntax-phonology interface
Erika Varis
University of Nevada, Reno


In Spanish, the regular masculine article is *el* (*el cuchillo ‘the knife[m]*’) and the feminine article is *la* (*la torre ‘the tower[f]*). However, the feminine article takes the masculine form *el* when followed by a noun that begins with stressed *a* (*el [á]guila ‘the eagle[f]*’), but not when followed by an adjective with the same initial stressed vowel (*la [á]ta* *aguila* ‘the high[f] eagle[f]*’).

In Russian, third person pronouns have an *n*-initial form when following prepositions (*в nevo* ‘in him’) and a non-*n*-initial form elsewhere (*ани iskali jevo* ‘they were looking for him’). Interestingly, if the pronoun follows a preposition but functions as a possessive, it takes the non-*n*-initial form (*в jevo dome* ‘in his house’).

I argue that for both languages the syntactic head-complement relation determines the level of prosodic clitic attachment. A small function word attaches as a clitic to the following Pwd, forming different prosodic structures depending on the syntactic relationship between clitic and host. In Spanish, when the host is a noun (*N*) it is the head of the lexical complement to the determiner (*D*), which takes the “feminine” *el* form; when the host is an adjective (*A*) it is not the head of the complement and *D* takes the regular *la* form (1). For Russian, when the pronoun forms the head of the complement to the preposition, it takes the *n*-initial form, but when it is a possessive it is not the lexical complement head and the non-*n*-initial form emerges (2).

(1) Spanish a. [DP *el*_{head} [águila\text{HComp} \text{alta}]]
   
   the eagle tall

   b. [DP *la*_{head} [alta águila\text{HComp}]]

(2) Russian a. [PP \text{в} \text{head} [nevo\text{HComp}]]
   
   in him

   b. [PP \text{в} \text{head} [jevo dome\text{HComp}]]

   in his house

The proposed difference between the clitic-host sequences is prosodic attachment at different levels of the prosodic hierarchy, following Itô & Mester’s (2007) extended Pwd (*ω*) structure. Items may be incorporated into an existing *ω* via conjunction, with reference to different *ω* nodes. The *ω_{min}* node does not dominate any Pwd, while *ω_{max}* is not dominated by any *ω*. In Spanish and Russian, the syntactic head-complement relation governs clitic attachment, enforcing attachment within a *ω_{max}* for adjacent head-complement sequences (3a and 4a), while non-head-complement sequences are separated by prosodic boundary of *ω_{max}* or greater (3b and 4b).

(3) Spanish a. (*ω_{max} el aiguila*) (*ω_{max} alta*)
   
   b. (*ω_{max} alta*) (*ω_{max} aiguila*)

(4) Russian a. (*ω_{max} в nevo*)
   
   b. (*ω_{max} в jevo*) (*ω_{max} dome*)

The current proposal provides a formal analysis for the syntactic component of phonologically conditioned allomorphy in two disparate languages. The most basic of syntactic relations, head-complement, is indirectly accessible to the phonology via prosodic structure differences. The proposed sensitivity to syntactic relations—not only syntactic XP edges—in prosodic organization enriches the syntax-phonology interface, allowing increased empirical coverage of syntactically-sensitive phonological phenomena and providing a uniform explanation for previously unrelated phenomena.
Selected References
Spirantization in Icelandic

Laurence Voeltzel
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One characteristic phenomenon of the Icelandic phonology is the spirantization of stops. In the literature [Thráinsson: 2002, Árnason : 2012] this process is described as follows: when they precede /t/ or /s/, Icelandic voiceless stops /p, t, k/ surface as [f, s, x]. The phenomenon is illustrated below in (1):

(1). (a) /skip/ [sci[ip] ship nom. /skip + s/ [sci[fs] ship gen.

(b) /taip + yr/ [taipvr] risky masc. /taip + t/ [taif] risky neut.
/rik + yr/ [rikvr] rich masc. /rik + t/ [rix] rich neut.

(c) /ak+a/ [aka] drive inf. /ak+tv/ [axtv] drive imp.2PS

/aip+a/ [aipa] scream inf. /aip+tv/ [aift] scream pres.3PS

Spirantization is commonly analyzed as a leiont process: in the coda (weak position [Scheer & Ségeral: 2001]), consonants may lose part of their content, thus altering their complexity. In our case, one could claim that the stops lose the element responsible for occlusion [?], which explains why they surface as their fricative counterparts. If being in coda suffices to trigger spirantization, we expect no voiceless stops in a weak position, only [f, s, x]. However, this is not always the case in Icelandic, like shown in (2):

(2) /vøe:kv+a/ [voe:kv[a] water inf. /rei:kvisk+v+yr/ [rei:kviskv[a] from Reykjavik

/steimn/ [stein] stone nom. /nefn+a/ [nefl[a] name inf.

/vagn/ [vakn] wagon

The examples in (1) could also be analyzed as an assimilation process in which the voiceless stops gain stridency from the following segment. While this theory could explain how the presence of /s/ (1a) near a stop triggers the change from /p, t, k/ to [f, s, x], spirantization caused by /t/ (1b-c) is more opaque: if “nothing falls from heaven” (Scheer 1999 : 214) where would the strident element come from in /taip+t/, /rik+t/ and /løy:p+tv/?

It seems then that, spirantization as illustrated in (1) cannot be uniformly explained by invoking fusion/fission processes: there is no reason at the segmental level for the spirantization to happen. In this study, we claim that the reasons why alveolar obstruents /t/ and /s/ trigger spirantization are not to be found in the segmental content of these consonants, but in the templatic structure of the affixes they come with. Icelandic stops spirantization is a spontaneous segmental content change caused by a constraint at a higher level: the syllabic level.

Following Bendjaballah [1998] and the Government framework [KLV: 1988, 1990], we assume that the affixes in (1) have an extra CV in their template, which gives them the following structure:

(3). (a) [C VC V]INITIAL (b) [C VC V]INTER (c) [C VC V]IMPERF. 2PS (c) [C VC V]IMPERS. 3PS

The addition of available space at the right of the root leads to a word resyllabification, causing several consonantal changes.

First of all, the last root consonant spreads to the first C-slot in the affix (see (4), /skips/ [sci[fs]s]):

(4). [C VC VC VC V] + [C VC VC VC]<s

We should get /skip/s/, with geminate /p/. Long voiceless stops are however unattested in
Icelandic – as shown in (5), they necessarily undergo preaspiration [Thráinsson: 2002, Árnason: 2011]:

(5). /kəpːar/ *[kʰəpːar] [kʰəpːar] chamber pot pl.
/hattər/ *[hattər] [hattar] hat pi.
/bakkə/ *[pakkə] [pahka] bank acc.

We assume that during the preaspiration process, the linking between the segment and its two syllabic slots breaks. While the right slot stays associated to the segmental content of the stop, the left slot is occupied only by noise, which automatically comes with any consonantal slot. As a consequence, /pp, tt, kk/ are no longer long and the stop is preceded by noise, surfacing as the glottal fricative /h/. We thus have an intermediate underlying form /skihs/.

Finally, simplification of the cluster /hps/ to /fs/ occurs. Codas in Icelandic (and in Faroese, the closest related language) are constrained: in internal position and before another consonant only single consonants are allowed (6a), in final position only two-segment clusters are allowed (6b):

(6). Icelandic:

(a) /fɪgl+di/ *[fɪldɪ] [fɪldɪ]/ follow pet.
/hɛmp+di/ *[ḥempdi] [ḥemdi]/ average pet.
/rɛmb+di+st+u/ *[rɛmbdist] [rɛmdist]/ work hard pet.

(b) Faroese:

/spɪrn+ti/ *[spɪnti] [spinti]/ hit pet.
/rɪgn+di/ *[rɪgndɪ] [rɪngdi]/ rain pet.
/sɪgl+di/ *[sɪgldɪ] [sɪldɪ]/ sail pet.
/rɪŋ+t/ *[rɪŋt] [rɪŋt]/ bad next.
/rɪld+t/ *[rɪldt] [rɪt]/ high (of meat) next.
/javn+t/ *[javnɪt] [jamt]/ even next.

This constraint has the effect that in examples such as (1a-c), one of the consonantal slots before the morphemic boundary must disappear. We specifically take the position that a structure such as (7) is ruled out because a nucleus would not be properly governed:

(7).

While the government domain is deleted, the segmental content that was associated to it does not disappear: it moves to the next consonantal slot. The two consonants sharing the same slot merge together into a single segment. This fusion can lead, either to the surfaceing of one of the two consonants (for example, in Icelandic /rɛmɓ+di+st+u/ [rɛmбудst], /m/ and /b/ merge into /m/), or to the emergence of a third segment (like in Faroese /javn+t/ [javnɪt], where /v/ and /n/ merge into a nasal bilabial /m/). For /skihs/, we have the same merging effect after the deletion of the governing domain containing /h/: the glottal fricative moves to the slot where the labial stop is. The result of the merging is a labial fricative, /f/ [sifc]

Icelandic spirantization is hence the result of many mechanisms triggered by the syllabic structure and its constraints (see (8)) and is not only due to a single lenition/assimilation process.

(8).

References:

Fear of Flapping: Probabilistic Rule Productivity and the OCP

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Middle East Technical University – Northern Cyprus Campus

We present a pair of production studies that demonstrate gradient variation in phonological rule application (North American English flapping), depending on phonological goodness (degree of Obligatory Contour Principle (OCP) violation).

The OCP is known to influence optional allomorphy and lexical choice (Mondorf 2009, Walter and Jaeger 2008), and also morphological productivity in flapping contexts specifically (of −/t/ with /t/-final stems; Berkley 1994). Derrick and Gick (2009) have shown that when multiple-flap sequences do occur, the four kinematic variants of flaps are exploited so that the same one is never produced twice in a row.

In optional contexts, flapping is sensitive to the presence of a morpheme boundary, lexical frequency, and speech rate (Patterson and Connine 2001). It is the contention of this paper that the similarity of the preceding consonant to a potential flap is one of the factors affecting the rate of optional flapping application, and that flap sequences are not just varied kinematically, but avoided altogether when possible.

➔ Flapping is dispreferred when a multiple-flap sequence would result.

Study 1 Methods
American English speakers (n=8) were digitally recorded in a sound-proof booth, reading words appearing on a computer screen in random order in an inflecting frame sentence. Stimuli (n=72) contained a sequence of first an obligatorily-flapped coronal stop, then an optionally flappable one. Each of the second, flappable coronals was classified as flapped or not by the author through auditory inspection.

Prediction: Less flapping than previously observed rates and with voicing-matched Cs.

Results
Subjects show extreme sensitivity to flap repetition in that they experience great difficulty in producing sequences of flaps at all, to the extent that only two speakers completed the task as instructed. Both subjects also consistently flap C2, so that no significant variation in flapping rate is observed. The remaining six subjects avoid potential double-flap sequences primarily by shifting stress so as to preclude flapping in one of the contexts. The durational measure is similarly uninformative; mean C1/C2 durations differ by no more than 2 ms (32 ms and 49/51 ms, respectively), a difference which is statistically insignificant. Thunclear results may have been due to the form of the stimuli, as the syllables sometimes are separable into independent English words. Study 2 avoids this issue, and introduces an explicit comparison of coronal stops with other consonants, in a test of real word production.
Study 2 Methods
American English speakers (n=8) were digitally recorded in quiet room reading a printed wordlist. Test stimuli (n=66, distractors=34) consisted of English quadrisyllabic –ity-suffixed words from a limited lexical frequency range, divided evenly into six groups according to stem-final C: [d n l r s labial (m/v)].

Results
Preliminary results indicate that flapping likelihood, as determined by a qualitative auditory check, correlates with stem-final C. It is least likely with stem C=/d/ (realized as flap), and most likely with stem C=/s/ (for which flapping makes the suffix consonant /less/ rather than /more/ similar to the stem C). Flapping rates for words containing the remaining stem Cs fall in between these two extremes, with the labial category an outlier within the group.

Conclusion
Previous studies show that phonological goodness as indexed by OCP violations affects both derivational morphology potentially resulting in flaps, and choice of flap variants. We show that application of the flapping rule itself is affected as well – either by triggering another process that avoids the context, or gradiently affecting its application when optional – in an example of phonology-driven probabilistic variation in rule application.

References


Acquisition of #sC clusters: Universal tendencies vs. Specific-language grammar?

Mehmet Yavaş

Florida International University

In any discussion of the acquisition of consonant clusters, sonority plays an important role, because the Sonority Sequencing Principle (SSP) which states that “In any syllable, the segment constituting a sonority peak (the nucleus) is preceded and/or followed by a sequence of segments with progressively decreasing sonority values”, is a significant force in languages. It has also been established that sonority distance between the cluster members translates into their relative complexity (markedness). Clusters that have smaller sonority difference are more complex than those with a greater difference. While two-member canonical clusters (first member is not /s/) expectedly follow the SSP (e.g., black), some /s/-clusters violate the SSP by lowering the sonority from the first member to the second (e.g., speak [spik]). The remaining /s/ clusters (‘s+nasal’, ‘sl’, and ‘sw’) all show sonority rises in varying degrees. Accordingly, /sw/ has the greatest sonority distance between the two members and ‘s+nasal’ has the smallest. Thus, we can say that there is a continuum of markedness in the following order: ‘s+stop’ > ‘s+nasal’ > ‘sl’ > sw, and it is reasonable to assume that this will be reflected in the order of acquisition. These issues have been examined in studies on first language acquisition (Ohala 1999; Pater 2004; Barlow 2005; Yavas et al 2008), and second language acquisition (Broselow et al. 1998; Broselow & Xu 2004).

This presentation examines the cross-linguistic patterns of correct renditions of two-member /s/-clusters. Data from 6 languages (3 Germanic-English, Dutch, Norwegian), (2 Slavic- Croatian, Polish) and 1 Semitic (Hebrew) languages coming from typically developing children and from children with phonological disorders are analyzed. Results show some similarities as well as some differences among the languages in question. Specifically, there were commonalities among the three Germanic languages which have limited inventory of SSP violations which come from ‘s+stop’ clusters. In these languages, we observe an increase in correct renditions as the sonority distance between C1 and C2 gets bigger. The trend was particularly obvious between the groups ‘s+[-continuant]’ versus ‘s+[+continuant]’ . There was no correlation between C1 to C2 sonority distance and the correct renditions in the data coming from the other three languages which have a rich inventory of clusters and are more lenient to SSP violations. The differences in the two groups of languages give support to the Specific-language grammar hypothesis which states that children acquire language based on the patterns in the input language, which drive children’s acquisition of phonology; the input triggers the default settings to be set or reset.
References


For the data studied on 6 languages

Journal of Multilingual Communication Disorders, 3:1, December 2006

Special Issue: Acquisition of #sC clusters. Guest Editor: Mehmet Yavaş

Clinical Linguistics and Phonetics 24:3, March 2010

Special Issue: Acquisition of #sC clusters in children with phonological disorders.

Guest Editor: Mehmet Yavaş
On morphological and lexical properties of Polish palatalizations
Sławomir Zdziebko
Catholic University of Lublin

Gussmann (2007) is an approach to Polish palatalizations that differs markedly from the past accounts of segmental phonology of Polish. Works such as Gussmann (1980), Rubach (1984, 2003) or Bethin (1992) assumed that opaque Polish patterns result from the application of re-write rules or constraint rankings manipulating abstract underlying and intermediate representations. All these approaches appealed to absolute neutralisations of segments, Duke of York derivations and other techniques whose necessity within the phonological theory is debatable and whose absence from phonology would render many analyses more transparent.

Gussmann (2007) assumes the existence of a morpho-phonological component of grammar that manipulates segments whenever certain morpho-lexical conditions are met. An example of such a manipulation is Palatalization Replacement 1 (PR1) (Gussmann 2007:128):

(1) PR1

<table>
<thead>
<tr>
<th>p</th>
<th>b</th>
<th>f</th>
<th>v</th>
<th>m</th>
<th>r</th>
<th>w</th>
<th>n</th>
<th>t</th>
<th>d</th>
<th>s</th>
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<tr>
<td>p^j</td>
<td>b^j</td>
<td>f^j</td>
<td>v^j</td>
<td>m^j</td>
<td>3</td>
<td>1</td>
<td>j</td>
<td>~^c</td>
<td>~dz</td>
<td>c</td>
<td>z</td>
</tr>
</tbody>
</table>

When one of the suffixes marked for PR1 is attached to a stem, the final consonant of this stem is replaced with the consonant in the bottom row in (1). PR1 is a productive operation triggered, e.g., by a locative singular ending -e /e/ as in temat /temat/ ‘subject, nom.sg.’ -temac-ie /temaće/ ‘loc.sg.’ or rektor /rektor/ ‘rector, nom.sg.’ - rektorz-e /rektorz-e/ ‘loc.sg.’. Interestingly, these roots contain sequences /re/ and /te/ with no palatalization, which shows that PR1 cannot be described by referring only to phonological categories without absolute neutralisation. The lack of palatalization before the instrumental ending -em (*/rektorz-em/ and */temaće-em/ are unattested), shows that the rule does not work simply before /e/s that constitute derived environments. The morphological conditioning of PR1 is as important as the phonological one indicating that the change belongs in morpho-phonology.

In my presentation Gussmann’s approach will be turned into a theory of the component of morpho-phonology. I will claim that morpho-phonological replacements are implemented in accordance with the Minimalist Hypothesis (MH) postulated by (Kaye 1992). The version of MH that I will use is given below:

(2) All operations within the interpretative sub-component of grammar work whenever their conditions are satisfied.

I will show that (2) rules out such derivational techniques as counter-feeding, counter-bleeding, bleeding and the Duke of York derivations.

Some of the Palatalization Replacement presented by Gussmann replace the same consonants with different consonants. Consider three patterns:

(3) PR2, PR5 and PR7 (Gussmann 2007:128-129)

a) PR2

<table>
<thead>
<tr>
<th>k</th>
<th>g</th>
<th>x</th>
<th>b) PR5</th>
<th>k</th>
<th>g</th>
<th>zg</th>
<th>x</th>
<th>c) PR7</th>
<th>~ts</th>
<th>~dz</th>
<th>t</th>
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<td>~ts</td>
<td>~dz</td>
<td>f</td>
<td>~t</td>
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<td>~t</td>
<td>3</td>
<td>~t</td>
<td>c</td>
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</tbody>
</table>

PR2 and PR5 replace /k/ and /g/ with different segments. Therefore, by MH, one would not expect them to form the lexical make-up of one and the same affix. This prediction is borne
out. However, in Gussmann’s (2007:141-142) analysis one finds suffixes which are marked for contradictory diacritics. These are diminutive -ik/-yk-, an adjectival -ist/-yst- affix, a nominal -nik and an agentic -arz ending. All of them seem to be marked for PR1 and PR7. As a result, a conflict over roots ending in /t/ is observed: the application of PR1 should replace /t/ with /ć/, whereas the application of PR7 should result in a /ń/ on the surface.

Additionally, adjectivalising morphemes -n-, -ist/-yst- and -ast- and the diminutive -(e)k-morpheme are claimed to be marked for PR5 and PR7. If morpho-phonology works in accordance with MH, one expects a feeding relation between PR5 that turns /x/ into /ʃ/ and PR7 replacing /ʃ/ with /ć/ in roots ending with a velar fricative. Since roots terminating in /x/ end up with /ʃ/ when concatenated with the relevant morphemes, MH seems to predict wrong outputs.

Since the set of replacements that contradicts MH is always PR7 a closer look at this set is required. As I will show the only two replacements subsumed by Gussmann under PR7 are problematic for MH: /t/~ń/ and /ʃ/~ć/.

Within Polish nominal system /ʃ/~ć/ is triggered only by the diminutive -ik/-yk- ending as exemplified by groszk /groʃ]/ ‘a penny, nom.sg.’ - grosz-ik /groʃiʃ]/ ‘dim.nom.sg.’ or kapelusz /kapelulʃ]/ ‘hat, nom.sg.’ - kapelus-ik /kapelukʃ]/ ‘dim.nom.sg.’. The change is, however, not exceptionless in Polish as exemplified by words such as kosz-ik /koʃiʃ]/ ‘basket dim.nom.sg.’, derived from kosz /koʃ]/ ‘basket, nom.sg.’, as well as zamsz /zamʃ]/ ‘suede, nom.sg.’ - zamsz-ik /zamʃiʃ]/ ‘dim.nom.sg.’ etc. What this shows is that /ʃ/~ć/ alternation is not a property of the -ik/-yk- morpheme but rather of a restricted group of lexically marked roots concatenated with this morpheme. Since /ʃ/~ć/ alternation is extremely marginal within the nominal morphophonology of Polish and is not automatically triggered by -ik/-yk-, its identity as part of PR7 can be called into question.

Considering /t/~ń/ alternation, it is not triggered by any derivational morpheme presented and discussed in Gussmann (2007). It is found in the verbal system of Polish and marginally in some zero-derived adjectives and nouns such as rob-ot-a /rɔbɔta/ ‘work, nom.sg.fem.’ – rob-ocz-a /rɔbotʃa/ ‘adj, nom.sg.fem.’ or brod-acz /brɔdatʃ]/ ‘bearded man, nom.sg.’ - brod-aty /brɔdatʃ]/ ‘bearded, nom.sg.’ and several others. In fact, the very presence of the alternation may be called into question. In particular, it may be argued that -ot-, -ocz-, -at- and -acz- are separate morphemes as many constructs in -ot- do not have adjectives in -ocz-, e.g., glut-ot-a /gwupɔta/ ‘stupidity nom.sg.fem.’ (but *glut-ocz-a). Similarly, very many nouns ending in -acz- do not have adjectives in -at- (sił-acz /ɕiwaʃ]/ ‘strongman, nom.sg.’ but *sił-aty) and vice versa (taci-aty /wɔtɔci]/ ‘patchy, nom.sg.’ but *taci-acz). This suggests that the /t/~ń/ alternation most probably does not exist in the derivational morpho-phonology of Polish outside of its verbal part and definitely is not a threat to the mode of application of the morpho-phonology outlined above.

In light of the facts presented above, PR7 should be abridged to two replacements that are regularly and productively triggered by -ist/-yst- and -ast- morphemes and do not contradict MH, i.e., /fʃ/~ń/ and /dʒ/~ʒ/.