The Thirty-First Manchester Phonology Meeting

ABSTRACTS BOOKLET

Thursday 25th - Saturday 27th May 2025

Held at
The Core Technology Facility, Manchester

Organised by a collaboration of phonologists at the **University of Edinburgh**, the **University of Manchester**, and elsewhere.

This booklet contains the abstracts for all the papers presented at the **Thirty-First Manchester Phonology Meeting**, held at Manchester University's Core Technology Facility, in May 2025.

The abstracts are arranged in alphabetical order by the surname of the (first named) presenter.

The abstracts for the **oral paper sessions** are presented first, followed by the abstracts for the **poster paper sessions**, and the booklet concludes with abstracts for the **special session**.

The **final programme**, available on the conference website and in hard-copy at registration, gives the details of which papers are in which room, and at which times.

Oral papers

Triradicalism can imply tricononantism but does not need to: glides in Semitic

Dominique Stephan Bobeck, Universität Leipzig, dom.bobeck@gmail.com

It has often been suggested that the underlying representations of morphosyntactic roots in Semitic languages are purely consonantal (Arad 2003, 2005; Faust 2019; Kastner 2019, 2020; McCarthy 1979, 1981, Tucker 2010, 2011; Wallace 2013 *i.a.*). Determining the consonantal status for some roots is relatively easy, as can be seen by means of the Tigrinya roots √*ngr*, √*gzʔ*, and √*t'lm* in *nəgərə* '(that) he said', *gəzəʔə* '(that) he bought', and *t'ələmə* '(that) he broke a promise'. However, so-called "weak" roots are not so easily analysable as purely consonantal. Regarding the Tigrinya verb forms *kədə* '(that) he went', *jɨxəjjɨd* 'he is going, *motə* '(that) he died', and *jɨməwwɨt* 'he is dying', the question arises as to whether they encompass glides, vowels, or segments that are none of them, i.e. underspecified. In other words, are the roots of the inflected forms *kədə* and *motə* √*kjd* and √*mwt*, √*kit* and √*mut*, or √*kIt* and √*mUt*? It can be shown that accounts based on underspecification of "high vocoids" (cf. Pike 1943) or absent vowel-consonant distinction (Faust & Hever 2010) are highly questionable and can be replaced by a clear separation of glides and high vowels. Therefore, a sonority contrast arises between these two kinds of segments (Clements 1990, Nevins & Chitoran 2008).

The talk is structured into three parts: (i) the presentation of the problem (see above), (ii) the reasoning behind the division of glides and high vowels, and (iii) the consequences for any analysis of Semitic root structure. In part two, data from a selection of natural languages highlight the importance of the vowel-glide distinction, as demonstrated by syllabification in Imdlawn Tashlhiyt Berber (*lur* vs. *lwr̩*; Dell & Elmedlaoui 1985, 2004), restrictions limiting maximal coda size to two consonants in Farsi (CVjC but no *CVjCC; Windfuhr 1997), the ban on complex codas in Shoshoni (CViC but no *CVjC; Dayley 1989), and vowel epenthesis in Coastal Marind (/k+uas/ → [ka.was], but /k+ualok/ → [kua.lok], i.e. avoidance of superheavy syllables; Olsson 2021). These data make it clear that the underspecification account of /I/ and /U/ fails to predict the attested syllable patterns. Concerning Semitic languages, the question arises as to whether roots encompass also true vowels or just consonants. Typically, Semitic roots have been analysed as devoid of vowels. Two case studies of high vocoids in Semitic show that high vocoid "radicals" (i.e. root consonants) must be either consonantal or vocalic. The former type is exemplified by Syriac, the latter by Amharic. As for Syriac (Muraoka 2005), the following forms elucidate post-vocalic spirantisation.

a. *bajtaː* 'house'	b. *briːθaː* 'creature'	c. *keθbaθ* 'she wrote'
d. *mawtaː* 'death'	e. *nmuːθ* 'he dies'	f. *kuθbuːn* 'write (pl.) to me!'

Therefore, *bajtaː* and *mawtaː* must correspond to the roots √*bjt* and √*mwt*, not *√*bit* and √*mut*.

On the contrary, Amharic geminates the second radical in the past tense (e.g. *səbbərə* 'he broke'), unless it is vocalic (*motə* 'he died', not **məwwətə*; Leslau 1995; Faust 2022). This rule presupposes a consonant-vowel distinction and favours an analysis of this root as √*mot*, not √*mwt*. These two case studies demonstrate that the traditional analysis of Semitic triradicalism *can* imply triconsonantism but does not necessarily do so.

Through *dick* & *dünn*: Cognates and the legacy of diachronic change in synchronic processing

Joshua Booth, Felicia Stich, Isabella Fritz & Aditi Lahiri, University of Oxford
joshua.booth@ling-phil.ox.ac.uk

Linguists and grammarians have always differentiated COGNATES, e.g. English *pound* ~ German *Pfund*, inherited from the same West Germanic source), from LOANS (e.g. E *reptile* ~ G *Reptil*, independently borrowed from French). However, most modern experimental research disregards this distinction, instead (mis)terming any words with form–meaning overlap across two languages 'cognates': e.g. E *ambulance* ~ Welsh *ambiwlans*. Such definitions additionally exclude many true (inherited) cognates, e.g. E *starve* ~ G *sterben*. German and English share many real cognates, but our question is whether they *hinder* or *facilitate* L2 word recognition.

Although modern speakers have no implicit knowledge of their language's history, sound change is *systematic*, resulting in *regular correspondences* between related languages. How does this affect processing, and do the phonological feature specifications of cognates matter? Does the phonological representation of *Zinn* affect the access of *tin* for fluent L2 E speakers? We present the results of a recent EEG study, arguing that the distinction between cognates and loans is as relevant for synchronic language processing as historical linguistics.

Systematic sound correspondences necessarily play a role in the phonology (even where there is no identity). Much L2 literature relies on algorithms of orthographic or phonemic similarity, but not all change is equal: *direction matters*. Due to historical phonological changes in G, certain classes of E–G cognates systematically differ in their **initial** consonant, which might be a stop, fricative or affricate, e.g. E [p]*ath*, [t]*in*, [θ]*orn* ~ G [p͡f]*ad*, [t͡s]*inn*, [d]*orn*.

In our experiment, native G speakers (with high E proficiency) completed a cross-modal lexical decision task in E, hearing a CV fragment prime (e.g. [θɔː]) before seeing a visual target, tasked with identifying whether or not the target was an E word. Reaction times and brain activity were recorded. We entertained the hypothesis that lexical access is not language-selective and fragments may thus *not only* activate the relevant E word, *but also* its G cognate (recall word-initial sounds are critical in word recognition). We expected near-identical G cognates to compete and *hinder* the activation of the E word (cf. Fritz et al. 2023); furthermore, depending on whether the feature specification of the initial consonant of the corresponding cognate **matches**, ***mis*matches** or is tolerated (**no-mismatch**), lexical activation of the target might be inhibited or facilitated. This is illustrated in Table 1:

	English	Extracted features	German cognate feature representation	Feature matching	Activation effect
(i) identical	***mild***	[NASAL]	[NASAL]	MATCH	Activated: competition
(ii) tolerated	***th**orn*	[CONTINUANT]	*UNDERSPECIFIED* [PLOSIVE]	NO-MISMATCH	
(iii) mismatching	***tin***	[PLOSIVE]	[STRIDENT]	MISMATCH	Not activated: no competition
(iv) non-existent	***pig***	[PLOSIVE]	—	—	

Table 1: Predicted activation effect of the G cognate; [PLOSIVE] is underspecified and thus not stored in the lexical representation (but is present in the signal, cf. Lahiri & Reetz 2010).

The results support our predictions, with the priming effect affected by condition. 'Identical' cognates had the **slowest** reaction times, as competing cognate forms were activated (hindering access). However, the features of the initial consonant were crucial: 'mismatching' cognates showed no activation of an L1 competitor (as in the 'non-existent' condition, where there was no competition, facilitating access) but reaction times in the 'non-mismatching' condition (e.g. *thorn*) were significantly slower than the 'non-existent' condition. Of particular interest was the 'N400' ERP component, which reflects ease of lexical access (more attenuated with greater facilitation). We expected fragments to activate and prime targets, but that interference from competing L1 cognates would lead to an increased reaction time and less-attenuated N400. **Most strikingly, the N400 was only significantly attenuated for the mismatching and non-existent conditions.** These words were therefore easier to access than the other conditions (where the competing L1 cognate *was* activated, leading to competition and inhibition).

Variation and breakdown in the saltatory interaction of Rendaku and velar nasalization

Canaan Breiss (USC, cbreiss@usc.edu), H. Katsuda (U. Kansas), S. Kawahara (Keio U.)

Summary: We present results of a corpus study and two experiments examining the interaction of voiced velar nasalization (hence "nasalization") and Rendaku in conservative dialects of Japanese. We revisit claims of a feeding relationship between Rendaku and nasalization in compounds in light of recent finding that high-frequency /g/-initial N2s resist nasalization in compounds, and demonstrate that the frequency-conditioned non-undergoing of /g/-initial N2s renders the feeding relation between Rendaku and nasalization saltatory. We observe a great deal of individual variation in the extent to which participants generalize the saltatory pattern to novel forms, suggesting that the feeding relationship between rendaku and nasalization may be breaking down, and the cause may lie in its being rendered saltatory.

Japanese nasalization: In many conservative dialects of Japanese, [g] and [ŋ] stand in an allophonic relationship, with [ŋ] occurring in prosodic-word-medial position, and [g] occurring elsewhere (e.g. [gama] "toad" vs. [kaŋami] "mirror"). This phonotactic also drives alternations in compounds. Recent experimental work (Breiss et al. *to appear*) has demonstrated that in compounds whose N2 is also attested as a freestanding word (hence "free N2s"), nasalization is optional (e.g. /doku+ga/ → [doku-ga] ~ [doku-ŋa] "poison moth", confirming Itō & Mester 1996), and further is strongly affected by both compound- and N2-frequency: increased compound frequency encourages nasalization, while greater N2 frequency inhibits it.

Japanese Rendaku: Rendaku is a widespread and heavily studied process of initial-obstruent voicing in Japanese compounds (cf. Itō & Mester 1986, among *many* others). In compounds with eligible N2s, Rendaku drives voicing alternations between bound and free forms (e.g. /oo+tanuki/ → /oo-danuki/ 'big raccoon'). Note we do not address "eligibility".

Interaction of nasalization and Rendaku: Ito & Mester (1997b) described Rendaku (when N2 is eligible) as feeding nasalization (ex,/ori+kami/ → *|ori-gami| → [ori-ŋami], "paper folding"), resulting in alternations between surface [k] in the free N2 and surface [ŋ] in the compound. Given Breiss et al.'s findings that high-frequency /g/-initial N2s resist nasalization in compounds, the feeding relationship is rendered saltatory: /k/ alternates with [ŋ], "jumping" ("saltating") over phonetically-intermediate [g], while /g/ usually remains [g].

Our contributions: We first present results of a <u>corpus study</u> (following Breiss et al. 2022) that verifies that in existing lexical items, compounds with Rendaku-eligible /k/-initial N2s exhibit the reported feeding relationship between Rendaku and nasalization, surfacing exceptionlessly as [ŋ], never as [g]. Next, in <u>Experiment 1</u>, a production task demonstrates a) speakers produce compounds with /g/-initial free N2s in a variable, frequency sensitive manner, b) speakers are sensitive to the blockage of Rendaku in novel compounds with /k/-initial free N2s, and c) some speakers demonstrate the reported feeding relation between Rendaku and nasalization in eligible compounds. Most speakers, however, deviate from the categorical pattern, either not applying Rendaku (and thus bleeding nasalization), or not applying nasalization. Finally, <u>Experiment 2</u> replicates Experiment 1 in the breakdown of the feeding relation in novel forms, and additionally verifies that existing compounds with /k/-initial free N2s which alternate with [ŋ] demonstrate sensitivity to lexical frequency, suggesting independent lexical listing rather than on-line phonological derivation.

Relevance to phonological theory: A central goal of the phonological enterprise is to discover what types of phonological patterns are representable in the synchronic grammar. We provide further evidence supporting the hypothesis (White 2013) that phonetically-unnatural, "P-map opaque" (Steriade 2003) patterns like saltation may be difficult to learn and represent, with converging evidence from breakdown of the saltatory pattern when generalizing to new items, and existing lexical items exhibiting tell-tale signs of lexical listing, suggesting they may not be represented in the synchronic grammar as saltatory.

Paraguayan Guarani progressive nasalization as phonologically conditioned allomorphy

Marisabel Cabrera (University of California, Los Angeles)

The nasalization system of Paraguayan Guarani has been described for decades (Gregores & Suárez 1967; Estigarribia 2020) and has significantly contributed to phonological theory (Beckman 1999; Walker 1999). However, its rightward nasalization system remains relatively understudied, often dismissed as idiosyncratic. This work presents the first rigorous analysis of Guarani progressive nasalization as phonologically-conditioned suppletive allomorphy, based on original data collected in in-situ fieldwork in Coronel Oviedo, Paraguay.

In Guarani progressive nasalization, the initial voiceless stop of some suffixes alternates to a postoralized stop (1a-b) in the environment of a nasal root, while other suffixes undergo full nasalization of their first syllable (1c-d). But, only some suffixes with initial voiceless stops alternate in the environment of a nasal root (2a-b), making this process lexically specific. Progressive alternations stack and occur at a long distance, as non-alternating oral suffixes may intervene between alternating suffixes and the nasal root (3).

(1) a. jagua-kuera / dog-PL / 'dogs'
b. **tãĩ**-nguera / tooth-PL / 'teeth'
c. oga-pe / house-LOC / 'at the house'
d. kõsĩn**ã**-mẽ / kitchen-LOC / 'at the kitchen'

(2) a. a-jeroky-ta / 1SG-dance-FUT / 'I will dance'
b. ãĩ-pỹtỹv**õ**-ta / 1SG-help-FUT / 'I will help'
c. o-pupu-mã / 3-hot-CMPL / 'it's already hot'
d. õ-ñẽ'**ẽ**-mã / 3-talk-CMPL / 'he already talked'

(3) a. o-karu-se-pa-pota-peve / 3-eat-DES-TOT-INCIP-until / 'until he wants to finish eating'
b. õ-ñẽ'**ẽ**-se-mba-mbota-mẽve / 3-talk-DES-TOT-INCIP-until / 'until he wants to finish talking'

I propose the constraint *[αNAS]ROOT … [-αNAS, -CONT] (PROGHARM), requiring stops to agree in nasality with the root. Such constraint is responsible for the selection of allomorphs and operates at a long distance to predict the patterns in (3a-b). Alternating suffixes have allomorphs with initial oral stops and initial nasal consonants (/{-kuera, -ŋuera}/ for 1a-b), suffixes which undergo full nasalization of first syllable have their nasal-initial allomorphs with a nasal vowel (/{-pe, -mẽ}/ for 1c-d), and non-alternating suffixes have only one allomorph (/{ta}/ for 2a-b, /{mã}/ for 2c-d). The nasal consonant of allomorphs such as /-ŋuera/ surfaces as a postoralized stop given the language's global restriction against oral vowels after nasal consonants (*NV >> *CNTR in (4)). Suffixes with only one allomorph may optimally violate PROGHARM (5).

(4)

/Ṽ-{TV, NV}/	*NV	ID[NAS]	PRGHRM	*CNTR
a. Ṽ-TV			*!	
b. Ṽ-NV	*!			
☞ c. Ṽ-N^{D}V				*
d. V-TV		*!		

(5)

/Ṽ-{TV}/	*NV	ID[NAS]	PRGHRM	*CNTR
☞ a. Ṽ-TV			*	
b. Ṽ-NV	*!			
c. Ṽ-N^{D}V		*!		*
d. V-TV		*!		

This analysis ultimately captures the differential behavior of suffixes in Guarani under the same grammar without the need for cophonologies (Russell 2021). I will also show that this analysis successfully predicts the exceptional causative constructions in Guarani, which have not yet received a straightforward analysis (Estigarribia 2021). I finally describe the attested dialectal variation in the pattern, and analyze it as variation in the lexical specification of suffix allomorphs.

Scalar Tone Shift as Downstep: A Reanalysis of Guébie

Jian Cui (Harvard University) & Nicholas Rolle (Princeton University)
Contact: jianui@fas.harvard.edu nrolle@princeton.edu

Problem. Guébie ([gie]; Kru: Ivory Coast) has four default tone levels (1–4), with a scalar pitch drop in imperfective (IMPF) contexts (Sande, 2018). The verb-initial tone lowers stepwise, except Tone 1, which remains unchanged, while the subject's final tone raises by one step (Table1). This presents two analytical challenges: (1) the shift is strictly local, affecting only the verb-initial tone and the subject; (2) IMPF enforces a stepwise tonal contrast, but only subject raising and verb lowering occur -- neither subject lowering nor verb raising is attested.

Subject tone		Verbal tone		Object tone
the rest	final tone	initial tone	the rest	
unaffected	unaffected	4→3 IMPF 3→2 IMPF 2→1 IMPF	unaffected	unaffected
	1/2/3/4→(correspondingly) 2/3/4/5 IMPF	1→1 IMPF		

Table 1. Guébie scalar tone shift

Reanalysis. We argue that the Guébie IMPF tone shift results from downstep plus a phonologically conditioned allomorphic upstep. Instead of a process-based cophonology model (Sande et al., 2020), we propose an additive morphology approach: IMPF is an underlying floating Tone1 positioned to the left of the verb post-linearization–$[_{phase2}$S-$[_{phase1}$ ^{IMPF}V(-O)]]. This explains the locality restriction and downstepping behavior. Using the Sub-Tonally Reductive and Additive Model (STReAM; Mamadou, 2023), We represent Guébie tones using numerical subtonal features (±1), treating tones as the sum of quantitative features (Table 2). At the initial ASPECT phase 1, IMPF triggers a downstep when docking onto a verb with an initial tone higher than 1, while docking onto Tone 1 verbs violates the OCP, preventing downstep to Tone 0 (Table 3). **Allomorphic Upstep on the Subject.** Subject raising results from an OCP-triggered allomorphic upstep. Regarding allomorph selection, Tone 3 <+1> is preferred over Tone 2 <+1, -1> because the latter's subtonal feature sum would result in a vacuous tonal change on its host, leaving IMPF unrealized. In other words, Tone 3 minimally violates IDENT-TONE while ensuring morpheme realization (REALIZEMORPH). This floating upstep allomorph docks in a later spell-out phase 2, affecting only the subject to avoid obscuring the trigger (i.e., the verb-initial tone when it is Tone 1) that phonologically conditions the IMPF allomorphy. We introduce a violable faithfulness constraint to capture this opacity-avoidance effect – PRESERVETRIGGER: *Assign a violation mark for any output candidate in which the phonological primitive that triggers a morpho-phonological change is obscured.* The IMPF pattern is modeled cyclically in parallel OT with the ranking: REALIZEMORPH, OCP, No Crossing Condition (NCC), PRESERVETRIGGER >> FLOAT >> IDENT-TONE. The following tableau illustrates the derivation for $[e^4\ [^{IMPF}pa^1]] \rightarrow [e^5pa^1]$ '*I run*'.

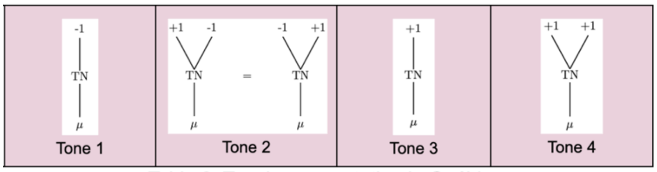


Table 2. Tonal representation in Guébie

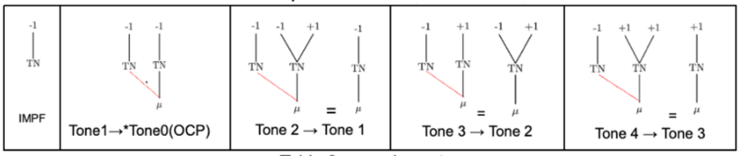


Table 3. IMPF downstep

$[_\varphi [_\omega\ ^{T3} pa^1]]$ Phase1	OCP	NCC	REALIZEMORPH	PRESERVETRIGGER	FLOAT	IDENT-TONE
a. ☞ $[_\varphi [_\omega\ ^{T3} pa^1]]$					*	
b. $[_\varphi [_\omega pa^1]]$			*!			*
c. $[_\varphi [_\omega pa^0]]$	*!					**
d. $[_\varphi [_\omega pa^2]]$				*!		**
$[_\varphi [_\omega e^4]]\ [_\varphi [_\omega\ ^{T3} pa^1]]$ Phase2						
a. $[_\varphi [_\omega e^4]]\ [_\varphi [_\omega\ ^{T3} pa^1]]$					*!	
b. $[_\varphi [_\omega e^4]]\ [_\varphi [_\omega pa^2]]$				*!		**
c. ☞ $[_\varphi [_\omega e^5]]\ [_\varphi [_\omega pa^1]]$						**
d. $[_\varphi [_\omega e^4]]\ [_\varphi [_\omega pa^0]]$	*!					**
e. $[_\varphi [_\omega e^4]]\ [_\varphi [_\omega pa^1]]$			*!			*

Conclusion. 1) We present how STReAM, which uses numerical feature representation for tones, transparently models stepwise tonal changes. 2) We propose that Guébie's scalar tone shift is best explained as default downstep plus a phonologically conditioned upstep resolving OCP. 3) We consider tonal upstep an expansion of the typology of active repair strategies for tonal OCP.

The role of lexical conservatism in the selection of allomorphs

Bartłomiej Czaplicki
University of Warsaw
bczaplicki@uw.edu.pl

Lexical conservatism refers to the finding that novel forms preserve elements that have precedents in a listed form in a paradigm (Burzio 1998; Steriade 1999; Breiss 2021). It is demonstrated that the notion of lexical conservatism should be extended to cover cases that require derivational suffixes to preserve elements of inflectional endings and, more generally, elements that do not stand in direct correspondence between the base and the derivative.

Polish locative adjectives (LAs) are formed using an optional intermorph and an obligatory suffix. There are three possible intermorphs and one suffix (with two allomorphs) (Kreja 1989): *root* + {aɲ, ɛɲ, ij/ɨj} + $\{sk/tsk\}_{LA}$. The three intermorphs (aɲ, ɛɲ, ij/ɨj) begin with the vowels /a/, /ɛ/ and /i/ɨ/. Two of these vowels are also used as endings marking gender in nouns: /a/ marks feminine nouns and /ɛ/ neuter nouns. Many place names end in /ɛ/ and /i/ɨ/, e.g. /mali/ 'Mali' neuter. The two gender markers and the stem-final /ɛ/ and /i/ match the initial vowels of the three intermorphs forming LAs. We test the hypothesis that the distribution of the intermorphs is partly controlled by the need to preserve the vowels of the endings or stems, which would otherwise be lost. For example, /dʑibut**i**/ 'Djibouti' has two competing LAs: /dʑibu-tsk-i/ (with a truncated stem) and /dʑibut-**ɨ**j-sk-i/. Similarly, the attested LAs of /angɔl-**a**/ 'Angola' are /angɔl-sk-i/ and /angɔl-**a**ɲ-sk-i/. The second LA in each case complies with lexical conservatism in the relevant sense.

We present the results of a corpus analysis of the distribution of affixes in Polish locative adjectives (2,503 lemmas). A multinomial logistic regression analysis (function *multinom ()* in the *nnet* package) was run on the data to identify the factors responsible for the gradient preferences for the affixes in LAs. The predictor *ending* (/a/, /ɛ/, /i/, no = *no ending)* was tested alongside other predictors: *base-final consonant, syllable structure* (presence of extrasyllabic consonants in the output: no/yes) and *stratum* (native/foreign). The hypothesis is confirmed: (i) /aɲ-sk/ is chosen significantly more often when the ending is /a/ (compared to "no", stem-final /i/ or ending /ɛ/), (ii) /ɛɲ-sk/ is chosen more often when the ending or the stem-final vowel is /ɛ/ (compared to "no", stem-final /i/ or ending /a/) and /ij-sk/ is chosen more often when the stem ends in /i/ (compared to "no" and endings /a/ and /ɛ/).

A formal analysis is proposed using a constraint that enforces lexical conservatism between the derivative and the base. Lexical conservatism is defined as the requirement to preserve properties of some listed form in the derived form (Steriade 1999). In the case at hand, the base with which correspondence is established is the citation form, i.e. the nominative singular form of the noun (Kenstowicz 1996). Following (Stanton & Steriade 2014), it is referred to as the "local base". LEXV_{IM} is violated when the vowel in an intermorph in a LA does not match in quality a corresponding vowel in the Local Base. Base-derivative correspondence is established between entire words. Noisy Harmonic Grammar (Boersma & Pater 2016) (implemented using OTSoft, Hayes et al. 2013) is employed to model the gradient preferences.

The novel finding is that word formation is opportunistic in the sense that it refers to elements that are not part of the morphological base as understood in Correspondence Theory (McCarthy & Prince 1995). The selection of the intermorphs is governed by the content of inflectional endings and other elements that do not belong to the morphological base and would otherwise be lost. This phenomenon bears some resemblance to exfixation in that it pulls in material from an adjacent affix (Downing 1997). However, exfixation is coerced by a violation of a markedness constraint, while the present case has a different rationale: the need to preserve material from the local base understood as a whole, including inflectional endings.

Exploring the roles of morphology and analogy in English stress assignment

Quentin Dabouis[1], quentin.dabouis@uca.fr Marie Gabillet[1], marie.gabillet@doctorant.uca.fr
Sabine Arndt-Lappe[2], arndtlappe@uni-trier.de Aaron Seiler[2] seiler@uni-trier.de
[1]Université Clermont Auvergne, [2]Trier University.

Stress position in English words is well-known to be influenced by phonological, morphological, and (morpho)syntactic factors (esp. verbs vs. nouns). All these influences, however, are far from categorical, and there is a lot of seemingly unpredictable variation in the lexicon. For example, heavy syllables within a three-syllable window at the right word edge tend to attract stress. Such effects are modulated by word-class: Stress in verbs is influenced by the weight of the final syllable while stress in nouns is influenced by that of the penult. The present study focuses on nouns and verbs. Regarding morphological determinants of stress, most theories distinguish between stress rules applicable in monomorphemic words and those in morphologically complex words. However, they disagree in how they partition the lexicon into words whose stress is influenced by morphology and words whose stress is not influenced by morphology. As a result, there is disagreement in how the nature of morphological effects is defined. The range of proposals spans from those defining relevant morphology only as transparent, productive form-meaning mappings to those including recurrent, but semantically opaque formatives. There is, however, leakage, no matter how morphology is defined. For example, approaches that include so-called 'opaque' morphological constituents have pointed to strong statistical correlations between stress position and the presence especially of opaque, i.e. etymological prefixes in the English lexicon (e.g. Dabouis & Fournier, 2024). Verbs like *commít* and *digréss* are cases in point, having final stress despite the fact that their final syllable counts as light, not heavy, by standard accounts. It is, however, unclear, why effects of opaque morphology should be productive synchronically. Also, such correlations raise more fundamental questions about the role of other types of recurrence in the English lexicon (e.g. of bound roots) in stress assignment, and their relation to traditional structural phonological predictors such as syllable weight (e.g. Hayes, 1982).

One question is whether effects of 'morphology' are purely based on recurrence of form or on a mapping of meaning and form. The other question is about the nature of relevant phonological representations: if recurrence plays a role, what is the evidence for more abstract representations, e.g. in terms of syllable weight? In the present paper we will analyze the findings of a pseudo-word experiment on English: a forced-choice experiment (50 native speakers of British English, N=2,400 observations) testing participants' preferences of stress patterns presented in disyllabic verb-noun pairs. The relevance of recurrence will be investigated by means of a computational analogical model (AML, Skousen et al., 2013), which computes lexical support for different stress patterns based on the similarity of the test words with existing words in the lexicon. The latter will be modelled as all verbs from the *Cambridge Pronouncing Dictionary* (Jones 2006, N=3,033, > 1 syllable), and all nouns from the *Longman Pronunciation Dictionary* (Wells 2008, N = 6,200, > 1 syllable). Structural predictors tested in the analysis comprise different measures of syllable weight and prefixation (measuring the transparency of prefixes). Lexical support measures were then used as predictors alongside weight and prefixation in a mixed-effects logistic regression model. Results show that all three variables are significant predictors of main stress in the experimental data. Lexical support is strongly correlated with actual productions, but AML underpredicts some of participants' preferences. These are, however, explained by syllable weight and transparency of the prefix in our regression model. We conclude that properties on different levels of representation are relevant for the prediction of stress position in English pseudo-words, both in nouns and in verbs. We also present the preliminary results of a reading experiment testing the production of trisyllabic pseudo-verbs (50 native speakers of British English, N=1,081 observations).

Eastern Andalusian Spanish Laxing Harmony and Vowel-Final Oxytones

Stuart Davis (Indiana University, davis @iu.edu), Nicholas Henriksen (University of Michigan, nhenriks@umich.edu), Matthew Pollock (Louisiana State University Shreveport, mpollock@lsus.edu)

Formal analyses of Eastern Andalusian Spanish (EAS) laxing harmony in Soriano (2012), Kaplan (2021), Jiménez & Lloret (2007, 2020), and Walker (2024) view laxing in plural forms, such as *nenes* 'boys' (EAS [nɛnɛ]) and *coches* 'cars' (EAS [kɔt͡ʃɛ]), as having the same phonological analysis as monomorphemic words ending in final lexical-s, such as *jueves* 'Thursday' (EAS [hwɛßɛ]) and *entonces* 'then' (EAS [ɛntɔnθɛ]). These analyses assume that EAS plurals are marked synchronically with suffixal /-s/, reflecting diachrony where, for a plural form like [nɛnɛ] 'boys,' the underlying form is /nene-s/ and through certain processes (including coda s-deletion, vowel laxing, and [–ATR] harmony), the surface form is derived. This same analysis holds for monomorphemic words like [xwɛßɛ] 'Thursday' from underlying /xuebes/. However, studies by Henriksen (2017), Herrero de Haro (2020), and Davis & Pollock (2024) differ from the previous ones by distinguishing vowel laxing in plural forms from phonological laxing triggered by word-final lexical s-deletion.

Here, we argue that plural words are better analyzed as being marked by a floating [–ATR] feature (i.e., $[–ATR]_{PL}$), which aligns to the right edge of the word (triggering vowel epenthesis in consonant-final nouns) and then spreads left by a feature alignment constraint. This is different than monomorphemic words, where the word-final coda s-deletion analysis can be maintained. An argument favoring the floating feature analysis is that the diachronic plural suffix -s never surfaces, even in phrasal contexts (e.g., Herrero de Haro & Hajak, 2022), whereas a word-final lexical /s/ in monomorphemic words surfaces in plural forms, as in *meses* 'months' (EAS [mɛsɛ], singular [mɛ]) and *jueveses* 'Thursdays' (EAS [xwɛßɛsɛ], singular [xwɛßɛ]). Further, Herrero de Haro (2020) notes that plurals of vowel-final oxytones differ from monomorphemic oxytones ending in lexical /s/: laxing occurs only on the final vowel in oxytonic plurals like *papás* 'fathers,' but can affect both vowels in monomorphemic oxytones like *revés* 'back'. While oxytonic plurals of vowel-final words and monomorphemic oxytones ending in lexical /s/ remain understudied in EAS, perhaps due to low frequency (Martínez-Paricio 2021), we addressed this gap by collecting data from 38 speakers (21 female, 17 male, ages 19-62) of a subvariety of EAS spoken outside of Granada city.

Our study focuses on vowel-final oxytones and paroxytones that include vowel-final singular forms and their plurals as well as monomorphs ending in /s/. Each speaker read a list of 146 words embedded in carrier phrases. Consistent with previous research, high vowels were never lax in plural forms. Thus, the singular and plural form of *tribu* 'tribe' were the same. Concerning plurals with mid vowels (e.g. *nenes* 'boys' and *bebés* 'babies'), most speakers laxed both vowels regardless of stress (i.e., [nɛ́nɛ] and [bɛßɛ́]). This was also the case with the monomorphemic oxytone *revés* 'back', pronounced with both vowels lax. Regarding low vowels, these typically were not laxed in monomorphs ending in lexical /s/, such as the name *Tomás* [tɔmá] or *jamás* 'never' [xamá]. The low vowel was also not laxed in plurals such as *becas* 'scholarships' [bɛ́ka] or *clases* 'classes' [klásɛ]. Crucially, just the final low vowel was usually laxed in plural words containing only low vowels (e.g., *papás* 'fathers'), in agreement with Herrero de Haro. In contrast, plural paroxytones like *camas* 'beds' showed considerable variation, with speakers either laxing both low vowels, laxing just one vowel, or showing no laxing at all. The key comparison is between the monomorph *jamás* 'never', which did not lax, versus the plural *papás* 'fathers' with final vowel laxing. The latter difference supports our view that the plural is marked with a floating $[–ATR]_{PL}$, which is realized by a plural alignment constraint that interacts with [–ATR] feature cooccurrence constraints and a Realize Morpheme constraint. Our study emphasizes the importance of vowel-final oxytones to better understand the key theoretical nuances regarding EAS vowel harmony.

A subregular hypothesis for birdsong phonology

Benjamin Flickstein (benjaminf@tauex.tau.ac.il) & Ezer Rasin (rasin@tauex.tau.ac.il)
Tel Aviv University

Contribution: Research on the computational properties of human phonology suggests that phonological patterns are at most subregular. We present a review and analysis of available birdsong data suggesting that birdsong is computationally similar to human phonology.

Background: Phonological patterns can be classified in terms of their computational complexity based on the subregular hierarchy of Formal Language Theory (Rogers et al. 2013, Heinz 2018). This hierarchy consists of nested complexity classes partially shown in (1). Most phonological patterns fall within the smallest, Strictly Local (SL) class. According to the *Subregular Hypothesis*, more complex patterns are limited to the Tier-base Strictly Local class (TSL, Heinz 2018) or the Non-Counting class (NC, Graf 2022).

$$\textit{Strictly Local} \subsetneq \textit{Tier-based Strictly Local} \subsetneq \textit{Non-Counting} \subsetneq \textit{Regular} \qquad (1)$$

Like human phonology, birdsong consists of sequences of discrete sounds that obey combinatorial restrictions. Berwick et al. (2011) proposed to classify birdsong patterns with respect to Formal Language Theory, noting that a formal comparison with human language can advance the study of birdsong as a cognitive system and the biological and evolutionary aspects of both systems. Since Berwick et al. (2011), our understanding of the subregular hierarchy has advanced significantly, but no systematic subregular survey of birdsong patterns has been conducted.

Our study: We compiled a collection of 60 unique song patterns from the literature on Bengalese finch and canary song syntax, which included sufficient detail for a formal computational analysis. The vast majority of this literature consists of analyses in terms of Probabilistic Markov Models (or equivalent models) for the song of these and a few other model species (Williams 2006, Ivanitskii & Marova 2022).

We converted those models to equivalent minimal deterministic Finite-State Automata, and constructed an automaton ourselves whenever one was not provided in the source. Then, we applied methods from the subregular literature to identify the minimal class for each pattern. When multiple methods to determine class membership were available, we used the more convenient one. SL patterns were identified using an algorithm for deciding SL patterns (Edlefsen et al. 2008) and through construction of equivalent SL automata (Chandlee 2014) or Strictly k-Local definitions (Rogers 2013). TSL patterns were identified using suffix substitution closure (Rogers & Pullum 2011, Heinz et al. 2011) or a deciding algorithm for automata (Lambert & Rogers 2020). NC membership was proven by providing star-free expressions or permutation-free automata, both of which are equivalent to NC (McNaughton & Papert 1971).

Results: Almost all of the song patterns in our survey fall within the SL class. Importantly, however, two patterns found in Bengalese finches (Lu et al. 2020, Warren et al. 2012) have proven to be properly Non-Counting given the hierarchy in (1). These results suggest a Subregular Hypothesis for birdsong that is equivalent to one currently suggested for human phonology. This equivalence could imply a similarity between the cognitive mechanisms underlying birdsong and human phonology, and highlights the potential of further comparative research of the neurobiology, genetics, and evolution of both systems.

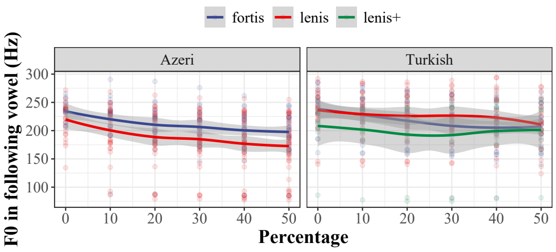
Microvariation in Turkic laryngeal systems: synchrony and diachrony

Deepthi Gopal (*Uppsala*), Stephen Nichols (*Edinburgh*), Pavel Iosad (*Edinburgh*), László Károly (*Uppsala*)

Cross-linguistic variation in the phonetics and phonology of laryngeal contrasts has been extensively studied in recent years following the emergence of Laryngeal Realism (Honeybone 2005) and responses to it. Two central hypotheses within LR are that languages can be classified into a small number of types, and that the phonological patterning and phonetic realization of laryngeal categories are closely aligned. It has been shown, however, that cross-linguistic variation is more extensive than that: the degree of phonetic variation does not neatly fit the small number of categories proposed (e.g. Kirby & Tan 2023); there exist more or less drastic mismatches between phonological and phonetic patterning (e.g. Salmons 2020); and correlates other than VOT make the picture more complex (e.g. Kirby & Ladd 2019).

Much current theorizing builds on evidence from a few, mostly European languages. In this paper, we consider material from the Turkic language family, which partially supports current understanding within LR: in particular, morphophonological patterns are relatively stable despite extensive phonetic microvariation. It also casts light on the diachronic development of laryngeal systems. Turkic languages are usually analysed as contrasting 'strong' (fortis) and 'weak' (lenis) obstruents (Johanson 1984–1986), suggesting an 'aspirating' system under LR. Phonetically, the *fortes* are aspirated and/or long, and the *lenes* are shorter and often only variably voiced, in line with the 'aspirating' prototype in LR (Turkish: Kallestinova 2004). The phonology also conforms to expectations: salient patterns include (progressive) devoicing (Kyrgyz [ɑtɑ-**d**ɑ] 'father-LOC', [køl-**d**ø] 'lake-LOC', [qonoq-**t**o] 'guest-LOC'), and a pattern of lenition where *lenes* follow long vowels and *fortes* follow short vowels (best preserved in Turkmen: *at* 'horse', *ād* 'name').

This basic description hides extensive variation. Traditional descriptions note categorically voiceless *lenes*, particularly in languages spoken in the Caucasus and in China, and pre-closure glottal marking of *fortes* (preglottalization, preaspiration), notably in Sayan Turkic. Many languages show patterns of voicing, such as intervocalic weakening (a poorly understood pattern, rare in aspirating languages [Kümmel 2007]) and perhaps vowel–consonant interactions allied to closure voicing (Vaux 2009). Some of this variation is traditionally linked to language contact.



We report a phonetic study of oral plosives in two closely related varieties, Turkish and Azeri. The data includes historical fortis and lenis stops in stem- and word-final position, controlling for right-hand context. We focus on VOT, closure voicing, and F_0. For Turkish, we replicate earlier findings: *fortes* are postaspirated, and *lenes* variably voiced. Word-finally, historical *lenes* (which are rare) show more closure voicing than historical *fortes*. In Azeri, we find categorical voicelessness in the lenis series and extensive pre-closure glottal activity (breathiness and/or preaspiration) in *fortes*. We argue that the Azeri system is innovative relative to Turkish. The key reason is that we observe systematically lower F_0 after *lenes* in Azeri, but not in Turkish. We interpret the F_0 effect as *phonologized* in the sense of Bermúdez-Otero (2015): a language-specific phonetic rule that is synchronically arbitrary but historically derived from what was a mechanical by-product of closure voicing.

Similar microtypologies are known from elsewhere (e. g. Germanic: Beckman, Jessen & Ringen 2013), but evidence for their diachronic pathways is circumstantial, with little agreement on interpretation (Goblirsch 2005, Salmons 2020). Our results provide direct evidence for the diachronic typology of laryngeal systems, particularly those of the 'aspirating' type. Further, we propose that contact played a smaller role in the rise of the Azeri system than often thought, highlighting the heuristic value of the life cycle of phonological processes framework.

A simple modular approach to environmental shielding

Daniel Currie Hall, Saint Mary's University ⟨daniel.hall@smu.ca⟩

As Stanton (2018) describes in some detail, many languages exhibit a pattern of 'environmental shielding', in which nasal consonants are partially (or completely) denasalized when adjacent to oral vowels. One example Stanton cites is Karitiâna, which has the pattern shown below.

Stopping (oralization) of nasal consonants in Karitiâna (Storto 1999: §2.3.2.1)

(1) *No stopping in the absence of oral vowels*

a.	/ãmãŋ/	[ãmãŋ̚]	'to plant'
b.	/ŋõŋõrõŋ/	[ŋõŋõrõŋ̚]	'summer'

(2) *Pre-stopping after oral vowels*

a.	/himĩnã/	[hi^{b}mĩnã]	'roasted'
b.	/osen/	[ose^{d}n̚]	'to rejoice'
c.	/esɨŋã/	[esɨ^{g}ŋã]	'waterfall'

(3) *Post-stopping (or total stopping, if word-initial) before oral vowels*

a.	/ãmo/	[ãm^{b}o]	'to climb'
b.	/neso/	[deso]	'mountain'

(4) *Pre- and post-stopping between oral vowels*

a.	/apimik/	[api^{b}m^{b}ik̚]	'to pierce'
b.	/kina/	[ki^{d}n^{d}a]	'thing'

From a survey of South American languages, Stanton argues shielding is motivated by contrast preservation. She finds shielding occurs only in languages with a phonemic oral–nasal contrast on vowels, and is most likely to occur in contexts where oral vowels would otherwise be most susceptible to coarticulatory nasalization that would reduce the phonetic cues to this contrast. She proposes a Dispersion Theory analysis (Flemming 2002), with shielding driven by a MinDist constraint requiring maximal phonetic distinctness of contrasting oral and nasal vowels.

Stanton's analysis requires the constraint grammar to evaluate a motley of gradient phonetic properties and categorical phonological ones: Nasalise requires vowels adjacent to nasals to be *at least partially* nasal, while Max[−nasal] penalizes *categorical* nasalization of underlyingly oral vowels. In arguing against an alternative involving autosegmental spreading of [−nasal], Stanton cites Steriade's (1993a; 1993b) arguments that the feature [nasal] is inherently privative, yet her own analysis requires the phonology to refer not only to [−nasal], but also to any number of intermediate degrees of nasality.

I propose a modular alternative, in which the phonological component of the grammar deals only in categorical feature specifications, assigned according to a contrastive feature hierarchy (Dresher 2009). Thus, vowels will have specifications for nasality only if it is contrastive on them. As in Hall's (2011) account of the typology of inventories, contrastive feature specifications set the targets for phonetic implementation. A contrastively nasal vowel will have a 'velum down' gesture (or the auditory–acoustic equivalent) as part of its instructions, and a contrastively oral one will have 'velum up'. A vowel that does not enter into an oral–nasal contrast will have no target; its realization will be oral by default, but subject to coarticulatory nasalization if there's a 'velum down' segment nearby. When adjacent segments have opposing targets (e.g., an oral vowel beside a nasal consonant), gestural timing may be off in *either* direction. This approach captures insights from both Stanton and Steriade:

Shielding depends on contrast: Only contrastively oral vowels have an oral target that can influence adjacent consonants in the phonetics.

Shielding is most likely in contexts where coarticulatory nasalization would otherwise be most likely: Coarticulatory effects in either direction are likeliest when segments are in close construction. E.g., nasalization and shielding are both more likely between a nucleus and a following coda than between a nucleus and a following onset.

Nasality can be privative in phonology: Hall (2011: §6.1) shows how a monovalent feature hierarchy can be translated into phonetic instructions, including instructions for realizing the contrastive absence of a feature.

Shielding is phonetic: As Steriade (1993a: 447–8) argues for Kaingang, shielding is not a phonological process, but arises from the timing of phonetic gestures realizing phonological contrasts.

How language-specific perceptual cues can explain differences in onset clusters: The case of plosive-liquid onsets in Polish and English

Silke Hamann, University of Amsterdam, silke.hamann@uva.nl

Languages differ in the type of consonant clusters they allow in onset position. On the one hand, there are languages like English and German, with a small set of clusters, only few of which violating the sonority sequencing principle (SSP). For these languages (Type I), a tight timing in the gestures of the consonants has been observed (Marin & Pouplier 2010 for English). On the other hand, there are languages like Polish and Georgian (Type II) that have a large cluster system, many clusters violating SSP. For this type, articulatory studies have shown that consonants in onset clusters are produced with less overlap of their gestures (Hermes et al. 2017 for Polish). This difference can also be observed in clusters occurring in both, such as plosive-liquid onsets (PL) in Polish and English (Schwartz et al. 2024), the focus of the present study.

Traditional phonological accounts referring to SSP fail to explain the differences between the two types. The *Onset Prominence framework* (Schwartz 2023) therefore proposes that it derives from different representations: while in English onset clusters have a non-branching structure in the top node of their tree, in Polish they have a branching structure in this position.

The present study provides an alternative to Schwartz (2023) in proposing there is no need to represent language-specific PL onset differences in the phonology, as it can be accounted for in the phonetics. Rather than claiming it is primarily a difference of gestural coordination (cf. articulatory studies cited above), we propose that it is a difference in the language-specific use of perceptual cues. Our proposal is crouched in *Bidirectional Phonetics & Phonology* (Boersma 2007) as it can formalize the interface between phonetics and phonology: cues are mapped onto phonological surface forms in perception, and vice versa in production, with cue constraints (formalized here in HG with constraint satisfaction).

Type II languages, due to their large cluster inventory, require plosives before other consonants to have an audible release to provide information on articulatory place. The surface onset cluster /.tr/ thus needs to be **realized** as [_^{tə}r] ("_" = plosive closure, "^{tə}" = release with little vocalic element, "r" rhotic with audible formants), and hence the cue constraint /.tC/[^{tə}] (mapping onset t before a consonant onto an audible release) has a high weight, cf. **(1)** right. In type I languages, the same cluster does not require a release (low weight to this constraint) but is realized with devoicing/affrication of the following liquid (common phonetic process in English, often treated as phonological), as expressed with a high weight for constraint /.tr/[tr̥], cf. (1) left. In **perception (2)**, different weights to a constraint dealing with the vocalic release (/ə/[^{ə}]: "perceive [^{ə}] as a vowel schwa") can account for why English often perceive a vowel in Polish /.tr/, and why Polish confuse English *train-terrain* (Schwartz 2023).

(1) *Production of surface form* /.tr/ *in type I English (left) and type II Polish (right)*

	0.1	1.0	0.3	*H*
/.tr/	/.tC/[^{tə}]	/.tr/[tr̥]	/r/[r]	
[_^{tə}r]	1		1	0.6
☞ [_tr̥]		1		1.0

	1.0	0.1	1.0	*H*
/.tr/	/.tC/[^{tə}]	/.tr/[tr̥]	/r/[r]	
☞ [_^{tə}r]	1		1	2.0
[_tr̥]		1		0.1

(2) *Perception of phonetic form* [_^{tə}r] *in type I English (left) and type II Polish (right)*

	0.1	1.0	0.3	0.6	*H*
[_^{tə}r]	/.tC/[^{tə}]	/.tr/[tr̥]	/r/[r]	/ə/[^{ə}]	
/.tr/	1		1		0.6
☞ /.tər/			1	1	0.9

	1.0	0.1	1.0	0.1	*H*
[_^{tə}r]	/.tC/[^{tə}]	/.tr/[tr̥]	/r/[r]	/ə/[^{ə}]	
☞ /.tr/	1		1		2.0
/.tər/			1	1	1.1

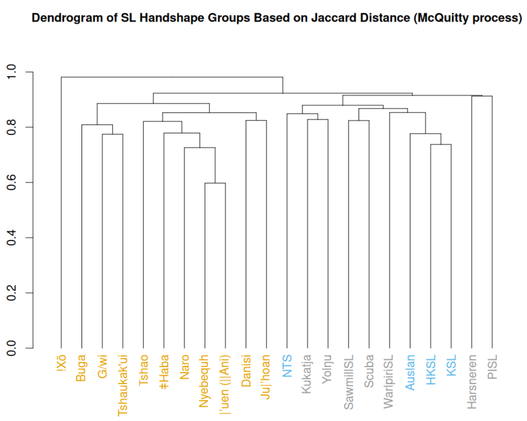
Towards a typology of handshapes across different types of sign language systems

Irurtzun, A. (CNRS-IKER), Aristidou, N. (UCL), Nevins, A. (UCL & UFRJ), Miotti, G. (UBM-IKER & IJN), Hosemann, J. (U. Köln) & C. Geraci (CNRS-IJN)

1. Introduction: In Sign Language (SL) linguistics, it is widely accepted that handshape (HS), place of articulation, movement, and orientation are key to phonology (Fenlon *et al.* 2018, Brentari 2019), with HS often seen as the most important (Emmorey *et al.* 2003, 2013; Schembri *et al*. 2005). How important is HS in alternate or secondary systems, such as underwater communication, hunting, loud sawmills, or across different L1 spoken language groups (*e.g.* Plains Indian SL)? Does the size of these systems' inventories affect HS distribution, similar to Dispersion Theory (Liljencrants & Lindblom 1972)? Does syntactic function and social pattern of the SL affect specific HS distribution (Brentari et al 2022)? How do articulation space and bimanuality affect possible comparisons between similar systems?

2. Comparative data: We performed a comparative analysis of the HSs across different types of gestural communication systems —from the most restrictive hunting codes (*n* = 11) such as !Xõ (Hindley, 2014) or Tshaukak'ui (Mohr et al, 2019), to alternate SLs (n=7) such as Kukatja (Jorgensen, 2021), or Plains Indians SL (Davis, 2010), to primary SLs across regions (*n* = 4), the Kenyan SL (Morgan, 2022), Auslan (Johnson & Schembri, 2007), Norwegian SL (Erlenkamp & Kristoffersen, 2010), or Hong Kong SL (Wong, 2008). This is currently the largest comparative HS analysis, including AltSLs.

3. Inventories: The dataset shows clear differences in (i) the frequency-distribution of different HSs, (ii) the size and nature of the inventories of different SL Types, and (iii) there are nontrivial associations between SL types and inventory sizes (see point 5. below). *E.g*, the HS that is the most present corresponds to a raised index and middle finger in a V format (ID 01-200-101 in the *International SignWriting Alphabet* (ISWA) 2010), attested in 20/22 lects (90.9%). There are also several HSs only present in one single lect (0.045%), *e.g.* the arching of the index and middle fingers conforming a cup with the thumb (ID 01-03-011-01, ISWA 2010), restricted to the G/wi hunting code. We also have sharp contrasts across groups: Hunting SLs show a mean of 11.27 HSs (σ: 4.33), while Alternate SLs μ: 28.71 (σ: 7.69), and Primary SLs μ: 43.5 (σ: 9.88); statistically credible differences.



4. Articulatory effort & frequency: We analysed the articulatory effort of each HS using Ann's (1993) metric, finding a lack of a clear linear correlation between HS ease of articulation and frequency across inventories. It is not the case that the most unmarked HSs are the most present in our dataset; other factors (perceptibility, dispersion) will have to explain this pattern.

5. Inventory set relations: We computed the Jaccard distance across inventories and performed a hierarchical cluster analysis (Fig. 1), where orange = Hunting code; gray = AltSL; and blue = Primary SL. As shown, lects pertaining to the same SL Type cluster together. This was confirmed by several tests of clustering accuracy with respect to an external criterion (SL Type): Fig. 1 is associated to an ARI of 0.66; NMI of 0.68, and a purity score of 0.82, which testify to substantive agreement between the clustering and ground truth (the SL Type of each lect).

6. Discussion: HSs vary across different SL Types, and are not structured in a subset-superset relationship across them. Different sign communication systems have characteristic HSs, which must be explained as an interplay between articulability, perception, iconicity, dispersion, and other factors such as syntactic (*e.g.* classifiers, verbs) and social function (speech avoidance, *lingua franca*, ritual…).

Ternary Vowel Length Alternations in Shilluk

Akil Ismael | University of California, Berkeley | akil.ismael@berkeley.edu

Introduction. In this paper we account for vowel-length alternations in Shilluk, a West-Nilotic language of South Sudan with a ternary vowel length system (Remijsen et al., 2019). Although these patterns have been meticulously described (Remijsen & Ayoker, 2018), they have not yet been analyzed within a theoretical framework. We propose an account which hinges on two analytical tools: (i) that underlying representations can contain vowels that are not associated with a mora (e.g. Zimmermann, 2017), and (ii) that morphemes triggering vowel-length alternations can be associated with distinct cophonologies (Orgun 1996; Sande et al.,2020).

Data. We focus on vowel-length alternations in the nominal and verbal paradigms (from Remijsen & Ayoker 2018)[1]. The underlying tonal specifications of the verbs can be seen in the active voice CV forms. The passive morpheme is expressed through a high-fall tonal template in the CV, but in the passive XV the tonal specification expones the XV and the passive is expressed via vowel-length alternations. Specifically, Short with grade verbs alternate between a short vowel (V) in the active voice XV and an overlong vowel (VVV) in the passive XV. Long with Grade verbs alternate between long (VV) and overlong (VVV), and Fixed Short verbs do not alternate. There is no V ∼ VV alternation, making this pattern distinct from additive lengthening in closely-related Dinka (Flack, 2007).

		Fixed Short		Short with Grade		Long	
		Low	Fall	Low	Fall	Low	Fall
ACT	CV	á-ŋɔ̀l	á-lɛ̂ŋ	á-càm	á-mʌ̂l	á-lɛ̀ɛŋ	á-mâat̪
	XV	á-ŋɔ̄l	á-lɛ̂́ŋ̄	á-cām	á-mʌ̂́l̄	á-lɛ̄ɛŋ	á-mấat̪̄
PASS	CV	á-ŋɔ̂́l	á-lɛ̂́ŋ	á-cấm	á-mʌ̂́l	á-lɛ̂́ɛŋ	á-mấat̻
	XV	á-ŋɔ̄l	á-lɛ̂́ŋ	á-cāaam	á-mʌ̂́ʌʌl̄	á-lɛ̄ɛɛŋ	á-mấaat̪

Analysis. We posit two passive allomorphs, one which overwrites the underlying tone of the verb with a templatic high-fall tonal melody (PASS, CV), and another null-morph conditioned by the XV (tonal) morpheme. This XV-conditioned passive allomorph is associated with a cophonology that triggers vowel-length alternations. Second, we rely on underlying representations that allow for vowels associated with different numbers of moras, including vowels associated with no moras at all (Hyman, 1985; Zimmermann, 2017). We posit that Fixed Short class verbs are underlyingly weightless, Short with Grade verbs monomoraic, and Long class verbs bimoraic, and suggest that the constraint-ranking in (1) is operative in the language, but that the passive allomorph triggering vowel-length alternations is associated with ranking (2).

(1) $*\mu\mu\mu$ » Max-IO(μ) » $*\mu\mu$, $*\mu$ » Dep-IO(μ)   (2) $*\mu$, $*\mu\mu$ » Max-IO(μ) » $*\mu\mu\mu$ » Dep-IO(μ)

$*\mu$-type constraints assign violations for a specific number of moras being asociated with the same V-node (cf. Flack, 2007). Max-IO(μ) and Dep-IO(μ) assign violations for deletion and creation of V-to-μ associations, respectively. Unassociated V-nodes remain unaffected by the constraints in (1-2) accounting for the Fixed Short class. Short with Grade and Long class verbs, however, undergo overlengthening under the ranking in (2). We assume that a high-ranked Associate(V, μ) constraint which applies at a later cycle of phonological evaluation forces the association of a mora to weightless vowels prior to output. We argue that this account extends neatly to other Shilluk patterns of vowel-length alternation in Shilluk. For example, a class of suffixed nouns show the mirror-opposite pattern when alternating between base, and singular possessive forms (*pîc-ɔ̀ ∼ pîc-ɪ̀*, *pâaal-ɔ̀ ∼ pâl-ɪ̀*, *bɔ̀ɔɔ̪t̪-ɔ̀ ∼ bɔ̀ɔ̪t̪-ɪ̀*), which we capture by positing that the base-suffix /-ɔ̀/ is associated with ranking (2), and the singular possessive suffix /-ɪ/ with ranking (1), but that both apply within the same cycle as the root.

Conclusion. We capture vowel-length alternation in Shilluk in which we see: (i) V∼V, (ii) V∼VVV, and (iii) VV∼VVV, but not (iv) V ∼ VV by reference to morpheme-specific constraints triggering markedness reversals, coupled with non-moraic V-nodes in URs.

[1] CV = Core voice (subject or object-initial clause), XV = applicative voice (applied argument initial clause), ACT = active voice, PASS = passive voice.

Differential role of F0 and transitional probability for word segmentation

Farhat Jabeen[1] and Theresa Matzinger[2]
Phonetics Work Group, Department of Linguistics, Bielefeld University, Germany[1]
Department of English & American Studies[2], Vienna Cognitive Science Hub, University of Vienna[2]

Based on their native language, listeners differ in their use of prosodic cues as well as transitional probability for the word level segmentation of a continuous speech stream in pseudo languages (cf. Saffran et al. (1999) for English, Matzinger et al. (2021) for German). This study investigates the role of F0 for word segmentation in pseudo languages by Urdu listeners. Each lexical word in Urdu carries a rising F0 contour. The low tone marks the left edge, while the high tone aligns variably either with the ultimate or the penultimate syllable on the right edge (Jabeen, 2019). This conventionalized use of low and high F0 leads us to investigate if Urdu listeners use it as a cue to identify words in pseudo languages as well. Furthermore, we analyze the interplay between F0 and high vs. low transitional probability for word segmentation by these listeners. Finally, we test if Urdu listeners' use of F0 and transitional probability is affected by their country of residence (Pakistan, Germany), as shown by previous research on their differential use of duration (Jabeen and Braun, 2023). If so, this would indicate the role of exposure to typologically different languages for Urdu listeners living in Germany and Pakistan.

Methods: For our experiment on word segmentation, the stimuli consisted of three pseudo languages, each comprising four words with three CV syllables, recorded by a female speaker. The syllables consisted of five vowels [a, e, i, o, u] in combination with different consonants (plosives, fricatives, nasals). They were concatenated into a continuous speech stream of 140 syllables. The sequence of syllables was controlled, leading to the transitional probability of 1 (henceforth statistical words) or 0.33. The low probability part-words (PW) were formulated across boundaries of statistical words and divided into two groups: PW1-2 comprised the last syllable of the preceding and the first two syllables of the following statistical word. PW2-1 consisted of the last two syllables of the preceding and the first syllable of the following word. Eighty-eight Urdu-speaking listeners (45 from Germany, 43 from Pakistan) were presented with speech streams in three conditions: 1) Control with transitional probability but no F0 manipulation (210Hz on all syllables), the final syllable of statistical words with 2) High F0 (260Hz), and 3) Low F0 (160Hz). The F0 manipulation was available in addition to the transitional probability. The participants were asked to listen to the speech stream and identify words from a list displayed on the screen. The list for each pseudo language consisted of four statistical words, four PW1-2, and four PW2-1. We used Generalized Linear Effects Regression to analyze the proportion of hits for statistical words and PWs in our experimental conditions.

Results & discussion: We report a three-way interaction between F0 manipulation (control, low, and high F0), transitional probability (statistical words, part-words), and the country of residence (Pakistan, Germany) ($\chi^2(1)=11.9$, $p=0.01$). The listeners from Pakistan show the main effect of transitional probability ($p=0.03$). For the listeners in Germany, there is an interaction between transitional probability and F0 manipulation ($\chi^2(1)=31.7$, $p<0.0001$). They use high probability to identify statistical words, regardless of the F0 contour. The low F0 on the left edge (PW1-2) leads to the high proportion of hits in this condition. The listeners do not identify words with low F0 at the second syllable (PW2-1), thus indicating that aligning low tone to the left edge of words is more important (PW1-2) for word segmentation than aligning high tone to the right edge (PW2-1). This is in line with Jabeen (2019)'s account of variability in the alignment of high F0 in Urdu and illustrates the role of native language in the use of F0 for word segmentation in pseudo languages. Moreover, exposure to typologically diverse languages leads to inter-language variability as evident by the differential use of F0 and transitional probability by Urdu listeners. Our findings highlight the nuance in listeners' use of cues for word segmentation in pseudo languages and the inter-language variability in this regard.

Vowels can be shorter before voiced than before voiceless consonants: reversed durations in two varieties of German

Björn Köhnlein, Phuong Dang, Tianyi Ni

Issue. Interactions of vowel duration and consonant voicing are phonetically reversed in two varieties of German, Aachen (Franconian) and Leer (Low German). We provide a diachronic account of this typologically unusual reversal and show that synchronically, the patterns in both varieties can be modelled with the same representational machinery – two types of feet, with durational differences arising from diverse lengthening processes.

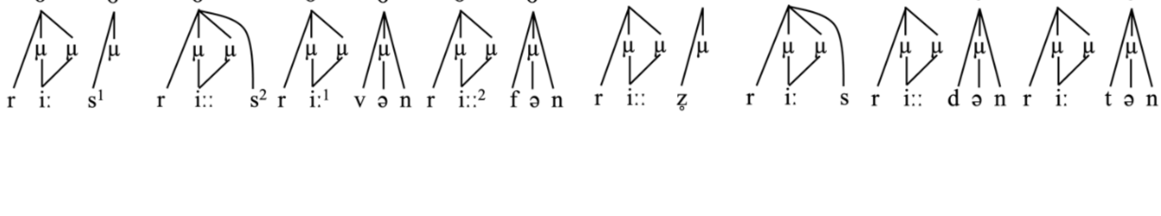
Data. Our fieldwork shows that despite having similar origins, Aachen and Leer systematically differ in their vowel-consonant interactions: long vowels in Leer are *longer* before voiced obstruents (some now final after apocope, partially devoiced) than before their voiceless counterparts, which is typologically expected (Lehiste 1970). In Aachen, however, long vowels before voiceless obstruents are longer than vowels before voiced obstruents (some now final after apocope, devoiced), which is unexpected (Scheer 2017:139 refers to this pattern as "unheard of"). This is shown in Table 1 for present-day monosyllables (Rows 1 and 2) and disyllables (Rows 3 and 4); indicated durational differences are statistically significant.

Table 1. Leer data versus Aachen data (superscripts indicate accent class); predecessor columns show approximate realizations of items from earlier stages of the varieties.

Row	Dialect	Predecessor	Overlong vowel	Predecessor	Long vowel
1	Leer	*rî*[z]*e*	[ri::z̥] 'giant'	*rîs*	[ri:s] 'rice'
2	Aachen	*rîs*	[ri::s^{2}] 'rice'	*rî*[z]*e*	[ri:s^{1}] 'giant'
3	Leer	*rîden*	[ri::dən] 'to ride'	*rîten*	[ri:tən] 'to pull'
4	Aachen	*rîfen*	[ri::^{2}fən] 'to ripen'	*rîven*	[ri:^{1}vən] 'to rub'

Analysis. *Diachrony*: We argue that the typologically unexpected Aachen patterns have developed naturally under the influence of two tonal accents (as described for Aachen in, e.g., Welter 1938, though our data suggest that the tonal opposition is now largely neutralized). Following a model of tone-induced durational change in Köhnlein (2015), phonologically long vowels with level tones (Accent 2 before originally voiceless consonants) tend to lengthen and those with moving tones (Accent 1 before originally voiced consonants) tend to shorten, ultimately overriding typologically expected original durations. In Leer, the contrast may have always been predominantly durational, so no tone-based change was ever initiated. *Synchrony*: For Franconian, some foot-based analyses treat Accent 1 as a disyllabic trochee (with a vocalic or empty-headed second syllable) and Accent 2 as a monosyllabic, moraic trochee (Iosad 2024 for overview). Informed by Prince (1980) for Estonian, Köhnlein & Cameron (2024) propose foot-final lengthening for Accent 2, where the whole duration of a foot is expressed in the accent syllable (1b,d = overlength); since Accent 1 is disyllabic, the foot duration is only partially expressed in the accent syllable (1a,c = normal length); unfooted syllables link directly to a PW node (omitted). We extend the foot-based approach to Leer: Overlength stems from vowel lengthening in an open syllable of a disyllabic foot before a (sometimes partially devoiced) obstruent (1e,g; onset status of final consonant in 1e supported by incomplete devoicing). Normal length corresponds to a moraic trochee where the vowel occurs before a voiceless consonant, which always blocks lengthening (as in 1f,h). Notably, the contrast cannot be derived from voicing alone since the opposition is also found before sonorants, as in monosyllabic [(ʃvi:n)] 'pig' vs. disyllabic [(ʃvi::.n)] 'pig.pl' (with an empty-headed σ in our analysis).

(1) Representations for Aachen (a-d) and Leer (e-h).



Word-final consonants in Italo-Romance

Martin Krämer
UiT The Arctic University of Norway

Standard Italian permits only short vowels in word-final position. Word-final consonants and consonant clusters are confined to loanwords. Italo-Romance varieties in the north of Italy display word-final codas which emerged historically through apocope (Rohlfs 1949/1966; Repetti 1997). In the centre, the core lexicon does not permit word-final consonants and we find some variation in which word final consonants and clusters are avoided in loanwords by epenthesis (Bertinetto 1985; Repetti 1993, 2012; Bafile 2005; Broniś 2016). South of the centre there is another cluster of dialects in which word final vowels have been eroded historically after certain consonant classes. While there are plenty of studies on individual varieties, there is no work yet that takes stock of the range of variation in word-final consonants across Romance varieties and languages on the Italian peninsula and nearby islands. In this paper, a typology of these patterns and its implications for typological work are presented.

The data source for this survey is the VIVALDI online database (Kattenbusch 1995; Müller et al. 2001), which provides a subset of the words used in the AIS survey (Linguistic and Ethnographic Atlas of Italy and Southern Switzerland) in locations in all regions of Italy except for Le Marche. Data from 54 locations in most regions are used in the coda survey reported here. Data from many additional regions were considered but will not be discussed here because they did not contribute additional patterns.

The patterns found in the northern locations by and large confirm the claims in the literature on coda markedness cross-linguistically: Sonorants are preferred over obstruents (Clements 1990; Prince & Smolensky 1993/2004), and fricatives are eschewed (Zec 1995). In systems with only one class at the end of the word we find only nasals as was reported for a large cross-linguistic study of over 200 languages by Krämer & Zec (2020).

The variation south of the centre shatters the faith in sonorants as unmarked in word-final position. We find a general preference for obstruents, especially for stops. The two regions do not exactly mirror each other, but they do seem to operate on different markedness scales. This provides further support for the claim that there are different markedness scales determining the shape of coda inventories (Krämer & Zec 2017; Merchant & Krämer 2018).

The Italian variation and other surveys of genetically close languages and a survey of over 500 genetically maximally diverse languages (Krämer & Zec 2023) show a lot of overlap. The variation among Tibeto-Burman (Namkung 1996) codas (only sonorants and stops, only sonorants, only nasals and stops, only nasals or no codas) resembles the northern Italian patterns. Within Grassfields Bantu (Hyman et al. 2019) we find almost the same scale of variation as in the large-scale survey, which lacks some patterns found in Italo-Romance. This study contributes five additional patterns to the global typology, most importantly an obstruents-only pattern, as well as patterns in which nasals are excluded. Strikingly, there is still no pattern which delimits codas to liquids.

While we are aware that there are multiple factors that historically can exclude a class from a position (e.g., intervocalic deletion of liquids followed by apocope after all consonant classes), the typology lends itself to an optimality-theoretic description as interaction of positional markedness constraints on codas, *CODAX, in interaction with the markedness constraint triggering apocope, *V]$_{\text{PWD}}$. The basic idea for the historical emergence of coda patterns in Italo-Romance is that apocope deletes the final vowel only if this results in an acceptable coda. If it doesn't, apocope is blocked in words containing these consonants (a) or the consonant disappears with the vowel (b).

Schematic ranking for selective apocope

a. DEP, MAXC ≫ *CODAX ≫ *V]$_{\text{PWD}}$ ≫ MAX ≫ *CODAXY, *CODAXYZ

b. DEP, MAXYZ ≫ *CODAX, *V]$_{\text{PWD}}$ ≫ MAX ≫ *CODAXY, *CODAXYZ

Understanding why there are no nasality-tone interactions

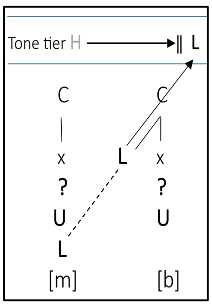
Nancy C. Kula
Leiden University Centre for Linguistics | n.c.kula@hum.leidenuniv.nl

Element theory argues that nasality and voicing are represented by the same element |L| supported by processes like post-nasal voicing; the contrastive existence of voiced stops and prenasalised stops in some language systems; and the contrast between nasal spread inducing nasals and voiced stops that do not. These contrastive patterns support the representation of voicing as headed |L̲| and nasality as non-head or dependent |L|. It is acknowledged that |L| is also one of the elements (together with |H|) that represents tone (Backley 2011). While there are attested alternations between Nasality and Voicing; and Voicing and Tone (in e.g. accounting for cases of tonogenesis and also in depressor consonant contexts) there is a missing yet predicted interaction between Nasality and Tone. Cross-linguistically there are no widely known cases of interaction between Nasality and Tone apart from the fact that nasals can be tone bearers. Whether this data gap holds or not it raises important representational issues that this paper tackles.

If there is an interaction, how can this be derived from |L| which has already reached its head-dependency representational limit? If there is no interaction, why should this be and how can we model it? Some data from West Grassfields Bantu (WGB) languages (zone A) suggest some possible interaction between nasality and tone in four morpho-phonological distributional patterns: **I** – Noun class prefix distribution compared to Narrow Bantu; **II** – Tone patterns between prefixes and stems; **III** – High Tone spread patterns; and **IV** –High tone blocking, all shown below.

I Noun classes with nasals in Narrow Bantu: 1, 3, 4, 6a, 9, 10 Nasal prefix lost in WGB: Classes 1and 9 – L tone Classes 3, 4, 6a, 10 – H tone	**III** Babanki (WGB) H spread in associatives a. kə^{L}shi^{H} kə^{H} kə^{L}ki^{H}m ▶ kə^{L}shi^{H} kə^{H} kə$^{H!}$ki^{H}m b. kə^{L}shi^{H} kə^{H} kə^{L}mbɔ^{L} ▶ kə^{L}shi^{H} kə^{H} kə^{L}mbɔ^{L} (a= '*place of crabs*'; b = '*place of bags*'
II Babanki prefixes *H (Proto B) but synchronic: Nasal stems: kə^{L}-ndɔ^{L}ng kə^{H} tsɔ^{F}ng '*neck of* ..' Other stems: kə^{L}-kɔ^{M}s kə^{H} tsɔ^{F}ng '*slave of* ..'	**IV** – Kom (WGB) H spread blocking a. fə^{H}-gha^{L}m ▶ fə^{M}-gha^{F}m '*mat*' b. i^{H}-n^{L}gɔ^{L}m ▶ i^{M}-n^{L}gɔ^{L}m '*plantain*'

I shows a mix of tone for lost nasal prefixes in WGB. II shows that nasal-initial stems (the first word in each case) surface with a Low tone in contrast to other cases that surface with a Mid. In IIIa the associative marker kə^{H} is High toned and spreads H rightwards resulting in a downstep on the final syllable of word 2, contra IIIb where the High tone fails to spread when there's a nasal in the stem. Similarly, IVa shows H spreading but which results in a Mid at the source and a fall on the stem vowel in IVa but not in IVb where there is a nasal which blocks spread of the initial High tone. Descriptively, in the data from Hyman 1980, Akumbu 2008, Akumbu & Hyman 2016, the nasals in each case are within NC clusters with no cases of simplex nasals.



The head-dependency contrast of element |L| is captured in element geometries (e.g. Botma 2004, Liu & Kula 2020) as voicing and nasality in different positions; |L| voicing in the Laryngeal node and nasality in Manner. Building on ideas of an enriched laryngeal node that itself contains head-dependency relations, it is argued here that the NC context allows the nasal with otherwise |L| in the manner node (left figure) to share the |L| laryngeal node of the following voiced obstruent (dotted line) and thus only indirectly interacts with the tonal tier to cause H spreading blocking (Laryngeal |L| projection to the tonal tier - arrow). This builds on previous work arguing that the outer suprasegmental node (above x slot) is the only one able to interact with the tonal tier in mapping segment-tone interactions. The proposed representations explain why it is only in voiced NC contexts that there is (indirect) nasal-tone interaction while simple nasals are unable to directly influence tone and thus the voicing-nasality and voicing-tone dichotomy.

Restructuring of composite underlying forms in Maga Rukai

Jennifer Kuo, Cornell University, jk2767@cornell.edu

Background: Maga Rukai (Austronesian, Taiwan) exhibits **rhythmic syncope**, where medial vowels are deleted in odd-numbered syllables. Prefixation changes which vowel gets deleted, resulting in Ø~V alternations. This is shown in (1) using the stem and negative allomorph (marked by the prefix /i-(k-)/ and final vowel lengthening). Consequently, for many words, the underlying representation (UR) must be **composite**, in that it is not predictable from any single surface allomorph, and combines information from multiple allomorphs. For instance, in (1a) 'salt', the UR includes V1 from the negative allomorph and V2 from the stem allomorph.

Albright (2002) suggests that composite URs are difficult to learn, and that there is a strong preference for URs to be based on a single surface allomorph. If this is the case, then alternations that require positing composite URs are likely to be mislearned by speakers, and restructured over time to become more surface-oriented. I show that Maga paradigms have been restructured to result in type of alternation I call **vowel-matching**, and argue that this supports the surface-allomorph approach.

(1)

UR	STEM	NEGATIVE	GLOSS
/t**i**m**u**su/	tm**u**su	i-k-t**i**msuː	'salt'
/ɖ**a**m**a**rɨ/	ɖm**a**rɨ	i-k-ɖ**a**mrɨː	'moon'

(2)

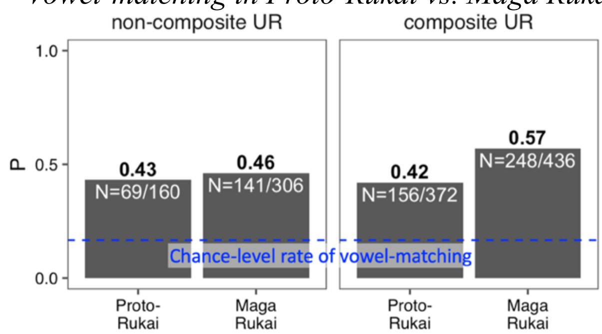
PROTO-RUKAI	*samito
EXPECTED MAGA UR	/s**a**mitu/
ACTUAL MAGA UR	/s**i**mitu/
ALLOMORPHS	[smitu~i-k-s**i**mtuː]

Results: Cases of restructuring were identified by comparing 532 Proto-Rukai forms (Li 1977) to 790 Maga paradigms (Hsin 2000). I find that vowels have been changed to result in a strong tendency towards **vowel-matching**, where alternating vowels match each other, e.g [sm**i**tu]~[i-k-s**i**mtuː]. An example of this type of change is given in (2). Crucially, if vowel-matching is a predictable tendency, it would render the stem and negative allomorphs *predictable from each other*, making the UR non-composite. For example, in (3), the negative allomorph of 'lips' can be derived from the stem allomorph using vowel copying and deletion. Overall, 73% of vowel-related changes have resulted in vowel-matching. Additionally, Fig. (4), which compares the proportion of vowel-matching in Proto-Rukai and Maga, shows that vowel-matching has increased specifically for paradigms that should have a composite UR. In Maga, almost 60% of these forms are now vowel-matching (well above the chance rate of 16.7%).

(3) *Deriving [ik-simtuː] from a stem base*

Input	smitu (=stem)
Morphology	i-k-smituː
Vowel copying	i-k-s**i**mituː
Vowel deletion	i-k-simtuː

(4) *Vowel-matching in Proto-Rukai vs. Maga Rukai*



Other sources of restructuring: Restructuring in Maga could be motivated not just by abstractness-avoidance, but by factors like pressures towards non-alternation (e.g. Paradigm Uniformity; Steriade 2000) and opacity-avoidance. In particular, rhythmic syncope is opaque, in that it must occur after building the metrical structure which conditions it (McCarthy, 2008). However, these factors cannot account for the vowel-matching changes, because vowel-matching does not remove rhythmic syncope alternations.

Conclusion: Maga rhythmic syncope alternations should require positing composite URs, but the majority of such paradigms have been restructured through vowel-matching. This supports the surface-allomorph approach to UR learning.

Typology and Learnability of Tone Spreading

KWONG, Ken Wing Hang (kenwhkwong@link.cuhk.edu.hk); LAI, Yee King Regine (ryklai@cuhk.edu.hk)
Chinese University of Hong Kong

Introduction. Tone spreading is a widespread tone sandhi process in African and Sinitic tonal languages. Typologically, left-to-right spreading (LR) is more attested than right-to-left spreading (RL); high tone spreading (HTS) is more attested than low tone spreading (LTS) (Hyman & Schuh 1974; Hyman 2007; Zhang 2007). It was predicted that HTS would be learned better than LTS and LR better than RL, based on the hypothesis that typology is shaped by human learning biases (Blevins 2004), such as substantial bias (Moreton, 2012). So, a typologically rare phonological process was harder to learn in laboratory settings than a typologically frequent process. The hypothesis is supported in some studies in segmental phonology (e.g. Moreton 2008; Kosa 2010; Finley & Badecker 2012; Lai 2015) and in a study on tone deletion (Kao 2017), but in the domain of tone sandhis, the relationship between learnability and typology remains largely unexplored. The focus of the study is to see if the typological asymmetry attested among tone spreading patterns supports this hypothesis, and whether there is an interaction effect of direction and tone type to learning.
Methods. An artificial grammar learning (AGL) experiment with 124 native Cantonese participants tested four conditions: high tone spreading, left-to-right (HTSLR), high tone spreading, right-to-left (HTSRL), low tone spreading, left-to-right (LTSLR), and low tone spreading, right-to-left (LTSRL). All audio stimuli were made with unattested syllables in Cantonese, with a high tone (55) or a low tone (22). Participants completed a pretest, assessing their preferences for the four spreading patterns with two-alternative forced choice (2AFC) trials. They listened to two novel words and two possible compounds formed by the two words. For example, a disyllabic word *boeng22fin55* and a monosyllabic word *lon22* were played, then two compounds *boeng22fin55lon22* and *boeng22fin55lon55* were played, and participants were instructed to choose the option that sounds right. Then, participants learned one of the spreading patterns with audio stimuli for around 20 minutes. For instance, a participant learning the HTSLR condition will hear a disyllabic word *boeng22fin55* and a monosyllabic word *lon22*, then the compound *boeng22fin55lon55*. A test, with the format identical to the pretest, was conducted to assess the learning effect. Accuracy and reaction time of the pretest and test items were measured.
Results. A generalized mixed-effects logistic regression model was fit to analyze the relationship between accuracy and the fixed variables: direction, tone type and PrePost (Pretest vs. Test), and participant and item as random effects. A significant direction effect ($\chi^2(1) = 4.82$, $p = 0.028$) and a significant PrePost effect were observed ($\chi^2(1) = 63.5$, $p < 0.001$), while no tone type ($\chi^2(1) = 1.05$, $p = 0.306$) effect was found. Specifically, direction RL was associated with lower accuracy ($\beta = -0.45$, $p = 0.0281$), and posttest had a higher accuracy than pretest ($\beta = 1.13$, $p < 0.001$). There were no significant interaction effects, in particular direction*PrePost ($\chi^2(1) = 0.98$, $p = 0.321$), were found. The test accuracies were significantly different between HTSLR and LTSRL (0.74 vs. 0.62, $p < 0.001$), and between LTSLR and LTSRL (0.73 vs. 0.62, $p = 0.005$).
Discussion. Learnability as seen from the results did not fully align with typological asymmetry, unlike previous results like Kao (2017). HTS was not learned better than LTS but LR was learned better than RL only among LTS. The results suggest the asymmetry might come from something other than typology, like cognitive factors. Also, the spreading pattern tested here is adapted from an African language, and the discrepancy between African and Asian tone languages might have contributed to the results here. There is ongoing data collection on native Thai (N = 36) and Vietnamese speakers (N = 23), and the preliminary results demonstrated that different language groups performed differently. The effect of native language on learning tone spreading is yet to be explored.

An autosegmental account of initial consonant mutation in Irish: evidence from preverbal *d'*

Anna Laoide-Kemp (University of Edinburgh) *anna.laoide-kemp@ed.ac.uk*

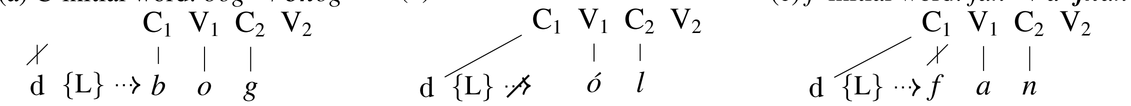
Sitting at the interface between phonology and morphosyntax, Irish initial consonant mutaiton (ICM) is the systematic alternation of word-initial consonants in a range of morphosyntactically defined environments: e.g. [b]*róg* 'shoe'; *an* [v]*róg* 'the **L**.shoe' ("**L**enition"); *ár* [m]*róg* 'our **E**.shoe' ("**E**clipsis"). Autosegmental models of ICM have been successful in positing a clear division of labour between modules: mutation is caused by floating phonological material residing at the right edge of a so-called "trigger word" that directly precedes the mutation target (e.g. Lieber 1983; Iosad 2014; Breit 2019; Laoide-Kemp 2023). In this talk, I resolve an apparent paradox that arises in the autosegmental account – the unexpected distribution of Irish preverbal tense particle *d'* /d/. I analyse this particle as consisting of an underlyingly floating segment, rather than a segmental prefix, and show that its distribution follows naturally from its interaction with the ICM system.

Preverbal *d'* is always accompanied by lenition on the following word, so it is typically assumed to carry lenition-inducing phonological material at its right edge. However, *d'* only emerges in the context of a segmentally empty C(onsonantal)-slot (assumed on independent grounds to be present in all Irish vowel-initial words – see Gussmann (1986); Ní Chiosáin (1991)). Crucially, whether it appears depends on the post-mutation status of the following C-slot: it is found not only before vowel-initial words (2), but also before words that are underlyingly *f*-initial (3) (since /f/ deletes under lenition, leaving behind an empty C-slot carrying secondary articulation features).

(1)	*(*d') **bh**og mé*	(2)	*d' ól mé*	(3)	*d' **fh**an mé*
	(TNS) **L**.move 1.SG		TNS drink 1.SG		TNS **L**.stay 1.SG
	'I moved.'		'I drank.'		'I stayed.'

This leads to an empirical puzzle: if the particle *d'* triggers mutation, it must be spelt out **before** mutation takes place; but since its insertion is sensitive to the post-mutation identity of the following segment, it cannot be inserted until **after** the mutation process is complete. I resolve this puzzle by proposing that preverbal *d'* consists of a floating segment *(d)* plus a bundle of lenition-inducing material {L}. Crucially, this particle is inserted in **all** phonological environments. Working within a strict CV framework (Scheer 2012), I demonstrate that the pattern in (1)-(3) falls out naturally if we assume that (i) the floating lenition-inducing material {L} always docks onto the consonant immediately to its right (if present), and (ii) the floating *(d)* is only pronounced if it can link to an immediately adjacent C-slot that is both empty and licensed. This is illustrated in (a)-(c) below:

(a) C-initial word: *bog* → ***bh**og* (b) V-initial word: *ól* → *d' ól* (c) *f*-initial word: *fan* → *d' **fh**an*



Note that in (c), a C-slot only becomes available after the lenition-inducing material {L} has acted on the initial *f*; but this no longer constitutes a spell-out timing paradox, because the floating *(d)* is assumed to **always** be present underlyingly, even if not ultimately pronounced at the surface level (as in (a)). My account requires no ad hoc mechanisms or assumptions: the only innovation is the idea that preverbal *d'* is underlyingly floating. The existence of floating consonants in Irish is independently motivated by its rich system of pre-vocalic consonantal prefixes in morphosyntactically defined environments (e.g. *éan* 'bird' → *an **t-**éan* 'the bird').

My analysis adds fresh evidence in favour of the autosegmental approach to ICM, which in turn supports a modular view of grammar (Scheer 2010; Bermúdez-Otero 2012): although morphosyntactic factors determine where floating material is inserted, the output form ultimately follows from the application of regular phonological processes, with no further reference to morphosyntax.

OCP_{place} beyond phonotactics: Sandhi place restrictions in Croatian

Aljoša Milenković Harvard University aljosamilenkovic@g.harvard.edu

Antigemination (AG; McCarthy 1986) is the avoidance of both true geminates (1a) and "near" geminates (1b) (Borowski 1987; Baković 2005).

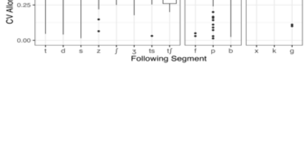
(1) a. /flʌd-d/ → [flʌdɪd] *flooded* b. /pɛt-d/ → [pɛtɪd] *petted*

Baković (2005, 2006, 2017) links AG to assimilation, proposing that OT does not need OCP_{place} constraints to model similarity avoidance, since near-identical clusters (1b) are avoided through the interaction of NoGem, which penalizes true geminates, and assimilation-inducing Agree constraints. While this account captures procedural AG—a constraint on the application of phonological rules (McCarthy 1986; Yip 1988; Côté 1997, 2004, a.o.)—OCP_{place} has remained indispensable for modeling static, i.e. phonotactic AG (Pierrehumbert 1993; Frisch et al. 2004; Coetzee & Pater 2008). This paper presents a *procedural* AG pattern in Croatian (C) where adjacent velar consonants are subject to similarity avoidance without being susceptible to total assimilation. The identification of such a pattern supports the utility of OCP_{place} in procedural AG.

In C, several morphemes alternate between C# and CV# variants, including the preposition k(a) 'towards'. Due to AG, the vowel-less allomorph [k] is dispreferred before velar stop-initial words, typically surfacing as [ka] in this context (Barić et al. 1997). Avoidance before [g] is in line with Baković (2005): /k#g/ becomes a true geminate ([g#g]) via sandhi voicing assimilation. To examine [k]~[ka] alternation, I analyzed 100,060 bigrams from the hrWaC 1.2 corpus (Ljubešić & Klubička 2014). The vowel-less allomorph was found to be avoided not only before velar stops, but also before the velar fricative [x] (Figure below), to which preceding [k] does not assimilate. A logistic regression model, with the following segment as a fixed predictor (reference: [x]), found significant negative effects for all non-velar obstruents, indicating that they were less likely to trigger [ka] realization than [x] (see Table 1). This constitutes evidence for near-identity avoidance in a non-assimilating pair—[k#x]. The model also found that velar stops had a stronger effect on [ka] realization than [x], suggesting that [k#x] is avoided, but less so than [k#k] and [k#g].

k~ka variation was analyzed in maxent HG (Goldwater & Johnson 2003) using the maxent.ot R package (Mayer et al. 2024). The baseline model, which included NoGem and Agree_{voi} but not OCP_{place} (following Baković 2005) failed to distinguish [k#x] from non-velar environments. Adding OCP_{dorsal}, which penalizes all velar clusters, significantly improved model fit ($\chi^2(1) = 344$, $p < .001$; $AIC_{baseline} = 109{,}743$; $AIC_{OCPdor} = 109{,}401$). The model enriched with OCP_{dor} not only captured the enhanced avoidance of [k#x] but also accounted for [k#x]'s weaker propensity for AG compared to velar stops: [k#x] violates only OCP_{dor}, while [k#k] violates both OCP_{dor} and NoGem, incurring a greater cumulative penalty. Alternatively, dispreference for [k#x] may be due to a phonotactic ban on this cluster. Indeed, [kx] is an impossible initial cluster in C and is severely underrepresented word-internally, but this is also the case with many [k]-initial clusters (e.g. [kf], [kp], [kʧ]). Nevertheless, [k#x] is avoided at a significantly higher rate than these other phonotactically undesirable clusters—an indication of an OCP_{place} effect.

This paper provides quantitative evidence that similarity avoidance operates beyond cases where nonidentical consonants can become a geminate by assimilation. This finding has theoretical implications, suggesting that OCP_{place} constraints are needed even for modeling procedural AG.



Following segment (baseline: [x])	β	SE	Wald z	p
(Intercept)	.88	.12	7.62	.000***
[k]	2.23	.18	12.65	.000***
[g]	.6	.15	4.11	.000***
[t]	−3.63	.12	−30.84	.000***
[d]	−.64	.12	−5.26	.000***
[s]	−2.04	.12	−17.5	.000***
[z]	−.56	.12	−4.47	.000***
[ʃ]	−.4	.18	−2.21	.03*
[ʒ]	−.99	.16	−6.26	.000***
[ts]	−.56	.13	−4.14	.000***
[ʧ]	−.4	.16	−2.54	.01*
[p]	−.32	.12	−2.67	.008**
[b]	−1.4	.12	−11.56	.000***
[f]	−.56	.15	−3.71	.000***

TABLE 1. Logistic regression results.

Stratal OT and Scottish Gaelic initial mutation/prothesis

Donald Alasdair Morrison (donald.morrison@manchester.ac.uk)
The University of Manchester

As is typical of Insular Celtic languages, Scottish Gaelic displays a complex series of morphophonological alternations affecting the left edge of the word. Alongside *initial mutation* (IM), which normally involves the replacement of one initial consonant by another, we must also consider *prothesis* (P), which typically affects vowel-initial forms and consists of the insertion of an initial consonant. Besides the sheer complexity of the alternations involved, some of these processes have proven difficult to account for in purely concatenative morphological frameworks due to their superficially non-additive nature. I present a unified account of IM/P in Scottish Gaelic in the framework of Stratal OT (Bermúdez-Otero 2018), in which the observed alternations are triggered by underlyingly-floating segmental or sub-segmental material that docks to the initial onset of the target morpheme (cf. Lieber 1983; 1987; Massam 1983; Wolf 2005; 2007; Iosad 2014; 2017; Breit 2019). Foregrounded here are converging strands of evidence for the stratal affiliations of different processes of IM/P in Scottish Gaelic, thus highlighting the power of a stratified phonological framework to account for these phenomena.

A crucial distinction is made between (i) *morphologically-triggered* IM/P, which occurs in a given morphosyntactic context and marks categories such as gender, number and case or aspect, tense and mood; and (ii) *lexically-triggered* IM/P, which occurs in the presence of an immediately-preceding closed-class word such as a determiner or a preposition (cf. Oftedal 1962). In the former case, I assume that the triggering phonological material is contained within an inflectional prefix that is inserted by the morphology and docks to the initial onset of the target in the word-level phonology after the concatenation of morphemes into words. In the latter case it forms part of the lexical representation of the immediately-preceding word, docking to the initial onset of the target in the phrase-level phonology after the concatenation of words into phrases. It follows that (i) lexically-triggered IM/P requires phonological adjacency of lexical trigger and target, in order for the phonological content of the former to affect the latter in the phrase-level phonology, while morphologically-triggered IM/P requires no adjacent lexical trigger; and (ii) lexically-triggered IM/P will apply exceptionlessly to all potential targets, since the phrase-level phonology is blind to the lexical identity of the target, while morphologically-triggered IM/P may apply irregularly to certain targets, since regular morphology can be overridden by lexically-specific suppletive allomorphy at the point of lexical insertion.

It is found that these two diagnostic criteria display a striking degree of consistency when applied to specific IM/P processes. For instance, *lenition* does not always require an adjacent lexical trigger, e.g. *balaich bhig bhàin* /paLixʲ vikʲ vãːNʲ/ 'boy.GEN small.M.GEN fair-haired.M.GEN' (*/pãːNʲ/), and also displays irregular underapplication in a number of closed-class items, e.g. *cha dèan* /xa tʲĩa̰n/ 'won't do' (*/ɣʲĩa̰n/), both of which indicate morphological triggering. On the other hand, *nasalisation*/*n-prothesis* always requires an adjacent lexical trigger, e.g. *am balach* /ə mpaLəx/ 'the boy', and applies exceptionlessly even to those targets that resist lenition, e.g. *an dèan?* /ə Nʲtʲĩa̰n/ 'will … do?' (*/ə tʲĩa̰n/), thus suggesting lexical triggering according to both criteria. In turn, the respective implied stratal affiliations of these two processes are borne out by the fact that lenition may be seen to feed or bleed nasalisation/*n*-prothesis in certain contexts, e.g. *an fhuil* /ə Ntulʲ/ 'the blood', *a' chaileag* /ə xalʲak/ 'the girl', whereas the reverse ordering is never observed.

These data show that a successful analysis of IM/P in Scottish Gaelic must recognise the fact that these alternations reflect a diverse set of morphophonological phenomena that are actualised at different stages of the phonological derivation (cf. Iosad 2014). Evidence from triggering patterns, exceptional targets and ordering effects points to a phonology with ordered strata operating upon specific morphosyntactic domains such as stems, words and phrases.

French du and au ain’t portmanteaux

Heather Newell (UQAM), Máire Noonan (UdeM), Tom Leu (UQAM)

Problem: In French, the prepositions *à* ‘at’ and *de* ‘of’ fuse with a following definite article *l-* *iff* said article is not followed by an underlying vowel.

(1) a. Je m’adresse [à le → au] public.
‘I’m speaking to the audience.’
[ʒə madʁɛs o pyblik]
Cf. Je m'adresse [à le → à l]'auditoire.

b. Je parle [de le → du] francais.
‘I’m speaking about French.’
[ʒə paʁl dy fχɑ̃sɛ]
Cf. Je parle [de le → de l]’anglais.

This paradigm causes interesting problems for our theory of linguistic computation (Haugen & Siddiqi (2016, and refs therein). Insertion at Non-terminals (Radkevich 2011, Haugen & Siddiqi 2013), Spanning (Svenonius 2012), and Readjustment (Embick 2012) run into lethal look-ahead problems and/or problems of cyclic incoherence: A portmanteau analysis should not be sensitive to phonology or be bled by the phonological environment to the right of the determiner, nor should phonological rules reference morphosyntactic features in a modular grammar. Furthermore, these analyses treat the fact that both *de* and *du* contain /d/ as accidental.

Proposal: The above problem is eliminated if the alternations seen in (1) are strictly phonological. We argue that this alternation is synchronically active in French and offer an analysis that avoids the above problem (à la Faust et al. 2018 for Italian). The underlying representation of the definite /l/ morpheme in French is underspecified for syllabic structure; it is a liaison consonant. This /l/ is also [velar] (not [coronal]). The velar nature of some Romance lateral consonants is indisputable: consider the synchronic velarization of /l/ in codas in Portuguese (*papel* [ɫ]/[w] ‘paper’, *papelada* [l] ‘a lot of paper’) and the diachrony of the ‘irregular’ plural in French: *cheval-chevaux* ‘horse-horses’ : cheva[ls] → cheva[ɫs] → chev[us] → chev[o] (Pope 1952, simplified). We argue here that the combination of liaison/underspecification of the synchronic morpheme /l/ causes phonological merger with a preceding V in ‘prepositions’ that are interpreted in the same phonological cycle as the determiner. Using Element theory, front vowels and coronals contain |I|, back vowels and velars |U|, and low vowels |A|: their mergers give [y] and [o]:

(2) a. $/d_{|I|}V/$ *de* + $/l_{|U|}/$ → $[dV_{|I, U|}]$ = [dy]
b. $/V_{|A|}/$ *a* + $/l_{|U|}/$ → $[V_{|A, U|}]$ = [o]

Such interaction in the phonology between P and D may be unexpected if DP is a phase; we argue that the so-called prepositions *de* and *à,* respectively, are not instances of P, but are heads in the left-periphery of the DP and thus internal to it. Specifically, we argue that they are oblique case heads, K, realizing gen and dat, respectively. A DP with structural case (nom/acc) also contains a K head, but in that case, it is simply a CV syllable, which then leads to the /l/ linking and the pronunciation *le* [lə] or l’ [l] for the definite article. Our analysis provides a unified account of *de* & *à*: they are always of category K (as opposed to P).

As there is no syntactic phase boundary between K and D, the phonology computes *à/de* and ‘l’ in the same cycle, allowing for their fusion. Bleeding by a following V (from a following V-initial word or feminine suffix /a/) is predictable in the phonology, as /l/ will not fuse with a preceding V when it is syllabified as an onset. That most French ‘l’s do not undergo fusion is due to the syntactic/cyclic distance between liaison consonants and words they are syllabified with. Phonology therefore signals the correct syntactic analysis.

Take Home Message: The morpho-phonological conundrum posed by the [dy]/[o] pattern is resolved via the regular mechanisms of autosegmental phonology. This apparent irregularity in French morpho-phonology is, in fact, not irregular. It is due to the interaction of cyclic spell out (syntax) and lexical underspecification (phonology). This investigation leads to increased precision of analysis of the underlying syntactic and phonological properties of French.

Opacity without underlying representations:
Empty morphs, neutralisation and paradigm predictability in Wubuy

Peter Nyhuis | Surrey Morphology Group, University of Surrey | petercnyhuis@gmail.com

A core assumption of mainstream generative phonology, common to SPE and Optimality Theory alike, is that words are built out of minimal, invariant sub-word units (i.e. morphemes) which are stored indepedently in the lexicon. The phonological component acts upon these strings of underlying morphemes, adjusting them according to well-formedness criteria to yield the observed surface forms. However, recent approaches in morphological theory, which Blevins (2006) terms 'abstractive', criticises these assumptions, arguing that full surface word forms are the basic units of lexical storage, and recurrent parts like roots and affixes are abstractions over those full forms but do not exist independently of them. Abstractive models have been most successful in analysing the structure of inflectional paradigms, giving attention to the ways that static phonological properties of surface word forms may be diagnostic of that form's inflection class membership (Ackerman et al. 2009; Wilmoth & Mansfield 2021). However, the place of *dynamic* phonology in abstractive models — systematic alternations involving, e.g., assimilation, deletion, epenthesis, and their interactions — is less well understood. As a result, a significant dimension of patterned variation among word forms remains largely unaccounted for in abstractive models, and one may rightly wonder if an abstractive phonology is even viable.

In this paper, I examine a particularly complex set of alternations in the phonology of Wubuy (Heath 1984), a polysynthetic language of northern Australia. The phonologically-conditioned empty morph *ŋu-* is inserted preceding a stop-initial stem when it follows a nasal-final inflectional prefix, as in (2b), or a derivational prefix of any kind. The process is thus sensitive to a two-sided context, and its interactions at each side — with nasal deletion in the prefix (2b), and continuant fortition in the stem (1b) — are opaque, of the 'overapplication' and 'underapplication' types respectively. We should expect this extreme opacity to present a challenge for an abstractive model of phonology, given that it allows only one level of representation, namely the surface form; recall that the poor performance of OT on opacity is usually attributed to it permitting only two levels of representation, unlike SPE, which allows intermediate levels (Pruitt 2023).

To test this, I present an abstractive analysis of the Wubuy pattern, formalised using Relational Morphology (RM: Jackendoff & Audring 2020). In RM, general patterns, including phonological ones, are expressed via schemas, deduced through analogical comparison of what is the same and what is different between full surface word forms, stored in the lexicon, and linked to one another on the basis of recurrent parts of structure. Those linkages, in turn, organise words (and schemas) into paradigms. I show that the basic machinery of the formalism — despite being argued for on non-phonological grounds — offers a compelling account of Wubuy's phonological alternations that is entirely surface-based, without morphemes and without underlying representations. Opacity emerges from RM's prediction that morphological constituents can subcategorise not only for the phonology of their immediate environment, but that environment as it is realised in morphologically related words; here, the empty morph *ŋu-* subcategorises for a stop that is elsewhere a stop, following a prefix that is elsewhere consonant-final. In addition to extending the empirical reach of RM in particular and abstractive approaches more broadly, the analysis presented here hints at some of the gains that formal phonology may accrue by reconsidering the morphemic assumptions it is to a large extent built on.

Input:	(1a) 1sg.R-carry-NPST2 /ŋa-juɻ-iː/	(1b) 2sg.R-carry-NPST2 /nuN-juɻ-iː/	(2a) 1sg.R-push-NPST2 /ŋa-cuɻ-iː/	(2b) 2sg.R-push-NPST2 /nuN-cuɻ-iː/
ŋu-Epenthesis	—	—	—	nuN-ŋu-cuɻ-iː
Hardening	—	nuN-cuɻ-iː	—	—
Nasal deletion	—	—	—	nu-ŋu-cuɻ-iː
Nasal assim.	—	nuɲ-cuɻ-iː	—	—
Output:	ŋa-juɻ-iː	nuɲ-cuɻ-iː	ŋa-cuɻ-iː	nu-ŋu-cuɻ-iː

Dependency-based strength asymmetries in single-element consonants

Hitomi ONUMA and Kuniya NASUKAWA (Tohoku Gakuin University)

In the Element Theory (ET) approach described in Backley (2011) the six elements |A I U L H ʔ| serve as phonological primitives in all languages. Each can stand alone as a fully-defined segment, meaning that a single element is pronounceable by itself. In consonant positions these elements are realized as [ɾ j w ɴ h ʔ] respectively, with other consonants combining two or more elements in their structures. For instance, English [t] has |A H ʔ|, which undergoes lenition in weak positions: it reduces to |A| (realized as [ɾ]) between vowels and to |ʔ| ([ʔ]) word-finally. This follows a well-documented pattern of consonant weakening in both synchronic variation and diachronic change (Lass 1984, Harris 1994, Honeybone 2008). Segments with just a single element (e.g., |A| or |ʔ|) are structurally the weakest, making [ɾ j w ɴ h ʔ] the weakest consonants cross-linguistically.

However, strength asymmetries exist among these consonants within individual languages. In Japanese, [ɾ] is identified as the weakest due to its distributional properties: it rarely appears word-initially in Yamato vocabulary (Vance 1987), frequently undergoes total assimilation in gemination (e.g., *kiɾanai* → *kinnai* 'someone does not cut'), and often functions as an epenthetic segment (*mi* 'to see' + *-u* → *miɾu*). In contrast, [j w ɴ h ʔ] do not display weak behaviour of this kind to the same extent. This suggests that ET's presumption of equal weakness among single-element consonants does not fully capture language-specific strength hierarchies.

We propose that these asymmetries can be explained through inherently determined dependency relations between elements. In Nasukawa and Backley (2005) it is argued that, in a non-nuclear (edge) position, the edge element |ʔ| typically dominates one of the source elements |L| or |H|, which in turn takes a resonance element, either |I| or |U|, as its dependent. Finally, |I| and |U| may themselves dominate the fundamental element |A|. The resulting hierarchy is as follows:

Consonantal dependency path (Onset, Coda)

<table>
<tr><td colspan="3">non-resonance</td><td rowspan="3">></td><td colspan="3">Resonance</td></tr>
<tr><td>edge</td><td></td><td>Source</td><td>colour</td><td></td><td>fundamental</td></tr>
<tr><td>|ʔ|</td><td>></td><td>|H/L|</td><td>|U/I|</td><td>></td><td>|A|</td></tr>
</table>

This hierarchy reflects the relative markedness of element-based contrasts. The edge element |ʔ| yields the strongest obstruent contrasts and serves as a prerequisite for the interpretation of |H| and |L| in consonantal structures. Meanwhile, the resonance set |U I A| is always structurally dependent on the non-resonance set. Furthermore, within the resonance set |U| and |I| dominate |A|, as |A| is the most marked element in consonants. Thus, the less marked an element is, the more structurally basic (dominant) it is.

We propose that this structural dependency directly correlates with consonantal strength: the most marked and least consonant-like element, |A|, is the weakest when realized as [ɾ] in Japanese. In this paper we will examine whether this dependency-based strength asymmetry holds cross-linguistically and, if not, how variation can be accounted for within the proposed framework. We will also discuss typological differences in the identification of the weakest consonant in different language systems.

Sampang Verb-Stem Alternations without Morphophonology

J. Joseph Perry (University of Hong Kong), jjp45@hku.hk
Shanti Ulfsbjorninn (Memorial University Newfoundland), s.ulfsbjorninn@mun.ca

Background: There has been recent lively debate regarding the handling of alternations with morpheme-specific conditioning, apparently requiring simultaneous visibility of syntactic and phonological features. These phenomena have implications for the linguistic architecture, since strict modularity is a widely held desideratum (see e.g. Scheer 2011, Starke 2009, Collins & Kayne 2023). Three main tacks can be identified: (a) *Allomorphy:* alternate exponents, listed and inserted by context (e.g. Embick 2010), (b) *Morphophonology*: form-altering operations sensitive to morphological properties (syntactic objects, features) are at play (e.g. DM readjustment rules, indexed OT constraints, etc.), (c) *Pseudoallomorphy*: surface variants are derived from a single exponent by the regular phonology, acting over abstract representations.

Aim: While Morphophonology has been rejected by some for its excessive power (Bermudez-Otero 2012, Haugen 2016), the debate between Allomorphy and Pseudoallomorphy often relies mainly on considerations of parsimony. We seek compelling case studies to arbitrate between these approaches; alternations which (a) seem sensitive to both morphological and phonological properties, and (b) cannot be explained through listed allomorphy. These give us crucial information about the necessary characteristics of phonology in the absence of Morphophonology. We present one such alternation, obtained by original fieldwork and unknown to the literature.

Case study: Sampang (Trans-Himalayan, Kiranti; Nepal), like most Central-Eastern Kiranti languages (cf. Herce 2021), displays verb-stem alternations sensitive to whether a following affix is consonant- or vowel-initial – examples given in (1). The variation in form is morpheme-specific and not obviously optimizing, either for syllable structure or vowel-quality.

(1)

Pre-C	*Pre-V*	
jam-	japs-	‘hit’
k^{h}ʌp-	k^{h}ap-	‘cry’
lai-	lʌt-	‘go out’
tsa-	tso-	‘eat’

(2) *Reduplication of Affixes* (Reduplicand in **bold**)

a. japs-**u-m**-dur-u-m-ka ‘hit-**3O-1PLS**-…’
b. jam-**n-a**-dur-n-a-ni ‘hit-**1S.2O-PST**-…’
c. japs-**a**-dur-a-tsu-ka ‘hit-**PST**-…’

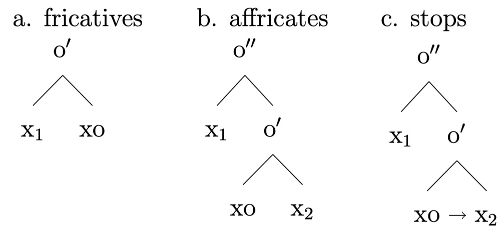
A listed allomorphy analysis is difficult to maintain. First, the alternation is outwardly-sensitive to phonology, a property difficult to reconcile with widely assumed inside-out cyclic exponence insertion. The non-optimising nature of the alternations also makes a parallelist derivation without constraint indexing problematic. Furthermore, one cannot merely dismiss the phonological conditioning as synchronically accidental. Crucially, the alternation is fed by a reduplication process (2), sensitive to phonological exponence, reduplicating the first syllable of a suffix string after an aspect marker without sensitivity to its morphological makeup. These elements condition the stem allomorph. Absent a morphophonological explanation, our only recourse is Pseudoallomorphy with abstract phonology. We note that many roots end in consonant clusters or floating consonants. Coda-restrictions, general to the language, trigger simplification in Pre-C position. The vocalic alternations are a product of vowel coloring, resulting from absorbing the deleted/floating consonantal material (cf. Kabardian, Scottish Gaelic, Czech, Digor Ossetic); modeled with Element Theory (Backley 2011), where vowels and consonants share features. The behaviour of consistently vowel-final stems emerges from interactions with unrealised skeletal units. Without morphophonology, abstract representations along these lines are indispensable.

Neutralisation as integration: The case of Korean

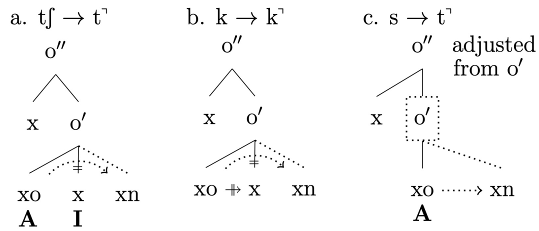
Markus A. Pöchtrager (University of Vienna, markus.poechtrager@univie.ac.at)

Prevocalically (_V), Korean contrasts neutral, tense and aspirated obstruents, as well as stops, affricates and fricatives. Elsewhere (_C/#), all obstruents merge as (i) non-continuant and (ii) unreleased. The object forms [na**d**-ɨl] 'grain', [na**tʰ**-ɨl] 'piece', [na**s**-ɨl] 'sickle', [na**dʒ**-ɨl] 'day', [na**tʃʰ**-ɨl] 'face' illustrate several contrasts; the unsuffixed base form of all five lexemes is [na**t̚**] Chang (1996: 16). Neutralisation affects continuancy and phonation, but not place, except for *palato-alveolar* affricates [dʒ/tʃʰ] turning into *alveolar* stops. I address three questions: **Q1.** Why does *place* change in exactly this one case? **Q2.** Why is continuancy affected in _C/#? **Q3.** Why is phonation affected?

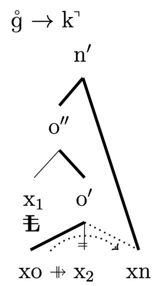
In Government Phonology, final consonants are onsets (Kaye 1990) followed by an empty nucleus (Ø); [na**t̚**] is /na**t̚**Ø/. Final Ø is silent by parameter, as per the Empty Category Principle (ECP; Kaye, Lowenstamm & Vergnaud 1990). Korean clusters also contain Ø (Heo 1994, Kim 1996): CC is CØC, an inter-onset domain silencing Ø. Neutralisation uniformly applies before Ø, allegedly due to Ø's inability to license too many elements in its onset, e.g. **h** (release). Yet Ø must also *add* the stop element **ʔ** ([s] → [t̚]). Weak licensing power of Ø *cannot* explain neutralisation.

(1)


Proposal. Stops, affricates, and fricatives are structured as in (1) (Pöchtrager 2006, 2021); xo represents a skeletal slot that is an onset head, x_1/x_2 non-head skeletal slots, the arrow *control*. Control (as part of the ECP) keeps its sister silent. Lack of control (fricatives/ affricates, 1a–b) encodes friction. Projection (o′/o″) follows the x-bar schema; x_1 hosts laryngeal properties, cf. Pöchtrager (2006, 2021) and below. (Lenition uniformly expressible as loss of structure/control/both.)

(2)


I concur with Heo (1994) and Kim (1996) on the distribution of Ø's, but propose that *Ø, in order to be silenced, must be controlled by a preceding xo.* Control silences (as in stops) and happens under sisterhood, thus Ø (a nuclear head xn) must be sister to xo. Heads project maximally twice, so trees with complement *and* specifier (stops, affricates) jettison the original complement along with its (palatality) element **I**. (Independent support from Japanese/Portuguese; Pöchtrager 2021). Thus, xn is integrated as complement and, with **I** now lost, a *palatoalveolar* ends up as an *alveolar* (2a; **A** = alveolarity). **Q1** is answered.

(3)


Three further predictions fall out, all correct: (i) Control of xn guarantees loss of **I** *and* non-continuancy (**Q2**), since occlusion *is* control by xo (1b). (Loss of release results from integration of xn.) Stops (2b) are correctly predicted to be affected vacuously (but lose release). (ii) In fricatives, xo projects once (1a). Thus, xn can be integrated/controlled *without* losing any positions (o′ in a dotted box, 2c), the bar level adjusts (o′ → o″), creating a stop structure, thus [s] → [t̚]. (iii) Laryngeal contrasts (Kim & Duanmu 2004 argue for voiced/neutral/aspirated) all merge as neutral before Ø. Integration of xn requires a search that traverses the (more detailed) tree in (3), where onset and nucleus form a constituent (n′, left out in (2) for simplicity). Assume that this search path, bold in (3), must be cleared (no elements in dominated positions like x_1). We predict laryngeal properties (**L** in x_1) to be given up in favour of neutral (**Q3**). **Q1–3** all receive the same answer: xn needs to be silenced. The proposal *links all changes* (place; manner; phonation) *to the same environment* (_Ø) *in a non-arbitrary fashion.*

Do we need AGREE? Evidence for Feature Agreement and Sharing from Secwepemctsín (Salish) Retraction and Reduplication

Julia Schillo and Gloria Mellesmoen – University of British Columbia

Main Claim: Patterns of retraction and reduplication in Secwepemctsín (Salish) provide evidence for two types of retraction: feature sharing (uvular-triggered retraction) and feature agreement (pharyngeal-triggered retraction). Specifically, we argue that cases of opacity provide evidence for Agree-type assimilation (e.g., Lombardi 1999), in addition to Share/Spread-type processes (e.g., Honeybone 2006; Jurgec 2011, among others).

Secwepemctsín Retraction: Pharyngeal (G) and uvular (Q) consonants trigger vowel retraction in Secwepemctsín (Shuswap, Salish). Both processes are local interactions between a consonant and a vowel. Pharyngeal retraction is bidirectional, as shown in (1); uvular retraction is exclusively regressive, as shown in (2). Examples (1–3) come from fieldwork with a speaker of the Skeetchestn dialect.

(1) ✓ Regressive /CVG/→[CṾG]
e.g., /i/→[ɛ]: [t͡s’lɛ́ʕʷəns] ‘scratch$^{\text{tr-3}}$’
✓ Progressive /GVC/→[GṾC]
e.g., /u/→[o]: [ʕʷojt] ‘tired’

(2) ✓ Regressive /CVQ/→[CṾQ]
e.g., /i/→[ɛ]: [pɛ́χməs] ‘hunt$^{\text{intr-3sbjv}}$’
× Progressive /QVC/→*[QṾC]
e.g., /i/→[i] (*[ɛ]): [t͡ʃqiɬ] ‘awake’

The words in (1) and (2) behave differently when they undergo diminutive/first-person C_1 reduplication, which copies the consonant before the stressed vowel and positions it following the stressed vowel. If the stressed vowel in the unreduplicated word is adjacent to a pharyngeal (i.e., CṾ́G/GṾ́C), then the vowel is retracted in the reduplicated form as well, despite the fact that the pharyngeal is not adjacent to the vowel. However, uvular-triggered retraction does not surface in words with C_1 reduplication.

(3) a. ✓ Retracted in Reduplication /CVG/→[CṾ<C>G]
e.g., /e/→[a]: [məʕmá<m>əʕts] ‘a little bit gray’ (cf. [məʕmáːʕt] ‘gray’)
b. × Not Retracted in Reduplication /CVQ/→*[CṾ<C>Q]
e.g., /i/→[i] (*[ɛ]): [pí<p>χəmwən] ‘hunt$^{\text{intr-1s.sbjv}}$’ (cf. [pɛ́χməs] ‘hunt$^{\text{intr-3sbjv}}$’)

Formal Analysis: We adopt Stratal OT (Kiparsky 2015): retraction occurs at an earlier stratum than reduplication. Uvulars have both dorsal and pharyngeal place features (Herzallah 1990); pharyngeals have a pharyngeal place feature with [RTR] as a dependent (Shahin 1995). Pharyngeal-triggered retraction is agreement; it satisfies Agree[RTR]. Uvular-triggered retraction is sharing; it satisfies Extend([phar]-L) (see Bickmore 2004 on bounded tone spreading). The output of the stem-level derivations on the right is the input to the word-level derivation where reduplication occurs. Uvular-triggered retraction is not retained with reduplication: features would be shared *across* a consonant, violating the No Crossing Constraint (e.g., Sagey 1988). Pharyngeal-triggered retraction is retained: the vowel has its own [RTR] feature.

Agree-Type Retraction:

C V G (G linked to [RTR], [RTR] linked to [PHAR])	Agree[RTR]	Ext([phar]-L)	Dep-Link	Dep[Phar]
☞ a. C Ṿ G ([PHAR]–[RTR] on Ṿ; [PHAR]–[RTR] on G)		*		*
b. C Ṿ G ([Phar]–[RTR] on G; dotted link from Ṿ to [RTR])	*!		*	

Share-Type Retraction:

C V Q (Q linked to [PHAR])	Agree[RTR]	Ext([phar]-L)	Dep-Link	Dep[Phar]
a. C Ṿ Q ([PHAR] on Ṿ; [PHAR] on Q)		*!		*
☞ b. C Ṿ Q ([PHAR] on Q; dotted link from Ṿ to [PHAR])			*	

Cinderella Syncope: stratal structure and the life cycle in centuries of Latin vowel deletion

Ranjan Sen, University of Sheffield (UK)
ranjan.sen@sheffield.ac.uk

Early Latin syncope (vowel deletion, e.g. **kʷiːŋkʷedekem* > *quīndecim* 'fifteen') has resisted formulation in terms of strict synchronic rules or diachronic sound changes for three reasons. Firstly, syncope continued to occur throughout Latin history, with different metrical, phonotactic, and morphological constraints in different time periods and registers. Secondly, the interaction of metrical factors is complex, so syncope is not restricted to certain fixed positions, e.g. not 'trapped' light syllables (Mester 1994), nor weak positions in feet (Jacobs 2004), nor second and fourth syllables (Cowgill 1970). Thirdly, some syncopes are sensitive to a stratal synchronic phonological structure, as there is an opaque interaction between stress placement and deletion.

This analysis builds upon Sen's (2012) observation that six different identifiable syncopes were brought about by metrical constraints which underwent continual diachronic re-ranking. The phonotactic constraints on each syncope provide a good independent test: each syncope wave (affecting several word shapes) seems to show a single set of phonotactic restrictions, whereas syncopes motivated by other rankings at other times have different environments.

Early syncopes brought about by the loss of a trisyllabic (LLL) foot (three light syllables) as in *pu(é.ri.ti)a* → *pu(ér)tia* 'boyhood' provide evidence for **stratal phonological structure**, as stress on the second syllable (confirmed by consistent verse ictus) demands a word-level stress assignment with an (LLL) foot (not *(pú.e).ri.ti.a* or *pu.e(rí.ti).a*), but syncope in the third syllable shows a phrase-level dispreference for this foot shape (*(LLL) » MAX-V), resulting in only binary feet as in classical Latin. The presented early Latin word- and phrase-level phonologies are further corroborated by their consistency with the metrical analysis of contemporaneous iambic shortenings (Sen 2023).

Finally, syncope illustrates the **life cycle of phonological processes** (e.g. Bermúdez-Otero 2015). Comparing second-syllable syncope in LLLH *bálineum* → HLH *bálneum* 'bath' with third-syllable syncope in identically shaped LLLH *miséritus* → LHH *misértus* 'pitied' reveals a diachronic re-ranking which matches the historical record (1st cent. BCE in *balneum*; 1st cent CE in *misertus*). Earlier *bálneum* is caused by phrase-level syncope respecting initial-syllable stress brought about the permitted (LLL) foot at the word level (as in *puéritia* above): word-level *(bá.li.ne).um* → phrase-level *(bál).ne.um*. At that stage, *míseritus* would have retained initial-syllable stress, but not syncopate at the phrase level owing to (1) the phonotactic constraint against /sr/ in the second syllable, and (2) the WSP violation in the unstressed second syllable if syncope occurred in the third syllable: **mí<u>ser</u>tus*. Later syncopated *misértus* shows third-syllable syncope at the phrase level after (LLL) feet came to be dispreferred at the **word level**, resulting in second-syllable stress: word-level *mi(sé.ri)tus* (regular according to the Latin Penultimate Law of stress placement) → phrase-level *mi.(sér).tus*. Notably (almost) all syncopated forms are ultimately lexicalised, reaching the end of the life cycle.

A comprehensive amphichronic account for Latin metrical structure has hitherto proved elusive; the present analysis makes significant progress in incorporating several phenomena under a single stratal phonology.

Preaccentuation across languages: A unified representational account

Razieh Shojaei Leipzig University razieh.shojaei@uni-leipzig.de

Introduction. Preaccentuation, where certain morphemes trigger accent on the preceding syllable, is attested in various lexical accent systems, including Cupeño (*táma* → *tamá-ʔaw* 'mouth-LOC'; Hill, 2005), Japanese (*Yósida* → *Yosidá-ke* 'family of Yosida'; Ito & Mester, 2016), A'ingae (*áfa* → *afá-hama* 'speak-CAUS'; Dąbkowski, 2021), Turkish (Inkelas, 1999), Greek (Revithiadou, 1999), and Getxo Basque (Hualde & Bilbao, 1993). Despite its cross-linguistic presence, its phonological nature remains debated, often requiring morphological indexing.

Claim. This paper proposes a novel analysis of preaccentuation that captures its typological diversity while eliminating the need for direct reference to morphological information. Based on evidence from A'ingae, Cupeño, and Japanese, I argue that preaccentuation can be explained purely within phonology under Gradient Symbolic Representations (Smolensky & Goldrick, 2016), where phonological elements can show degrees of activity. Crucially, the preaccenting effect of morphemes follows from their 'strong' requirement to be part of a metrical foot but their 'weak' preference for bearing the accent, namely serving as the head of the foot (see, de Lacy (2004) on prominance and positional strength). This requirement creates a foot-attracting but stress-repelling effect that leads to preaccentuation. This is directly reflected in the morphemes' gradient representation across two tiers: the mora and the vowel. The gradient activations encode the competing demands: vowels show 'strong activation' for foot parsing, while moras remain too 'weak' to function as the foot head, producing the preaccentuation pattern. The representational account proposed here naturally extends to accent subtraction, a phenomenon that often accompanies preaccentuation and presents challenges for theories of lexical accent.

Case study. The gradient account is illustrated here with a case study of the verbal stress system of A'ingae, an Amazonian isolate. A'ingae shows complex interactions between recessive and dominant preaccenting patterns and stress subtraction effects. Previous analyses have relied on Cophonologies (or different constraint rankings in OT terms) and cyclic derivations to capture these patterns (e.g. Dąbkowski 2021), highlighting the need for a purely representational approach. A'ingae exhibits stress culminativity (i.e. at most one stress per word) and contrastive stress in roots and functional morphemes (Dąbkowski, 2021). Default stress predictably falls on the penultimate syllable. However, the ultimate stress pattern of a word depends on the type and order of suffixes. **Recessive prestressing suffixes** induce a stress on the syllable preceding the 'leftmost' prestressing suffix when combined with stressless roots (1a), whereas they have no effect on stressed roots that realise their underlying stress (1b). **Dominant prestressing suffixes** always assign stress to the preceding syllable, regardless of root/suffix types (1c). **Subtractive suffixes** delete preexisting stress in stressed roots, which in turn allows recessive prestressing to apply (1d); cf. (1b), where in the absence of **subtractive suffix**, prestressing does not occur.

(1)	a.	paˈ^{n}dʑa-ja paˈ^{n}dʑa-ʔfa-ja hunt-PLS-IRR	b.	ˈko^{n}dase-ja ˈko^{n}dase-ʔfa-ja tell-PLS-IRR	c.	aˈfa-hama afa-ẽ-ˈʔfa-hama speak-CAUS-PLS-PROH	d.	ˈafa-ʔfa-je afa-ˈje-ʔfa-je tell-PASS-CAUS-PLS

A single phonological grammar derives all stress preferences in A'ingae from two principles: Ⓐ competition between morphemes with gradient activity in their vowels and moras (shown in 2) to attract the foot or stand as the foot head, and Ⓑ a rightmost preference for stress realisation.

(2)

Stressless Root	Stressed Root	Dom Prestressing	Rec Prestressing	Subtractive
μ_{1} V_{1}	μ_{1} V_{4}	$\mu_{0.6}$ V_{6}	$\mu_{0.8}$ V_{1}	μ_{20} V_{1}

Implementation of Ⓐ and Ⓑ is possible in a model where constraints are weighted (not ranked), namely, Gradient Harmonic Grammar (Legendre et al. 1990). Ⓐ is captured by PARSE φ that is sensitive to vowel and mora activities and penalises unfooted vowels and unstressed moras by their acitivity. Ⓑ is captured by ALIGN R φ that is sensitive to mora activities: it penalises moras intervening the word's right edge and the foot by the sum of mora activities.

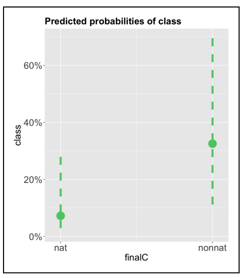
Themelessness in Spanish: a wug test

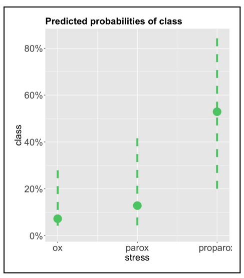
Francesc Torres-Tamarit, Universitat Autònoma de Barcelona [francescjosep.torres@uab.cat]
Violeta Martínez-Paricio, Universitat de València [violeta.martinez@uv.es]

Background and hypothesis. Most nouns and adjectives in Spanish belong to one of three core classes, distinguished by their respective theme vowels, which are overtly present in the plural, before the plural suffix /-s/ (a-c) (Bermúdez-Otero [BO] 2006, 2007, 2013).

a.	*o*-stem	lí-o	lí-**o**-s	'muddle'
b.	*a*-stem	kán-a	kán-**a**-s	'grey hair'
ci.	*e*-stem	luz-∅	luc-**e**-s	'light'
cii.	only *e*-stem	cruc-e	cruc-**e**-s	'crossroad'
d.	athematic	clip-∅	clip-∅-s	'clip'

Additionally, a few nominals belong to a fourth, peripheral class with no theme vowel (d). Even though the assignment of a stem to a specific class is idiosyncratic, BO (2013: 12) makes a crucial observation regarding athematic stems: "the chances that a stem will be athematic increase if the phonological shape of the singular form is atypical for the core vocabulary". However, this hypothesis has not yet been experimentally tested, nor have the specific factors that determine phonological atypicality been investigated in detail. **Goals.** In this paper we aim at testing in a controlled production experiment the tendency for nominals with uncommon phonological shapes to be assigned to the athematic stem class and determine the specific phonological factors that favor the categorization of a stem as athematic. Our experiment seeks to investigate whether atypical endings and irregular metrical patterns (C-final paroxytones and proparoxytones) favor the categorization of a stem as athematic. **Methodology.** We designed an experiment consisting of a wug-test task in which participants first heard a recording of a carrier sentence containing a target nonce word referring to alien species in its singular form, while seeing a picture of the corresponding alien species along with its orthographic representation. Then, participants saw two instances of the alien species and were asked to complete a sentence with the plural form of the nonce word ("Here there are two ..."). The experiment consisted of 84 stimuli (nonce words with no lexical neighbors), which were distributed as follows: 24 items ended in a licit final consonant ([n, l, ɾ, θ]), 24 items ended in an illicit consonant ([p, t, k, m]), and 36 items ended in a non-thematic vowel ([-í, -ú, -i(s), -u(s), -á, -ó]) or an offglide ([-ej, -aj]). Additionally, 84 fillers ending in a theme vowel (unstressed *-a*, *-o*, *-e*) in both paroxytone and proparoxytone patterns were included. The experiment was implemented in PsychoPy, where the 168 stimuli were randomized, and was conducted with 20 adult speakers of Northern Central Peninsular Spanish. **Results.** Our preliminary statistical analysis of the data of 7 informants corroborates BO's hypothesis and delivers crucial findings: the nature of the final segment and marked stress forms (especially C-final proparoxytones), favor their athematic classification. We conducted a mixed-effects logistic regression with a random effect for participants and fixed effects for stress and final consonant. The reference category was oxytone with a licit final consonant. The coefficient for an illicit final consonant was highly significant, as was the coefficient for proparoxytone, whereas the coefficient for paroxytone was not. The two plots show the predicted probability that the class is athematic for the different categories. Similar findings were reported for glides and non-thematic final vowels (except [-í/ú], which are preferably assigned to the e-stem class). These findings strengthen BO's analysis of Spanish nominal classes and add proofs against interpreting *-e* as an epenthetic vowel.





Rhotic variation in Lancashire: Gradience and category in /r/-loss strategies

Danielle Turton and Robert Lennon, Lancaster University

Rhoticity, the presence or absence of non-prevocalic /r/ in words like ***star*** or *heart*, is typically associated with the accents of Scotland, Ireland, and North America, but infrequently with England. Whilst most of England became non-rhotic following an 18th-century sound change, small pockets of rhoticity remain (see Figure 1). One such area is Blackburn, Lancashire, North-West England described as "an island of rhoticity" by Britain (2002). Given the highly stigmatised nature of rhoticity in England (Foulkes & Docherty 2007), its rapid loss has been widely predicted (Trudgill 2000). Despite these predictions, rhoticity loss in England remains unexamined in detail. This study provides the first instrumental investigation of the phonetic and phonological status of /r/ in England, with a focus on the Blackburn dialect.

Figure 1: Rhotic areas of England shown in lighter colours (Britain et al. 2016)

This is a crucial moment to capture /r/ in Blackburn while it is still present but undergoing attrition: failing to do so risks missing the opportunity to document an ongoing sound change in progress. To this end, we analyse data from two corpora: a sociolinguistic corpus (28 sociolinguistic interviews; *14f, 14m; age 17–81*; supplemented with wordlists and minimal pair tests) and an ultrasound tongue imaging corpus (28 ultrasound recordings; *14f, 14m, age 18–72*; Tongue spline and auditory analyses across 10 prosodic contexts and three vowel environments).

We argue that /r/-loss is not typically a binary phonological deletion but a process mediated by phonetic gradience, preceding categorical absence. Drawing on ultrasound tongue imaging, acoustic and auditory analysis, we examine the temporal alignment of coronal and pharyngeal gestures in /r/ realisation across ten phonological contexts. Findings reveal that younger speakers exhibit gestural weakening, particularly in pre-consonantal and pre-pausal contexts, while retaining a phonetic distinction between rhotic and non-rhotic forms. This suggests that Blackburn's /r/ is undergoing a phonetically gradual process of attrition, with weakened gestures and vowel offglides serving as transitional forms. Further, we observe a Constant Rate Effect (Kroch 1989) in which /r/ weakens progressively across vowel environments at the same rate: front vowels > central vowels > back vowels.

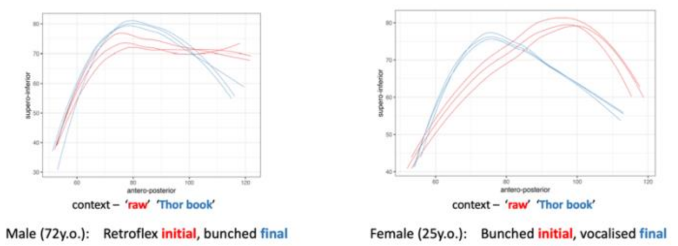


Figure 2: Tongue shapes from ultrasound tongue imaging. Left panel representing one of the most variably rhotic speakers in the corpus, right panel a completely non-rhotic speaker.

By demonstrating that even speakers with very low rates of rhoticity (<20%) remain phonologically rhotic, we argue that gradient phonetic reduction does not equate to categorical phonological loss, but may initiate a path toward categorical loss over generations. The rarity of intrusive and hyper-rhoticity further suggests the relative stability of rhoticity in the speech community. Blackburn's /r/-loss exemplifies how gradual phonetic attrition can precede categorical reanalysis**,** underscoring the role of gestural weakening as an intermediate phonetic stage in sound change. This work contributes to broader debates on the phonetics–phonology interface, highlighting the importance of articulatory evidence as a piece in the puzzle in helping to potentially diagnose phonological representation.

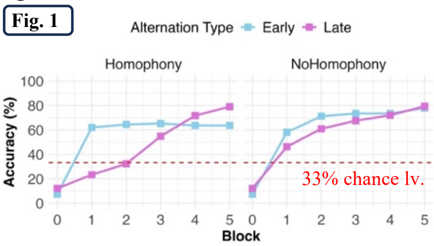
A lexical competition approach for modeling homophony avoidance

Sora Heng Yin and Adam J. Chong; *Queen Mary University of London*

Overview: Previous studies have found that neutralizing alternations are more likely to be phonologized if they introduce less homophony into the lexicon (e.g., Wedel et al., 2013). This echoes with experimental results: adults were worse at learning neutralization in artificial grammar, but only if it created homophony (Yin & White, 2018). We present a MaxEnt grammar that models this homophony avoidance effect as part of the candidate evaluation process, enabled by a set of lexical constraints (see Smith, 2015) that allows competition between individual lexical items. This lexical competition model (**LexComp**) outperforms a baseline model without any homophony avoidance mechanism, as well as an input discount model (Song, 2023) where the avoidance emerges prior to the candidate evaluation as learning inputs triggering homophony are discarded.

Data to be modeled (Yin et al., 2024): Learners were exposed to a neutralizing pattern: /t/ → [tʃ] and /k/ → [tʃ]. They were first only presented with /t/ → [tʃ] (***Early alternation***), before gradually shifting to /k/ → [tʃ] (***Late***) through a series of training/test blocks. The two alternations always derived homophony, e.g., [**t**imu]/[**k**imu] → [ni-**tʃ**imu] in the Homophony condition; they never did so in the No Homophony condition. At Blocks 1-2 (Fig. 1), participants were worse on learning Late alternation in the Homophony condition, than those in the No Homophony condition, where robust product-oriented generalization (Bybee, 2002) occurred from Early to Late alternation. However, at Blocks 4-5 in the Homophony condition, the accuracy on Late alternations overtook that on Early ones, suggesting competition between Late and Early alternation over the same plural form.

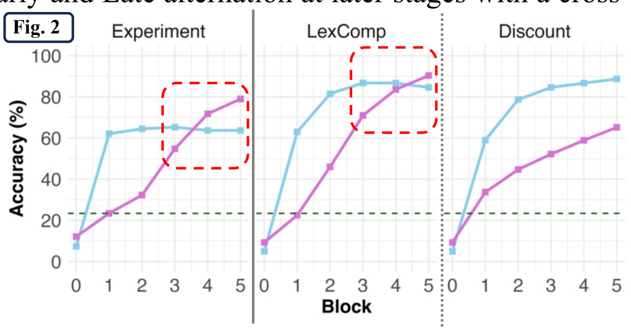
Fig. 1



The LexComp model: implements homophony avoidance through L-MAP(f_i, m_i) constraints defined as follows: Assign a violation for every form-meaning mapping (f, m_i) or (f_i, m) that does not conform to (f_i, m_i). For instance, L-Map([ni-tʃimu], *cats*) penalizes: (I) ([ni-timu], *cats*) for a surfaceform mismatch, and (II) ([ni-tʃimu], *apples*) for a meaning mismatch. Type-I penalty ensures that L-Map([ni-tʃimu], *cats*) only gains weight given the input of ([ni-tʃimu], *cats*); Type-II penalty captures homophony avoidance, e.g., [ni-tʃimu] can only correspond to *cats*, not *apples*.

Results and discussion: All models were implemented using the *maxent.ot* package (Mayor et al., 2024) in R. The **LexComp** model has the best overall fit to the experiment data with its highest log likelihood of −769.07 (Discount: −778.01; Baseline: −794.89). LexComp also predicts a learning pattern closer to the observed learning trajectories (Fig. 2). First, while all three models encourage product-oriented generalization by penalizing plurals without a [ni-tʃ] onset, only the LexComp model is able to counter such generalization with homophony avoidance by penalizing [ni-tʃ]-initial candidate for Late items. This is evident at Block 1 where only LexComp predicts lower accuracy on Late alternation as in the experiment (green dashed line). Secondly, LexComp successfully depicts the dynamics between Early and Late alternation at later stages with a cross-over in accuracy in at Blocks 3-5 (Fig. 2, boxed areas). These results suggest that homophony avoidance emerges from more than just input processing alone (counter the Discount model). Instead, higher integration of lexical learning into the grammar better accounts for its interaction with other learning bias/mechanisms such as product-oriented generalization and input frequency.

Fig. 2



A single-step derivation of ‘soft’ and ‘hard’ outputs of Polish palatalizations

Sławomir Zdziebko (s.zdziebko86@gmail.com)
The John Paul II Catholic University of Lublin

The division into the ‘soft’ ([-back]/|I|-headed) and the ‘hard’ ([+back]/non-|I|-headed) consonants is fundamental for the morphophonology of Polish (see Gussmann 2007; Rubach 2017). The two classes of consonants play a crucial role in the distribution of close front vowels with /i/ found only after ‘soft’ consonants and /ɨ/ attested only after ‘hard’ consonants.

Given these facts, it comes as a surprise that some of the most productively palatalizing affixes in Polish provoke the derivation of both the ‘soft’ and ‘hard’ consonants. The vast majority of affixes triggering Anterior Palatalization, which derives ‘soft’ pre-palatals and palato-labials (cf. *ko*/t/ ‘cat’ > *ko*/tɕ-i/ ‘feline’, *chło*/p/ ‘peasant’ > *chło*/pʲ-i/ ‘nom/voc, pl.’), also trigger the 1st Velar Palatalization, which derives ‘hard’ retroflex obstruents (cf. *ra*/k/ ‘shellfish’ > *ra*/tʂ-ɨ/ ‘adj.’) or the 2nd Velar Palatalization, which derives ‘hard’ dental affricates (*szpie*/g/ ‘spy’ > *szpie*/d͡z-ɨ/ ‘nom/voc, pl.’). These properties of Polish palatalizations make it difficult to analyse them in terms of a single assimilation process or an integration of a single autosegment into the representation of stem-final consonant.

This paper offers an analysis in which ‘hard’ and ‘soft’ outputs are the effect of the integration of the same subsegmental affixes without resorting to rule ordering or level-specific re-rankings of constraints.

We postulate that the affixes which trigger Anterior and the 1st VP are lexically represented as preceded by a floating place of articulation node hosting elements |A|-head and |I|-head. We also assume that velars do not contain resonance elements (see Gussmann 2007, Cyran 2010). The ranking *FLT (‘No floating autosegments’), $*2PL_P$ (‘No 2 phonetically visible place nodes’); $*HYDRA_P$ (‘No 2 phonetically visible headed elements’) > ALTERNATION (‘No tautomorphemic docking’) > PARSE $|A/I|_{FLT}$ (‘Realize elements which are part of the floating autosegment in the input’) > IDENTHEAD |A̲| (‘Do not demote |A̲|’) > IDENTHEAD |I̲| (‘Do not demote |I̲|’) makes sure that the integration of [Pl[A̲][I̲]] into stem-final velars derives the representations with elements |A|-head and |I|-operator, pronounced as retroflexes.

Due to the ranking of constraints PARSE $|A/U|_C$ (‘Realize elements in consonants’), $*2\ |E|_P$ (‘No 2 phonetically visible instances of the same element’) and the inventory constraint $*\{A.U\}_C$ (‘Do not combine |A| and |U| in consonants’) above the constraint PARSE $|A/I|_{FLT}$, the integration of [Pl[A̲][I̲]] into the structure of coronals (represented with |A|) and labials (|U|) results in the non-realization of element |A|-head and the linking of the lexical specification of the stem-final segments to the newly-integrated place nodes. This derives |I|-headed, i.e. ‘soft’, pre-palatals ({A.I̲…}) and palato-labials ({U.I̲…}).

The two affixes deriving Anterior and the 2nd VP are the dative/locative singular /ɛ/ and the nominative/vocative plural masculine /i/. Let us postulate that the segmental portion of these affixes is preceded by the floating element |I|-head as well as the place node hosting elements |A|-operator and |I|-operator. With the stems in velars, the floating |I|-head docks onto the stem-final place node, while the [Pl[A][I]] docks onto the stem final root node. The stem-final place node is underparsed due do the high ranking of $*2PL_P$. This results in the violation of the low ranked PARSE $|\underline{I}|_{FLT}$ and the realization of the [Pl[A][I]] as the dental place of articulation. In the case of the velar spirant, |A| obtains the status of the head due to the ranking of the inventory constraint *{A.I.H} above IDENTHEAD |A| (‘Do not promote |A|’). In the context of anterior consonants, |I̲| docks onto the floating [Pl[A][I]] not to derive the place node with more than one element, thus violating ALTERNATION. The |I|-operator is underparsed due to the high ranking of $*2|E|_P$. The high ranking of constraints PARSE $|A/U|_C$ makes sure that the lexical specification of stem-final consonants is linked to the newly-integrated place node. This results in the derivation of pre-palatals and palato-labials.

Loosing strength at each optimization: Interstratal differences in Kashaya

Eva Zimmermann | Leipzig University | Eva.Zimmermann@uni-leipzig.de

The Pomoan language Kashaya (Buckley, 1994, 1998, 2017) shows a variety of interacting interstratal differences that are an ideal testing ground for theories of the morpho-phonology interface. Kashaya's metrical system is based on iterative, left-aligned iambs. Iambic lengthening (=IL, Vː) applies only to stem-level material (/a/ in (1a)), never to word-level suffixes (/e/ in (1a)). A pitch accent (=PA, V́) is realized on the leftmost foot-head (1a) unless it consists of an underlyingly long V (1b) in which case PA is realized one foot further right. PA is hence surface-opaque: It is sensitive to underlying (1b) but not derived long V's (1a). Mora flip (=MF, V), finally, changes word-initial CVːCV into CV.CVːif the second syllable is open. As IL, this process never affects word-level affixes. Interestingly, syllabification with word-level affixes is still crucial in determinining the context for MF: It is possible in (1c) but impossible in (1d).

(1a)	(mo.máː)(ʧe.de)la [[mo-maʧ-ed] -ela]* 'I keep running in there'	(1c)	(q'aː)(me.lá) [[q'aː] -mela] 'I left'	(1c)	(q'a.ʧiː)dú [[q'aː-ʧid] -u] 'keep leaving'	(1d)	(q'aː)(ʧín')ba [[q'aː-ʧid] -ba] 'after leaving'

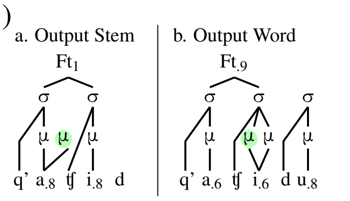
*Morphological structure: [[ ]$_{stem}$]$_{word}$ (Buckley, 2017, 114-121)

These facts are challenging in a stratal system based on co-grammars (e.g. Kiparsky, 1982, 1985; Bermúdez-Otero, 2018, i.p.). That, for example, IL never applies to word-level material follows if IL is only a stem-level process. However, that PA only avoids underlyingly long V's follows best if IL is a word-level process applying after PA was assigned at the stem-level – an ordering paradox results. In contrast to stratal accounts, Harmonic Layer Theory (=HLT) is based on a cyclic optimization with a single phonological grammar; is it hence more restricted than stratal models. Within HLT, interstratal differences fall out since phonological elements can predictably decay in their activity (e.g. Smolensky and Goldrick, 2016; Rosen, 2016); i.e. loose a fixed amount of activity at each optimization cycle. In Kashaya, V's and feet are taken to predictably decay by 0.2 and 0.1 activity respectively at each optimization (cf. (3)). IL is assumed to be blocked for V's that enter the optimization with a full activity of 1 by DEPAL(V-μ) (=DEP) penalizing the insertion of new association lines between V's and μ's (2-i-a). After one optimization, however, stem-level material is weakened and violates DEP less: It can now undergo IL (2-ii-b). Since the foot also decays, *HD/L demanding feet with heavy heads is also violated gradiently and the need for IL decays: At the phrase layer, word-level V's will hence never undergo IL even though they are weaken enough. PA is assumed to be assigned as early as possible and to avoid long V's. Since IL applies only to weakened V's and is thus a late process, earlier placement of PA is simply counterbled by IL (2-ii-b). MF, finally, follows from the preference of initial feet to be bisyllabic: An underlying initial long V hence preferably gives its μ to a following syllable to allow an unmarked (CV.CVː)-iamb. Since V's are not lengthened before they are weakened, MF is a two-step process: A μ remains stray at the stem level (3a) and is only associated at the word level where the syllabification will determine whether it can associate to the second syllable (1c-3b), or whether it has to integrate into the initial syllable after all (1d). Such a Duke-of-York-derivation is possible in HLT since feet decay in their activity; the constraint demanding initial feet to be bisyllabic is hence not important enough anymore at the word level to block re-association of the μ to the initial V.

(2)

cf. (1a) IP stem: mo$_1$ma$_1$ʧe$_1$d			DEP 70	*HD/L 69	$\mathcal{H}$
i. Stem:	☞ a.	(mo$_{.8}$.má$_{.8}$)$_1$ ʧe$_{.8}$<d>		-1	-69.0
	b.	(mo$_{.8}$.máː$_{.8}$)$_1$ ʧe$_{.8}$<d>	-1		-70.0
ii.Word:	a.	(mo$_{.6}$.má$_{.6}$)$_{.9}$ (ʧe$_{.6}$.de$_{.8}$)$_1$ la$_{.8}$		-1.9	-131.1
	☞ b.	(mo$_{.6}$.máː$_{.6}$)$_{.9}$ (ʧe$_{.6}$.de$_{.8}$)$_1$ la$_{.8}$	-0.8	-1	-125.0
	c.	(mo$_{.6}$.máː$_{.6}$)$_{.9}$ (ʧe$_{.6}$.deː$_{.8}$)$_1$ la$_{.8}$	-1.8		-126.0

(3)



In HLT, processes are not bound to certain strata; they are restricted to elements with a certain activity. This change of perspective is able to predict the interstratal differences in Kashaya.

Poster papers

Language-specific variability informs Universal Grammar: Yiddish voicing assimilation

Adam Albright, MIT (albright@mit.edu)

Variability has increasingly been used to shed light on phonological computation (Coetzee 2009; Hayes 2017; Smith & Pater 2017; Zymet 2018). These studies have focused on how phonology assigns probability distributions over competitors. I argue here that patterns of variation also contribute to our understanding of the constraints themselves. Often, constraint sets that adequately describe the typology of categorical patterns cannot capture rates of variation (Pająk & Bakovic 2010). Using data concerning variable voicing assimilation in Yiddish, I show that a simple constraint set captures the basic pattern, but it cannot model the observed variability. The solution requires a refined constraint set, sensitive to contextual markedness (Steriade 1997).

Yiddish has voicing distinctions for singleton obstruents in initial, medial, and final position. Clusters of obstruents that agree in voicing are also allowed in all positions. In Northeastern Yiddish, clusters of disagreeing obstruents generally undergo regressive voicing assimilation: /vɔg+ʃɔl/ -> [vɔkʃɔl], /bak+beɪn/ -> [bagbeɪn] (Lombardi 1991 et seq., Wetzels & Mascaró 2001, following Katz 1987). The literature mainly focuses on compound (word) boundaries, where assimilation is gradient in degree and rate. However, assimilation also occurs word-internally, where it is phonetically complete, but lexically variable. To examine variability, I counted application in existing words (Weinreich 1977). Rates and examples are shown in (1).

(1) Rates of voicing assimilation by voicing value and context

	/[+v][−v]/		/[−v][+v]/	
Initial	100%	/dxak/ → [tx] 'straits' —	0%	— /kduʃə/ → [kd] 'sanctity'
Medial	87%	/plugtə/ → [kt] 'dispute' /kodʃe/ → [dʃ] 'holy of'	24%	/hekdəʃ/ → [gd] 'poorhouse' /makdim/ → [kd] 'ahead'
Final	100%	/zɔgt/ → [kt] 'says'	(gap)	

A successful model must derive regressive assimilation in all contexts and the observed preference for devoicing over voicing, along with rates of application. One popular approach to regressive assimilation involves positional asymmetries between onsets and codas (Lombardi 1996). This approach fails for Yiddish, where assimilation is consistently regressive, even when both consonants are in the onset or coda. Instead, I adopt contextual constraints, disfavoring voicing contrasts in obstruents not followed by sonorants (Steriade 1997)—e.g., Agree(voi)/V__ O encodes the difficulty of perceiving a voicing contrast before an obstruent. To model the preference for devoicing over voicing, I adopt Comparative Markedness (McCarthy 2003): *Vcd obstruent$_{\text{Old}}$ penalizes underlyingly voiced obstruents that remain voiced on the surface, and *Vcd obstruent$_{\text{New}}$ penalizes underlyingly voiceless obstruents that become voiced. Six constraints suffice to accurately model a categorical version of Yiddish in which preferred outputs are made the sole outputs, both in OT with strict ranking, and in MaxEnt with weights.

This constraint set cannot capture the observed variability, however. When trained on actual rates of application, the best-fitting MaxEnt grammar underapplies regressive voicing word-medially (/apda/ -> [abda] 16.5%, vs. observed 24%), and overapplies it initially (/pda/ -> [bda] 7%, vs. observed 0%); with similar errors for regressive devoicing. Although the model has separate Agree constraints by context, the effect is not in how often Agree is violated, but in the voicing/devoicing asymmetry. If we provide a refined set of markedness constraints, including comparative *VoicedObstruent constraints for a fuller set of contexts, the model accurately captures the attested rates of application. Narrowly, this supports the claim that contrast licensing involves contextual markedness constraints (Steriade 1997). More importantly, it demonstrates how reasoning about the constraints that define universal variation must include not only categorical patterns, but also quantitative data about gradient reflexes of the same restrictions.

Correlations of prevocalic VOT and preconsonantal vowel duration:
Evidence from New Zealand English

Katalin Balogné Bérces[1,2] & Erika Sajtós[1]
[1]Pázmány Péter Catholic University, Budapest; [2]Catholic University in Ružomberok
berces.katalin@btk.ppke.hu; sajtos.era@gmail.com

Tanner et al. (2020) show that dialects of English differ substantially from each other in the size of the Voicing Effect (VE) (i.e., the degree to which vowel duration is clipped before fortis consonants), and set up a scale that is roughly: the US > England > Scotland. What studies do not investigate (properly/fully), however, is phonological/functional explanations, esp. the relationship between the VE and the average prevocalic VOT within the variety, although such a relationship seems to exist: (i) in the US, there is dialectal variation but generally, aspiration is heavy in fortis and lenes are voiceless; (ii) in England, again, there is dialectal variation but generally, less heavy aspiration is the norm and a number of voice languages with weak or no aspiration are spoken in the North/North-East (Durham, Yorkshire, Lancashire, the Black Country, etc.); (iii) in Scotland, studies report voice languages in Scots-speaking areas (the Lowlands). Apparently, the heavier the overall aspiration in a system, the larger the average VE. That is because typically, a more strongly aspirated fortis system implies less voiced lenes, consequently, when aspiration lenites in coda position, the fortis-lenis distinction becomes perceptually less salient so it is no more cued in VOT but in preconsonantal vowel duration.

However, the functional load of vowel duration also depends on the status of vowel length in the dialect. It is well-established in the literature that vowel length is phonologically secondary to vowel quality (tenseness/laxness) in US English (also reflected in the absence of length indication in transcriptions); in addition, forms of word-final devoicing are reported from many regions in the US as well as from African American English, inducing extra lengthening before devoiced lenes. On the other hand, Scottish varieties exhibit a separate Vowel Length Rule. These factors may also contribute to the VE scale established by Tanner et al. (2020).

In order to test whether a correlation between VOT and the VE exists independently of the vowel system, we investigated two forms of New Zealand English (NZE) whose vowels overlap: Pākehā English (PE) and Māori English (ME). Traditional descriptions report heavy aspiration and a large VE for PE and weaker/less frequent aspiration (as a substrate effect) for ME. Our database contains sound recording corpora of spontaneous speech, whose relevant chunks were extracted and analysed in Praat. Vowel duration for seven vowels and VOT for the fortis plosives were measured and compared. Statistical analyses were carried out using the lme4 package in R. Our results confirm that PE is at the maximal end of the scale with a great VE size (fraction/ratio: 0.75/1.32) and long VOT values (68 ms). As was expected, the VE size is smaller compared to the results of previous studies due to the more spontaneous speech style. Regarding ME, we find that it is at the lower end of the scale with a small VE size (fraction/ratio: 0.9/1.10), and with weaker aspiration (60 ms) and no unaspirated tokens.

Our data show that VOT and the VE correlate irrespective of the vowel system of a dialect: PE has longer VOT and a larger VE size, while ME has shorter VOT and a smaller VE size, even though all our informants are acrolect speakers using basically the same type of general, NZE vowels, i.e., the function of vowel length vs vowel quality is the same for both speaker groups.

Nasal place assimilation in the German negative prefixes *in-* and *un-*

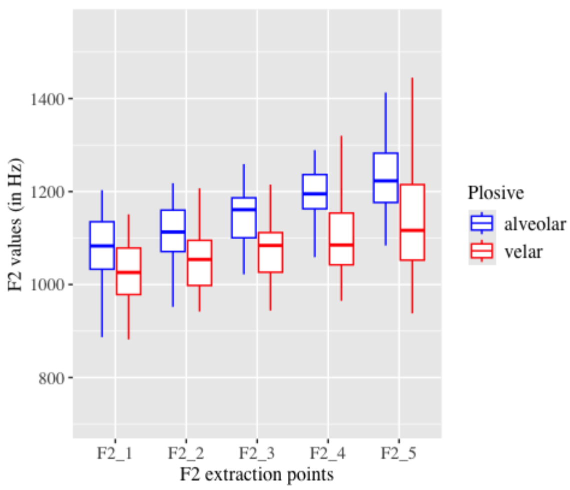
Tina Bögel
University of Konstanz, Tina.Boegel@uni-konstanz.de

This paper discusses regressive nasal place assimilation patterns (henceforth NPA) of the German negative prefixes *in-* and *un-*. Both prefixes are stressed and frequently prefer adjectives, but also occur with other word categories. Competing constructions exist, as in *inakzeptabel* and *unakzeptabel* ('unacceptable'), but in general *in-*, a loan prefix from Latin/French, occurs mostly with Latin stems, while native *un-* can be mostly found with stems of Germanic origin. Of particular interest to phonologists are the prefixes' different patterns with respect to NPA: The general assumption is that *in-* assimilates, while *un-* doesn't. The following table illustrates this pattern with respect to the plosives [p], [t], and [k].

sequence	**prefix *in-***	**prefix *un-***	translation
Vn+[bilab]	i[m]potent	u[n]produktiv	impotent/unproductive
Vn+[alveolar]	i[n]tolerant	u[n]teilbar	intolerant/indivisible
Vn+[velar]	i[ŋ]konsequent	u[n]kontrolliert	inconsistent/uncontrolled

This difference in assimilation is one of the main reasons why *in-* and *un-* are assumed to belong to different affix-classes, where *in-* is deemed to be a member of class 1 with closer ties to the following stem, and *un-* is a member of class 2, with less closer ties (e.g., Wiese 2006). NPA is furthermore assumed to be bound by the prosodic word domain, which led Wiese (2006) and more recently Féry (2025) to analyse *un-* as a separate prosodic word, while *in-* is integrated with the following stem: ((un-)$_\omega$ (teilbar)$_\omega$)$_\omega$ (with the recursive structure added by Féry) vs. (intolerant)$_\omega$. In contrast, Raffelsiefen (2000) proposes that all stressed prefixes form independent prosodic words. Consequently, NPA cannot be a criterium for the prosodic word domain. A similar prosodic structure is also suggested in Hall (1992) and Yu (1992), but they furthermore assume that NPA occurs with both prefixes. To sum up: NPA has been claimed to occur only with *in-*, or with both prefixes, with fundamental consequences for morphological theory and prosodic analysis – but so far without any experimental evidence.

The research presented in this paper took this as a starting point. A production experiment was conducted with the sequences *int/ink* and *unt/unk* in four different conditions: 1. within one syllable, one word (e.g. *Funk* 'radio'), 2. between two syllables, in one word (e.g. *Dun.kel* 'dark'), 3. At the morpheme boundary (as in Table 1), and 4. between two words *Monsun k...*. 13 participants took part in the study and the F2 trajectories in a total of 503 sentences were analysed at the transition stage between the vowel and the following nasal. The Figure below illustrates the F2 trajectories of the prefix *un-* in the alveolar and the velar condition (with stimuli as presented in Table 1), showing a significant difference between the two nasals: [n] and [ŋ].



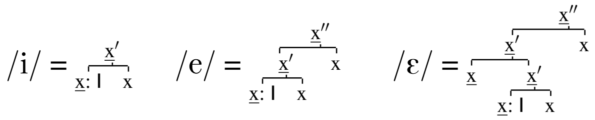
The results confirm that the prefix *un-* is subject to nasal place assimilation, which has general consequences for the morphological classification. The results furthermore showed significant differences in the grade of NPA between the within-word condition (1. and 2.) and the prefix-condition (3.), but also between the prefix condition and the word condition (4.). These differences in NPA patterns can be captured by assuming different prosodic word structures for the three groups, and specifically a recursive structure for the prefix-condition: (un-(teilbar)$_\omega$)$_\omega$.

We don't need no |A|rboration – pruning GP2.0

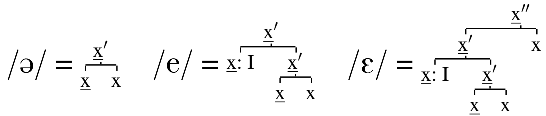
Julian Bradfield, `jcb@inf.ed.ac.uk`
University of Edinburgh

In 'standard' element theory/GP ('SGP') per Backley (2011), elements A, I, U represent, roughly coronality/lowness, frontness/height, backness/rounding. Segments are sets of elements, with (variably) no, one, or sometimes more elements marked as *heads*, effectively making elements bivalent. E.g. [e] = |$\underline{\text{I}}$.A|, [ɛ] = |I.$\underline{\text{A}}$|. A radical development in GP is GP 2.0 by Pöchtrager (*op. mult.*). He abolishes A for lowness/openness, and posits that sounds are binary trees with (optional) elements at the nodes, with one or two head terminals. 'Openness' is interpreted as larger trees with more empty nodes. Various processes now become removing structure, or allowing 'extra space' (empty nodes) to absorb parts of neighbouring sounds.

We consider here how important is the treeness of structures. Consider first Pöchtrager (2018) on vowel reduction in Brazilian Portuguese. /ɛ/ merges to /e/ in prestressed positions, and further to /i/ in final unstressed position. He asks: given an SGP model of /i/ = |$\underline{\text{I}}$|, /e/ = |A.$\underline{\text{I}}$|, /ɛ/ = |$\underline{\text{A}}$.I|, why is one reduction process modelled both by change of headedness and loss of element?, and why is the merge target /e/ not /ɛ/ (as |A.$\underline{\text{I}}$| → |$\underline{\text{A}}$.I| is also a head-change)? In the inset GP2.0 representation, mergers cut down the tree as 'weak positions allow less space'; /e/ to /ɛ/ would add structure. (But a possible SGP analysis is /i/ = |I|, /e/ = |A.I|, /ɛ/ = |$\underline{\text{A}}$.I|, with simply progressive diminution of A.)



However, in Eastern Catalan, /e, ɛ/ both merge to /ə/ in unstressed position. (2018) proposes the inset model; reduction is reduction to height 1 trees, and the melodic |I| is in a removed layer. The natural SGP model is /ə/ = |.|, /e/ = |A.I|, /ɛ/ = |$\underline{\text{A}}$.I|, so reduction removes both A and I. In both BP and EC, back vowel reduction follows the BP model with U for I. Thus GP2.0 unifies the reduction computation but uses different representations for BP and EC front vowels, while SGP uses the same representation but different computations.



But: is it *structure* that matters? The properties actually used are (1) the height h of the tree, (2) for each melodic element X, its depth $d(X)$ from the root and whether its node is a head. Thus the pruned representation $(h, \underline{X}_{d(X)}, Y_{d(Y)}, \ldots)$ suffices. In the example above, we have:
BP: /i/ = $(1, \underline{\text{I}}_1)$ /e/ = $(2, \underline{\text{I}}_2)$ /ɛ/ = $(3, \underline{\text{I}}_3)$ EC: /ə/ = (1) /e/ = $(2, \underline{\text{I}}_1)$ /ɛ/ = $(3, \underline{\text{I}}_2)$
and reduction reduces h to 1 and all d's by $h-1$, with elements vanishing when d becomes 0.

However, purely melodic applications are the easy part. The origin, and meat, of GP2.0 is the interaction of melody and length and syllable structure (Pöchtrager 2006, 2015, 2021 etc.) What of these? The analyses there use positions in the tree together with a complex array of stipulated command and control relations (m-command, p-licensing, plain old government). A relatively simple example from (2006) is the analysis of 'pre-fortis clipping' such as *whiff/give* [ʍɪfː/gɪːv]. (2006) says /f/ is [$_{O'}$ x_1 xO: U] specified for an 'm-command' which spreads the melody to [$_{O'}$ x_1: U xO: U], while /v/ has no internal m-command, and so the x_1 node can acquire I by m-command from the preceding /i/ = xN: I. In a pruned representation, /i/ = $(-1, \underline{\text{I}}_0)$, /f/ = $(1, \underline{\text{U}}_1, \text{U}_1)$ (with 'm-command' already applied), and /v/ = $(1, \underline{\text{U}}_1)$ – then I spreads in traditional fashion into the spare slot of /v/ (an $h = 1$ represention is maximally two slots). Of course, here the notion of spare slot is derived from a calculation about trees, but the tree structure is not, and need not be, explicit. One might think that the pruning loses information, but in fact:

Proposition: The constraints on tree structure imposed by Pöchtrager are such that a pruned representation uniquely identifies one of his trees.

Hence the pruned representation suffices: it is not structure as such that matters, but the power to express multivalent multidimensional values for elements. Whether it also suffices for the immensely complex higher level structures of GP2.0 is work in progress.

A Reanalysis of Syllabic and Rhythmic Gradation in Nganasan As A Single Consonant Gradation Process

Juan D. Cancel Massachusetts Institute of Technology juanc374@mit.edu

The literature on Avam Nganasan (Helimski 1998; Wagner-Nagy 2018) has argued that the language exhibits two kinds of Consonant Gradation: Syllabic Gradation (SG), in which an onset consonant alternates in voicing depending on whether a syllable is open or closed as in *ɟi.k̲ə* "mountain" vs. *ɟi.g̲ə-ʔ* "mountains", and Rhythmic Gradation (RG), in which an onset consonant alternates in voicing depending on whether it aligns with the left-edge of a foot or not as in *(nɨ-rə)(g̲ɨ)* "woman-like" vs. *(ɲotə)-(rək̲u)* "grass-like". Consequently, SG and RG have been analyzed as being two different phonological processes not only because of the different contexts in which they occur, but also because although the single consonant alternations are the same in both SG and RG (T → D), the homorganic nasal alternations are not: While SG exhibits a NT → ND alternation parallel to that of the single consonant alternations such as *kin.tə* "smoke" vs. *kin.də-ʔ* "smokes", RG exhibits a NT → (N)T alternation such as in *(ba.ku)(nu-n.tə)(nu)* "salmon-LOC.SG" vs. *(ko.lɨ)-(tənɨ)* "fish-LOC.SG", where the homorganic nasal disappears unless it is preceded by another nasal across a vowel (cf.*(mi.ni-n)(tə.nu)* "kidney-LOC.SG") and where there is no change in voicing.

In contrast to the description above, this analysis will argue in terms of Optimality Theory (Prince and Smolensky 2004) that we should instead reanalyze SG and RG as a single Consonant Gradation process. In particular, if we argue that the reason the homorganic nasal disappears in RG is because of a process of foot-final nasal deletion which is independent of RG but just happens to occur right next to the foot-initial context where RG occurs, we can reanalyze SG and RG as a single case of Consonant Gradation in which the alternations are derived from the combination of a special fortition process that occurs on the onset of a foot-medial open syllable and of other cross-linguistically attested lenition processes such as intervocalic and postnasal voicing that then occur everywhere else modulo word-initial position. This reanalysis not only clearly explains why the single consonant alternations in both in SG and RG happen to be the same - they would just be the same instantiation of intervocalic voicing - but it also serves as the ground for reanalyzing in more concrete terms some of the Avam Nganasan data that Vaysman (2009) looked at such as the NT → T → D chain-shift that we see in RG or the cases of counterbleeding that we see in words such as *(ɟi.g̲ə)-(tə.nu)* "mountain-LOC.SG", where we have a voiced consonant in an unexpected environment and where there are strong reasons to believe that the underlying representation of the LOC.SG suffix should be /NTənU/.

Positional variability of velars in early-onset L1 Moroccan Arabic dysphasic production: An Optimality-theoretic account

Ranya Erramh

ranya.erramh-etu@etu.univh2c.ma

Hassan II University

This study investigates the prosodic motivation behind the asymmetrical syllabic distribution of the [+dorsal] place feature in the phonological production of a 12 year-old female dysphasic and native speaker of Moroccan Arabic.

The informant presents a case of recently diagnosed early-onset neurodegenerative Wernicke's Dysphasia, whereby expressive fluency is damaged, yet production is sensible and both perception and comprehension are intact (Goodglass et al., 2001). Globally, Speech Sound Disorders (SSDs) encompass difficulties emanating from constraints associated with the articulation versus phonological disorder dichotomy (Shriberg, 2010), a prominent marker of which is child production inconsistency. Amongst the salient attestations for atypical acquisition is the consistent production of typical phonological and prosodic phenomena beyond the age of 5 (Grunwell; 1981, 1982), such as fronting, backing, coalescence, cluster reduction, and prevocalic voicing. Fronting atypically manifests in child output up to the age of 3 years and 6 months, accordingly. The frequency is amongst all syllabic positions, targeting the onset position more than the coda, e.g.: [tʌp] 'cup' and [dæso] 'castle' (McAllister Byun, 2012). Table (1) below illustrates the data exemplifying the asymmetrical misproduction of voiceless and voiced velars in different syllabic positions.

Target production	**Impaired child production**	**Gloss**
kura	**t**ula	ball
sa**k**	sa**k**	handbag
gləs	**d**ləs	sit
brg**ə**g	brk**ə**k	gossip

Table 1. *Impaired child production of velars in Moroccan Arabic*

We notice irregularity in the distribution of the [+dorsal] feature across word-initial and word-final positions, also encompassing onset and coda positions in the present data. We examine these findings by providing a unified Optimality-theoretic (Prince & Smolensky, 1993) account of the underlying phonological representation.

The 200 data were collected via a controlled and spontaneous production mimicking experiment of two 25 minute sessions per week, administered across 10 weeks. It comprises 4 prosodic subsets of velar occurrence, which are word-initial and word-medial onset positions and word-medial and word-final coda. Findings showcase a confined dorsal inventory due to prosodic considerations (Subset Principle of Manzini & Wexler, 1986) that are the undominated positional markedness constraints *O [+dorsal] and *[+cons,+vce]#, ranked higher than the highest ranked positional faithfulness constraint Anchor-R ([+dorsal], PhW). Accordingly, the phonological template is provided in the following unified OT constraint ranking: **Ons, *O [+dorsal], *[+cons,+vce]# >> Anchor-R ([+dorsal], PhW) >> IDENT-IO [voice], IDENT-IO [place] >> *[+coronal]**

Tesar & Smolensky (1996, 2000)'s Principle of Constraint Demotion is employed to tackle demotion in typical acquisition's final stages against the present atypical acquisition. *O [+dorsal] and *[+cons,+vce]# are to be demoted in no specified order as they are structural constraints no longer marked as fatal *!, thence incurring uncancelled winner marks, with the unified constraint ranking adjusting to Ons >> Anchor-R([+dorsal, PhW)] >> IDENT-IO >> *O [+dorsal],*[+cons,+vce]#, with Ons incurring an uncancelled loser mark *.

The findings corroborate that structural markedness constraints license marked subsegmental features, which are prosodically misproduced in this disordered grammar. Thence, they challenge de Lacy (2001) as marked velars are misproduced in onset (weak position here), ruling out that positional faithfulness alone triggers feature distribution in atypical production.

An extrasyllabic account of North Sámi triple gemination

Christopher Geissler[1], Emily Posson[2]

[1] *Boston College,* [2] *University of Minnesota*

Introduction: Extrasyllabic or syllable-appendix consonants have been described at word edges and in word-medial environments where consonants are not able to be syllabified as either onset or coda (Polish: Rubach & Booij 1990, French: Rialland 1994). Using data from a North Sámi length alternation, we provide evidence for an extrasyllabic mora that only occurs medially.

The Western Finnmark dialect of North Sámi (Uralic) exhibits a typologically unusual three-way contrast between short, long, and overlong consonants (Q1, Q2, Q3), alongside a two-way vowel length contrast. North Sámi consonant length contrast manifests at a root-medial syllable boundary (roots are generally disyllabic; primary stress falls consistently on the initial syllable). Alternations between consonant lengths, known as "consonant gradation", instantiate morphological contrasts with a shorter consonant in the "weak grade" and a longer consonant in the "strong grade". The three alternations are as follows (Bals Baal et al. 2012):

(1) Short C alternates with long CC after long vowels, but with overlong CCC after short vowels.

Q1~Q2: VVC→VVCC

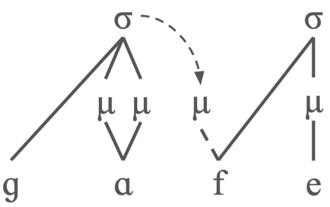
Q1~Q3: VC→VCCC

(2) Long CC alternates with overlong CCC, accompanied by vowel shortening:

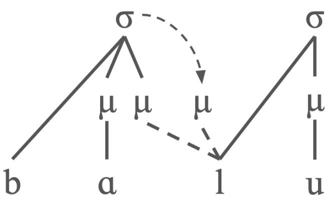
Q2~Q3: VVCC→VCCC

Analysis: We account for these facts by positing that extrasyllabic moras are licensed following heavy syllables. (We assume geminates must straddle a syllable boundary as in Kahn (1976), Clements & Keyser (1983)). In our account, the strong grade is formed by lengthening the medial consonant. A short consonant following a long vowel simply requires insertion of a non-moraic coda, as in (3). However, following a short vowel, an extra syllabic mora must also be inserted in order to license the non-moraic coda, as in (4). If the consonant is already long, it is instead made overlong through compensatory shortening of the preceding vowel, as in (5).

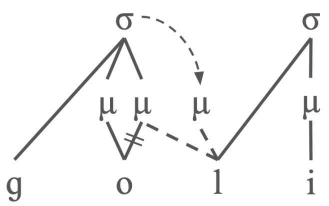
(3) Q1~Q2
[gaafe]~[gaaffe]
'coffee (acc sg~nom sg)'



(4) Q1~Q3
[bɑlu]~[bɑlllu]
'fright (acc sg~nom sg.)'



(5) Q2~Q3
[goolli]~[gollli]
'gold (acc sg, nom sg.)'



Implications: Unlike extrasyllabic units at word boundaries, the North Sámi geminates are obligatorily word- and foot-medial. This expands the typology of attested extrasyllabic positions, resembling proposals that present multiple degrees of affiliation between a syllable and its consonants (e.g. Fujimura 2000, Shaw et al 2011). It also begins to offer an explanation for the conditions necessary to allow a 3-way consonant length contrast to arise.

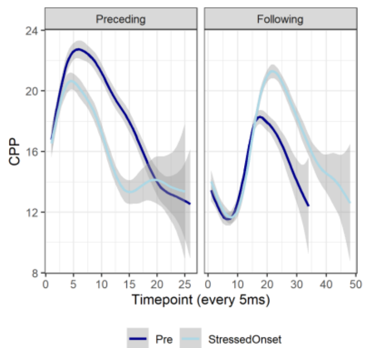
The role of contrastiveness: Stress effects on derived 'VOT' in Sevillian Spanish

Madeline Gilbert, *University of Georgia*, *madeline.gilbert@uga.edu*

Introduction: Segments in stressed syllables are often enhanced. For stops, stress can increase VOT duration and affect spectral properties of the burst (Lisker & Abramson 1967; Tabain et al. 2016). Strengthening seems to target features that are contrastive in a language (Cho & McQueen 2005), but some changes could result from the articulatory settings needed to produce a following stressed vowel (Giavazzi 2010). I investigate the importance of contrastiveness in prosodic enhancement by analyzing stop-h sequences that look like aspirated stops, but where [h] is not a contrastive feature of the stop. These stop-h sequences come from Sevillian Spanish, where they arise through gradual metathesis of debuccalized /s/ with following /p, t, k/ (/ka**sk**o/ → [ka**hk**o] → [ka(h)**kh**o]). Metathesis occurs in all stress configurations, but studies find conflicting results for the effect of stress (e.g., Torreira 2012). This study investigates whether Sevillian derived 'VOT' is sensitive to prosodic enhancement, using acoustic methods to capture nuanced patterns.

Experiment: Data come from 4 female Sevillian speakers (data from ~25 speakers will be presented) reading target words in carrier sentences. Target words had /st, sk/ and were designed in pairs differing only in stress. In the *Pre* condition, stress precedes /sC/ and stop-h is the onset to an unstressed syllable (*re**fres**co* [re.ˈfre(h).kho]). In the *StressedOnset* condition, stress follows /sC/ and stop-h is the onset to a stressed syllable (*refres**có*** [re.fre(h).ˈkho]). I use Cepstral Peak Prominence (Hillenbrand & Houde 1996) to capture breathiness corresponding to [spread glottis], beyond traditional VOT measurements. CPP was extracted every 5ms in the intervals preceding and following the stop closure (214 intervals total). GAMMs will be run to model CPP curves.

Results: The figure shows CPP curves for /sC/ words in the two stress conditions. Lower CPP indicates greater breathiness. In the interval following the stop closure (right panel), CPP starts low and increases in tandem in both stress conditions. After a long breathy period ('VOT'), formant structure resumes at the same rate. Stress does not affect the duration of this breathiness. In the interval preceding the stop closure (left panel), CPP drops earlier in the *StressedOnset* condition than in the *Pre* condition. Acoustically, breathiness starts earlier when the vowel is unstressed and is followed by stop-h in a stressed onset.



Discussion: In Sevillian, the temporal extent of [h] metathesis to after the stop is not conditioned by stress. Furthermore, unlike languages where [h] is the realization of contrastive [spread glottis], Sevillian derived 'VOT' does not lengthen under stress. These results support the hypothesis that contrastiveness is necessary for a sound to be targeted for enhancement. The difference between conditions in the preceding interval (earlier breathiness in the StressedOnset condition) is harder to explain. It could be a cue to stress, rather than to segmental contrasts: formant structure may be less defined in unstressed vowels. Or, metathesis may be less complete in the StressedOnset condition, distributing cues to /s/ across syllables. In that condition, /s/ originates in an unstressed syllable and more of [h] remains in the original location. Increased breathiness could make [h] more perceptually salient in an unstressed syllable. The current results contribute to our understanding of prosodic enhancement, and raise questions about the multiplicity and interaction of acoustic cues to stress and segmental contrasts. They also raise the question of whether other spectral measures may show enhancement effects in Sevillian stop-h sequence releases (as has been shown for other languages; Tabain et al. 2016), even if the duration of breathiness is similar.

Sound Change in a Substance-Free Framework

Mark Hale (mark.hale@concordia.ca) & Madelyn Kissock (madelyn.kissock@concordia.ca)
Concordia University

Since acquisition, the domain of phonological change, is a surface-string-driven process and therefore completely 'substance-full,' it is reasonable to ask whether a substance-free conceptual framework adopted for the modeling of the (adult) computational system has any bearing at all on diachronic events. We argue that it does, in the following manner. There are two possible points at which a phonological difference in grammars may come into being. The first of these is in the transduction of an (already heavily processed) acoustic input into an abstract, substance-free featural representation. This transduction, we assume, is mechanical, but that does not entail that it is course-grained. For example, hits at the margins of the rather large acoustic space for vowels may trigger one of two vowel representations but do so consistently, not arbitrarily. This first step seems unarguably 'substance-full.' The second point in the process occurs when stored forms reach some required minimum number/type and the multi-step process of Lexicon Optimization (LO) is initiated. Since the stored forms have already been transduced into substance-free features, there is no possibility that the acquirer's under-construction grammar can take into account how close one acoustic input is to another or how similar one articulation is to another. LO has only an abstract set of lexical items stored in substance-free UG features to compute over. This is the stage at which we see the construction of stored phonological operations which produce multiple phonetic representations (allophones) from a single UR.

To illustrate our points, we will use as examples two developments of pre-Marshallese word-initial **ko-*: *k^wow 'tentacles' > MRS /k^wV^{MID}w/ (in *joko* 'octopus') and *k^wor^j 'fibre' > MRS /k^wV^{MID}r^j/, though the same arguments hold for the development of the Marshallese phonological system from pre-Marshallese in general. The phoneme V^{MID} is famously underspecified on the back/round dimensions. Its phonetic realization involves the transfer of backness and roundness from adjacent consonants. Thus our forms are realized physically as [k^wow] and [k^wo͡er^j], where the 'tied' vowel is, crucially, not diphthong, but steady a transition from the consonantal back/round values on the left of the vowel to the consonantal back/round vowels on the right (Bender 1968, Choi 1992) in the mid-space. This sound change could be stated very simply: *o > V^{MID}. We believe that this simple statement obscures the complexity of the actual event.

Let us look in detail at what happens when the aquirer is exposed initially to our forms [k^wow] and [k^wo͡er^j]. Given the perceptual acuity of infant acquirers, we assume they would posit as initial representation of 'tentacles' /k^wow/, but what of 'fibre'? While the vowel realization provides ample evidence that it is mid, it provides no clear evidence for a target on the back/round dimension — the learner must assume it is underspecified, and posit /k^wV^{MID}r^j/. At this early point, the acquirer's analysis does not match that of the adult Marshallese speaker. For that, we need step two!

In step two, the acquirer, armed with an inventory of lexical items, can deduce that there are no *realizational* implications of storing *all* Marshallese vowels as underspecified on the back/round dimensions — i.e., that representations like the initially-posited /k^wow/ can be safely stored as /k^wV^{MID}w/.

Sound change, in our view, exactly parallels this development: the initial change results from the learner's *novel* transduction of input [k^wor^j] into substance-free features, based on a vowel that was influenced by the consonantal properties on either side of it, as having no inherent back/round specifications, but having its realization on those dimensions triggered *solely* by its surrounding consonants. That was a misparse of the *phonetic substance* s/he was exposed to and must therefore obey constraints on possible acoustic parses. The change of the *o in *k^wow to V^{MID} was necessarily a *substance-free*, grammar-driven change given that, post-transduction into features, only substance-free features underwent any change.

Is ‘phonetic erosion’ a phonological concept? **Fae Hicks**

Often cited as the ‘cause’ of change in grammaticalisation accounts ‘phonetic erosion’ seems to encompass a wide range of phonological processes. Here, I aim to determine whether erosion can be considered a phonological concept, arguing that although it closely correlates to reduction and lenition (which, for brevity’s sake, I term together as ‘reduction’), none of these labels actually represent coherent phonological concepts.

The grammaticalisation theoretic definition of erosion is vague, generally referring to some kind of loss of phonetic information, the imprecise nature of this definition has been repeatedly highlighted most recently by Elerick (2023). Among the changes commonly labelled erosion are unstressed vowel syncope, loss of contrast (e.g. merger of /m/ and /n/ in Middle English inflections), loss of segments (the loss of *ne* in French negation). The definition even stretches to phonologically and morphologically complex erosions such as the loss of the first (stressed) syllable of Latin *ille* in the development of the French determiner *le*. The range of domains involved in erosion already suggests that it cannot be a truly phonological concept but nonetheless it bears some semblance to reduction.

Both grammaticalisation accounts of erosion and phonological accounts of reduction commonly refer to loss of manner of articulation contrast, place contrast, tone contrast, and segments. Thus, it would seem that the historical process ‘phonetic erosion’ can be translated to the phonological concept reduction. However, I argue that reduction itself is not a coherent phonological concept. Phonological reduction has been defined in a number of ways: in phonetic accounts of phonological change the name ‘reduction’ is fittingly given to the reduction of articulatory effort (Kirchner, 1998) whereas in Element Theoretic (ET) accounts it refers to reduction of complexity as elements are delinked from compounds (Harris, 2005). However, in Rule Based Phonology different rules are needed to explain each process i.e. /m/ /n/ merger cannot be explained using the same rule as schwa syncope or segment loss, nor can these changes be explained by the same reranking process in Optimality Theory. Thus, the notion of reduction is couched within ET and effort-based accounts since they are built around ideas of complexity (representational and physiological, respectively) but outwith these theories it makes little sense to group together phonologically distinct processes which just happen to produce similar results (=loss of contrast).

In conclusion, the closest thing to a phonological correlate of erosion is reduction. But, it has been established that the label reduction only makes sense when analysed within theories built on notions of complexity where such processes are proposed as a means of increasing phonological simplicity. Outside such theory specific goals there is no one feature or process that fundamentally unites the so-called reduction processes as a phonological unit. Beyond this, the processes labelled ‘erosion’ are often embedded in a mess of morpho-phonological conditioning which makes them impossible to explain from a solely phonological perspective. Thus, given that the closest phonological correlate of erosion is itself meaningless and morphology clearly plays a role in some erosion events, phonetic erosion cannot be a strictly phonological concept – rather it is a haphazard assortment of phonological things that happened to have occurred near a grammaticalisation event.

References: Harris, J (2005). Vowel reduction as information loss. In: Carr, P., Durand, J., Ewen, C.J. (Eds), *Headhood, Elements, Specification and Contrastivity.* **Kirchner, R.** (1998) An effort-based approach to consonant lenition. **Elerick, C.** (2023) New perspectives on phonological erosion as an aspect of grammaticalization. In: Tantucci, Vittorio & Hancil, Sylvie (eds.) *Different Slants on Grammaticalization*, 176-196.

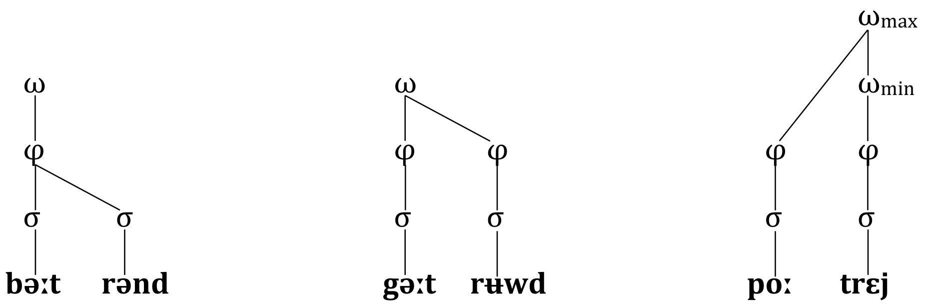
The prosodic conditioning of glottalization in British English

Hamza Khwaja, Bert Botma, Joseph Smith, Janet Grijzenhout (Leiden University)
h.o.khwaja@hum.leidenuniv.nl, e.d.botma@hum.leidenuniv.nl,
j.a.smith@umail.leidenuniv.nl, j.grijzenhout@hum.leidenuniv.nl

For over 70 years, phoneticians have observed a connection between stress placement and the glottalization of fortis stops in mainstream accents of British English (O'Connor 1952; Iles 1960; Higginbottom 1964; Andrésen 1968; Roach 1973, 1978). To our knowledge, this connection has not yet received a satisfactory formal interpretation. The clusters **pl**, **kl**, **pr**, **tr**, **kr**, **pj**, **tj**, **kj**, **tw**, **kw** — as well as the affricate **tʃ**, which we analyze as an underlying cluster — can be glottalized when the stress precedes, e.g., **'aˀkjʊrət** *accurate*, **'bəːˀtrənd** *Bertrand*, **'rɪˀtʃəd** *Richard*, but never when the stress follows, e.g., **ə'kjʉwt** *acute*, **ˌpoː'trɛj** *portray*, **ə'tʃɪjv** *achieve*. By contrast, glottalization of **tl** and obstruent-obstruent clusters is stress-insensitive: glottalization can occur in both **'aˀtləs** *atlas* and **əˀt'lantɪk** *Atlantic*, and in both **'aˀksɪdənt** *accident* and **əˀk'sɛpt** *accept*.

In this paper we present an account of these facts in Stratal Optimality Theory. As already observed by Higginbottom (1964) and Andrésen (1968), the stress-sensitive glottalization pattern applies to just those clusters that constitute legal complex onsets. We argue that the stem level syllabifies these clusters as onsets if they occur at the left edge of a foot or prosodic word, and as heterosyllabic clusters otherwise. We formalize this pattern using positional markedness constraints on complex onsets. At the word-level, a markedness reversal causes the heterosyllabic clusters to be resyllabified as complex onsets, but the coda affiliation of the stop is preserved due to faithfulness. This process results in derived geminates in words such as **'aˀk.kjʊrət** *accurate*, **'bəːˀt.trənd** *Bertrand*, and **'rɪˀt.tʃəd** *Richard*. Surface representations containing geminates make it possible to uphold two phonetic generalizations: (1) glottalization targets only codas, and (2) sonorant devoicing and **tr** affrication occur only in complex onsets.

Bipedal words such as **'saj(ˀk).ˌkləwn** *cyclone* and **'gəː(ˀt).ˌtrʉwd** *Gertrude*, where the cluster falls between two feet but follows the primary stress, are subject to inter-speaker (and possibly also intra-speaker) variation. Glottalization in this context is less widespread than in foot-medial positions (e.g., *Bertrand*), but is possible for some speakers, unlike at foot-boundaries preceding the primary stress (e.g., *portray*), where it is ruled out entirely. To explain this asymmetry, we argue that the English prosodic word is a left-headed structure with maximally binary branching. Feet located to the left of the primary stress are adjoined to the minimal prosodic word (ω_{min}).



Whereas glottalization in *Bertrand* reflects a dispreference for non-foot-initial complex onsets at the stem level, enforced by ALIGNL([$_\sigma$CC, φ), glottalization in *Gertrude* reflects a dispreference for complex onsets that are not positioned at the left edge of a prosodic word projection, enforced by ALIGNL([$_\sigma$CC, ω). We find additional support for this model of the prosodic word in patterns of expletive infixation and nasal place assimilation.

The Phonological Lifecycle's Morpho-phonological Applications

Brandon Kieffer| University of Edinburgh | B.Kieffer@sms.ed.ac.uk

In the Bantu languages there was a diachronic shift, "Bantu-Spirantization" (BS), which in addition to rearranging phonemes, led to the inception of morphophonological rules in many Bantu languages (Bostoen 2008). Suffixes which contained the BS-triggering vowel */i/ became variously morphologized to trigger morphological-BS (morpho-BS). There are strong discrepancies in the frequency of morpho-phonologization of each suffix. Using a layer-sensitive model of sound change like the Lifecycle of Phonological Processes (LPP) (Bermudez-Otero 1993), we can elicit the discrepancies in frequency of morpho-phonologization by specifying the amount of time the rule acted on each level.

BS was a rule where the stops of Proto-Bantu became strident when followed by the highest vowels (*i, *u) in Proto-Bantu. A vowel merger which occurred much later obscured the triggering environment by merging *i and *u with the next highest vowels, *ɪ and *ʊ, which did not trigger BS. While the LPP, like other Lexical Phonologies (Kiparsky 1982), has three strata (phrase, word, stem), we will only be looking at the word and stem strata and the root-lexicalization, since inter-word interactions lack the trigger for BS. For the purposes of brevity, I will only be looking at two of the BS-triggering suffixes, the Causative */-i-/ (CAUS) and the Perfective */-ide/ (PERF). As an inflectional morpheme, the Perfective is at the word level, while the derivational Causative is at the stem level. Few Bantu languages have morpho-BS with the perfective, while the majority of 5V languages have morpho-BS with the causative (Bostoen 2008). The model below shows the Stratal and morphological bracketing of the relevant morphemes in verbs in early Bantu.

[*Agreement,Inflection***{(**Root**)**-CAUS*,Valency***}**$^{\mathbf{Stem}}$-PERF**]**$^{\mathbf{Word}}$

The morpho-BS of 5V languages can be sorted into three categories: no morpho-BS, morpho-BS with the causative, and morpho-BS with both suffixes. A language which quickly underwent domain narrowing and root-lexicalization, or had the vowel merger early enough, would not have enough time to lexicalize or morphologize BS with either suffix. Meanwhile, a language which had BS actively applying on the word level for a long period had enough time to morphologize BS with both suffixes. A language which quickly narrowed the domain of BS to the stem level, and kept it there for a long period, would have had time to morphologize BS with the causative only. The ability of the morpheme to be morphologized is thus tied to the amount of time where the rule applied productively to it. Since the causative has the rule applied to it at both word and stem level, it would naturally be undergoing BS for the lifetime of the rule, giving it a greater likelihood of being morphologized. Meanwhile, the perfective is only affected by the productive rule at word level, meaning when the domain narrows, it will not be subject to the rule. This means that less time is given for the perfective to morphologize, compared to the causative.

Morpho-BS Examples	*/bun/	(Root)	{(Root)-CAUS}^{Stem}	[{(Root)}-PERF]^{Word}
Bemba M42 (Hyman 1995)	[-funa] "break"	[-pooka] "burst"	[-poosya] "make burst"	[-pookele] "burst"
Kinyarwanda JD61 (Zorc and Nibagwire 2007)	[-vuna] "break"	[-gura] "buy"	[-guza] "lend"	[-guze] "borrow"

By using the existing mechanics of the LPP, I am able to motivate the frequent morphologization of the causative, and discourage the rare morphologization of the perfective. This system also projects the dependency situation seen in the data, where the perfective can only have morpho-BS if the causative does too.

Coronal palatalization gets [ʃtʃɹ]*onger*: the case of *s*-retraction and coronal affrication in contemporary English

Artur Kijak
University of Silesia in Katowice, Poland
artur.kijak@us.edu.pl

This study examines specific cases of coronal palatalization [t d s z] > [tʃ dʒ ʃ ʒ] observed predominantly in younger speakers across various contemporary English varieties. The discussion focuses on three processes known in the literature as affrication (e.g., *train* [tʃɹeɪn], *dream* [dʒɹiːm]), *s*-retraction (e.g., *street* [ʃtʃɹiːt], *student* [ʃtʃuːdənt]), and palatalization (e.g., *this year* [ðɪʃ jɪəɹ]). Building on historical developments from Middle English (ME) and Early Modern English (EModE), this study proposes that the evolution of the ME diphthong [iu] > [juː] (e.g., *issue* [ɪsjuː] > [ɪʃuː]) plays a crucial role in the palatalization patterns found in Present-Day English (PDE) (Kijak 2023). The analysis adopts the Minimality Hypothesis perspective (Kaye 1995, Pöchtrager 2014); this step allows us to exclude some cases of yod palatalization (mostly in unstressed positions) as lexicalized historical relics, e.g., *virtue* [ˈvɜːtʃuː] and *soldier* [ˈsəʊldʒə]. Since, however, yod palatalization in stressed positions and across word-boundaries, e.g., [tʃ]*uesday* and *di*[dʒ] *you*, is an ongoing tendency, it must be recognized as an active phonological process. Moreover, the cases of full palatalization before the rhotic - an innovation widely observed in youth speech across English varieties (Gylfadottir 2015) - seem to be a follow-up step, e.g., *train* [tʃɹeɪn], *dream* [dʒɹiːm], *street* [ʃtʃɹiːt], etc. The latter conclusion may be confirmed by the fact that *s*-retraction is also found before the yod-triggered affricates, e.g., *student* [ʃtʃuːdənt] (Nicholas & Bailey 2018). Additionally, the absence of *s*-retraction in /spr/ and /skr/ clusters, while its regularity before /tr/ and /dr/ branching onsets (e.g., *a*[ʃtʃɹ]*onaut* and [ðiːʒ dʒɹ]*eams*), suggests that the process is not merely a case of a gradient phonetic interpretation – a funny way of producing /s/ in s+Cr sequences - but an active phonological mechanism. Contrary to claims that the shift has already been accomplished in younger speakers (e.g., Smith *et al*. 2019 and Bailey *et al*. 2022), i.e., that /s/ = |A H| has already been phonologically restructured into /ʃ/ = |I H|, this study argues that *s*-retraction remains synchronically active. Evidence from morpheme-internal and external sandhi environments (e.g., *con*[ʃtʃɹ]*uction*, [ðɪʃ tʃɹ]*ick*, and [ðiːʒ dʒɹ]*eams* further supports this view. It is proposed that in English both the glide /j/ and the rhotic /ɹ/ are specified for the palatal element |I| (see also Scheer 1999, 2004, van der Torre 2003) that provides a phonological basis for their role as palatalization triggers. It is further argued that the coronal affrication before /j/ and /ɹ/ is a prerequisite for *s*-retraction (cf. Shapiro 1995) and that the affrication and *s*-retraction are the result of the strong tendency for the element |I| (light elements) to appear at the left boundary of a prosodic domain (Backley 2017).

This study also addresses the exclusion of labials and velars from full palatalization targets and the inability of front vowels to trigger coronal palatalization in PDE. These findings contribute to a broader understanding of synchronic phonological processes, phonetic variation, and ongoing sound change in contemporary English.

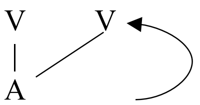
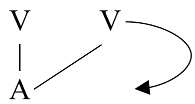
Mohamed Lahrouchi & Shanti Ulfsbjorninn
CNRS, Paris 8 University & Memorial University of Newfoundland

The Formal Typology of |A| and Vowel Length: Melody-to-Structure Licensing Constraints

Typological Background: In his investigation of universals in vowel systems, Crothers (1978) remains almost silent on long vowels. The only long vowel 'universal' is the tendency for short high/low vowels to be more central than their long equivalents (ibid:123). Lass (1984:91) complains that there is no reason to privilege the shorts as '*the* vowel system' of a language. Lass leaves this unresolved: "more complex, more relevant… than has been admitted".

Theoretical Background: Particular grammars contain well-formedness statements on featural distributions. These featural distributions can be stated with respect to each other, such as occurs in vowel harmony (particularly in Charette & Göksel's model 1998). However, many other restrictions are stated in terms of a feature's position in syllable structure. Especially common are restrictions on distributions with regard to monopositional vs. bipositional structures. Lahrouchi & Ulfsbjorninn (L&U 2025) propose a theory of such restrictions, which amounts to a theory of the formal distributional restrictions of features. The proposal is that phonological UG can make distributional statements bidirectionally; thereby yielding a specific shape of typological variation. Languages can restrict a feature/melody (M) to a particular structure (S) (Bottom up), or they can force a given structure (S) to contain a given feature/melody (M) (Top down). These bidirectional grammatical statements are called: *Melody-to-Structure Licensing Constraints* (MSLCs).

Aim: We investigate the typology of |A|-vowel restrictions with respect to bipositionality. We will show that it mirrors what L&U find for occlusion |ʔ|. The typology of |A|-vowel and bipositionality restrictions reveal the expected bidirectionality of MSLCs. Just as for occlusion (L&U), this condition can be made separately for headed/pure |<u>A</u>| (open-mid/low or just [a]), or all |A| (any mid & low vowels). The table below displays the predicted 4 types of language.

(1)	**Bottom up**	**Top Down**
		
	Feature must be contained in structure	*Structure must contain feature*
Any |A|	**Gadsup** (Franz & Franz 1966) Short i |I|, u |U|, ʌ |Ø| Long eː |A.I|, oː |A.U|, aː |A|	**Hupa** (Golla 1970:35) Short ɪ |I|, ʊ |U|, a |A| Long ɛː |A.I|, oː |A.U|, aː |A|
Headed |<u>A</u>| Pure	**Telegu** (coastal, Lisker 1963) Short i, |I|, u |U|, e |A.I| o |A.U|, ə |A| Long iː |I|, uː |U|, eː |A.I|, oː |A.U|, æː |<u>A</u>.I|, aː |<u>A</u>|	**H. Yao** (Downer 1961:137) Short any Long aː |<u>A</u>|

Gadsup stands for a language type where MSLCs proceed Bottom up such that the feature |A| is found only in bipositional structure. Whereas, Hupa is a Top down type of language whose |A| can be short, consequently any bipositional V structure must contain |A|. The remaining types differ from the first two on the basis of headedness function. Additionally, we will also see that the MSLCs can be made in both directions *simultaneously*. Furthermore, following L&U, the pattern where |A| is excluded from bipositional structures is impossible to state in MSLC's (they cannot be negative), ergo this pattern is correctly predicted to be unattested. For this feature, we therefore find that MSCLs correctly model a phonological grammars's feature to structure co-occurrence restrictions.

Positional Effects in Kannada Past formations: A Government Phonology account

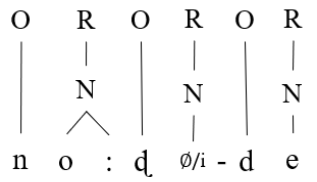
Therese Liam Tom, *Indian Institute of Technology Delhi.* thereseliamtom@gmail.com

Morphophonemic processes have been analysed using Government Phonology across languages including Japanese (Honeybone 1999; Yoshida 1996), German (Pöchtrager 2001), and Turkish (Kula 2007). This paper attempts a similar account for certain past-tense formations in Kannada, a Dravidian language. (1) outlines two patterns in Kannada verbs. Verbs in (1a.) take the regular Past suffix [-*de*]. With the same suffix, verbs in (1b.) appear to undergo two processes: place assimilation and devoicing. I show these as positionally motivated, using Standard GP (Kaye et al., 1990) and Element Theory (Backley 2011). This abstract compares [CV:C] verbs in (1a.) with [CVC] verbs (1b.), although the analysis extends to others in (1a.) as well.

(1)	Template	Example		Past Form
(1a.)	CV:C	no:ɖu[$]	*see*	no:ɖ(i)de
	CVCV	naɖe	*walk*	naɖede
	CVCC	muʈʈu[$]	*touch*	muʈʈ(i)de
(1b.)	CVC	koɖu[$]	*give*	koʈʈe
		nagu[$]	*laugh*	nakke

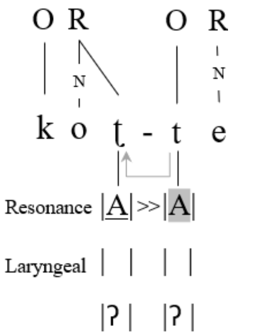
[$]*/u/ is epenthetic in Kannada to avoid C# words*

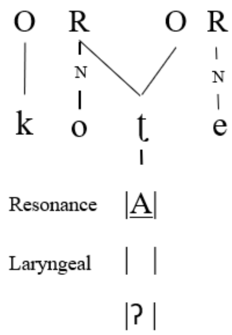
In $[C_pV{:}C_q]$ verbs, like [*no:ɖ*], the nucleus (*o:*) is branched (Kaye et al., 1990), and C_q (*ɖ*) would be an onset preceding an empty nucleus. When suffixed, it forms [*no:ɖ-de*] with the empty nucleus optionally filled with /i/ (2).

(2) 

Contrarily, in $[C_xVC_y]$ verbs like [*koɖ*], C_y can form a rhymal branch. Word-final /u/ epenthesis in Kannada (Krishnamurti 2003) would put C_y in an inter-nuclear environment that is cross-linguistically ground for voicing/lenition (Scheer & Ségéral 2008), also typical in Dravidian. In Kannada I propose that the stops surfacing as 'voiced' are of two kinds: (I.) contain |L| underlyingly if they occur in non-inter-nuclear positions/after a branched nucleus, like [CV**CC**] verbs and [CV:**C**] verbs, or (II.) lack |L| underlyingly, acquiring it only in inter-nuclear positions (even if the nuclear position is overtly null), as in [CV**C**]*u* or [CV**C**V] verbs. This proposal makes three empirical predictions for Kannada– (A) the presence of $[CVVC_a]$ verbs where C_a remains voiceless after /u/ epenthesis (like [*ha:ku*] "put"), (B) the lack of $[CVC_b]$ verbs where C_b remains similarly voiceless, and (C) the lack of $[CVC_cV]$ verbs where C_c is voiceless— all of which are successfully borne out.

Based on this proposal, I analyse the past-tense formations of [CVC] verbs like [*koɖ*] (henceforth [*koʈ*]) . The Past suffix is also assumed to be underlyingly [-*te*], acquiring |L| only when inter-nuclear (2). In a Past construction like [*koʈ-te*], the stem-final stop and the suffix-initial stop form a domain for inter-constituent government (3), which in turn enables spreading (Honeybone 1999; Kaye et al., 1990). The place assimilation involved in past tense formations of [CVC] verbs is therefore due to Left-to-Right spreading in the resonance tier (3). The result is then a 'voiceless geminate' (4) at the morphemic boundary.

(3) 

(4) 

The paper shows that, contrary to initial observations, the post-suffixation 'voiceless-ness' observed in (1b.) is not due to 'de-voicing', but rather due to a lack of 'voicing'. Suffixations of verbs in (1a.) would involve voicing/inter-nuclear lenition (Scheer & Ségéral 2008) and be used to further support the proposal that morphophonemic processes involved in Kannada Past formations are triggered by positional specifications and inter-constituent government.

Templates vs Faithfulness in Denominal Loanverbs

Nabila Louriz | University Hassan II of Casablanca | louriznabila@gmail.com

The aim of this paper is to investigate how Moroccan Arabic (MA) morphology operates on French borrowed nouns. This study represents an intriguing contact scenario between two languages that are typologically different: French is concatenative, whereas MA is non-concatenative. It examines the way French loanwords into MA undergo native morphological operations, given that French words are not derived from consonantal roots (C-root). After undergoing phonological adjustment, loanwords are integrated in the lexicon and become subject to native derivational processes.

Word formation in Semitic languages has long enjoyed a special attention among linguists (Holes 1995, Bat-El 1984, Ussishkin 1999, Ratcliffe 2003, Kiparsky 2021). It is traditionally believed to operate on consonantal roots which constitute the lexicon (McCarthy 1979, Idrissi et al 2008, Boudelaa 2014). Yet, advancement in the field have brought about other accounts of Semitic word formation; some research defends the word-based account (Bat-El 1994, Ussishkin 1999), whereas others take an in-between stand and claim certain morphemes to be stored as consonants roots, whereas others as whole words (Ravid 2006, Watson 2006).

The present study contributes in this discussion by examining derivational operations applied to French loanwords in MA. The complication that this study represents is twofold. First, there is a lack of consensus as far as the root-based and stem-based accounts in Semitic morphology; second, the two languages are typologically different. I will address both issues relying on evidence from denominal verb (DV) formation of French loanwords into MA. Consider the following examples:

'Gloss'	**French**	**MA**	**DV 1**	**DV 2**
Folder	Dosjɛ	DuSi	DoS**a**	Də**ww**əS
Goal	by(t)	Bit	bit**a**	bə**jj**ət
Loan	Kredi	Kridi	krid**a**	----------
Neck tie	kʁavat	gRafaT	gRafaT**a**	gə**Rf**əT

Data of denominal loanverbs manifest derivational variation. On the one hand, nouns are turned into verbs either by –a suffixation (DV1) or take the form of CəCCəC (DV2). What is more, several cases show both derivational possibilities suggesting within and across-speaker variation. The analysis adopts a templatic morphology framework to account not only for the source of variation, but also for the interaction of phonology and morphology in word formation. I will show that morphological and prosodic constraints (e.g. *AlignVSuff* and *Prosodic Stem Minimality),* on the one hand, and faithfulness and markedness constraints (e.g. *Max-μ, Contiguity* and *Edge-Integrity*), on the other hand, interact in a way to account for not only variation, but also unpredicted output forms given the non-concatenative nature of Arabic morphology. Results show that DV in loanwords are directly derived from underlying nouns rather than from extracted consonants.

I conclude the paper with insights on the structure of the lexicon in MA. There is ample evidence that loanwords are stored in a stratum of their own, and, unlike native C-roots, function as direct input to derived lexemes.

Tracing the Origin and Spread of NG-Coalescence in English

Donka Minkova & Jian-Leat Siah (UCLA)

Of the 469 world languages surveyed in Anderson (2013), only 87 or 18.5% have non-initial *phonemic* velar nasals. Among them are English and its closest Germanic relatives. Interest and debate over the realization of orthographic <ng> as [ŋg], [ŋ], or [n] in English goes back to the mid-17th to the mid-18th century, when contemporary commentators first identified /ŋ/ as contrastive (Lass 1992: 119-120, Strang 1970: 79-80). The current [ŋg]~[ŋ]~[n] variation figures prominently in sociolinguistic, morphological, phonetic, and phonological theory.

The very extensive literature on the velar nasal (e.g., Tagliamonte 2004, Hazen 2006, Tamminga 2016, Bailey 2018) covers relatively recent (Early/Late Modern English) data. Our research addresses [ŋ]'s deeper diachronic roots: how far back can one posit NG-Coalescence and what language-internal factors triggered it? Our data source is a new corpus of pre-16th c. orthographic and rhyme attestations tagged for morphology, prosody and domain position.

Analysis of the data is couched in Optimality Theory (Prince & Smolensky 1993/2004) and uses perceptually-motivated constraints (Jun 1995; Steriade 1999, 2001; Côté 2004). We build on the previous researchers' identification of NG-Coalescence as a corollary of final vowel loss (Bermúdez-Otero 2015, Bailey 2021) which removed crucial cues to the perceptibility of [g] (Wright 2004); it was prevocalic position that licensed the realization of [-g] in uninflected forms. This is formalized using McCarthy's (2005) Optimal Paradigms (OP) theory, which enforces paradigm uniformity when OP constraints are undominated.

The analysis is given in Tableau I. The constraint NasAssim penalizes any heterorganic nasal-consonant sequences (Candidate a). Candidates (c) and (d) do not incur a violation of NasAssim at the expense of violating Max-C, which penalizes deletion. Crucially, they also violate the OP counterpart of Max-C, which is undominated, because the members within the same paradigm are not identical. Candidate (b) is selected as the optimal output paradigm, even though the final [g] of the uninflected form violates C ↔ V, which requires a consonant to be adjacent to a vowel.

After the loss of final vowels, the majority of the paradigms consist of members with final [-ŋg], which makes the OP-Max-C constraint irrelevant. Since the constraint C ↔ V dominates Max-C, the final [g] is deleted (Tableau II). We suggest that this is the initiation of English phonemic /ŋ/.

Non-deletion of final [k] in [-ŋk] also has a perceptual basis. The likelihood of cluster simplification correlates with the degree of contrast within the cluster: the more similar the segments, the greater the likelihood of deletion (Côté 2004).

Old English

Tableau I

/Vng, Vng-V/	NasAssim	OP-MAX-C	C ↔ V	MAX-C	IDENT-Place
a. Vng, VngV	*!*		*		
b. ☞ Vŋg, VŋgV			*		**
c. Vŋ, VŋgV		*!		*	**
d. Vn, VŋgV		*!		*	*

Early Middle English

Tableau II

/Vŋg/	NasAssim	OP-MAX-C	C ↔ V	MAX-C	IDENT-Place
a. Vŋg			*!		
b. ☞ Vŋ				*	

Tableau III

/Vŋk/	MAX-C/Con=[voice]	C ↔ V	MAX-C
a. ☞ Vŋk		*	
b. Vŋ	*!		*

[-ŋk] contrasts in voicing while [-ŋg] does not. By ranking Max-C/Contrast=[voice], which penalizes deletion of a consonant that contrasts in voicing with an adjacent segment, above C ↔ V, final [k]-deletion in [-ŋk] is prevented (Tableau III). The other rankings remain the same.

English inflectional paradigms have undergone extensive syncretism, significantly increasing the ratio of members with final [-ŋg], and allowing a probabilistic approach to capturing the paradigmatic effects of the loss/retention of <Vng(V)> forms (e.g., Breiss 2024). Additionally, our contribution identifies morphology (noun vs. verb), prosody (stressed vs. unstressed), domain position (medial vs. final), and frequency as instrumental in the initiation and spread of NG-Coalescence.

Can a phonetically-blind machine learn sublexical groups like us?

Stanley Nam
University of British Columbia
stanley.nam@ubc.ca

L-Tensification (LT) in Korean is conventionally analyzed as a selective process, applying only to a certain sublexical group of Sino-Korean words (Kim-Renaud, 1974). As in (1), lenis coronal obstruents /t, s, tɕ/ get tensified to [t*, s*, tɕ*] following /l/, when LT applies.

(1) L-Tensification (modified from Kim-Renaud (1974))
[−son, +cor] → [+tense] / l ___
"A coronal obstruent becomes tense following a /l/."
(NB: Kim-Renaud explicitly states that it only applies to Sino-Korean words.)

Nonce words raise an interesting question, as they lack etymology by definition. If LT is purely etymological, it should not apply to any of them. Alternatively, speakers may generalize phonotactic characteristics of existing lexical subclasses and analogously apply (or not apply) LT to novel items. This hypothesis would be supported by previous research that Sino-Korean words have distinct phonotactic characteristics (Chae, 1999; Kang, 1998; Park, 2014, 2020; Park, 2023; Park et al., 2013), and recent machine learning studies in Japanese where phonotactics alone can effectively cluster lexical items into etymological groups (Morita, 2018; Morita & O'Donnell, 2020)

The study has two main objectives. First, it investigates whether a nonce word is more likely to undergo LT if it has phonotactic characteristics of the Sino class. Second, it explores whether a symbol-based transformer model behaves like human speakers with subphonemic knowledge. To this end, native Korean speakers and a transformer-based machine learning model were presented with phonotactically plausible nonce words and judged whether LT should apply. A transformer sequence-to-sequence model (Vaswani et al., 2017) was trained on phonetic representations of input-output mappings of Korean nouns with each segment being a discrete symbol without phonetic details.

The stimuli were designed to be (i) ambiguous, (ii) Sino-like, and (iii) non-Sino-like in their phonotactics. If LT is purely etymological, all nonce words should not undergo LT. If phonotactics is relevant for LT, but only up to the level of distributions of the segments, both machine and human will selectively apply LT to the same subset of nonce words but not others. If phonotactics is relevant but segment distributions are not enough, humans will have different results from machines.

The results reveal that both native speakers and the transformer model applied LT selectively, contradicting the etymological accounts. However, humans and the model diverged in their decisions about which words should undergo LT. Native speakers' decision aligned with phonotactic patterns reported in the literature. However, the machine learning model's predictions do not align well with the phonotactic factors.

Mixed-effects analyses show that non-Sino-like phonotactics lowers the likelihood of LT application in both humans and the model. However, the model predicts that base forms (i.e., those without phonotactic biases) are more likely to undergo LT than Sino-like stimuli.

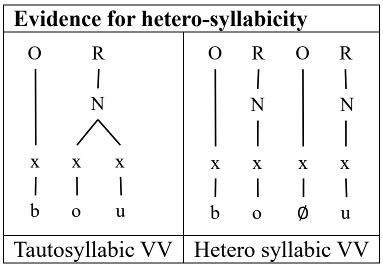
This discrepancy suggests that human phonotactic learning involves more than segmental distribution patterns. I argue that phonetic knowledge plays a role. For example, phonetically similar vowels may exhibit significantly different distributions across etymological classes, but such differences may draw less attention of speakers. If the transformer model, by contrast, relies on these subtle but skewed distributions, it may make 'incorrect' predictions.

Phonological realization of segmental length in Odia and Bangla

Anusuya Nayak	Paroma Sanyal
anusuyanayak78@gmail.com	sanyalparoma@gmail.com
Indian Institute of Technology Delhi

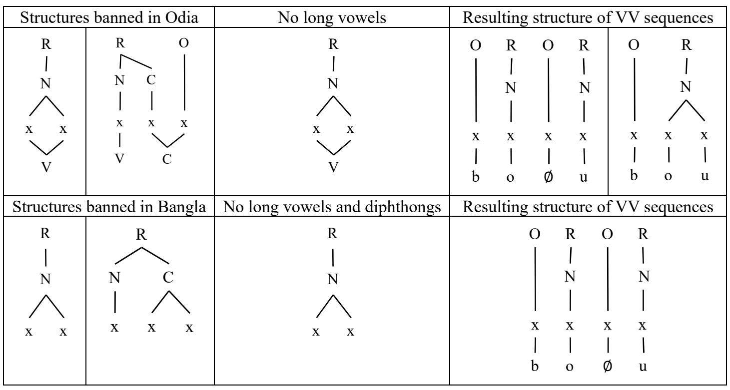
Two Eastern Indo-Aryan languages, Odia and Bangla, readily attest VV sequences in both derived and underived environments without any intervening consonant. In this respect, they differ from most IA languages. Unlike other IA languages, these languages do not have phonemic vowel length distinction either. In this paper we argue that the neutralization of vowel length contrast in Odia and Bangla result from different structural restrictions within the syllable. Further evidence for this proposal is found in the lack of geminate consonants in Odia, another property readily seen in other IA languages.

The VV sequences show systematic distributional restrictions. In the underived environment, Odia prohibits the vowel /o/ as the second vowel in a VV sequence while Bangla disallows the vowels /æ/ and /ɔ/. These distributional restrictions coincide with the positional restrictions on these vowels in the respective languages. In Katki (standard) Odia /o/ is restricted to the initial syllable (Guru and Nayak 2024), and in Bangla the vowel /æ/ is restricted to the initial syllable and the vowel /ɔ/ appears in odd numbered syllables only (Sanyal 2011). This alignment of distributional restriction with positional restriction on the second syllable in both the languages suggests that these VV sequences undergo hetero syllabic parsing rather than forming tautosyllabic diphthongs. In the derived environments, while Odia licenses all the vowels in V2 position, the suffix-initial position in Bangla is restricted to the vowels /i/, /e/, /o/ and /ɑ/.



The absence of long vowels can be explained by two distinct structural restrictions. First, the absence of doubly linked vowel segments, and second, the absence of a binary branching nucleus. In Odia the restriction on doubly linked vowels extends across the board to all segments, accounting for the complete absence of geminate segments. In Bangla, geminate segments are present in the surface representation, though many of these, correlate to other CC sequences in IA cognates. The fact that Bangla allows for the dual linking of segments in consonants and uses it as a phonological strategy to avoid marked CC sequences indicates that unlike Odia, the lack of phonemic vowel length distinction in Bangla is not due to the lack of doubly linked structure. Rather it is blocked by the structural restriction on more than one constituent in any of the rhymal positions, nucleus and coda.

Bangla	koppur	obbeš	šahɑɟɟo	kollæn	rokkʰɑ
IA	kə**rp**ur	ə**bʰj**ɑːs	səhɑ**jt̪**ɑ	kə**lj**ɑːn	rə**kʰš**ɑː
	camphor	*habit*	*help*	*well*	*protect*



Based on the above arguments, we propose that the lack of vowel length distinction in Odia and Bangla stem from different structural restrictions. In Odia, both consonants and vowels cannot have dual linked segments and thus fail to attest phonemic long vowels and geminates. In Bangla, the rhymal constituents cannot function as a branching node and thus fail to attest phonemic long vowels, diphthongs as well as complex coda. Since diphthongs are not structurally ruled out in Odia, the native speakers accept most of the underived VV sequences as both diphthongs as well as hetero syllabic parses (Mahapatra, 2007;LSI, 2002).

Gradual syllabification obviates gradual deletion

Ruby Noble and Andrew Lamont - University College London

When deletion occurs in underlying /VC_1C_2V/ sequences, [(V)(C_2V)] surfaces, not *[(V)(C_1V)] (Wilson, 2000); parentheses indicate syllables. McCarthy (2008, 2019) captures this generalization in Harmonic Serialism (HS; Prince and Smolensky, 1993/2004; McCarthy, 2000; et seq.) by proposing gradual deletion: /VC_1C_2V/ → (V$ʔ_1$)(C_2V) → [(V)(C_2V)]. This paper demonstrates that the same generalization can be captured without gradual deletion by adopting gradual syllabification (Elfner, 2009; Torres-Tamarit, 2012; Moore-Cantwell, 2016).

Theories of gradual syllabification in HS limit Gen to three syllable parsing operations: core syllabification CV→(CV), onsetless syllabification V→(V), and adjunction (CV)C→(CVC); for the sake of simplicity, we omit minor syllables from discussion. These operations improve on the constraint Parse(seg), which penalizes stray segments (McCarthy and Prince, 1994, 344). Crucially, core syllabification also improves on CodaCond, which penalizes [place] features not associated to a syllable onset (McCarthy, 2008, 279). As in the derivation below, which maps underlying /akta/ onto [(a)(ta)], deleting a prevocalic consonant is impossible. In the first step of the derivation, creating a core syllable and deleting one of the consonants both improve on Parse(seg) and CodaCond, but no constraint prefers deletion, which is harmonically bounded. Deletion is only possible when a core syllable cannot be parsed, as in the second step of the derivation. Thus, HS captures the [(V)(C_2V)] ∼ *[(V)(C_1V)] generalization even if Gen is able to delete segments in one step.

/akta/	Parse(seg)	CodaCond	Max
☞ak(ta)	2	1	
ak_a	W 3	1	W 1

⇒

ak(ta)	Parse(seg)	CodaCond	Max
☞a_(ta)	1		1
(a)k(ta)	1	W 1	L

⇒

a(ta)	Parse(seg)	CodaCond	Max
☞(a)(ta)			
(ta)			W 1

By contrast, McCarthy (2008, 2019) restricts Gen to deleting only placeless segments, forcing an intermediate step where a segment debuccalizes: /k/ → ʔ → _. He further assumes that syllabification is not gradual, and occurs in parallel with other operations. As the derivation below illustrates, this derives the [(V)(C_2V)] ∼ *[(V)(C_1V)] generalization because only debuccalizing a coda improves on CodaCond.

/akta/	CodaCond	Max(place)	HavePlace	Max
☞(aʔ)(ta)		1	1	
(ak)(ʔa)	W 1	1	1	

⇒

(aʔ)(ta)	CodaCond	Max(place)	HavePlace	Max
☞(a)(ta)				1
(aʔ)(ta)			W 1	L

Tonic vs. templatic lengthening in Italian and Italo-Romance

Diana Passino | Université Côte d'Azur & CNRS BCL | diana.passino@univ-cotedazur.fr

Italian, as well as many Central Southern Italo-Romance dialects, are well known languages where stressed vowels in open syllable are subject to lengthening (Loporcaro 2015:117). There is group of Italo-Romance dialects, however, that display a peculiar situation whereby only open syllable of paroxytonic words undergo lengthening and further diphthongization, whereas open syllables of proparoxytonic words and syllables preceding obstruent/liquid clusters do not undergo such processes and behave as vowels in closed syllables. I will examine both Italian and a well described variety of Southern Italo-Romance, namely Altamuran (Loporcaro 1988), and argue, assuming a CVCV representation, that a metrical template ˈCVCVCV (that as implicit in CVCV theory, may contain empty C or V positions) is active in both languages with some relevant differences: in Italian ˈCVCVCV acts only as a minimal word-template that exploits stress-related V lengthening (/pane/[pa:ne]'bread') or other strategies of template satisfaction, such as C lengthening (/gas/ [gass] 'gas'). The ˈCVCVCV minimal template, in addition, plays an active role in the formation of hypocoristics and clippings, as Thornton (1996) has shown, proposing trochaic feet as Italian minimal words. The ˈCVCVCV minimal template is also active in Altamuran, as in many other Upper-Southern dialects, where, as in Italian, it triggers lengthening and then diphthongization of vowels (/fɪl/[fii̯l] 'thread', as well as compensatory C lengthening after V loss (tjene > tiene > tiənə > tinə [tinn] 'he/she holds).

I argue, however, that V lengthening/diphthongization, *contra* common assumptions in the literature (Loporcaro 2015:27-28, among others), although targeting stressed syllables, is not stress-related but purely templatic. It only takes place in subminimal ˈCVCV words (/fɪl/ 'thread'/) because, as opposed to Italian, ˈCVCVCV in Altamuran and other Upper-Southern dialects not only acts as a minimal template, but also as a maximal template. Stressed open syllables of words that already satisfy the ˈCVCVCV template, like ˈrɪtənə, 'they laugh',ˈʃɪdd 'wing', vɪtr 'glass', do not lengthen/diphthongize because the template is already satisfied lexically (1):

(1)

ˈC	V	C	V	C	V
r	ɪ	t	ə	n	ə
ʃ	ɪ	d		d	
v	ɪ	t		r	

I will then discuss data that further substantiate the claim that vowel lengthening in Altamuran does not originate by spreading on the space projected by stress, arguing that stress in Altamuran projects empty space to the left of vowels and not to the right, like in Italian. In Italian vowel-spreading takes place to the right causing vowel lengthening (Larsen 1998), as shown in (2) for the word /fato/ [fa:to] 'destiny':

(2)a. C V [C V]$_{stress}$C V

f a t o

Relevant evidence for claiming that stress projects on the left in Altamuran comes from two phenomena that target stressed word-initial vowels to the exclusion of unstressed word-initial vowels: definite article /l/ doubling after prepositions such as /a/ ([a **l**ˈ**l** ert] 'to the garden' vs. [a **l** arˈd͡ʒɪnd] 'to the silver') and /j/ prosthesis, as shown for instance by the first present indicative form of 'to have' that gets prosthesis when lexical and stressed [ˈ**j**aggj], whereas the same word unstressed if auxiliary does not get prosthesis [ˈaggj]. The two phenomena hint at the presence of structural space projected to the left of the stressed vowel, as it will be shown in detail.

Chierchia. G. 1982-1986. Length, syllabification and the phonological cycle in Italian, *Journal of Italian Linguistics* 8 : 5-34. **Larsen, B. U**. 1998. Vowel Length, Raddoppiamento Sintattico and the Selection of the Definite Article in Italian, in P. Sauzet (éd.) *Actes des colloques Langues et Grammaire 2 & 3 (1995, 1997)*. Paris : Université Paris 8, 87-102.**Loporcaro, M.** 1988. Grammatica storica del dialetto di Altamura. Pisa, Giardini. **Loporcaro, M.** *Vowel length from Latin to Romance*. Oxford, OUP. **Thornton, A. M**. (1996). On some phenomena of prosodic morphology in Italian: accorciamenti, hypocoristics and prosodic delimitation. *Probus*, 8, 1, 81-112

Root-&-Pattern Morphology and Consonant Mutation: Are They Really Two Phenomena?

Jack Pruett

This research presents a unified analysis of Arabic Root-&-Pattern Morphology and Irish Mutation. It is demonstrated that by using cyclic morphosyntax (Kastner 2019, 2020) and Optimality Theory (Prince & Smolensky 1993) one can analyze both Mutation and Root-and-Pattern as instances of optimal phonological realization of morphemes whose spell out are subsegmental phonological material. This analysis simplifies theories of morphophonology such that there is no need for language-specific analyses of individual nonconcatenative morphological patterns. This is desireable because a unified treatment of these phenomena allows for a deeper understanding of what nonconcatenative morphology is—namely an optimal phonological realization of morphemes that are themselves not full-fledged phonological segments. Mutation and Root-and-Pattern pose challenges for linguistic theory since they consist of morphological information being expressed through a phonological process or change. For example, in Irish, the change from the bare verb to the past tense is achieved through leniting the first consonant of the verb (1). In Arabic (2), the causative is expressed through the gemination of the second consonant of the verb root (Boudlal 2018: Moroccan Arabic). Mutation and Root-and-Pattern Morphology are problematic for morphological theories like Distributed Morphology (DM; Halle & Marantz 1993) since the lexical root and the inflectional morphology are not linearly ordered in the phonological output. Morphosyntax, in DM, is inherently structured with respect to how morphemes combine. I argue that these examples of nonconcatenative morphology are the same phenomenon and can be captured under a single analysis.

(1) **a.** ***glan*** [g] **b.** ***ghlan*** [g ⟶ ɣ]
clean.IMP **clean.PAST**
'clean!' **'cleaned'**

(2) **a.** ***ktəb*** **b.** ***kə<tt>əb***
write.PRFV **write<CAUS>.PRFV**
'wrote' **'caused to write'**

I contend that in both Arabic and Irish, the causative and past tense morphemes are spelled out as prosodically deficient phonological material (i.e., associated with phonological content but lacking full segments), consisting only of a single mora or small set of phonological features respectively (3) and (4). I argue a language's specific constraint ranking (in the sense of OT) in the phonology determines the best way to pronounce the sequence of these prosodically deficient morphemes with respect to the other phonological material in its environment (Table 5 & Table 6). By analyzing Irish Mutation and Arabic Root-and-Pattern in this way, a unified account of these nonconcatenative morphologies can be accomplished. As such, multiple analyses for various types of nonconcatenative morphology may not be needed. A significant analytical contribution of this work is that nonconcatenative morphology arises when the most optimal phonological output associates a phonological autosegment in a place that is not the expected location given morpheme order.

(3) a. [PAST] ↔ [+cont.] b. /[PAST] + clean/ → /[+cont.] glan/

(4) a. [CAUS] ↔ µ b. /write + [CAUS]/ → /ktb + µ/

ktb+µ	$*CC_{CODA}$	$*^{ə}]_{\sigma}$	CONTIG	DEP
☞ a. kəttəb			*	**
b. ktətb	*!		*	*
c. kətəbb	*!	*		**
d. kəktəb			**!	**
e. kətəbbə		*!*		***

Table 5

[+cont.] glan	DEP	$MAX_{[AUTOSEGMENT]}$	$IDENT_{[CONT]}$
☞ a. ɣlan			*
b. glan		*!	
c. h glan	*!		

Table 6

Michela Russo UJML 3 & SFL UMR 7023 CNRS/U. Paris 8

Heterosyllabic Cj Syllabification and Fortition in Corsican and Romance

This study investigates the syllabification and fortition of consonant+yod (Cj) sequences in Corsican, an endangered minority language, providing insights into the phonological evolution of Romance languages. Corsican exhibits heterosyllabic syllabification in these sequences, with a Coda-Onset structure where yod occupies a strong position, triggering either gemination or initial fortition. This pattern mirrors Sardinian and Italo-Tuscan, reinforcing a broader Romance typology.

In Corsican, Cj fortition yields geminated realizations such as [ˈkɔɟ.ɟu] for COR.JU 'leather' and [ˈaɟ.ɟu] for HAB.JO 'I have,' akin to Sardinian forms like VIN.JA 'vine' [ˈviɲ.ɲa] or [ˈbin.d͡ʒa]. Similarly, Italo-Tuscan shows Coda-Onset restructuring, with Latin sequences L.J and B.J (e.g., PAL.JA 'paglia/straw,' RAB.JA 'rabbia/rage') developing into palatal geminates [ʎ.ʎ] ([ˈpaʎ.ʎa]) and [b.b] ([ˈrab.bja]). French exhibits a related heterosyllabicity in Cj sequences, though the underlying yod gemination surfaces as fricatives rather than true geminates. As seen in rage [ʁaʒ] (RAB.JA) and cage [kaʒ] (CAV.JA) (Scheer & Ségéral 2001), the yod remains fortis but loses coarticulatory influence from the preceding consonant.

To document this phenomenon, we analyzed data from the BDLC (*Corsican Oral Language Database*), NALC (*New Linguistic Atlas of Corsica*), ALEIC (*Linguistic and Ethnographic Italian Atlas of Corsica*), and the ALFCo (*Linguistic Atlas of France*, specifically the fascicles dedicated to Corsica), alongside the ALF field notes archived at the *National Library of France* (BNF). Our findings reveal a systematic pattern of fortition in Corsican Cj sequences, including positional strengthening through gemination and consonification of Latin hiatus vowels, as well as positional fortition, particularly post-sonorant. From a Government Phonology perspective, Corsican Cj fortition can be analyzed as a licensing strength effect: the yod in a strong onset position gains increased segmental complexity, leading to gemination or fortition. The process aligns with the Coda-Onset interaction, where a consonant releases its governing potential onto a following yod, triggering its strengthening. Using CV-template phonology, Cj sequences align with a CV.CV structure, where the floating consonantal element (C) of the yod docks into the onset position, triggering hardening and gemination. This explains why Corsican, like Sardinian and Italo-Tuscan, reinforces the yod in these structures.

In Autosegmental Phonology, fortition is represented as feature spreading from the preceding consonant onto the yod, reinforcing its continuancy and place features. Depending on the phonological properties of C, Corsican fortition results in different strengthened forms:

- [ɟ.ɟ], [ʎ.ʎ], [ɲ.ɲ], or [ɖ.ɖ], preserving features such as nasality ([viɲ.ɲa] VIN.JA) or retroflexion ([paɖ.ɖa] PAL.JA).
- [r.ɟ] or [n.ɟ], where post-sonorant yod is reinforced through feature fusion, as in [ˈar.ɟa] (ARJA).

Our analysis of Corsican Cj sequences demonstrates that heterosyllabic structures promote fortition across Romance languages and the glide /j/ is argued to carry a latent consonantal component. Because onsets enjoy strong positional licensing in Romance, the erstwhile glide is fortified into a robust or geminate consonant (e.g., [ʎ.ʎ], [ɲ.ɲ], [ɟ.ɟ]). This mechanism thus activates yod's latent consonantal skeleton, transforming a simple palatal glide into a reinforced segment.

We propose a formal phonological model integrating Autosegmental Phonology, Government Phonology, and CV-template approaches to account for Corsican Cj fortition, revealing a shared strengthening pattern across Romance languages. Sardinian, Italo-Tuscan, and other Romance languages exhibit the same fortition pattern, underscoring the CV-template's crucial role in strengthening. This dual reinforcement mechanism is crucial for understanding Romance syllabic structures, with Corsican providing a key perspective on positional fortition in Italo-Romance and beyond.

References:

Giovanna Marotta, Laura Vanelli (2024). *Fonologia e prosodia dell'italiano*. Roma: Carocci.

Tobias Scheer & Philippe Ségéral (2001). Les séquences consonne + yod en gallo-romain », *Recherches linguistiques de Vincennes* [On line], 30 | 2001. URL : http://journals.openedition.org/rlv/324 ; DOI : 10.4000/rlv.324

Paamese-type Arbitrary-sized Stress Windows are Theoretically Learnable (if you are very patient)

Ryan Sandell, Ludwig-Maximilians-Universität München
ryan.sandell@lrz.uni-muenchen.de

The position of primary stress in Paamese (Southern Oceanic; Vanuatu; data from Crowley 1982) exhibits an ostensible four-syllable stress window (see Goldsmith 1990:215–16, Hayes 1995:178–79, Lee 1999, and Kager 2012:1466 for discussion). Default primary stress (marked by an acute) occurs on the antepenult ((1)a./b.), but falls preferentially on the preantepenult when the antepenult contains a lexically "unstressable" vowel (V̆; see (1)c./d.), and otherwise on the penult (see (1)d./e.).

(1) **Paamese Stress Patterns**

a.	*í.nau*	'I'	*i.náu.li.i*	'oh, me'	*i.nau.li.í.ri.si*	'oh, me again'
b.	*sú.u.hi*	'it scrapes'	*na.sú.u.hi*	'I scrape'		
c.	*mó.lă.ti.ne*	'man'	*mo.lă.tí.ne.se*	'only the man'		
d.	*tă.hó.si*	'it is good'	*ná.tă.ho.si*	'I am good'		
e.	*tŏ.vŭ.é.li*	'not exist'				

The analysis of Lee (1999) correctly generates primary stress for examples like those in (1) through the constraint ranking shown in (2), where *[ˈə] penalizes stress on an "unstressable" syllable. This grammar of strictly ranked constraints will result in overgeneration: a word of five or more syllables containing an unstressable antepenult and preantepenult, /σ_1 σ̆ σ̆ σ σ/, would receive primary stress on the stressable fifth-to-last syllable per (2). The absence of an output like [ˈσ σ̆ σ̆ σ σ] in Paamese must by explained by the grammar, given Richness of the Base. In fact, Lee's (1999) analysis would yield an unbounded stress pattern, contrary to Crowley's data.

(2) **Constraint Ranking in Lee 1999:** FtBin, Trochee, *[ˈə] $\gg$ NonFin-Ft $\gg$ All-Ft-R $\gg$ Parse-σ

As correctly observed by Legendre et al. (2006), a constraint like All-Ft-R can act as a window-size restrictor in a formalism that permits constraint (self-)ganging. Given the constraints in (2), Linear OT (Potts et al. 2010) will find weights that allow for windows of arbitrary size $N + 2$, where N is the number of violations assigned to All-Ft-R in the leftmost permissible stress position (1 in window size 3, 2 in window size 4, etc.). Accounting for a four-syllable stress window of the Paamese type thus has a typologically undesirable consequence: bounded stress patterns with arbitrarily large windows can be generated, even though four-syllable windows are vanishingly rare, and bounded windows of size five or larger are unattested (cf. Hayes 1995, Goedemans et al. 2014).

Granting that the Paamese pattern is best analyzed using weighted constraints, the secure typological absence of Paamese-type stress systems with stress windows of size five or larger requires another account, since the grammar formalism and constraint set itself do not properly exclude their existence. To this end, computational simulations of the learnability of several Paamese-like stress patterns were carried out, using Robust Interpretive Parsing (Tesar and Smolensky 2000, Jarosz 2016) under Maximum Entropy Grammar trained through Stochastic Gradient Ascent (Jäger 2007); compare Staubs 2014, Hughto 2020, O'Hara 2021, and Sandell 2023. Inputs of 2–8 syllables in length consisting of all logically possible combinations of stressable (σ) and unstressable (σ̆) syllables were generated (508), alongside all unique overt positions of primary stress (3584), and all unique parses of those overt forms with a single unary or binary foot (9736). The constraint set consisted of prosodic markedness constraints from Kager 1999:Ch. 4, plus the markedness constraint *[ˈə]; in the initial state, all constraints except *[ˈə] were set to a nonzero weight of 5; all overt forms were set as equiprobable. The average number of updates to constraint weights over 100 runs required to reach a sum squared error value of less than 1 between the model's trained probabilities and the target categorical grammar was established for eight right-edge oriented stress patterns (fixed final, penultimate, and antepenultimate stress; Paamese-like two-, three-, four-, five-, and six-syllable windows). Code and input files for these simulations (in R v. 4.4.2) are available at: `https://tinyurl.com/a4hfbtax`. For the six window systems, a positive correlation between window size and average number of grammar updates needed to satisfy the convergence criterion was statistically significant ($r = 0.99$, $t = 13.52$, df = 3, $p < 0.01$). This finding indicates, for a further class of stress patterns, that typologically unattested patterns are not strictly unlearnable, but are severely disadvantaged relative to attested patterns, making them less likely to be learned accurately; compare Staubs 2014 and Stanton 2016.

Asymmetry of onset vs coda cluster complexity in variable adaptation of loanwords

Sehrish Shafi (Mirpur University of Science and Technology) & Sam Hellmuth (University of York)

Cross-linguistic syllable structure typology displays well-known implicational tendencies. The distribution of simplex onsets and codas is uncontroversially asymmetrical, in that onsets are found in all languages, but codas are not. The presence of complex (branching) onsets implies the presence of simplex codas (Kaye & Lowenstamm 1981; Davis & Baertsch 2011). In contrast, availability of complex onsets versus complex codas is logically independent, as languages may have either one without the other (Blevins 1995, 2006). However, asymmetry is observed in the typical order of first language acquisition of syllable phonotactics in languages with complex syllable structure, such as English and Dutch (Kirk & Demuth 2003, Levelt et al. 2000). We report here a parallel asymmetry in (non-)modification of onset versus coda clusters, in variable adaptation of loanwords in Mirpur Pahari in elicited judgements from speakers with varying levels of exposure to English, explored through OT factorial typology.

Our data are 466 established loanwords (Poplack 2017) from English into Mirpur Pahari (MP), an Indo-European language spoken in Mirpur, Pakistan, and by 500K+ in the UK. Target words were identified by the first author based on their L1 MP speaker intuitions, and grammaticality judgements on the realisation of each word elicited from three types of MP speaker, varying in their exposure to English (Haugen 1950): Monolingual (ML), minimal exposure to English; Late-Bilingual (LB), up to 14 years of English in school; Early Bilingual (EB), born in UK. We focus on phonotactics, setting aside segment realisation/vowel length.

MP itself disallows complex onsets and complex codas, except homorganic nasal-obstruent word-final coda clusters ([kənd] 'backbone'; [bəŋg] 'bangle'). As Table 1 shows: the ML speakers' loanword grammar aligns to MP phonology; LB speaker judgements variably accept homorganic onset clusters (#tr, #dr) and non-homorganic coda clusters (e.g. lk#); EB accepts all English onset and coda clusters (with occasional exceptions e.g. [pʰə.ˈleɪt]$_{\text{EB}}$ 'plate'). The patterns clearly correlate with level of exposure to English but display onset-coda asymmetry (Table 2): at all levels of exposure onset clusters are modified more than coda clusters.

Table 1	crockery /kɹɒ.kɹɪ /	trolley /tɹɒlɪ /	milk /mɪlk/	camp /kæmp/
MonoLingual	[kə.rak.ri]	[tə.raː.li]	[miː.lək]	[kæmp]
LateBilingual	[kə.rak.ri]	[tə.raː.li]~ [traː.li]	[miː.lək]~[mɪlk]	[kæmp]
EarlyBilingual	[kra.kri]	[traː.li]	[mɪlk]	[kæmp]

Table 2	**onset clusters**	**coda clusters**
ML	Very restricted (i.e. none)	Partially allowed (homorganic only)
LB	Partially allowed (homorganic only)	Partially allowed (variable adaptation)
EB	Partially allowed (variable adaptation)	Unrestricted (English-like)

If MP syllable phonotactics are modelled in OT, the ML pattern follows the same grammar (Shafi et al, 2020): *COMPLEX$^{\text{ONSET}}$, *COMPLEX$_{\text{PLACE-ONSET}}$, MAX, IDENT$_{\text{PLACE}}$, *COMPLEX$_{\text{PLACE-CODA}}$ >> DEP, *COMPLEX$^{\text{CODA}}$. The LB and EB patterns (Table 1) are straightforwardly captured through constraint re-ranking (of DEP), with variable realisations modelled as partial ordering of constraints. To determine whether the asymmetry of onset-coda complexity seen in Table 2 is also captured by an OT analysis, a factorial typology was performed in OTSoft (Hayes et al. 2013). The 7 constraints yield 7!=5040 possible rankings. OTSoft found 27 possible grammars: 21 rankings predict cluster reduction through consonant deletion in onset and/or coda; neither are observed in our judgement data, which we tentatively ascribe to influence of orthography. Of the remaining six, five are re-rankings in our analysis (ML + EB + three LB combinations). The last predicted ranking breaks the asymmetry in predicting acceptance of non-homorganic clusters in onset [kra.kri] but not coda [mɪlk]. The asymmetry is thus not formally predicted, but its predominance is arguably envisaged. We suggest (cf. Kirk & Demuth 2003) that the observed asymmetry arises due to relative higher frequency of complex codas in English input.

Slovenian inflectional stress without accented inflectional suffixes

Guy Tabachnick (University of Nova Gorica), Marko Simonović (University of Graz)

Background Simonović (2020, 2022) argues that stress in Slovenian derived forms is dependent on their syntax (cf. Marvin 2002) and that certain configurations trigger erasure of lexical accent and default stem-final stress (STEMSTRESS ≫ RIGHTMOST, cf. Simonović & Kager 2023)—thus, [star-óːst] 'old age' is underlyingly unaccented /star-oːst/. We explore the consequences of this analysis by looking at stress in inflectional paradigms for 58,000 nouns from the *Dictionary of Standard Literary Slovenian* (2014), arguing that inflectional affixes are also unaccented; instead, their variable stress patterns are due to an underlying length contrast.

Default and suffix stress The feminine noun [staróːst] contrasts with feminine nouns from other classes including [stʋáːr] 'thing', which has the same suffixes but different stress, and [stəzá] 'footpath', which has different suffixes and fixed suffix stress (Table 1).

class	FEM 2	FEM 2	FEM 1
stress	stem	mobile	suffix
NOM	staróːst	stʋáːr	stəz-á
GEN	staróːst-i	stʋar-íː	stəz-ɛ́
DAT	staróːst-i	stʋáːr-i	stəz-í

Table 1: Partial singular paradigms for three feminine nouns

Post-accentuation If [star-óːst] is underlyingly stressless and has the same inflectional suffixes as [stʋáːr], the latter must, contrastively, have underlying stress. We argue that [stʋáːr] is *post-accenting*; per Revithiadou (1999), it has a floating accent (/stʋaːr´/) realized on the suffix due to *DOMAIN, which penalizes accents linked to the morpheme that introduces them.

Length and stress avoidance Post-accentuation is typically used to account for words with fixed suffix stress like [stəz-á] (cf. Revithiadou 1999). In our analysis, post-accentuation interacts with suffix length: suffixes with underlyingly short vowels avoid stress. Vowel length and stress are closely aligned: in standard Slovenian, length is only contrastive in stressed final syllables, and most speakers have lost even this contrast (Srebot-Rejec 1988, Šuštaršič et al. 1995, Toporišič 2004). To receive stress, short underlying vowels like dative /i/ must either lengthen (violating DEP-μ) or violate the STRESS-TO-WEIGHT PRINCIPLE (SWP, "heavy syllables are stressed"). In [stəzá], all suffixes are both short and stressed: in Slovenian, [ə], is always short (even in stressed pre-final syllables), so SWP does not prefer [stə́za] to [stəzá]. The relevant constraint rankings are summarized in Table 2.

	example		*ranking*
GEN	/staroːst-iː/	[staróːsti]	STEMSTRESS ≫ RIGHTMOST
GEN	/stʋaːr´-iː/	[stʋaːr-iː]	*DOMAIN ≫ STEMSTRESS
DAT	/stəz´-i/	[stəzí]	*DOMAIN ≫ STEMSTRESS
DAT	/stʋaːr´-i/	[stʋáːr-i]	SWP, DEP-μ ≫ *DOMAIN

Table 2: Constraint rankings with examples

Alternative In analyses of inflectional stress in languages like Russian (e.g. Halle 1973, Melvold 1989, Idsardi 1992, Revithiadou 1999, Gouskova 2010), nouns with fixed stem stress like [staróːst] have a lexical accent, while those mobile stress (like [stʋáːr]) are assumed to be underlyingly unaccented, such that the suffix is stressed when accented and the stem gets default stress when both stem and suffix are unaccented (see also Jurgec 2019). We will show that the analysis proposed here has several advantages beyond its motivation of uniting stress patterns in derivational and inflectional morphology. It correctly predicts that derived forms never take mobile stress—even those built from mobile-stress words like /stʋaːr´-c-a/ [stʋáːrca] 'thing (dim.)', whose floating stress cannot dock on the short suffix /a/. This analysis also correctly predicts that (with two or three exceptions) all class 1 stems with suffix stress have no vowel or [ə] and all class 2 stems with mobile stress have a long vowel. It also motivates inflectional patterns in the plural of mobile-stress masculine nouns (not shown here). Many of these predictions hold true even for speakers who have lost contrastive vowel length (and, often, fixed suffix stress in nouns like [stəzá]), for whom underlying vowel length in suffixes is purely a marker of defectiveness.

Counterbleeding as Shared Activity: Overapplication in Gua vowel harmony

Sören E. Tebay (Universität Leipzig), tebay@uni-leipzig.de

Main Claim: Rasin & Obiri-Yeboah (2024) convincingly argue that phrase-level vowel assimilation in Gua (Niger-Congo, Ghana) shows a pattern of opaque counterbleeding interaction problematic for many theories of phonology, such as Stratal OT (Kiparsky 2015). Phrase-level hiatus resolution unexpectedly does not bleed the application of vowel harmony, even though it destroys its context of application on the surface. I argue that the shared activity account for phrase-level counterfeeding in Tebay (2024) can be extended to counterbleeding if faithfulness constraints are sensistive to shared activity. *Gua phrase-level opacity:* Gua has a process of cross-word ATR harmony inside phonological phrases. It changes a word-final [-ATR] vowel to [+ATR] if it is followed by a syllable with a [+ATR] vowel (1). A second phrasal process in Gua is vowel hiatus resolution. This includes total

(1) Phrasal regressive [+ATR] harmony

a. tʊ́ wátɕɪ̀ — ‘A calabash broke.’

b. tú hè — ‘A calabash fell.’

(2) Hiatus resolution

a. kwɛ̀lé téì — ‘Fry food!’

b. kwɛ̀ló òní — ‘Fry fish!’

regressive assimilation if two non-high vowels become adjacent across word boundaries inside a phrase (2). Both processes apply in an intraphrasal sequence of three words with a monosyllabic medial word. The final vowel of the first word harmonizes with the underlying non-high vowel of the following word. This underlying vowel does not surface because it fully assimilates to the initial vowel of the following word. On the surface, there is thus no trigger for cross-word harmony; yet it applies. *Gua Counterbleeding as Shared Activity:* I propose that phrase-level opacity follows from Shared Activity (Tebay 2024, Lamont 2024 cf. also Faust & Smolensky, 2017; Zimmermann, 2021) in gradient symbolic representations (Goldrick & Smolensky, 2016). Processes are opaque if activity — and consequently constraint violation — is changed by feature sharing (4). I model vowel harmony and hiatus resolution as spreading (cf. also Zaleska, 2018). The crucial comparison is now between the attested opaque counterbleeding candidate [(à$_{1.0}$)(ɲé$_{1.0}$) (kwɛ̀$_{0.\bar{3}}$ ɛ̀$_{0.\bar{3}}$dɛ̀$_{0.\bar{3}}$)], where the activity sharing of the final [-ATR] span leads to an activation of $0.\bar{3}$ for its vowels, and the transparent bleeding candidate [(à$_{0.2}$ɲɛ́$_{0.2}$ kwɛ̀$_{0.2}$ ɛ̀$_{0.2}$dɛ̀$_{0.2}$)], where all vowels share a [-ATR] value and therefore only have an activation of 0.2 (under the assumption that adjacent identical features automatically fuse due to some version of the OCP (Leben, 1973; Goldsmith, 1976; Myers, 1997). Both candidates have a single locus of violation for the gradient Ident(+ATR)$_g$, namely in the mapping from /kwè/ to [kwɛ̀]. The former candidate, however, violates the constraint to a lesser degree because the vowel in question has a lower output activation because its [-ATR] feature is linked to two other vowels, leading to a violation of $1\text{-}0.\bar{3}=0.\bar{6}$. The latter candidate has the same [-ATR] feature linked to five vowels, leading to an activity of 0.2 for the unfaithful vowel in question and therefore to a crucially higher violation of 1-0.2=0.8. Therefore the opaque counterbleeding candidate can become optimal. The main prediction of this caccount is that any case of phrasal opacity should involve at least one spreading process, excluding e.g. opaque interaction of dissimilation, epenthesis, and/or deletion. This is more restricted than e.g. ordered rules (Chomsky & Halle, 1968).

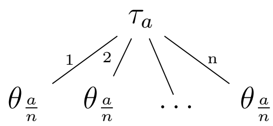
(3) Opaque interaction

a. àɲé kwɛ̀ ɛ̀dɛ̀ — ‘A man grinds s.th.’

b. kwè — ‘grind’

c. àɲɛ́ — ‘man’

(4) Shared Activity: The activity a of a feature-bearing unit θ depends on the number n of FBUs associated to the feature τ that is associated to the FBU θ, i.e. $a(\theta) = \frac{a(\tau)}{n}$.



(5) Ident(+ATR)$_g$: Count 1-x for a vowel with activity x that is associated to a [+ATR] feature in the input but not in the output.

Sonority Alignment

Jochen Trommer | Leipzig University | jtrommer@uni-leipzig.de

Paster (2006, 2009) dismisses sonority as a possible explanation for non-compositional affix order based on a detailed refutal of Arnott's (1970) claim for verbal derivational suffixes in Fula. In this presentation, I show that the much-better known cases of templatic suffix ordering in Bantu (the so-called 'CARP-template', Hyman 2003, Good 2007, Zukoff 2020) actually provide evidence for sonority-based linearization of affixes.

The standard claim for Bantu derivational affixes is that they tend to obey a fixed ordering according to the template in (1), where template positions refer to morphosyntactic categories (or specific affixes):

(1) *Bantu CARP-template (Hyman 2003)*

Causative		**A**pplicative		**R**exiprocal		**P**assive	
-ic	>	-id	>	-an	>	-u	Proto-Bantu
-is	>	-il	>	-an	>	-w	Shona
-ic	>	-il	>	-an	>	-idw	Chichewa

The novel claim I make here is that this template can be reinterpreted in terms of the phonological sonority of the single affixes. I will assume a Gradient Harmonic Grammar system(Smolensky and Goldrick 2016, Hsu 2022, Zimmermann 2024) which may change affix order to satisfy alignment constraints that anchor more sonorous feature values to the right word edge. This is shown for the Chichewa affixes *-ic*, *-il*, and *-an* in (2) and (3). A sonority feature value of an affix is computed here as the numerical average of the values of its segments. Thus *-an* is 0.5 [-consonantal] since *a* is [-consonantal] (it has the value 1 for the feature value), and *n* is not (it has the value 0 for the feature value). On the other hand, *-an* has the value 1 for [+sonorant] because both segments have this specification. The Morphology generates only affix sequences in compositional ordering which may then be reversed if the violations of sonority alignment outweigh the LIN(EARITY) violations sensitive to the strength of precedence relations between single affixes (indicated by numbers between dashes such as -0.5-):

(2) **Input:** = a.	-cons ⊳ 100	+son ⊳ 10	+ low ⊳ 5	LIN 7	$\mathcal{H}$
a. -il-0.5-ic	0.5	1.0	0.0	0.0	60.0
☞ b. -ic-0.5-il	0.5	0.5	0.0	0.5	58.0

(3) **Input:** = a.	-cons ⊳ 100	+son ⊳ 10	+ low ⊳ 5	LIN 7	$\mathcal{H}$
a. -an-0.01-il	0.5	1.0	0.5	0.0	62.50
☞ b. -il-0.01-an	0.5	1.0	0.0	0.01	60.07

I extend the Gradient Harmonic Grammar analysis to capture also cases where the template triggers not dislocation, but doubling of affixes, based on different activations values of affixes.

Striking confirmation for the sonority-based approach comes from the cross-dialectal ordering of Causative morphemes in Bantu, which have basically two variants *-i* and *-ic*. As predicted, *-i*, the more sonorous marker, appears much more to the right than *-ic*. The phonological approach is also in line with the findings of Good (2003, 2007) that the domains of affix ordering templates are phonological (prosodic) for which he provides detailed evidence from Bantu. Finally, sonority alignment also obviates the argument of Ryan (2010) against an alignment-based account of Bantu suffix ordering based on variation between non-adjacent suffix positions. In a nutshell, Ryan's argument is based on the assumption of morpheme-specific alignment constraints, whereas sonority alignment constraints affect classes of affixes.

In the final part of the talk, I will present additional evidence for sonority-based linearization of morphemes. Sonority-based ordering seems also to be attested in the affixal morphology of Assiniboine (Nawratil 2019), and, strikingly, in the pronominal inflection (though not in the derivational morphology) of Pulaar (Arnott 1970, Stump 1992). Similar ordering principles have also been attested in the ordering of binomial expressions in German (Ross 1980, Müller 1997) and Chintang (Vorberg 2008).

Does low functional load facilitate merger in a less dominant language?: Evidence from Cantonese Vowel Mergers in Cantonese-English Bilingual Communities

Holman Tse, St. Catherine University, hbtse110@stkate.edu

The functional load hypothesis (FLH) has long been controversial in phonological theory (Round et al 2022, Wedel et al 2013). The FLH states that phoneme pairs with a lower functional load (i.e. those involved in distinguishing fewer minimal pairs) are more likely to undergo merger. AUTHOR(S) (2024) has recently suggested that in a bilingual language context, low functional load contrasts in a less dominant language may become even more susceptible to merger than in a dominant language or in a monolingual context due to decreased use of the less dominant language (e.g. a heritage language). Can this claim be supported?

The focus of the current study is on further addressing this claim through a variationist sociolinguistics study of the AM/P~OM/P merger in Toronto vs. Hong Kong Cantonese. The AM/P~OM/P merger is a dissimilatory merger in which /o/ becomes /ɐ/ in pre-labial contexts (Bauer & Benedict 1997). With only five minimal pairs in the language, the AM/P~OM/P contrast has very low functional load. Given the low functional load, the prediction is that the merger would be more advanced in Toronto (where Cantonese is spoken as a heritage language) and led by individual speakers who are more English dominant than it would be in Hong Kong (where Cantonese is the dominant language).

The merger is addressed based on analysis of vowel production patterns across 41 sociolinguistic interviews recorded as part of the Heritage Language Variation and Change (HLVC) in Toronto Project (Nagy 2011). The analysis includes 41 speakers (31 from Toronto and ten from Hong Kong) and a total of 1163 vowel tokens. Midpoint F1, F2, and F3 measurements were collected using a Praat script and were subsequently normalized using the Nearey technique (Thomas & Kendall 2007) based on a vowel space of 9 monophthongs. Pillai Scores were calculated for each individual speaker. To determine whether an individual speaker has merged AM/P~OM/P, Stanley & Sneller's (2022) formula for calculating threshold Pillai Score values was used. Merger status then became an independent variable in a set of T-tests. The dependent variables tested included a set of factors related to individual linguistic dominance and ethnic orientation.

The results show a lower percentage of Toronto speakers (23%) with the merger than in the Hong Kong group (30%). Results from the T-tests show that lower Cantonese Vocabulary Count Score (calculated based on the total number of unique Cantonese words uttered and normalized based on recording length, $p < 0.01$), higher English Vocabulary Count Score (calculated based on the total number of unique English words uttered and normalized based on recording length, $p < 0.05$), and lower Ethnic Orientation Score ($p < 0.05$) all significantly favor merger within the Toronto group.

While the Hong Kong group is more advanced in merger overall (though not significantly so), which runs contrary to the prediction, the results from the T-tests are more consistent with the claim that a low functional load pair may become more susceptible to merger due to decreased use of the language. These results show decreased use of Cantonese, stronger English dominance, and weaker orientation to Chinese culture as individual speaker factors that favor AM/P~OM/P merger. These results, thus, provide partial support to AUTHOR(S)'s claim about the vulnerability of low functional load phoneme pairs to merger in a heritage language context.

AN ISOGLOSSIC ANALYSIS OF PRO-NOCONTOUR TONAL CHANGE IN SOME CENTRAL LOWER CROSS SPEECH COMMUNITIES

Ememobong Udoh & Enoabasi Urua

University of Uyo

ememobongudoh@uniuyo.edu.ng, enoabasi@gmail.com

The Ibibio and Anaañ people had, around 500 A.D. moved as a common linguistic group from the Benue valley southwards into the forest regions, thus settling together in the Ibom Arochukwu area of Abia state; but happened to migrate from there to the present Akwa Ibom State (Abasiattai 2010). The Anaañ and Ibibio languages belong to the same stock – the Central Lower Cross subgroup of languages (Connell 1994; Urua 1996). At the lexical level, whenever the segmental make-up of a lexical item is the same in both languages, Ibibio disyllabic words with the H.HL tonal pattern have a corresponding H.L for Anaañ. For example, *ú.nâm* (H.HL) 'meat' in some varieties of Ibibio is produced as *ú.nàm* (H.L) in Anaañ. Even at the post lexical level where tonal changes are constantly expected in some Ibibio morphemes, this NOCONTOUR outlook still holds sway in Anaañ. For example, in some varieties of Ibibio where the inherent high toned ú-prefix is used to form gerundive nominals, the tonal pattern in *wàt ìɲàŋ* (L-L.L) 'sail (verb)', due to tonal spreading from the ú-prefix, becomes *ú-wâr ìɲàŋ* (H-HL-L.L) 'sailing'. Whereas, in Anaañ, *wàt ìɲàŋ* (L-L.L) 'sail (verb)' is realised with the ú-prefix as *ú-wàr ìɲàŋ* (H-L-L.L) 'sailing'. By implication, the H-HL sequence in Ibibio might have overtime, changed in Anaañ to a simplified H-L pattern. This is seen as the effect of the NOCONTOUR constraint. Our concern in this work is to examine the effect of NOCONTOUR and tonal simplification of H.HL syllables on isoglossic lines by exploring this phenomenon in Ibibio speech communities that speak standard Ibibio through the non-standard variety of Ibibio up to the Anaañ speech communities. This on-going work will help us to ascertain whether the contouring phenomenon cuts across all the Ibibio speech communities, and whether the NOCONTOUR effect also cuts across all Anaañ speech communities. In that case, where is the exact location of sound change within the Ibibio inter-variety isoglossic network and along the Ibibio-Anaañ isoglossic network; and have these contouring and NOCONTOUR phenomena rebuffed the effect(s) of language contact? We also expect to offer some geo-phonological explanations to this phonological situation, especially as Anaañ is closer to the Rivers and Igbo languages that are spoken in entirely different states and do not belong to the Central Lower Cross subgroup like Anaañ and Ibibio.

Too strong, too weak, or just right: gradiently active tones and tonal fusion in Ayutla Mixtec

Thom van Hugte | Universität Leipzig
thom.van_hugte[at]uni-leipzig[dot]de

Main claim: Assuming Gradient Symbolic Representations and the possibility for tonal primitives (H, L, etc.) to “fuse” is necessary in order to analyse tone in Ayutla Mixtec, an Oto-Manguean language of Mexico. The data are too complex to be accounted for using standard assumptions on tonal representations, such as an open set of primitives or tonal features. **Data (Pankratz & Pike, 1967):** Ayutla Mixtec has H, M, and L surface tones. Roots are typically bisyllabic and cannot end in M unless they are entirely M-toned. Floating H tones appear after word-final /ʔ/. For example, when [ʃī.dà^{ʔ}] ‘tongs’ and [vì.ʃĩ̀] ‘cold’ are combined into the sequence [ʃī.dà ví.ʃĩ̀] ‘the cold tongs’, [ví] is high-toned (note: /ʔ/ is deleted if word-final without being phrase-final). Table 1 shows the data with the most crucial tonal alternations.

2nd root / 1st root	**M.L**	**L.L**	**L.H**
H.H	H.L	--	--
M.L^{ʔ}/L.L^{ʔ}	H.H.L	H.L	--
H.L^{ʔ}	H.H.L	M.L	--
H.H^{ʔ}	H.H.L	M.L	M.H

Table 1: *tones of bisyllabic roots in isolation in bold, with glottal stops indicated for the preceding root so as to indicate the presence of floating H. The other cells show the surface realisations of the second root. Double hyphens indicate that no alternation takes place.*

Plain H.H overwrites M.L to H.L, and never affects any L. When the first root ends in /ʔ/, there are three possible different effects on the leftmost tone of the second root: nothing, raising a low to mid, or complete overwriting. H.H^{ʔ} uniquely raises L.H to M.H, but patterns with H.L^{ʔ} in its effects on L.L roots, whereas M.L^{ʔ}/L.L^{ʔ} roots cause full overwriting there. Yet all ʔ-final roots overwrite M.L roots, which will surface as H.H.L trisyllables. Assuming only floating H, it should not be able to raise L to M. Assuming tonal features like [+upper], the alternations are inconsistent. In both cases, one would need to posit extremely specific constraints to account for these diverse alternations and still lack a uniform explanation of the data. **Analysis:** I assume a version of Gradient Symbolic Representations where each phonological object can have an activity/strength between 0 and 1. In Ayutla Mixtec, a constraint penalising too much H-activity at the word-level phonology forces floating H to weaken if the root has an associated H already, and the closer the associated H, the weaker floating H needs to become. That is: L.L^{ʔH1}, H.L$^{ʔH0.75}$, H.H$^{ʔH0.5}$. At the phrasal level, these H-tones will violate the same weighted constraints differently; H$_1$ violates them fully, H$_{0.75}$ by three quarters, and H$_{0.5}$ by half, hence their different behaviours. The M in M.L can always be overwritten by spreading or docking because I assume it is in fact Ø, which also explains the restriction on M-final roots. In L.L, only the strongest floating H can delink L. The weaker H’s must “fuse” with L to become a derived M, phonologically distinct from but phonetically identical to Ø. My analysis thus joins recent work which assumes /many/-to-[one] relationships between underlying forms and surface M tones. More controversially, both H and L are associated to the same TBU in my analysis without creating a contour, an approach that I defend based on cross-linguistic data. As for L.H, only the weakest H can fuse with L, because it is weak enough to avoid a severe penalty from the constraint that bans too much H-activity in roots.

Anticipatory labialization: phonetic or phonological?

Veno Volenec | University of Zagreb | vvolenec@m.ffzg.hr

Introduction. Anticipatory labialization (AL) is typically defined as a process in which the lip rounding gesture from a rounded sound is temporally extended in the regressive direction, influencing one or more of the preceding consonants (Farnetani & Recasens 2013; Volenec 2015; Liker 2024). Despite the vast experimental and theoretical literature on labial articulation and coarticulation in various languages (Benguerel & Cowan 1974; Lubker et al. 1975; Bell-Berti & Harris 1979; Descout et al. 1980; Sussman & Westbury 1981; Perkell & Matthies 1992; Farnetani 1999), only three studies have undertaken a cross-linguistic investigation of AL (Lubker & Gay 1982; Boyce 1990; Noiray et al. 2010), and none of them have directly compared AL across more than two languages. Thus, we ran a wide-scale cross-linguistic study to address two underexplored research questions: (1) Is AL always present in a consonant (C) that is followed by [u] in all languages? (2) Is there a cross-linguistic difference in AL in C[u] clusters? We hypothesize that if AL is present in all languages and does not differ cross-linguistically, it is much more likely that is a universal phonetic process and not a language-specific phonological one.

Method. To facilitate direct cross-linguistic comparison, this study only concentrated on AL originating from [u] (because [u] is typologically the most frequent rounded vowel), and it only investigated AL in word-initial C[u] clusters (because CV syllables are typologically most common and because word-initial C[u] clusters ensure that only anticipatory and not carryover coarticulation is present). Lip movements of 10 native speakers of 10 languages (Brazilian Portuguese, Croatian, American English, Quebec French, Italian, Japanese, Jordanian Arabic, Lithuanian, Persian, and Telugu) were video-recorded during the production of all the C[u] clusters that exist in each language. Participants read isolated words beginning with C[u] (e.g., *rule* [ɹuł]) from a screen; this trial was repeated three times. The dynamics of AL before [u] was determined using OpenFace2.2 (Baltrušaitis et al. 2018; Krause et al. 2020), an automated facial behavior analysis toolkit driven by artificial intelligence. One-way ANOVA was used to test if there are statistically significant differences in AL between the 10 tested languages.

Results. All l0 languages displayed AL in every token of every word-initial consonant that was followed by [u]. There was not a single instance of an absence of AL in any of the tested words. In all of the tested words in all languages, AL could always be observed as the first overt articulatory gesture associated with a C in a C[u] cluster, before any audible signal was emitted by the speaker. The average duration of AL for each language is presented in Table 1. The total average duration of AL in all C[u] clusters calculated across all 10 languages was 96.7 ms. One-way ANOVA showed that there is a statistically significant difference in the duration of AL in C from C[u] between the 10 languages: $F = 4.773$, $p = 0.01$.

Table 1. Mean duration of AL in C[u] clusters in 10 languages.

Language	Mean duration of AL (ms)	Standard deviation
B. Portuguese	109.7	18.6
Croatian	89.3	18.5
English	92.3	18.7
French	92.7	19.5
Italian	102.0	19.6
Japanese	86.3	18.7
J. Arabic	104.2	20.1
Lithuanian	96.1	19.1
Persian	97.6	18.7
Telugu	96.7	19.7

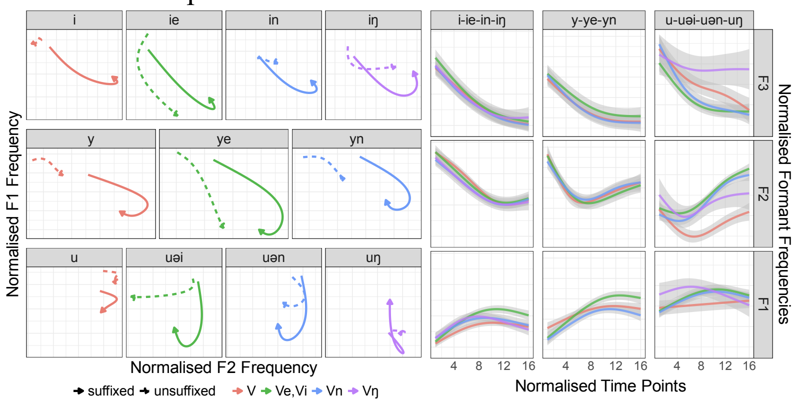
Discussion. The fact that AL systematically appears in genetically unrelated languages with vastly different phonologies suggests that AL is a universal phonetic process. It is likely that the temporal differences in AL result from the differences in the underlying phonological systems of the languages in question. It has previously been shown that syllable structure, prosody, and the contrastive vs. redundant nature of the feature [±ROUND] can all play a role in the realization of coarticulatory effects (Farnetani 1999; Liker 2024). Thus, AL has a different duration in different languages because during speech production the effect of AL is superimposed onto different, language-specific phonological representations. The interaction between the language-specific phonology and the non-language-specific nature of AL explains why on the one hand languages can differ in the average duration of AL (because AL is manifested on different phonological systems) and why on the other hand all of the tested languages display strikingly similar AL variability as indicated by the standard deviations in Table 1 (because the variability of AL is due to idiosyncratic biomechanical factors that are the same irrespective of a speaker's native language).

Near-mergers in Beijing retroflex suffixation

Yutong Wang[1], Mitko Sabev[2,1], Brechtje Post[1]
[1]University of Cambridge, [2]Universität des Saarlandes

Background. Incomplete neutralisation (IN) poses a conundrum to early theories of the phonetics-phonology interface (Cohn, 1990; Keating, 1990) wherein phonologically neutralised categories should not yield phonetically non-neutralising outputs, and in a modular feedforward model, phonetic implementation only has access to the discrete phonological output that does not contain gradient information (Bermúdez-Otero, 2007; Kenstowicz, 1994; Pierrehumbert, 2002). Although some previous work has ascribed apparent IN to potential task effects and orthographic knowledge, less attention has been given to IN in languages where phonological contrasts are not explicitly marked in the orthography. The goal of this paper is to offer a clear case of IN with data from Beijing Mandarin (BM), which is putatively less impacted by orthographic encoding of phonological contrasts compared to languages such as German (Port & O'Dell, 1985; Roettger et al., 2014) and Dutch (Warner et al., 2004). In Beijing retroflex suffixation (BRS), a suffix [ɚ] is attached to the rime to denote diminutiveness, substantially changing the quality of the rimes. This results in the loss of phonological distinctions between some rime categories while subtle acoustic differences can be preserved. We aim to expand the typology of IN to include a non-alphabetic language, thereby offering a better understanding of the multifaceted relationship between phonetics and phonology.

Methodology and Results. Recordings of 11 BM speakers (7f, 4m) producing 136 unsuffixed monosyllabic words and their suffixed counterparts in carrier sentences were analysed. Natural speech without hyper-articulation was elicited through a simulated question-answering task. Generalised Additive Mixed Models (Hastie & Tibshirani, 1986) were fitted for time-series analysis across 15 equidistant points for each rime's first three formant frequencies (Lobanov-normalised (1971)). Overall, we found complete acoustic neutralisation for rimes with low nuclei, whereas high-nucleus rimes (see the figure for modelled formant trajectories) exhibited small yet significant acoustic differences, which may or may not be above the just-noticeable difference (Hawks, 1994; Kewley-Port & Watson, 1994; Sinnott & Kreiter, 1991).



Theoretical Implications. Through dynamic vowel formant analysis, we identified variation patterns that are height-conditioned. However, we argue that such minor acoustic differences may not reflect the true phonological status of the suffixed rime categories in the BM inventory. IN in BRS could be accounted for within the framework of *Classic* generative phonology, where phonology is viewed as grammatical knowledge used by speakers to map a string of lexical items in a specific structure to articulation and the use of such knowledge is affected by multiple performance factors (Chomsky, 1964, 1965, *inter alia*). The interacting factors of independently motivated performance mechanisms and social biases, such as gender, age and frequency effects, that influence phonetic planning should be recognised and prioritised in accounting for IN. Therefore, the presence of systematic differences in the production of BRS rimes cannot automatically be taken as evidence of phonological contrast and IN is not necessarily in conflict with generative phonology. Further investigation is needed to determine whether these phonetic traces are perceptually relevant and therefore phonologically meaningful.

Prefix coherence and consonant strength in Blackfoot

Natalie Weber (Yale University)

Overview In Blackfoot (Algonquian; ISO 639-3: bla) there is no evidence from right edge restrictions, stress, or minimal size constraints that prefixes are separate prosodic domains. In addition, deletion and epenthesis processes remove [+cons] segments from the left edge of non-initial roots. I argue both facts result when a language requires strong consonants at prosodic left edges but prohibits the addition of prosodic constituents. Removing strong consonants from the left edge of non-initial roots lets the roots be parsed with the prefix into one prosodic word. This paper contributes to the typology of affix coherence (Dixon 1977; Elkins 2020) and prosodic word structure.

Root alternations Every stem-initial nasal deletes, (1a), and an [i] is epenthesized before every stem-initial obstruent, (1b). Both processes feed vowel coalescence. These processes are phonological because they are systematic (based on a corpus study of the dictionary) and productive. (Data from FR = Frantz & Russell 2017; ⟦ ⟧ around IPA based on orthography.)

(1) a. ⟦ni.kɔ́ː.ka.kɪs.ko.a.wḁ⟧
nikáᅟ☐**ó**kakisskoawa
n–ikaa–[**mo**kaki–ssko]–aa–Ø–wa
1–PRF–[wise–by.foot.TA]–3OBJ–IND–3
'I have 'wised him up' ' [FR 183]

b. ⟦ʔá.kɛː.po.ni.pa.wḁ⟧
áka[**i**]**p**onipawa
akaa–[**p**on–p]–a–Ø–wa
PRF–[cease–by.mouth.TA]–3OBJ–IND–3
'he's no longer being carried […]' [FR 91]

Glides remain at the left edge of non-initial roots but delete at the left edge, feeding glottal stop epenthesis before word-initial vowels. As a result, the left edge of the prosodic word prohibits [-cons] segment and the left edge of non-initial roots prohibits [+cons] segments.

Analysis I adopt an alignment constraint from Elkins (2020) which requires the left edge of each morpheme to align with a prosodic word (ω). The DEP(ω) constraint from (Itô & Mester 2019) prohibits the addition of prosodic words (ω) in the output. The ranking DEP(ω) ≫ AL(M,ω,L) causes stems to be incorporated into a ω with the prefixes rather than beginning a new ω.

The Boundary Disruption (BD) constraint below (modelled after constraints in Katz 2016) requires the left edge of a ω to begin in a strong consonant, and prohibits strong consonants within a ω. For Blackfoot, any [+cons] segment is "strong" (i.e., obstruents and nasals), though BD([+cons]) could be one of a family of stringency constraints defined over sonority (de Lacy 2002) or acoustic parameters (Katz 2016). Blackfoot requires {DEP(ω), BD([+cons])} ≫ FAITH ≫ AL(M,ω,L), where FAITH stands in for MAX or DEP. The bolded **C** in (2) is [+cons].

(2)

C…-**C**V…	DEP(ω)	BD([+CONS])	FAITH	AL(M,ω,L)
a. (C…-**C**V…)	∗	∗!		∗
b. (C…)-(**C**V…)	∗∗!			
☞ c. (C…-V…)	∗		∗	∗
HB d. (C…)-(V…)	∗∗!		∗	

BD constraints alone cannot explain why nasals delete but obstruents do not. One possibility is that the deletion of sonorants like nasals is less perceptible than the deletion of obstruents, motivating a perceptual definition of correspondence constraints (Steriade 2008). The stand-in constraint FAITH would then expand to Max(ΔO-Ø) ≫ Dep ≫ Max(ΔN-Ø), Max(ΔG-Ø).

Phonology Drives Asymmetries in the Auditory Processing of Affixed Words

Hilary Wynne and Aditi Lahiri, University of Oxford

There are phonological processes that occur asymmetrically at the edges of complex words: these processes tend to affect the stem of an affixed word **disproportionately**. For example, resyllabification between a consonant-final stem and a vowel-initial suffix is permitted more frequently in a stem-suffix combination than in a prefix-stem combination, cf. English *sanity* {san-ity} > [sa.ni.ti] versus *unable* {un-able} > [un.abl], not *[u.nabl]. This has ramifications for the stem: phonologically, suffixes adhere to the stem more than prefixes, sometimes resulting in significant changes to the stem form. Conversely, the phonological shape of stems in prefixed words generally remains intact: [eɪ.bəl] ~ [ʌn.eɪ.bəl] vs. [seɪn] ~ [sæ.nɪ.ti].

Other languages behave differently. Bengali, for instance, has a complex set of rules reflecting phonological changes at stem edges. Where prefixes undergo resyllabification, assimilation or dissimilation, it is generally progressive with the result that both prefix and stem changes shape. For example, in the prefixed word [ɔn-ɑd̪or], 'disrespect', resyllabification causes the [n] of the prefix to become the onset of the first syllable of the stem: [ɑ.d̪or] ~ [ɔ.**nɑ**.d̪or]. In the suffixed word [bʰoʊ.t̪ik], 'ghostly', the shape of the stem not only undergoes diphthongisation where the stem vowel of [bʰut̪] 'ghost' changes from [u] > [oʊ], but the syllable boundary shifts: [bʰut̪] ~ [bʰoʊ.t̪ik]. In the case of a rule of /r/-assimilation, where the prefix [dur-] is added to [d̪in] or [ʃɑhoʃ], the [r] assimilates to the following stem consonant (see table1), but the stem initial consonant remains the same. Again, if the [r] assimilates completely to a following consonant as in [dur-din] > [dudːin], then the geminate makes the boundary unclear, but the quality of the stem initial consonant remains untouched. The question we ask is: do morphophonological rules affect stem access in the processing of a complex word?

To investigate this, two priming experiments (N=64) were conducted in Kolkata, India, with a cross-modal (auditory affixed prime ~ visual stem target, e.g. [ɔ.nɑ.d̪or] ~ আদর *ador*) paradigm. In Exp 1, primes consisted of conditions reflecting key phonological changes in Bengali prefixed words:

	Prime		Target	
<u>**Conditions**</u>	**UNDERLYING**	**SURFACE**	**STEM**	
Resyllabification	*ɔn.-a.d̪or*	[ɔ.nɑ.d̪or]	আদর	[ɑ.d̪or]
Assimilation	*dur.-kri.ti*	[duʃ.kri.ti]	কৃতি	[kri.ti]
Initial geminate	*ɔ.-ʃot.ʃʰo*	[ɔʃ.ʃot.ʃʰo]	বচ্ছ	[ʃot.ʃʰo]

In Exp 2, primes consisted of the key changes that occur in Bengali suffixed words:

	Prime		Target	
<u>**Conditions**</u>	**UNDERLYING**	**SURFACE**	**STEM**	
Resyllabification	*dam.-i*	[dɑ.mi]	দাম	[dɑm]
Stem quality	*bʰut̪.-ik*	[bʰoʊ.t̪ik]	ভূত	[bʰut̪]

Filler affixed words in which no changes occurred were also present. In Exp 1 (prefixed words), we found that all conditions resulted in significant priming (all $t > 3.4$). In Exp 2, there was significant priming for suffixed words that underwent resyllabification (76 ms, $t=9.50$), but when the stem quality changed (e.g. [bʰut̪] ~ [bʰoʊ.t̪ik]), this **resulted in a much smaller effect** (20 ms, $t= 2.06$). Our findings suggest that having clearly defined morpheme boundaries in the prime allows for easier decomposition of word into stem + affix. In order to extract the stem from an affixed word, one must undo the intricacies caused by morphophonological alternations. Importantly, due to how these alternations affect the stem, these intricacies are not translated into equal processing effects at the prefix and suffix edges.

An Autosegmental Approach to Nanga Verb Stems

Fabian Zuk, LLACAN–CNRS, Paris.

Nanga **[náŋî]** like other Dogon languages of the Bandiagara Region (Mali) makes use of morphologically-conditioned vowel alternations to signal ASPECT-MOOD-POLARITY (AMP) categories within the verbal system. These AMP-marking vowels also interact with traditionally labelled [±ATR] (Hantgan & al. 2012; 2019; 2024; Sandstedt 2019) and [±back/round] processes (McPherson 2013; Author et al. in prep) identified in a growing theoretical literature on the Dogon languages. Building upon existing analyses with data from Nanga, drawn from Heath (2016; *in prep*), we offer a unified analysis of permissible vowel configurations within the stem and explain the paradigmatic relation between what Heath (2016: 19) has called the "bare stem" employed "in nonfinal position in verb chains" and inflected "-E/-O" forms of the stem, all of which are characterized by harmonic constraints imposed by V_1 of the verb root. By concentrating on Nanga, we expand our understanding of AMP-marking vowel alternations within the family, expanding upon the toolkit of autosegmental phonology (KLV 1990) and element theory (ET) (Backley 2011), notably the challenge of ATR harmony within modern ET (cf. van der Hulst 2016, 2017; Brandão de Carvalho & Faust 2017; Charette 2018; Pöchtrager 2025).

We argue that the distinction between strong (non-i final) verbs, e.g. *kɛ́sɛ́* 'reap' and weak (i-final) verbs, e.g. *kɛ́sí* 'bury' described by Heath (2016; *in prep*) concerns their underlying representation; strong verbs are of a CVC-ɐ (CVC|A|) pattern, i.e. they end in a short low vowel; while i-final verbs end in /ɨ/ (CVC@), where |@| is realized as a high front vowel, alternating between [i] and [u]. These basic patterns reflect the underlying form of the verbal bare stems wherein the final vowel |A| is subject to both |I/U| and ATR (Head) harmony. Weak CVCɨ roots in contrast do not contain a target for harmony and the bare stem surfaces as [i]. Furthermore, inflected stems, here implemented as the superposition of autosegmental |I| in the case of 3SG perfectives and |Ù| in the case of 3PL perfectives onto V_2 of the bare stem blocks further |I/U| harmony. The imperative, in turn, is built off the bare stem with an -|Ù| suffix which becomes headed [o] after a +ATR (I/U headed vowel) in the root, but is lost after a non-|I/U|-headed vowel, leaving only its tonal pattern behind.

	Bare Stem				**|I|-stem** (PFV.3SG)		**|U|-stem (Pfv.3Pl)**	**-|Ù|-Imperative**	
	'reap'	'jump'	'bury'	'do'	'leave'	'do'	'leave'	'jump'	'leave'
Root	kɛsɐ	perɐ	kɛsɨ	kar̃ɨ	dɔgɐ	kar̃ɨ	dɔgɐ	perɐ	dɔgɐ
Inflect	Ø	Ø	Ø	Ø	dɔg|AI|	kar̃|@I|	dɔg|AU|	perɐ-|Ù|	dɔgɐ-|Ù|
Assign Tone	kɛ́sɐ́	pérɐ́	kɛ́sí	kár̃í	dɔ̀gɛ̀	kár̃í	dɔ̀gɑ̀	pérɔ̂	dɔ́gɐ́ʊ̀
|I/U| Harm.	kɛ́sɛ́	pérɛ́	-	-	-	-	-	-	-
ATR-Head Match	-	Yes	-	*opaque*	-	*opaque*	-	Yes	-
	kɛ́sɛ́	péré	kɛ́sí	kár̃í	dɔ̀gɛ̀	kár̃í	*dɔ̀gɔ̀*	pérô	*dɔ́gâ*

In summary, the morphology-to-surface output of Nanga is dependent on the addition of AMP-inflection through autosegmental concatenation on V_2 of the bare-stem and on tonal overlay. Front/Back harmony is achieved within stems by the obligatory matching of V_2's |I/U| specification with that of V_1 while ATR harmony is controlled by a requirement that a headed V_1 be followed by a headed V_2, together accounting for the copy-vowel like appearance of V_2 in the bare stems. Because |I/U| colouring can only affect central vowels, both traditional perfective "E-stems" and "O-stems" (Heath 2016) are ineligible for |I/U| harmony, thereby restraining possible surface shapes of the verbal stem in Nanga, but also, we hypothesize, in sister languages.

Special Session

Let templates surprise you

Noam Faust (Université Paris 8, CNRS SFL), noam.faust@univ-paris8.fr

In this talk, I present a state-of-the-art of the formal morphophonological aspects of Semitic templates, complemented by some notable aspects of the phenomenon that have received less scholarly attention.

The talk begins by the necessity of admitting that templates cannot emerge from pure constraint interaction, because by definition they involve marked syllabic structures (Golston 1996). In other words, *templates surprise you*, specifically by triggering reduplication or altering syllable structure.

The question then arises about how to specify the surprising aspects of a template, and whether to specify only those aspects. I show that an approach that uses skeletal slots (e.g. McCarthy 1981) fares better than one that replaces those with moras and syllables (McCarthy & Prince 1990, Bat-El 1994), specifically because many templatic languages are not moraic. A third approach, which reduces templates to their vowels (e.g. Buckley 2000, Bat-El 2003, Ussishkin 2006) fares even worse than the strictly syllabic approach. The initial difficulties of the skeletal approach are taken care of in Strict CV (Guerssel & Lowenstamm 1996); but at the same time, this approach requires some sort of plug-in in order to deal with denominal verbs in Modern Hebrew – whereas a syllabic approach does not.

Another aspect of the debate about the markedness of templates is embodied in the claim that non-concatenative morphology is epiphenomenal (e.g. Bye & Svenonius 2012). According to that view, the relevant processes can be reduced to concatenation. I show that Semitic templates are not clearly prefixed or suffixed to their base, but seem to be "imposed from above", or "superfixed". While a purely concatenative analysis using alignment constraints is not impossible, it makes interesting typological predictions that require more exploration.

In the last part of the talk I focus on my own ongoing work and past contributions to the issue of templatic morphology and template satisfaction. First, I mention the idea that the different vowels of the template can be the result of different Vocabulary Insertion rules (Faust 2013). Then, I discuss two templatic effects in Mehri (South Arabian, Watson 2012, Rubin 2018). The first features templatic length being treated differently from stress-induced length, showing that templates must be referenced by the grammar; the second sheds light on an interesting issue of template allomorphy. Finally, I present the issue of weak-final verbs and their apparent violation of template satisfaction principles, and explain their behavior using a constraint against root and template misalignment (Faust 2023).

I conclude that Semitic templates can still surprise you, if you only let them.

On infixes and infixation: Beyond prosodic morphology

Laura Kalin (Princeton University), lkalin@princeton.edu

Infixation is a cross-linguistically widespread phenomenon whereby a morphological exponent appears *inside of* the stem it combines with, rather than preceding or following it. For example, in the Austronesian language Muna, the verb *hela* 'sail' combines with the irrealis infix -*um*- to form *h<um>ela* (van den Berg 2013).

The classic prosodic morphology approach to infixation (Prince and Smolensky 1993, McCarthy and Prince 1993, i.a.), couched in Optimality Theory, holds that infixation is the result of a particular affix being subject to competing prosodic and morphological pressures; the morphological pressure is either "be a suffix" (corresponding to the constraint RIGHTMOSTNESS) or "be a prefix" (LEFTMOSTNESS), and the prosodic pressure involves either circumscription (e.g., "attach to a foot", AFX-TO-FT/ALIGN-TO-FT) or a general well-formedness constraint (e.g., "don't have a coda", NOCODA). Infixation is possible just in case the prosodic constraint dominates the morphological constraint (P>>M), thereby compelling an exponent that would otherwise be a prefix/suffix to instead appear inside its stem.

Where are we now, in terms of understanding infixation? In this talk, I lay out a typology of theories of infixes, categorizing theories primarily based on whether infixation is *direct* (one step) or *indirect* (two steps, from a peripheral position to an infixed position) and whether infixation is *phonological* (governed by the general phonological grammar of a language) or *morphophonological* (not governed by the general phonological grammar). Applying this terminology, the prosodic morphology approach described above is a direct (one step) and phonological theory of infixation, and many proposals have continued in this vein (e.g., Cohn 1992, Zoll 1996, Buckley 1997, Kaufman 2003, Klein 2005, Wolf 2008, Zukoff 2023).

I will argue that we need the exact opposite kind of approach from the classic prosodic morphology approach. Specifically, I will argue that:

i. infixation is indirect, involving two derivational steps or representational levels, one where the morpheme (that is exponed by an infix) is in a concatenated prefixal or suffixal position, and one where the infixal exponent is in a stem-internal position,
ii. infixes are characterized by an exponent having an arbitrary phonological/prosodic condition on its placement (formalizable as a subcategorization frame), and
iii. the displacement step of infixation, whereby an infixal exponent is infixed into its stem, precedes the phonological computation.

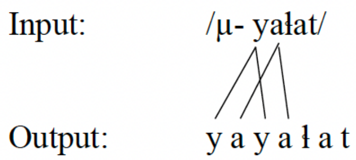
These arguments are built on typological findings from Yu 2007 and Kalin 2022a as well as case studies of individual languages (Kalin 2022b, Kalin 2023). Along the way, I crucially tease apart conditions on insertion from conditions on position (Kalin and Rolle 2023), as well as infixes (e.g., -*um*-) from infixation (e.g., *abso<bloody>lutely*), and lay out a path for future research that investigates the role of infixes/infixation in root-and-pattern morphology and reduplication.

Where is reduplication headed?

Suzanne Urbanczyk (University of Victoria), urbansu@uvic.ca

Comprehensive models of reduplication should ideally account for three key components of reduplicative exponence: the shape or size of reduplicants, their segmental quality, and what is copied. Most research has focused on accounting for the shape of reduplicative morphemes by proposing some form of template. This talk will provide a critical review of the research on templates, from CV-skeleta (Marantz, 1982), to prosodic units (McCarthy & Prince, 1986), to emergent templates (McCarthy & Prince 1999; Downing 2006) and back again to prosodic units (Bermudéz-Otero 2012; Saba Kirchner 2013). What emerges from this review is that many models keep the three components separate, while others capture interesting correlations between shape and segmentism. None provide a unified account of all three components.

The talk then explores how prosodic models are able to derive interesting connections between shape, segmentism, and what is copied, once one assumes heads in reduplication. In these approaches the reduplicative affix is an empty prosodic unit filled by fission of an input segment to two output segments, with branching structures as indicated below.



If we assume that one of each branching segment is a head, this is consistent with other branching structures having heads in syntax (phrases) and phonology (metrical feet).

The key to understanding the predictions of having headed structures in reduplication comes from Dresher & van der Hulst's (1998) Head-Dependent Asymmetry (HDA) hypothesis, where heads can license more complexity than dependents. Because heads can license more complexity, this accounts for cases where the reduplicant eliminates marked structure that the base retains (the emergence of the unmarked effects). This has been a challenge for approaches in which the reduplicative morpheme is a prosodic unit because there is no way to determine which is the copy (c.f. Base-Reduplicant Correspondence Theory, McCarthy & Prince 1999). The licensing of more complexity is modeled by extending the work in positional faithfulness (Beckman 1999) to include a set of HEAD-FAITH constraints to apply to reduplicative fission.

The talk then explores how identifying two types of heads within reduplicated words – prosodic and morphological heads – can account for a range of seemingly unrelated phenomenon in reduplication. The key here is the violable constraint HEADSBRANCH (Downing 2006; Dresher & van der Hulst 1998). Because only the segments in heads can branch, this accounts for a preference for segmental fission (branching structure) to be on morphological and prosodic heads (roots and stressed syllables). The predictions are borne out by examining languages which preferentially copy root material, such as Axininca Campa (McCarthy & Prince, 1993). The preference for reduplicative infixes to copy material in the stressed syllable is also discussed. An examination of the infixing patterns found in Yu (2007) reveals that all cases of reduplicative infixing are to a stressed syllable (prosodic head). A further effect of the preference for heads to have branching reduplicative structure also accounts for what is known as reduplicative haplology, as found in Manam: *ragogo* 'be warm' → *ragogo-go* 'warm' vs. **ragogo-gogo*.