Phonetics and Phonology in Europe
Speech variation in the wild

Satellite Workshop 'Metaphony':
Theoretical, descriptive and typological issues
https://pape-conference.org/satelliteworkshop.html

Thursday 1 June – Nijmegen, Radboud campus, Erasmus Building, 2nd floor, room 66

Organizers: MICHELA RUSSO (CNRS SFL /U. Paris 8 & U. Lyon, France)

RACHEL WALKER (University of California, Santa Cruz, USA)

09:00-09:05	*Welcome by the Organizers*	
09:05-09:45	Keynote Speaker: MARIA-ROSA LLORET (Universitat de Barcelona)	*Constraining the scope of metaphony in southeastern peninsular Spanish*
09:45-10:05	HARRY VAN DE HULST (University of Connecticut)	*The challenge from Metaphony for AIU systems*
10:05-10:25	RACHEL WALKER (University of California, Santa Cruz)	*Metaphony and Asymmetric Positional Activity*
10:25-10:45	BERT VAUX (Cambridge University)	*Umlaut, multiple opacities, and staged computation in Kazakhstani Uyghur*
10:45-11:05	*Break*	
11:05-11-25	FÉJES LÁSZLÓ (Hungarian Research Centre for Linguistics)	*Canonical vowel harmony vs. metaphony: radically different tendencies for morphologization*
11:25-11:45	MICHELA RUSSO (UJML 3 & SFL 7023 CNRS/U. Paris 8)	*The Morphemic Metaphony, the Neuter and Feminine gender. The puzzle of the hidden triggers*
11:45-12:25	Keynote Speaker: AARON KAPLAN (University of Utah)	*Prominence Conflicts in Bolognese*
12:25-13:30	*Lunch*	
13:30-13:50	MARK SIMMONS (University of California, San Diego)	*Morphologically constrained metaphony in Tira*
13:50-14:10	PAOLO DANESI (University of Côte d'Azur)	*Metaphony in Radical Substance Free Phonology: variation and morphological conditioning*
14:10-14:50	Keynote Speaker: CHARLES REISS (Concordia University & Concordia Centre for Cognitive Science)*	*Metaphony in Substance Free Logical Phonology*
14:50-15:10	JOSE BENAVIDES (Indiana University)	*Raising to high in Nariñense*
15:10-15:30	STEFANO CANALIS (Boğazici University)	*Transparency and locality in Romance vowel harmony*
15:30-15:50	*Break*	
15:50-16:10	ANDREA CALABRESE (University of Connecticut) & MIRKO GRIMALDI (University of Salento)	*Southern Salentino metaphonic microvariations: Acoustic, articulatory and phonological analysis*
16:10-16:30	GREESHMA JOSEPH (University of Delhi)	*Vowel Lowering in Malayalam*
16:30-17:30	Round table	*Future directions in metaphony*

Constraining the scope of metaphony in southeastern peninsular Spanish

Maria-Rosa Lloret
(Universitat de Barcelona)

In southeastern peninsular Spanish (spoken in the eastern Andalusian provinces of Almería, Granada, Córdoba and Jaén, as well as in the neighboring region of Murcia), the loss of some final consonants —or their weakening to [h]— is compensated by lowering the preceding vowel (and further /a/ fronting), as in *mes* [ˈmɛ] 'month'. The open character of the rightmost vowel may extend to the preceding syllables, providing a rich array of harmony processes. In all attested patterns, harmony proceeds leftwards and usually from a weak position (the final unstressed vowel) to a strong position (the stressed vowel), as in *nenes* [ˈnɛnɛ] 'boys' (cf. *nene* [ˈnene] 'boy'). However, the scope of harmony shows noteworthy divergences within and across varieties, which fall into two main patterns: one that imposes phonological requirements (as in the Granada and Murcia varieties) and another that additionally places specific morphological conditions (as in the Jaén variety).

In this presentation, we will begin by briefly reviewing the conditionings of such harmonies, considering three factors (in line with Jiménez & Lloret's 2020 work). First, the nature of the final consonant that concomitantly opens the rightmost vowel; e.g., in Murcia any nonnasal final consonant triggers the opening, in Granada only -/s/ and -/h/ induces it, and in Jaén only -/s/ and -/ɾ/ from some inflectional suffixes do. Second, the conditionings on the possible triggers and targets of harmony; e.g., in Granada and Murcia only nonhigh vowels harmonize, while in Jaén all vowels do. Third, the domains of harmony; e.g., in Granada posttonic and pretonic vowels may be affected or not by harmony, while in Jaén and Murcia harmony extends to the full word.

We will then concentrate on the results of the Granada variety, which, as mentioned, shows variable patterns with respect to the domain in which harmony applies, targeting minimally stressed nonhigh vowels (e.g., *tréboles* [ˈtɾɛβolɛ] 'clovers', *comemos* [koˈmɛmɔ] 'we eat'), and variably posttonic and pretonic nonhigh vowels (e.g., [ˈtɾɛβɔlɛ], [kɔˈmɛmɔ]). These data has contributed much to the debate on how the harmonizing features are transmitted and what drives metaphony, with favorable results for positional licensing approaches (e.g., Walker 2005, 2011; Lloret & Jiménez 2009; Kaplan 2018; Jiménez & Lloret 2020)

In previous works, enclitic pronouns (in clitic groups with a single pronoun) are described as triggering and targeting harmony under the same conditions (e.g., *recógelos* [reˈkɔhelɔ] ~ [reˈkɔhɛlɔ] ~ [rɛˈkɔhɛlɔ] 'gather them'), but much less is said for proclitic pronouns and for the combination of two clitics. Hence, the main goal of this talk will be to complement the existing descriptions with clitic-group outcomes in order to check the suitability of previous analyses on the light of these new data set.

Jiménez, J.; Lloret, M.-R. (2020): Vowel harmony. In S. Colina & F. Martínez-Gil (ed.), *The Routledge Handbook of Spanish Phonology*. London & New York: Routledge, 100-128.

Kaplan, A. (2018): Positional licensing, asymmetric trade-offs and gradient constraints in Harmonic Grammar. *Phonology* 35: 247-286.

Lloret, M.-R.; Jiménez, J. (2009): Un análisis *óptimo* de la armonía vocálica del andaluz. *Verba* 36: 293-325.

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The challenge from Metaphony for AIU systems.
Harry van der Hulst, University of Connecticut

In van der Hulst (2018), I consider two analyses, both within the context of Radical CV Phonology (van der Hulst 2020, 2021). While the first analysis, which uses the ATR element as the active element (cf. Calabrese 2011), is possible and consistent, it is not satisfactory, because of the need to represent high mid vowels in terms of two distinct structures. While RcvP does not forbid this kind of *phonological ambiguity*, I will here focus on the second analysis, which attributes metaphony to activity of the primary height element $|\forall|$. This analysis uses the vowel system analysis in (1b) and thus avoids phonological ambiguity (which arguably makes it simpler) and it also acknowledges the role of stress, which the first analysis ignored.

In the second analysis, the distinction between the mid vowels can be made in terms of the headedness relation between the elements A and $\forall$. While African tongue root systems that have a 1H vowel system display dominance of [–ATR], which is formally represented in terms of A-headedness "agreement" in RCVP, Italian metaphony takes a different (in some sense, an opposite) route: targets of metaphony attract (i.e. copy) the redundant $\forall$-element from the triggers. The formalization of metaphony as the addition of the $\forall$-element invokes a *resolution convention* which accounts for the raising effect; see (3 and 4). $|\forall|$-attraction (or copying) has three different consequences: simply adding $|\forall|$, demoting the $|A|$-element to non-head status and pushing out the A-element; see (5). While these are seemingly three different responses, all three routes constitute natural formal consequences of $|\forall|$-addition in a system that does not allow multiple occurrence of the same element, as such formally expressing the increase in preponderance of an element.

As acknowledged in many analyses, metaphony is clearly stress-related, it would be almost perverse to disregard stress as an important factor in this process (see Majors 1998; Mascaro 2024). Following an important proposal in van Coetsem (1996), I assume that this is precisely what distinguishes metaphony (and umlaut) from vowel harmony proper. Umlaut (and, I will assume, metaphony) occurs in languages with 'strong' (often lexical) stress, whereas (non-stress related) vowel harmony is more typical of language with 'weak', typically predictable stress. A correlation of this type has been noted in many typological studies.

The proposed analysis of metaphony uses a 'high' $|\forall|$-element, which makes the RCVP system different from classical unary AIU systems. However, this element is a natural consequence of the basic architecture of this model in which elements come in opposing pairs, which implies that the low element A must have a high counterpart. In RCVP analyse of raising processes there is no direct reference to the A-element (although there will be in 'lowering' processes in African languages), which gets removed from high mid vowels due to the resolution convention. Unary analyses of metaphony that use models without a high element have either been restricted to cases of metaphony that only involve fronting (see Canalis (2016), (who also appeals to the resolution notion in order to 'get rid of the A-element' in some cases) or they have postulated A-deletion (Maiden 1991) or they use of a negated element (Staun 2003). It seems to me that both deletion and negated elements should be avoided at all cost in a unary system.

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(1)   a.   2H-system   b.   1H-systems

```
         i        u              i           u
        ┌─────────────┐        ┌─────────────────┐
        │ɪ        ʊ    │       │ e           o    │
        └─────────────┘        └─────────────────┘
         ɛ        ɔ              ɛ           ɔ
              a                        a
```

(2)
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      [ɔ]    [o]    [ɛ]    [e]    [a]    [u]    [i]
       A̲      A      A̲      A      A
       U      U                           U
                     I      I                    I
       ∀      ∀̲      ∀      ∀̲             ∀      ∀
```

(3)   Resolution schema: Add B: A   >   A̲B   >   AB̲   >   B

(4)
Add ∀ to A =>   A̲∀   (low becomes low mid)
Add ∀ to A̲∀ =>   ∀̲A   (low mid vowel becomes high mid; headedness flip)
Add ∀ to ∀̲A =>   ∀   (high mid vowel becomes high; loss of |A|)

(5)
    a.   (V   V   )F
```
                    e/o > i/u      i/u
                    {∀̲A}           {∀}
                    {∀̲A+∀}         (∀)      attracting/copying the ∀-element
                    {∀}        »   (∀)      resolution: loss of |A|
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    b.   (V   V   )F
```
                    ɛ/ɔ > e/o      i/u
                    {A̲∀}           {∀}
                    {A̲∀+∀}         (∀)      copying/movement of the ∀-element
                    {A∀̲}       »   (∀)      resolution: headedness reversal
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Metaphony and Asymmetric Positional Activity

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In the Positional Licensing (PL) approach to metaphony, harmony is driven by a licensing constraint that drives membership of a given element in a prominent position (Walker 2011, Kaplan 2015). In Optimality Theory, a PL constraint is framed as in (1), where λ is a variable over elements that are subject to licensing, and π is a variable over licensing positions. In application to a metaphonic pattern in which a final high vowel triggers raising of a stressed vowel, λ would be some or all of height features of a high post-tonic vowel and π would be a stressed syllable.

This work probes issues surrounding the variables for PL, focusing on what renders λ deficient without π, and what makes π a favored position. The approach proposed here employs Gradient Symbolic Representations, in which segments have gradient activity (Smolensky & Goldrick 2016). In this account, λ is subject to PL based on its occurrence in a prosodically weak position with deficient activity (<1). Lower activity of high vowels may also factor into deficiency of λ. On the other hand, π is a position with enhanced activity (>1) due to its prosodic prominence.

Consider the metaphony of the Pugliese of Foggia in which final high vowels trigger raising of a preceding stressed vowel (Valente 1975, Calabrese 1988) in (2). In Romance metaphony, harmony typically operates from a post-tonic vowel to the stressed syllable, as in (2). Pretonic vowels, however, do not usually trigger harmony in the stressed syllable in Romance. This asymmetry has been attributed, in part, to a greater weakness of post-tonic vowels. Based on various evidence including metaphonic patterns, the following prominence scale has been proposed for a number of Romance varieties: Stressed syllable > Pretonic syllable > Post-tonic syllable (Maiden 1995, Walker 2011). Building on the insight of Faust & Smolensky (2017) that prosodic positions may have different levels of activity (α), this scale is reinterpreted here as: Stressed syllable, $\alpha>1$ > Pretonic syllable, $\alpha=1$ > Post-tonic syllable, $\alpha<1$.

An activity value of 1 is the customary value, therefore in this scale, a stressed syllable has *enhanced* activity, a pretonic syllable has *sufficient* activity and a post-tonic syllable has *deficient* activity. Under this view, the PL constraint for the alternation in (2) is driven by the constraint: LICENSE($[+high]/\sigma^{\alpha<1}$, $\sigma^{\alpha>1}$), which penalizes a [+high] feature in a syllable with activity of less than 1 that does not have membership in a syllable with enhanced activity. Under this view, [+high] incurs a penalty if it belongs only to a post-tonic syllable, with deficient activity, without also coinciding with the licensing position, which has maximal activity due to its metrical prominence. Pretonic syllables have sufficient activity so their [+high] features are not subject to PL.

The approach is sketched in (3), implemented in Harmonic Grammar (HG; Legendre et al. 1990). Activity values are shown with superscripts. Apart from prosodic structure, vowels here have activity of 1. The stressed vowel receives an enhanced activity of +0.5 and the post-tonic vowel has activity reduced by -0.5. Violations of IDENT are accrued relative to vowel's activity. Faithfulness specific to the word-final syllable has a sufficiently high weight to prevent spreading of height from the stressed syllable to the unstressed syllable, while faithfulness to the stressed syllable has a sufficiently low weight so as not to block metaphony. Positional activity contributes here to formalizing notions of (i) what is deficient and subject to licensing, (ii) what is enhanced and may serve as a licensing position, and (iii) what is sufficient and thus not subject to licensing.

Extension of the concept of deficient activity to a positive version of the PL constraint in HG will be discussed. Kaplan (2018, 2019) argues for a version of PL in which +1 is assigned for each λ that coincides with some π, and for each λ that coincides with some π, +1 is assigned for each additional position that λ coincides with. Positive PL suggests the possibility that activity can be accrued along both dimensions of prominence and temporal span: licensing of material in an activity-deficient position is achieved by membership in a prominent position with maximal activity but activity is also gained from extension to additional syllables.

(1)   LICENSE(λ, π): Assign one violation for each λ that does not coincide with some π.

(2)   'mo̠ʃʃa   'mu̠ʃʃu   'soft'
        'kje̠na   'kji̠nu   'full'
        'pɛ̠te   'pi̠ti   'foot/feet'
        'grɔ̠ssa   'gru̠ssu   'big'

(3)

/kjen-u/	LIC([+high]/$\sigma^{\alpha<1}$, $\sigma^{\alpha>1}$) 10	IDENT-$\sigma]_\omega$-[high] 10	IDENT-'σ-[high] 1	**H**
→ a. 'kji$^{1+0.5}$nu$^{1-0.5}$			-1.5	-1.5
b. 'kje$^{1+0.5}$nu$^{1-0.5}$	-1			-10
c. 'kje$^{1+0.5}$no$^{1-0.5}$		-0.5		-5

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Umlaut, multiple opacities, and staged computation in Kazakhstani Uyghur
Bert Vaux, Cambridge University

Recent studies have argued that relatively simple optimality-theoretic architectures provide better accounts than their rule-based predecessors for the facts of Uyghur phonology (Mayer 2021 and McCollum 2021 for monostratal OT, Kiparsky 2023 for (tri-)Stratal OT). In this paper I argue that accounting for the full spectrum of phonological processes in the language requires the richer range of ordering interactions that is available in Rule-Based Phonology (RBP), but is explicitly excluded in both monostratal and tristratal constraint-based alternatives. Our empirical focus will be a lexical process of Umlaut (3ii) and its interactions not only with the lexical processes of Vowel Harmony (3i) and A-Raising (3iii) addressed by the sources above, but also with a range of processes that are not normally included in phonological analyses of Uyghur because they are not represented in the orthography. For example, the dative gerundive /bɑq-Iʃ-GA/ 'try' is rendered orthographically as <beqishqa> but is pronounced [bɪ̥ᵚχsˠˈqɤ] (Matthew 4:7), revealing a counterbleeding interaction between Umlaut, Vowel Deletion, and Lowering that is not captured in the spelling and ignored in phonological treatments of Umlaut. In order to address this problem I employ surface forms transcribed from a publicly-available translation of the Bible recorded by a speaker of Kazakhstani Uyghur (Uyghur Bible Society 2007), which largely conform to the descriptions of Uyghur allophony in Hahn 2006:33-44 but are not accounted for in his treatment of phonological processes (44-58, 80-90).

Vaux (2000:678) argues on the basis of forms such as /æswɑb-I-GA/ 'tool-3.SG.POSS-DAT' → [æswibigæ] and /ɑdæm-i-GA/ 'man-3.SG.POSS-DAT' → [ɑdimigæ] (e.g. Mark 5:35) that VH is both cyclic and non-cyclic, and AR is non-cyclic and precedes VH in the non-cyclic stratum. Kiparsky 2023:9 points out that the same surface effects can be derived in Stratal OT by having VH (his "Fronting") active in both the Stem and Word strata, and AR (his "Raising") active only in the Word stratum. Kiparsky's analysis is appealing insofar as his three universal strata are tied to cross-linguistically salient categories (stem, word, phrase) and hence arguably are more accessible to learners than alternatives with more abstract strata. However, his model predicts that (i) process interactions *within* strata should invariably be transparent (feeding or bleeding), and (ii) whereas interactions *between* strata can be opaque (counterfeeding or counterbleeding), there should be a maximum of two stages of opacity involving a given process. Both of these predictions are problematized by the Uyghur facts:

- contra (ii), VH is counterbled by Umlaut (4i), which is counterbled by Vowel Deletion (4ii), which is counterbled by Lowering (4iii).
- contra (i), Umlaut is also counterfed by A-Raising (4iv), which itself both feeds and counterfeeds Vowel Deletion (4v) (Orgun 1996).

Building on the analyses in Orgun 1996 and Vaux 2000, the facts can be modeled in RBP:
stratum 1 (cyclic, structure-preserving, restricted to derived contexts)   VH
stratum 2 (cyclic, structure-preserving, restricted to derived contexts) U → VD → AR → VH
stratum 3 (non-cyclic, non-structure-preserving)   L
The rule-based architecture correctly allows for intra-level opacities, as Orgun 1996 points out for cyclic word-level VD and AR (see (4v)).

The same interactions are not easily accounted for in constraint-based formalisms. The surface orientation of monostratal versions (e.g. Mayer 2021) encounters difficulties with the structure-preserving nature of U and AR, predicting that both should produce [ɯ] or [ɨ] from underlying /ɑ/ rather than the attested [i] ~ [ɪ] ~ [e]. Their monostratalism moreover creates familiar problems with the counterbleeding interactions between e.g. U and VD/L. Stratal OT can avoid the structure preservation problem by placing U and AR in the Stem or Word strata, where paradigmatic inventory constraints are sufficiently high-ranked, but is architecturally unable to deal with length of opacity chains and the intra-stratum ordering required.

(1) phoneme inventory based on Hahn 2006:33, and adding his archiphonemes {A I U ᴏ}

	i	y	e	œ	æ	ɑ	(ɯ)	o	u	A	I	U	ᴏ
high	+	+	-	-	-	-	+	-	+		+	+	+
low	-	-	-	-	+	+	-	-	-	+			
back	-	-	-	-	-	+	+	+	+				
round	-	+	-	+	-	-	-	+	+	-	-	+	
atr	+	+	+	+	+	-	+	+	+				

(2) Uyghur vowel allophones (simplified from Hahn 2006:33-44)

	i	ɪ	y	ʏ	e	ɛ	ø	æ	ɑ	ɐ	ɨ	ə	ɯ	o	ɔ	ɤ	ʊ	u
high	+	+	+	+	-	-	-	-	-	-	+	-	+	-	-	-	+	+
low	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-
back	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+
round	-	-	+	+	-	-	+	-	-	-	-	-	-	+	+	-	+	+
atr	+	-	+	-	+	-	-	+	-	+	+	-	-	+	-	+	-	+

(3) relevant processes (expressed in linear notation to conserve space)

i. VOWEL HARMONY (VH; Vaux 2000): Spread contrastive [-back] from root to affixes.

ii. UMLAUT (U; cf. Lindblad 1990:9): $V_{[-round]} \rightarrow$ [+high] / # (C) _ $CV_{[+high, -round]}$

iii. A-RAISING (AR; cf. Lindblad 1990:10): $V_{[+low]} \rightarrow$ [i] in medial open syllable

iv. VOWEL DELETION (VD; cf. Orgun 1996) Unstressed non-round high vowels optionally delete / VC _ CV

v. LOWERING (L; simplification of four allophonic processes in Hahn 2006:36): High non-round vowels become mid after labial fricatives or adjacent to back consonants (k q ʁ ŋ h).

(4) Extrinsic orderings

i. VH precedes U: /baʃ-I-GA/ 'on his head' → <beshigha> [b̥iʃəˈʁɑ] (Genesis 48:14)

ii. U precedes VD: /jan-I-DA/ 'side-3.SG.POSS-LOC' → <yenida> [jinˈdə] (Acts 1:10)

iii. VD is counterbled by L: /baʃ-I-GA/ → [b̥iʃəˈʁɑ] as in (4i), not *[b̥iʃˈʁɑ]

iv. U precedes AR: /jaz-A-mæn/ 'I write' → [jazimæn]; compare /jaz-ᴏʃ-GA/ 'write-GRDV-DAT' → [jiziʃqa] (Jude 3) (Lindblad 1990:21)

v. A-Raising feeds and counterfeeds Vowel Deletion: /bala-lAr/ 'children' → [b̥aluɫɑː] (cf. Mark 10:14) not *[b̥allɑː], but /bala-lAr-nI/ 'child-PL-ACC' → [b̥allɑɾnɯ] (cf. Mark 10:16) not *[b̥aluɫɑɾnɯ]

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Canonical vowel harmony vs. metaphony: radically different tendencies for morphologization

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In this presentation, two types of vowel harmony (VH) are distinguished. **Canonical vowel harmony** (CVH) is defined as the iterative progressive spreading of a feature from syllable to syllable beginning typically from the first syllable and throughout the word. **Metaphony** (MP) or **umlaut** is the regressive spreading of a feature from an unstressed syllable to a stressed one: by definition, it cannot be iterative. Additionally, in CVH, vowels can be assigned to harmonic classes (HC), and any vowel in the triggering position results in the appearance of a vowel belonging to the same HC in the target position. Meanwhile, in MP, triggers and targets are usually different vowels (e.g. only /i/ causes the fronting of back vowels or raising of non-high vowels, but the result in not – or not always – /i/).

This presentation argues that CVH emerges rarely and it is relatively stable, and when it collapses, it usually does not morphologize; on the contrary, MP emerges relatively frequently but tends to morphologize immediately. VH is morphologized when a phoneme undergoes harmony or triggers alternation depending on the morpheme it occurs in. Moreover, vowels can undergo different types of alternations, depending on the morpheme they occur in. In these cases, morphemes are marked due to whether they participate in harmony or not. Consequently, morphologization must be understood here as a gradual phenomenon.

The presentation focuses on examples taken from Uralic languages. Uralic languages are known for exhibiting CVH: however, although the Uralic proto-language exhibited CVH, it was lost in many languages/dialects but remained and developed in different directions in many others (Fejes 2022; Fejes et al. forthcoming). Although a certain degree of morphologization of CVH occurs in all Uralic languages exhibiting CVH, it is usually quite restricted. The only exception is Nganasan (Fejes 2018; Wagner-Nagy 2018), in which a vowel shift caused drastic changes and CVH became strongly morphologized.

Proto-Uralic did not exhibit MP, but it emerged in some Uralic languages in different times and independently of each other. In Livonian (Kallio 2016), it strongly resembles Germanic *i*-umlaut. In Saamic (Feist 2015; Tamás 2006; Wilbur 2014;), it manifests in height alternation, but it can be very different depending on the language. In Vakh–Vasyugan Khanty (Filchenko 2007; Helimski 2001; Honti 1973; Живлов 2019; Терешкин 1961), alternation affects all the features except for front/back, although historically it developed from height alternation. In all these cases, the alternation is morphological, it cannot be described in phonological terms. It seems that phonological umlaut is very unstable and tends to be morphologized fast.

Cross-linguistic data suggest that the different development of the two kinds of VH is universal. E.g. Proto-Turkic also exhibited canonical VH, and it was preserved in most of the Turkic languages, but it never morphologized. On the contrary, different types of umlauts in Germanic languages are morphological and cannot be described in phonological terms: moreover, it appears to have been a characteristic feature of them from the beginning (Janda 1983). Purely phonological umlaut seems to be extremely rare if it is attested at all (Pöchtrager & Kaye 2013, 2014). However, as Calabrese (2011) states that MP became morpho(phono)logized in some Italian dialects, it implies that it is still a completely phonological process in some other dialects. Even if this is the case, completely phonological MP seems to be rather an exception.

A suggested explanation is that regressive assimilation can make the suffix redundant, and such a redundancy supports phonological processes such as apocope, syncope or reduction of vowels, which undermines the phonological motivation of MP.

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The Morphemic Metaphony, the Neuter and Feminine gender. The puzzle of the hidden triggers

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This talk focuses on the interaction between metaphony and indefinite nominal constructions in Southern Italian dialects spoken in Naples and Campanian region, and crucially on the interaction between metaphony and what is known as Neuter gender. In these languages, gender and number are expressed in a metaphonic system as internal *Ablaut* morphemes (see Russo 2001), due to unstressed vowel reduction (to schwa or empty 'v'). Gender and number are signalled by metaphonic stressed internal markers on the root without redundant I/U inflections, i.e., without a synchronic post-tonic licensing α[+high] constraint or spreading of an I/U elements from the suffix. Since inflection is only on the roots, metaphony looks much more as a synchronically morphologically-triggered phonological process subjects to some restrictions. Russo (2001, 2007) proposed a morphologically-triggered affixal A-*floating/spreading* in Neapolitan area, D'Alessandro & van Oostendorp (2013) postulate an A-*eater* for central Italian dialects of Abruzzi.

Next to masculine and feminine gender, these southern Italian varieties have a third gender, the Neuter, which designates the third grammatical gender of many Indo-European languages. According to a common opinion, the neuter gender that existed in Latin was lost in Romance languages. The Romance Neuter is linked to the Latin Neuter gender, and it is found in Southern Italian dialects, in Asturian, Northern Castilian, Romansh (see Russo 2002, 2009; Helmut Lüdtke 2003; Loporcaro & Paciaroni 2011; Mascaró & Torres-Tamarit 2022). In our varieties, the Neuter gender (reshaped through different strategies) is associated to uncountability, Mass entities, indefinite plurals and to what we call indefiniteness constructions.

In our Italian varieties, this (in)definiteness (Mass/Count opposition) interacts with metaphony within recursive DPs. Through a decompositional analysis, we propose an account to explain the reshaping of metaphonic roots which combines phonology with morphosyntactic gender and numbers exponents within layered DPs. At the same time, we challenge the use of a post-tonic licensing high feature or spreading of a final I/U elements in generating the metaphonic patterns attested in these varieties.

The Neuter gender distinction is carried out by the interaction between metaphony with other elements such as internal affixes attached to demonstratives, prepositions + articles contraction, adjectives, quantifiers, Syntactic Doubling (*Raddoppiamento Sintattico*) through latent consonants which are gender markers.

We explain the metaphonic mechanisms and grammatical Neuter gender in layered phrases, composed by such elements, in a Syntax-Phonology mapping, using Element Theory to represent inflectional internal markers.

Since the Middle Ages, demonstratives in Neapolitan have been subject to the grammatical tripartition singular/plural/uncountable to which the metaphonic mechanism applies. Both Mass and masculine Ns are metaphonized; however, in higher DPs positions only masculine demonstratives undergo metaphony, whereas if a demonstrative is combined with a Mass nominal, it has a non-metaphonic affixal outcome √/e/ (with the |A| element inserted in the root, as for the non-metaphonic feminine). Through this mechanism DPs express the Neuter Gender, as outcome of the third Latin gender. Furthermore, post-tonic syllables show a deficient activity in licensing height features, as in (1) (unary elements are represented in a hierarchical bracketed structure):

(1) Demonstratives: stressed √/e/ = (Ɨ(I.A)) (15ᵗʰ century Neapolitan, also modern)
   Metaphonic internal morpheme [i]   D +N   A→∅
              I°⎯⎯U°
      (a) <quisto triunfo> MSG 'this triumph'   D = [ˈkwisto]
          DEM + Mass-SG
      (b) <quiste fante> MPL   'these foot soldiers'   D = [ˈkwistə]
          DEM + MPL
   Mass internal morpheme stressed /e/:

      (c) <quello grano> Mass SG   'that wheat'   D = [ˈkwello ˈgra:no]
          DEM + Mass-SG

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(d) <que̲llo poco> Mass SG   'that little bit'   D = [ˈkwe̲llo ˈpɔ:ko]
        DEM + Mass-SG

In these DPs the variable elements √AIU in the root of DEM and N depend on the kind of properties embedded in layered phrases.

Also, a final empty consonant matches indefinite feminine indefinite plurals through Syntactic Doubling and interacts with metaphony (see Russo 2022):

(2) Floating C in INDEF D-   UR N Root √o
(Floating $_{C\varnothing}$ marks indefiniteness)
Neapolitan 17th century but also modern dialects

(a) <duie lenzu̲le>   'two sheets'   Metaphonized [√u] A→∅
   D-MPL MPL

(b) <le$_{C\varnothing}$ llenzo̲la>   'an amount of sheets'   Syntactic Doubling – Non-Metaphonized [√o]
IND-FPL INDEF FPL

Today in all the central and southern areas where the final vowels have reached a complete melodic deficiency, two distinct articles designate the Mass and indefinite vs. count distinction within metaphonic systems. They show different outcomes (of the lateral: definite /l/ or indefinite /(v)ll(v)/), a single lateral matches definite Ns. The categorial match in (1) and (2) layered D shows (in)definiteness agreement through floating features and melodic metaphonic material.

Metaphonic gender and number require a match D layers to be assigned to Ns, they are not just harmonic categories assigned by an assimilatory relation between a post-tonic deficient vowel and a Root.

Post-tonic vowels do not carry out the gender and number features in Neapolitan, N-Roots need additional affixal elements since roots are deficient to match alone the Neuter gender. Ns Root need an external agreement to express it. Deficient harmonic roots need an agreement relation with the preceding elements to be embedded in (in)definite construction to match Neuter and indefinite feminine plural gender. Metaphonic Roots must be headed by indefinite articles, prepositions or through floating 'metaphonic' |A| elements in DEM to match DPs.

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Prominence Conflicts in Bolognese

Aaron Kaplan

Prominence plays a central role in metaphony (Walker 2011). It is typically triggered by low-sonority (i.e. high) vowels, and these vowels' features become more perceptually salient by spreading to the stressed syllable. Other prominence-driven phenomena have very different motivations. For example, whereas metaphony invites weak elements into a prominent position, positional augmentation (Smith 2005) excludes them from that domain, thereby enhancing the contrast between prominent and non-prominent positions.

In Bolognese, these two kinds of phenomena interact. Metaphony occurs in the category of words identified by Saunders (1984) as Class III. In this class, plural nouns are distinguished from singulars by a raised stressed vowel: [ˈmæjz] 'month' vs. [ˈmiːz] 'months'; [ˈoːrgen] 'organ' vs. [ˈuːrgen] 'organs.' If the stressed vowel is long or a diphthong, as in the preceding examples, it becomes high. If it is short, it becomes mid: [ˈmæs] 'messenger' vs. [ˈmes] 'messengers'; [biˈzaɲ] 'need' vs. [biˈzoɲ] 'needs.'

Raising of short vowels to mid is consistent with the near-total exclusion of short high vowels from stressed positions in Bolognese (Canepari & Vitali 1995). Short stressed vowels appear only in Italian borrowings and as the output of a process that shortens word-final long vowels. This is positional augmentation: *[Peak/HighV̆]/ớ (a version of Smith's (2005) *[Peak/HighV]/ớ) bars short high vowels from stressed syllables, preventing metaphony from creating a weak vowel in a prominent position.

This interaction is accounted for as follows. The plural morpheme consists of the features [+high, –low, +ATR]. The features [high], [low], and [ATR] form the feature class [Height] (Walker 2011). Metaphony is driven by License([Height]$_{plural}$, ớ), which requires the [Height] features associated with the plural morpheme to appear in the stressed syllable. But *[Peak/HighV̆]/ớ prevents [+high] from appearing on a short stressed vowel, leaving only [–low, +ATR] to participate in metaphony. Hence [e] and [o] emerge as the result of metaphony in that context.

Metaphony and augmentation conflict in Bolognese, and the latter wins out. This competition reveals subtle properties of both phenomena. Because long vowels become high in metaphony, it is tempting to conclude that the plural morpheme consists solely of [+high]; other feature changes required for, say, /a/ → [i] could stem from prohibitions on high lax vowels and the incompatibility of [+high, +low]. However, because short vowels raise to mid tense vowels, the features [–low, +ATR] must also be a part of the plural morpheme: they affect the stressed vowel even when [+high] cannot.

Bolognese's treatment of high vowels is asymmetrical. Long high vowels may bear stress, but short high vowels may not. Zabiče Slovene, as described by Smith (2005), behaves similarly. In Smith's account, *[Peak/HighV]/ớ penalizes all high stressed vowels, but this constraint's effect is visible only on short vowels because it is dominated by a positional faithfulness constraint for long vowels. Bolognese shows that this cannot be the correct way to distinguish long and short vowels. Metaphony creates new long high vowels that violate *[Peak/HighV]/ớ, but positional faithfulness does not protect them because these vowels are unfaithful. Instead, *[Peak/HighV̆]/ớ, which penalizes only short vowels, is required.

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Morphologically constrained metaphony in Tira

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Tira (Heiban, Sudan) exhibits a process of vowel metaphony in which [ɛ] alternates with [ɔ] before a word-final suffix -ɔ. The system can be considered metaphony as it is suffix-triggered and typically targets a single vowel. However, Tira lacks a system of stress, so it is independent of prosodic prominence. Metaphony operates locally but in some cases is iterative. Not all instances of [ɛ] in Tira undergo metaphony to [ɔ]. This talk shows that the rounding alternation in Tira is restricted to verbs of certain inflection classes, and gives historical evidence to explain this restriction, and shows the role of morphological category played in shaping the diachronic trajectory of rounding metaphony. Specifically, I show that morphologically indexed constraints provide the best insight into the diachronic development of rounding metaphony in Tira.

Verbs in Tira can be divided into inflection classes based on the paradigm of final vowel (FV) suffixes a given verb exhibits (Kaldhol, in prep). For example, verbs of the ɔɔ-class have the final vowel suffixes -ɔ, -ɔ, -ɛ, -ɔ in their paradigm going from left-to-right, top-to-bottom, and verbs of the aɔ-class have -a, -ɔ, -ɛ, -ɔ in their paradigm. Rounding metaphony occurs on verbs of the ɔɔ-class (e.g. 1), but not on the aɔ-class even when the same conditions are met e.g. *C-á mɛ̀ð-ɔ́* not **C-á mɔ̀ð-ɔ́* (2).

Comparative evidence shows that rounding metaphony in Tira likely derives from the merger of a proto-phoneme *ɜ, which originally was the target of the metaphony, with *ɛ, which was not a target for rounding (3). One possible analysis is that Tira has two underlying phonemes i.e. /ɛ, ɛˀ/, with /ɛˀ/ being the reflex of *ɜ, only distinguishable from /ɛ/ by its participation in rounding metaphony. The merger of vowels from different harmonic classes, where each vowel maintains their phonological interactions but are otherwise indistinguishable from each other, is attested in other languages such as Tutrugbu (McCollum and Essegbey, 2020) and Lokaa (Akinlabi, 2009).

This raises the question of why /ɛˀ/ is distributed as it is in Tira, only occurring in verb roots of certain inflection classes. Further comparative evidence shows that PTM likely had [ATR] harmony, with *ɜ being a [+ATR] vowel, and *ɛ being a [-ATR] vowel. The ɔɔ-class in Tira is the reflex of verb roots with [+ATR] vowels in PTM, whereas the aɔ-class derives from PTM verb roots with [-ATR] vowels. Given that /ɛ, ɛˀ/ are reflexes of *ɛ, *ɜ respectively, the distribution of these two phonemes is a result of historic [ATR] distinctions. However, it is surprising, given this hypothesis, that rounding metaphony is nearly absent on nouns, with only one instance (5), even though several other nouns should exhibit the alternation. Specifically, (6-8) should have an underlying /ɛˀ/ based on their reconstruction in (4), but instead have non-alternating /ɔ/, showing that the rounded allophone has been generalized to the whole paradigm. It is possible that metaphony is more pervasive in verbs due to the verbal inflection class system, since speakers expect a metaphonic /ɛˀ/ to occur in verbs of the ɔɔ-class, and non-alternating /ɛ/ or /ɔ/ in the aɔ-class. As there is no such inflection class system in nouns, the language learner does not have this heuristic to distinguish between /ɛ/ or /ɔ/ and /ɛˀ/, thus metaphony is less regular in nouns. For this

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reason, morphologically indexed constraints (Pater, 2009) that reference inflection class such as (9) are a preferable analysis to proposing the phoneme /ɛᵒ/ to explain the distribution of rounding metaphony in Tira. The case of rounding metaphony in Tira gives insight into the role morphological paradigms can have in preserving phonological alternations.

(1) umɛᵒð 'count' (ɔɔ-class)

	Itive	Ventive
IPFV	Cá úmɔ̀ð-ɔ̀[1]	Câ ùmɔ̀ð-ɔ́
PFV	Cà úmɛ̀ð-ɛ̀	Cùmɔ̀ð-ɔ́

(2) mɛð 'plait' (aɔ-class)

	Itive	Ventive
IPFV	Cá méð-à	Câ mɛ̀ð-ɔ́
PFV	Cà méð-ɛ̀	Cɛ̀-mɛ̀ð-ɔ́

(3)

	PTM[2]	Tira	Moro	Gloss
a	*um3d̪ː	umɛð, umɔð	um3t̪	'count'
b	*mɛð	mɛd	með	'make rope' (Tira), 'twist rope' (Moro)

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(4)

	PTM	Tira	Moro	Gloss
a	*ðidʒɽi, -o	ðə̀-dɛ̀ɽì, ðə̀-dɔ̀ɽɔ́[3]	no cognate	'herb'
b	*l3dw3(ŋ)	lɔ́rɔ̀, -á	lɔ́dwɔ́ŋ	'back'
c	*lVm3n-	lúmɔ́n, -ɔ́	lɔ́mínɪ́ɔ	'charcoal'
d	*iðj3ŋ(g)-	íðɔ́ŋ, -ɔ́	iðjəŋg-én	'offspring'

(5) ðə̀dɛᵒɽì 'herb'

	Singular	Plural
NOM	ðə̀-dɛ̀ɽì	è-dɛ̀ɽì
ACC	ðə̀-dɔ̀ɽ-ɔ̀	è-dɔ̀ɽ-ɔ̀

(6) lɔ́rɔ́ 'back' (expected *lɛ́ᵒrɔ́)

	Singular	Plural
NOM	lɔ́rɔ́	ŋɔ́rɔ́
ACC	lɔ́r-á	ŋɔ́r-á
(Expected)	*lɛ́r-a	*ŋɛ́r-a

(7) lúmɔ́n 'charcoal' (expected *lúmɛ́ᵒn)

	Singular	Plural
NOM	lúmɔ́n	ŋúmɔ́n
(Expected)	*lúmɛ́n	*ŋúmɛ́n
ACC	lúmɔ́n-ɔ́	ŋúmɔ́n-ɔ́

(8) ìðɔ́ŋ 'offspring' (expected *íðɛ́ᵒŋ)

	Singular	Plural
NOM	íðɔ́ŋ	l-ɔ́ðɔ́ŋ
(Expected)	*íðɛ́ŋ	*l-ɔ́ðɛ́ŋ
ACC	íðɔ́ŋ-ɔ́	l-ɔ́ðɔ́ŋ-ɔ́

(9) ALIGN-L(RD/-HI, ROOTₒₒ): The autosegment [round], when occurring with [-high], is aligned with the left edge of the verb root of a verb belonging to the ɔɔ-class.

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[1]C(ə̀)- indicates a class prefix, where the consonant varies with the class of the noun the verb agrees with.

[2]Tira and Moro are the only members of the West Heiban language group, as per the phylogenetic analysis in Schadeberg (1981). Proto Tira-Moro (PTM) is the ancestor of Tira and Moro. Moro data comes from Jenks et al. (to appear).

[3]The form after the comma is the accusative form or accusative suffix.

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Metaphony in Radical Substance Free Phonology: variation and morphological conditioning
Paolo Danesi

Intro: Metaphony in Italian dialects appears with numerous differences amongst dialects. Cross-dialectal variation in metaphony depends on three general parameters (Savoia & Maiden 1997): input, (only a subset of the expected targets may undergo metaphony); conditioning (in some varieties only final /i/ acts as a trigger, while in others both /i/ and /u/ do so); and output (metaphonies can result in a raised -complete or scalar- or in a diphthongized outcome). In addition, morphology may affect metaphony. In some instances, metaphony may apply one way when the trigger belongs to a verbal suffix and in another way when it belongs to a nominal one. This happens in the dialect of Cervara

Data: In Cervara (southern Lazio, Merlo 1922, Schirru 2012) metaphony applies differently in nouns/adjectives and in verbs: stressed mid-low vowels undergo scalar raising (/ɛ/→[e]; /ɔ/→[o]) in nouns and adjectives (cf. 1a), while they undergo complete raising in verbs (/ɛ/→[i]; /ɔ/→[u], cf. 1b). This means that the context of application is contemporarily phonological (triggers are always final unstressed high vowels) and morphological (the way metaphony applies depends on whether the trigger belongs to a verb or to a noun/adjective).

Analysis: In this contribution, an analysis of metaphony based on Radical Substance Free Phonology (RadSFP) is proposed, which accounts for all the variation found in metaphonic processes and morphologically conditioned processes without recurring to morpho-phonological rules or root-suppletion. In RadSFP, phonological primes are emergent and not innate and universal. They are unary and abstract labels assigned to segments according to language-specific contrasts and alternations (Mielke 2008, Dresher 2014, Odden 2022, Samuels 2022). The relation between phonological and phonetic categories is lexicalized during acquisition and is arbitrary, meaning that it can be anything and its reverse. Phonological primes are thus purely symbolic items without a universal and innate correlation with phonetics: there is no [+high] or |I|, but only empty labels such as |α|, |β|, |γ|, etc…, which are assigned a phonetic correlate only upon spell-out to phonetics.

Such a theory of phonological representation prompts questions concerning the nature of the interface between phonetics and phonology, as well as issues concerning computation and the mechanism of prime emergence. The position held here is that the interface between phonetics and phonology (intended here as cognitive modules) is arbitrary. The computation that involves melodic items works as addition of primes (linking) or removal of primes (delinking), much like in traditional autosegmental approaches. Alternations perceived by learners and contrast are the main factors of prime emergence, with alternations being the main factor and contrast being ancillary.

Learners exposed to the alternations of their language build their own set of prime-based segmental representations, or unary primes that may enjoy hierarchical relations. Computation informs learners about primes that the segments contain as well as about the relation between primes within segments. RadSFP has at its disposal the possibility of positing multiple phonological segments, which may map onto the same phonetic representation: processing suggests to learners that segments displaying a different behavior have a different representation, regardless of how they are externalized. When exposed to alternations such as those in (1a) and (1b), learners would notice the double behavior of mid-low vowels in the raising patterns at hand and assume two sets of triggers, with both of them surfacing as high vowels. In Cervara, one set of high vowels (/I/ and /U/, containing two |β| primes, cf. 2) appears in verbs, while another set of high vowels (/i/ and /u/ containing only one |β| prime, cf.2) occurs in nouns. All metaphonic triggers share the prime |β| which triggers metaphony, but the process applies twice in verbs, resulting in complete raising.

	/e/→i/ __C_0i,u		/o/→[u]/ __C_0i,u	
1a. Metaphony in nouns/adjectives: scalar raising	frel'lenka	'vulva (vulg.)'	ne'pote	'nephew'
	fril'linku	'penis (vulg.)'	ni'puti	'nephew'
	ε→[e]/ __C_0i,u		ɔ→[o] __C_0i,u	
	'b:ɛlle	'beautiful F PL'	'b:ɔne	'good F PL'
	'b:eʎʎi	'beautiful M PL'	'b:oni	'good M PL'
	/e/→[i]/ __C_0I,U		/o/→[u]/ __C_0I,U	
1b. Metaphony in verbs: complete raising	'vedo	'I see'	'korro	'I run'
	'vidi	'you see'	'kurri	'you run'
	'vede	'he sees'	'korre	'he runs'
	'vidu	'they see'	'kurru	'they run'
	ε→[i]/ __C_0I,U		ɔ→[u]/C_0I,U	
	'mɛto	'I reap'	'kɔʎʎo	'I pick'
	'miti	'you reap'	'kuʎʎi	'you pick'
	'mɛte	'he reaps'	'kɔʎʎe	'he picks'
	'mitu	'they reap'	'kuʎʎu	'they pick'

2. Internal structure of segments built of emergent primes

```
/a/    /e/    /ɛ/     /o/        /ɔ/      /i/    /u/       /I/        /U/
        |      |      /\         /\        |     /\         |         /\
        α      α     α  δ       α  δ       α     α  δ       α        α   δ
               |                 |         |     |         /\          /\
               γ                 γ         β     β        β  β        β    β
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Metaphony in Substance Free Logical Phonology
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I attempt to provide a modular account of metaphony patterns by bringing together several recent strands of research:

- A model of intrasegmental changes that relies on a system of rules with a structural CHANGE component built from two basic operations on segments: set subtraction and set unification (Bale et al., 2014; Reiss, 2021).

- A model of rule environments that takes long-distance interaction as the default and locality as more complex. Under this approach, each rule includes a parameterized SEARCH algorithm (Mailhot and Reiss, 2007; Nevins, 2010; Dabbous et al., 2021).

- A characterization of the effects of varying the *scope* of specifications in rules. A feature specification can have scope over the **initiator** of SEARCH, the **terminator** of SEARCH, or the CHANGE component (Dabbous et al., 2021).

- The use of underspecified representations in the spirit of work by Inkelas (1993; 1995) to simplify phonological analyses, and also to reduce putative morphological analyses to pure phonology.

The interaction of the basic operations (subtract and unify), the SEARCH algorithm, variations in the scope of specification, and the judicious use of underspecfication provides for the emergence of patterns such as transparent and opaque segment interactions and 'icy targets' (Jurgec, 2011) that are commonly observed in metaphony and other harmony systems. The focus on purely formal aspects of metaphony leads to a streamlined model that can potentially be applied to all phonological processes. Phonetic and diachronic issues are not part of the grammatical model, so the approach is consistent with Substance Free Phonology (at least the versions developed by Hale and Reiss 2000, 2008; Reiss 2017; Reiss and Volenec 2022; Volenec and Reiss 2020).

The components of this framework are simple, but combinatorics provides for vast typological coverage. I will illustrate with novel analyses of Basque *a*-raising, Bantu local and long-distance nasalization of laterals, and several metaphony patterns discussed in the literature. The simplicity of the model does not entail that the task of the analyst becomes trivial, since "[a]s concepts and principles become simpler, argument and inference tend to become more complex—a consequence that is naturally very much to be welcomed" (Chomsky, 1982, p.3). Metaphony is an ideal domain for studying phonological microvariation, and I look forward to feedback from metaphonists at the workshop concerning unresolved complexities and challenges for my approach.

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RAISING TO HIGH IN NARIÑENSE
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METAPHONY describes the process where a vowel assimilates partially or totally to the height of a following vowel *or* post-tonic stressed vowel assimilation [Reference 1, 2]. Whereas raising patterns and locality issues in tense/lax vowel harmony systems have generated longstanding debate, primarily in European Spanish varieties [2, 3, 4, 5, 6, etc.], *very* little attention has been paid to Latin American Spanish. Focusing on Andean Spanish spoken in Southwestern Colombia, this study provides valuable data to be considered in the analysis of metaphony. I follow the argument that METAPHONY differs from HARMONY phenomena in that the latter are either *'stem-controlled'* or *'dominant-recessive'* [7, 8]. Stem-controlled harmony involves a phonological characteristic of a stem inducing a change in an affix. Metaphony, however, is the occurrence of an affix inducing a change in the stem [8].

Natural speech data come from Nariñense ([nariɲénse]), a variety that exhibits unique characteristics in a continuum with Quechua and other minority languages [9]. One descriptive problem that emerges in the analysis of Nariñense is the phonological discrepancy against heavily cited height harmony systems (e.g., Lena, Nalón, Tudanca, and Pasiego). I account for two main raising patterns in Nariñense. The first is ONE-STEP FINAL RAISING: and optional raising harmony, whereby final vowel [o] raises to [u], as shown in (1). Such raising occurs in any masculine singular/plural forms ending in [o], gerundives, and infinitives bearing the clitic *-lo/s*. Moreover, Nariñense displays TOTAL RAISING HARMONY where both mid-vowels raise, as seen in (2). However, in (3) we observe a raising restriction in closed syllables in disyllabic or trisyllabic words. Further support for metaphony in Nariñense comes from verbal paradigms in present indicative in the *yo* '1SG.I', *vos* '2SG.you(for/inf.)', and *nosotro/as* '1PL.we' forms. Verbal inflections differ from other varieties (e.g., Argentinian) in that the underlying vowel [e] raises to [í] *and* [o] either remains the same, surfaces as tense/lax [u]-[ʊ], or is elided– especially in the 1PL form, (e.g., *querer* 'to want' is inflected as *yo quieru/ʊ, vos querís ~ quirís,* and *nosotro/as querímus* [kerémos] ~ [kerímos] ~ [kerímu/ʊs] or [kerím's]). I describe this behavior as OPTIONAL RAISING HARMONY. As expected, mid-vowels raise and spread in the *vos* forms, as illustrated in (4). The second most intriguing pattern in Nariñense is LOW RAISING TO HIGH FRONT, evidenced in the future paradigm. This is an extremely robust pattern that is only present in the *vos* form (e.g., *ver* 'to see', *votar* 'to vote', and *pedir* 'request' are realized as *vos verís ~ virís, votarís,* and *pedirís,* respectively – cf. verás, votarás, and pedirás).

In investigating metaphony in Nariñense, I expanded on raising patterns occurring in nouns, adjectives, and tense-verbal paradigms in singular and plural forms, as opposed to other varieties. In (5), I provide a representation of the chain shifts in Nariñense [3]. A non-harmonic vowel shift is illustrated in (5a) followed by possible one-step final raising in (5b-d). A case can be made for height spreading in which the stressed vowel carries [+H] to the adjacent vowels (e.g., verás = *verís ~ virís*). Additionally, (5d) shows that if the vowel in the last syllable surfaces as [o] (as can be the case), there is no subsequent raising *or* raising is self-generated in the penult, as in [kerímos], so this realization is categorized as partial spreading. One last issue to consider in (5d) is that the pre-tonic vowel does not raise even though the vowel is in an open syllable. One explanation for this has to do with distance spreading (i.e., only having an effect in the adjacent syllable, the open penult). Finally, I argue that the Nariñense variety is apparently similar to the raising phenomena in the Asturian and Cantabrian varieties, but it is operatively different in that vowel raising is optional as to whether it triggers metaphony and vowel harmony. If high harmony takes place, there is a feature-changing vowel harmony process that is context-free. I maintain that metaphony is present in Nariñense since affixation can induce a change in the stem and vowel raising is not stem controlled. However, phonetic-

phonological characteristics in the stem suggest that the mid vowel triggers raising independently motivating vowel harmony either way.

Representative data

(1) *Final vowel, mid raising to high.*

Standard Spanish	Nariñense Variety		
Nouns, Mass Adj, Participles	Masc. SG	Masc. PL	Gloss
a. gato	gátu/ʊ	gátu/ʊs	*'cat'*
b. cinco	sínku/ʊ	sínku/ʊs	*'five'*
c. zurdo	súrdu/ʊ	súrdu/ʊs	*'left-handed'*
d. pájaro	pájaru/ʊ	pájaru/ʊs	*'bird'*
e. muchacho	mutʃátʃu/ʊ	mutʃátʃu/ʊs	*'teenager*

Raising in participles/gerundives.

    a. bebiendo   [beβjéndu/ʊ]   *'drinking'*
    b. nadando   [naðándu/ʊ]   'swimming'
    c. comprando   [comprándu/ʊ] *'buying'*
    d. comer*lo*   [komérnlu/ʊ]   *'eat it'*
    e. lavar*los*   [laβárlu/ʊs]   *'wash it'*

(2) *One-step: both mid vowels raise to high.*

    a. *pelo*   [pélu/ʊs] / [pílu/ʊs] ~ [pɪlu/ʊs] 'hair' (Masc. SG/PL)
    b. *seco*   [séku/ʊs] / [síku/ʊs] ~ [sɪku/ʊs] 'dry' (Masc. SG/PL)
    c. *peso*   [pésu/ʊs] / [písu/ʊs] ~ [pɪsu/ʊs] 'peso' (Masc. SG/PL)
    d. *queso*   [késu/ʊs] / [kísu/ʊs] ~ [kɪsu/ʊs] 'cheese' (Masc. SG/PL)

(3) *Final raising, no spreading.*

    a. **cerdo** [cérdu/ʊs] / *[círdu/ʊs] *[cɪrdu/ʊs] 'pig' (Masc. SG/PL)
    b. **ternero** [ternéru/ʊs] / *[tirníru/ʊs] *[tɪrnɪru/ʊs] 'calf' (Masc. SG/PL)
    c. **cordero** [kordéru/ʊs] / *[kurdíru/ʊs] *[kʊrdɪru/ʊs] 'lamb' (Masc. SG/PL)
    d. **enfermo** [eɱférmu/ʊs] / *[infírmu/ʊs] *[ɪnfɪrmu/ʊs] 'sick' (Masc. SG/PL)

(4) *Raising and spreading in mid vowels in the 'vos' form.*

    a. *tejer* [teχís] ~ [tɪχís] '2SG.knit'
    b. *coser* [kosís] ~ [kʊsís] '2SG.sew'
    c. *poner* [ponís] ~ [pʊnís] '2SG.put'
    d. *comer* [komís] ~ [kʊmís] '2SG.sew'
    e. **ven**cer [bensís] *[bɪnsís] '2SG.defeat'

(5) *Chain shifts in Nariñense.*

	a.	b.	c.	d.
Underlying Representation	-H -H | | g á t o s	-H-H | | p é l o s	-H-H | | b e r a s	-H -H -H | | | k e r é m o s
Final Raising	-H +H | | g á t u s	**-H+H** | | p é l u s	**-H+H** | | b e r í s	**-H -H +H** | | | k e r é m u s
Spreading/Metaphony		**+H** ∧ p í l u s	**+H** ∧ b i r í s	**-H +H** | ∧ k e r í m u s
Surface	gátus	pilus	berís	kerímus
	'cats'	'hair'	'see.FUT'	'want.PRS'

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Transparency and locality in Romance vowel harmony

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Most assimilatory processes are local, i.e., they take place among adjacent segments. Vowel harmony is not strictly local, as harmonized vowels are usually separated by consonants; yet several proposals to explain this type of transparency exist (see e.g. [1]). More glaring locality violations in harmony processes are represented by cases of vowel transparency, in which a vowel intervenes between the trigger and the target vowel even when it bears the opposite value for the harmonic feature(s). Transparency in vowel harmony raises a number of empirical and theoretical questions, such as whether transparent vowels are really non-participants, which segments can be transparent, whether interactions among phonological elements can be non-local.

A few vowel harmony processes in Romance languages display vowel transparency. In some Italo-Romance and Ibero-Romance varieties (see e.g. [2, 3, 4]), when metaphony occurs in a proparoxytone the penultimate vowel is skipped, even if the stressed vowel is raised by a [+high] final vowel just as in paroxytones (e.g. /paʃar + u/ → [ˈpɔʃaru] 'bird' in Asturian). Vowel transparency is not restricted to metaphony in Romance; for example, in Canadian French [5] the laxness of the final vowel spreads to the first vowel, skipping intervening vowels, as in [ɪlisɪt] 'illicit'.

I will argue that the domain of vowel harmony in these processes is metrically defined [3, 4, 6]), and therefore these patterns are not real counterexamples to locality, if locality is interpreted as holding between structurally adjacent segments rather than between physically adjacent ones. In the metaphonic processes mentioned above and closely related ones, the penultimate vowel of proparoxytones often undergoes neutralization, assimilation to other vowels, or allophonic reduction and centralization. These processes are all typical of unstressed vowels, but they do not affect the word-final vowel. This suggests that in proparoxytones the final and the penultimate vowel do not have the same prosodic status, the penultimate being prosodically weaker (1). Assuming this representation, transparency to metaphony in proparoxytones is only apparent: metaphony targets the higher prosodic node immediately preceding the final vowel, even when a weaker syllable intervenes.

```
(1)     *
        *           *
        *     *     *
       ˈσ     σ     σ #
```

In Canadian French initial syllables bear secondary stress, which justifies the metrical representation in (2). Similarly to metaphony in proparoxytones, assimilation occurs between vowels whose syllables are metrically adjacent, even if metrically weaker syllables may intervene.

```
(2)                     *
         *              *
         *     *        *
      #  σ     σ   …    ˈσ #
```

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Tricasino metaphony in Southern Salento:
Acoustic, Articulatory and Phonological Analysis

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The Italo-Romance Southern Salentino (SS) varieties have a five-vowel system: /i, ɛ, a, ɔ, u/. This system displays metaphony that raises the stressed mid-vowels /ɛ/, /ɔ/ to the mid-close [e], [o] when followed by the high vowels [i], [u]. Acoustically, this change involves F1 lowering and F2 enhancement for [e] and only F1 lowering for [o] (Grimaldi 2003). SS metaphony is characterized by microvariation. Generally, when metaphony is active, the most common pat- tern is the raising of /ɛ/→[e] before [i]; varying applications of the assimilatory process are found in all other conditions: i.e., the cases of /ɛ/ before [u], /ɔ/ before [i], and ɔ/ before [u] (Grimaldi, Calabrese 2018). Notwithstanding this kind of microvariation, the consistent bi- modal distribution of output tokens of this process shows that it involves a generalization over discrete categories as in phonologically stabilized processes (Scobbie 2005, Bermudez-Otero and Trousdale 2013). SS metaphony is not a gradient phonetic process due to co-articulation. Furthermore, behavioral and neurophysiological investigations showed that SS metaphonic pat- terns are contrastively encoded in memory representations of speakers. This again argues for considering SS metaphony a phonologically stabilized process (Miglietta et al. 2013). To better understand this process, we focused on the Tricasino variety of SS. Our objectives were (i) to investigate the acoustic and articulatory nature of the metaphonic patterns, (ii) to establish what features are involved in the assimilatory process. In a laboratory setting, the acoustic-articulatory productions of 6 speakers (2 females; mean age 21.6, range, SD 1,21) were recorded read- ing out, at a normal rate, word stimuli embedded in a carrier phrase *Ieu ticu_moi* 'I say_now' (the words contained the target and the triggers vowels). 90 stimuli for each subject, for a total amount of 540 stimuli, randomly interchanged, were elicited. The articulatory data were ac- quired using the Aplio XV machine (Toshiba Medical System) at 25 Hz. The ultrasound video stream was synchronously acquired together with the audio signal. Independent t-tests were carried out to acoustically examine the assimilatory effects of the high vowels [i], [u], on the stressed mid-vowels /ɛ/, /ɔ/ (alpha level $p < 0.05$). Also, the non-assimilatory effect of the un- stressed vowels [e], [a] was taken under consideration (cf. Figure 1). To statistically compare ultrasound tongue curves, we used the Smoothing Spline ANOVA method (Davidson 2006). The speakers showed the metaphonic patterns described in Table 1. From an acoustic point of view, our findings show that F1 lowering seems the main correlate of the Tricasino metaphonic patterns, as already found for other harmony processes (Archangeli, Pulleyblank 1994). F2 enhancement is active only for the front allophone [e] raised by [i]. Articulatorily, the advancement/non-advancement of the tongue root resulted significantly implicated, with inertial tongue dorsum adjustments. Thus, we propose that the different metaphonic alternations observed in SS metaphony involve a right-to-left process of [+ATR] assimilation from the final vowels onto the stressed vowels. Interestingly our data showed that the same patterns of microvariation identified in Grimaldi (2003) across varieties are also found across the Tricasino speakers we investigated. Further experiments showed the same microvariation is found in the same speaker across performances. A generalization characterizes the varying patterns, though: the back vowels behave in a special way across patterns. Sometimes [u] is not a possible trigger; some other time, [ɔ] is not a possible target, or both. We will argue that the special behavior of the back vowels in SS metaphony is a consequence of the interaction between the metaphony process as [+ATR] assimilation and an independently needed constraint against [+back, +ATR] vowels (Calabrese 2000). We will suggest that in the case of Southern Salentino metaphony we are dealing with a process that is phonologically stabilized but not yet fully normativized across social groups and communities. Learners of SS varieties acquire the knowledge that there is a process of harmonic assimilation where mid stressed vowels acquire the feature [+ATR] before final high vowels. The process is interacting with the active constraint *[+back, +ATR]. Given the absence of an established grammatical norm, they are still exploring how this process works. We will show that this generates the variation that we observe in this phenomenon.
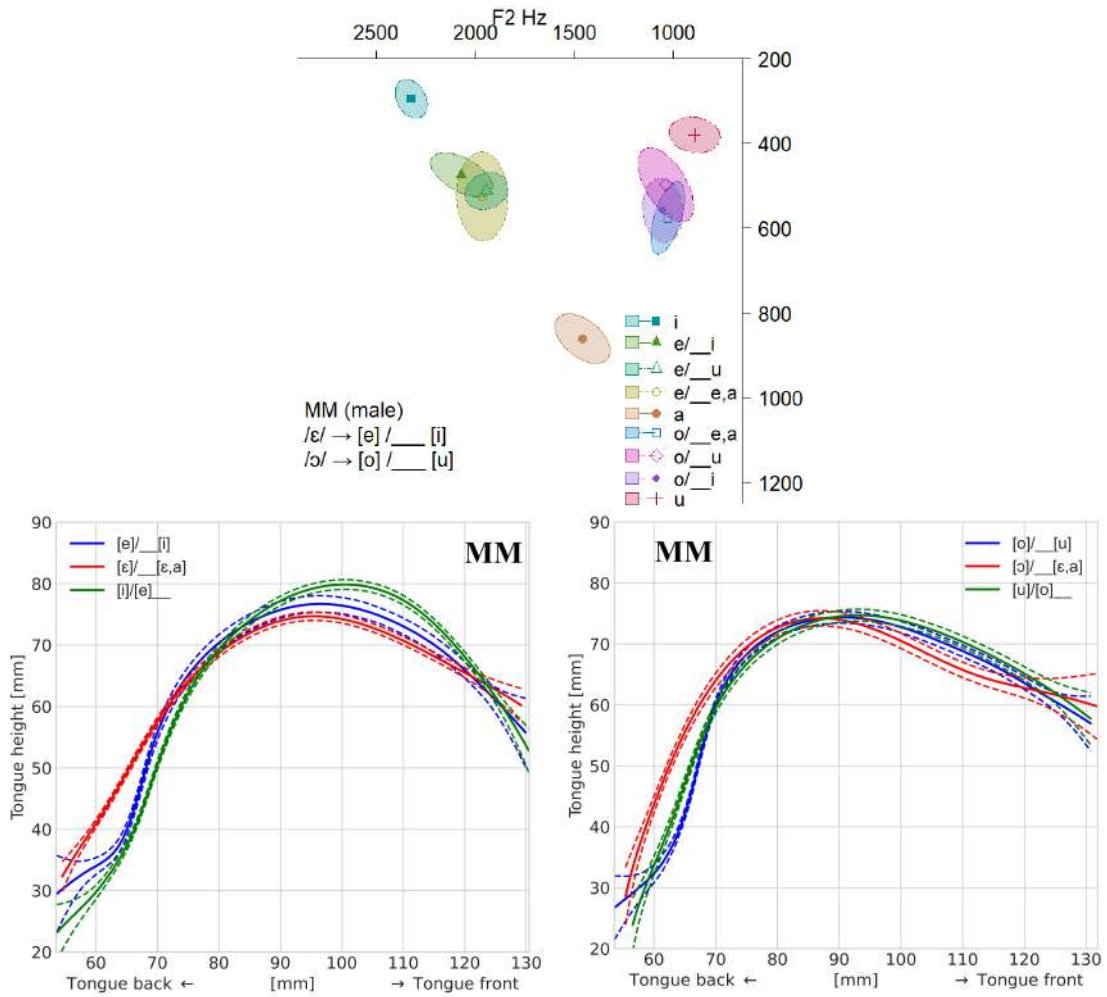
Figure 1: Top: F1-F2 scatterplot on hertz scale of the MM Tricase speaker. Significant metaphonic adjustments of mid-vowels /ɛ/, /ɔ/ are shown with ellipses on data (confidence level 68,8%). Bottom: Representative example of the articulatory data. Tongue contours of the metaphonic patterns found in the MM subject. The tongue contour of vowels affected by metaphony ([e] before [i], [e] before [u]) are compared with the tongue contours not affected by metaphony ([ɛ] before [ɛ, a] and [ɔ] before [ɛ, a]), and the tongue contour of the unstressed high vowels that triggers metaphony ([i]/[e]__ and [u]/[o]__).

Subjects	Metaphonic patterns	Interaction effects Root Advancement	Interaction effects Dorsum raising	Acoustic effects
M.B. (f.)	/ɛ/→[e]/__[i]	**	*	Raising + Front
C.R. (f.)	/ɛ/→[e]/__[i]	**	*	Raising + Front
	/ɔ/→[o]/__[u]	**	/	Raising
M.M. (m.)	/ɛ/→[e]/__[i]	**	/	Raising + Front
	/ɔ/→[o]/__[u]	**	/	Raising
G.C. (m.)	/ɛ/→[e]/__[i]	**	/	Raising + Front
	/ɔ/→[o]/__[i]	**	/	Raising
	/ɔ/→[o]/__[u]	**	/	Raising
L.G. (m.)	/ɛ/→[e]/__[i]	*	/	Raising + Front
	/ɛ/→[e]/__[u]	*	/	Raising
	/ɔ/→[o]/__[i]	*(*)	/	Raising
	/ɔ/→[o]/__[u]	*(*)	/	Raising + Posterior
G.E (m.)	/ɛ/→[e]/__[i]	**	*	Raising + Front
	/ɛ/→[e]/__[u]	*	/	Raising
	/ɔ/→[o]/__[i]	**	(*)	Raising
	/ɔ/→[o]/__[u]	**	(*)	Raising + Posterior

Table 1: significant (*) articulatory and acoustic effects of the Tricase metaphonic patterns.

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Vowel Lowering in Malayalam

Abstract: This study concerns the phonological process of vowel lowering in Malayalam. Vowel lowering is a kind of stress-induced height harmony whereby the height feature is assimilated between adjacent vowels. In Malayalam [+Dravidian][1] words, the high vowels undergo lowering in the initial syllables. This study aims to explore the factors affecting vowel lowering and its correlation to other phonological processes in Malayalam. The high vowels [i] and [u] lower into mid vowels [e] and [o] in the initial syllable when a low vowel /a/ is present in the second syllable as in (1-4):

root	vowel lowering	gloss	root	vowel lowering	gloss
1. ila	*ela*	'leaf'	*3. kuʈa*	*koʈa*	'umbrella'
2. kiŋar	*keŋar*	'well'	*4. cuma*	*coma*	'cough'

From the above examples, we can see that the height feature of the vowel in the initial syllable is assimilated into the height feature of the vowel in the second syllable. There it is clear that the constraint IDENT [HIGH] is ranked lower and is violated and the vowel sequence [+HIGH, -LOW]-[-HIGH,+LOW] is a marked structure in Malayalam. I also aim to investigate the environments where this phonological phenomenon is restricted. Yes, there are restrictions to this lowering as in (5-8):

|			
/i/ in the initial syllable	*5. vilpana*	*vilpana*	'sale'
	6. ima	*ima*	'eyelash'
/u/ in the initial syllable	*7.unnam*	*unnam*	'aim'
	8. kuttam	*kuttam*	'crime'

/i/ do not undergo lowering when followed by a consonant sequence and labial nasal and /u/ do not undergo lowering when followed by a consonant sequence. It is evident from the examples that there is a consonantal interference that is blocking the vowels from undergoing lowering. This study will look at:

a. How and to what extent are the consonant(s) interfering and interacting with vowel lowering which is a stress induced phenomenon in Malayalam? For this I am aiming to apply the element theory and an OT analysis.

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[1] Mohanan (1987) uses the feature [+Dravidian] for native Malayalam words.

b. If taken as a natural class (high vowels) why do the vowels /i/ and /u/ possess a different environment for the vowel lowering restriction? Why is the labial nasal affecting the vowel /i/ and not /u/?

I have given two acoustic graphs showing the concerned vowels when they are not affected by vowel lowering (i male and i female) and (u male and u female) as a baseline to compare when the same vowels undergo lowering.
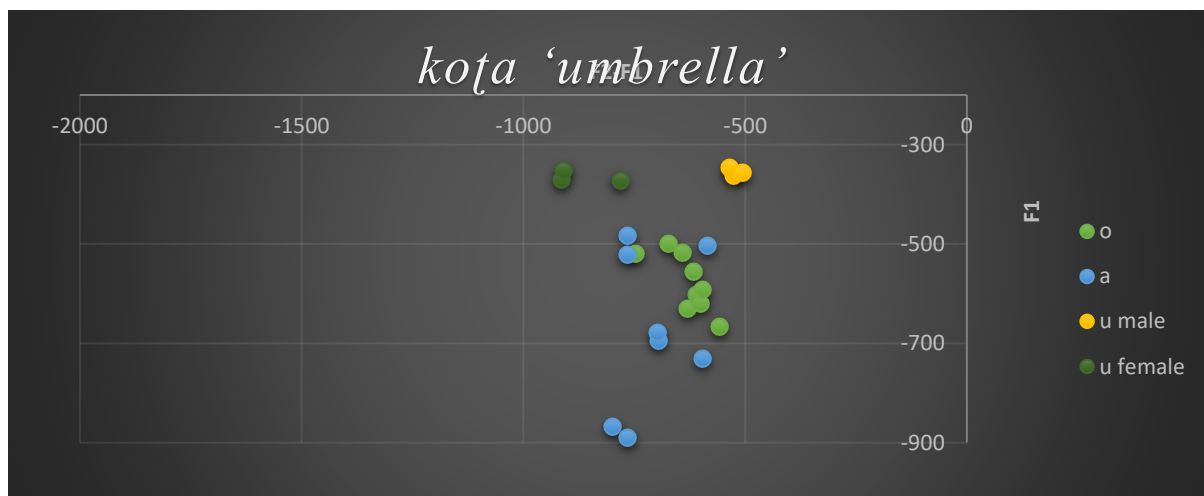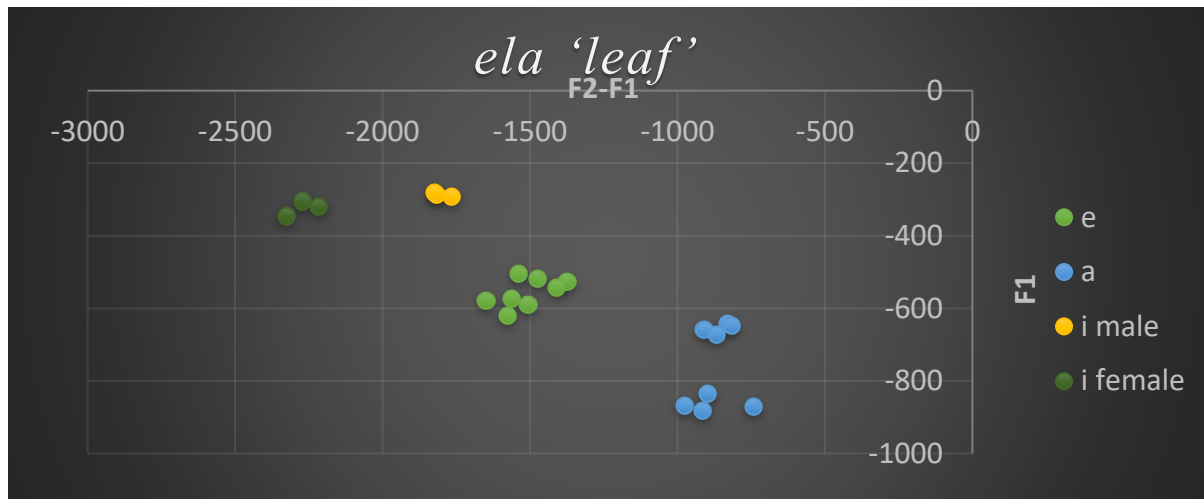
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