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Italo-Romance Metaphony as non-concatenative morphology. A bracketing paradox?

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1. Long-distance dependency relationships in Italo-Romance Metaphony

- Traditionally, Italo-Romance Metaphony is interpreted as a height harmony where stressed mid vowels undergo a raising triggered by unstressed post-tonic high vowels (Maiden 1991; Russo 2001a/b; 2002; see different approaches in Torres-Tamarit *et al.* ed. 2016).
- Metaphony emerges therefore classically as a licensing triggered by inflectional vowels. According to this view, the vowel in the stressed syllable assimilates in height features to a post-tonic high vowel
- I propose a different account of Metaphony in a theoretical model which lets us to build a derivation of the ***Righthand Head* principle** (Williams 1981 ***Righthand Head Rule*** = ***RHR***) and of the ***Mirror Principle*** (Baker 1985: 375):

Morphological derivation must directly reflect syntactic derivation (and vice versa).

- **Bracketing** - My analysis goes against Spencer (1991) hypothesis, according to which in non-concatenative morphology it is impossible to trace through a bracketing structure of constituents.
- Italo-Romance Metaphony is not an assimilatory process triggered by final /i u/, but the feature low, **the Element A is the key to understanding the process** (see Russo 2001 and 2007).
- Still, **the phonology creates the order of the morphemes**

2. Opaque Metaphony. Inflexional suffixes reduced to an Element value

- Metaphony has morphological effects illustrated from nominal paradigms, where the masculine singular inflection and the plural inflection /-u/ and /-i/ are supposed to trigger the raising of stressed vowels.
- The latter remain unaffected before the inflections /-a/ and /-e/ that indicate the category feminine singular, or feminine plural.
- In a metaphonic system, the morphosyntactic categories of NumP and N°, Number and Gender, are carried by the internal tonic vowels with an internal marking. The same applies for the TP features AGR°/T° in verbal paradigms.
- We concentrate here on some Central and Southern Italian varieties.
- Tonic vowels system affected by Metaphony (= *Proto-Romance vowel system):* {a, E, e, O, o, i}
- The deletion of final vowels makes the “metaphonic” systems opaque.
- Morphologisation of Metaphony occurred when the original conditioning environment was preserved.
- *Final vowels in Modern Neapolitan (SI):* [ə] Ø /a/ -
- This **opacity is old**, even if not complete: in Medieval Neapolitan, <e> Ø <o> /a/ - Medieval graphical <e> was realized as [ə] and replaced final /i/ and /e/.
- In most dialects, the sign of the current Metaphony is therefore to be found only on the vowel-root.
- In many Central and Southern Italian dialects, the result of the metaphonic process is in synchrony, a system of **apophonic alternations**.
- **We claim that in this apophonic operation, the morphological value of the Italo-Romance Metaphony is reduced to an Element, the apophonic A Element, that lends itself to an interpretation by combination with other vocalic material.**

3. What concatenation in the Metaphonic Italo-Romance Grammar?

In the absence of manifestations of concatenative morphology (here suffixation) we can think that it is the internal morphology, which bears the inflexional affixes within an apophonic system which is a set of predictable alternations.

Tab.1 *Apophonic Alternation in Modern Neapolitan* A → ∅

A	IA or UA		A → ∅
[mesə] M SG	ME(N)S**E** *month*	[misə] M PL	*months*
[**no**rəkə] M SG	*knot*	[**nu**rəkə]	*knots*
[vorpə] FSG	*fox*	[vurpə]	*foxes*
[**ve**rələ] M SG VIDUU	It. *vedovo*/widower	[**vi**rələ]	*widowers*

The simple mechanism to which Metaphony seems obey is the loss of the Element A → ∅ (see Russo 1996; 2001a/b; 2007). The element A is dissociated from the left tonic vowel:

Root m-i-s-*N* Ita. *mesi* Eng. *months*
Root r-u-s-s-*Adj* Ita. *rosso/rossi* Eng. *Red*

The metaphonic raising and diphthongs become, after that final morphemes have been opacified, the only means for morphology to distinguish the morphosyntactic categories of gender and number.

4. Openness Metaphony….

The vowel change, relative to the height, can be represented as a decrease of a vowel component. Within *Dependency Phonology*, Maiden (1991, 139 discussed in Russo 1996, 2001a and 2007) already proposes to express the structural change of the **Metaphony as *Demotion* of |a|:** V→ -|a|. Its causal relationship with the metaphonic triggers consists in the fact that /i/ and /u/ are ~ |a|.

We have continued in the same line, considering Metaphony as the dissociation of the Element (A) (Russo 1996; 2001a/b; 2007).

- I have argued strongly (in Russo 2001a/b; 2007) that the responsible of the Metaphony is an Element, and specifically not one or the ones that we were expecting for...
- I brought conceptual and empirical arguments, which indicate that the Element A (the one that defines low and mid vowels) is the active element in the Italo-Romance Metaphony. He is active in blocking a spontaneous change in the tonic vowels.

5. The A Element is a metaphonic infix

- We argue strongly that Metaphony results - as in non-concatenative morphology - from the fusion of two elements/morphemes, a discontinuous open A element which merges with an I or U morphemes in the root – as an interdigitation of two infixes : I°/A° = e° or U°/A° = o°. In Italo-Romance metaphony we have a non-concatenative fusion of two heads morphemes:

I°/A° = e°:

Root m-i-s-*N* Ita. *mesi* Eng. *Months*
m-e°-s-*N* I°/A° Head2/Head1

or U°/A° = o°

Root r-u-s-s-*Adj* Ita. *rosso/rossi* Eng. *Red*
r-o°-$_{\varnothing s}$-s-*Adj* U°/A° Head2/Head1

6. Linearity and Metaphony. Minimalist Position

In our approach, linearity is not a feature (pre)supposed by the syllables. Linearity is a derived property *builded*. We criticize numerical concatenation which gives undetermined constituency. Our approach to the concatenation uses a *(a)-local relation* and build constituents.

We start from a *non-oriented adjacency*, a binary relation, symmetrical and non-transitive, in which the sequences are reduced to the occurrences of primitives. Our objectives are two: construction and interpretation. We derive linearity through syllabification from right to left.

How linearize the phonological information of morphemes?

We can build a linearization of forms that are morphologically complex.

I propose here a model to analyse relations between internal morphemes that cannot be described by a concatenative modality.

Test: Metaphony process

Italo-Romance Metaphony builds a linearization of complex morphological forms. There is no coincidence between morphemic and syllabic structures. Occurrences of primitives I, A, U produce sequences of concatenation by construction.

In our approach, the morphological structure is hierarchical, and the phonological interpretation creates the linearity. In this approach the primitives within morphemes have only between them some relations of adjacency, that correspond to the selection (in other words to the sub-categorisation).

The phonological linearization backward is responsible of the inverted character, strictly in mirror, of the morphological structure realisation.

Particularly in Italo-Romance Metaphony the phonological interpretation of two heads builds linearity: [head°$_1$[$_{compl}$head°$_2$]. Both heads have phonological material.

7. The hierarchical concatenative and non-concatenative modality

Given a radical and a flexional suffix, the suffix is the realization of a head (see Williams 1981, Selkirk 1982). In generative morphology, we say by definition that the head of a morphologically complex word is the member to the right of this word (*RHR*, Williams 1981: 248):

RHR=*Righthand Head Rule*

In morphology, we define the head of a morphologically complex word to be the righthand member of that word

Within the flexional morphology the *Mirror Principle* of Baker (1985) is satisfied: the morphological structure reflects the syntactic structure. This principle implies that the order of the affixes in the morphological structure of the word reflects the hierarchy of functional heads in the phrase.

The movement can affect heads that are on the level of the word (affixes), not only phrases and this type of movement is subject to the same constraints as those which regulate the phrasal movement. **The affixes are functional syntactic categories**, like the others positions in the syntactic designated nodes.

Thus, in concatenative morphology we have concatenation from the head to the dependent, as in:

Fre. *chanteur* ‘singer’ [$_N$œʁ-N° [$_V$chant-V]] in other cases between gender and number

[Ge°[N° or [$_{NumP}$Num° [N° as in Ita. [$_{DP}$ i° [$_{NumP}$i° [$_N$tavol-]]] ‘i tavoli/ the tables’ (the first ‘i’ is D, the second ‘i’ is the suffix [+ count]).

In the first case, the head manifests itself as such because it determines the category of the word ([$_N$œʁ-N°]); in the second case, the head is syntactically defined: it is a functional category of Number or Gender. We could also have functional categories of person (AGR°) and time (T°) associated with the verb:

[$_{TP}$ iamo-1PL/Pres° [$_V$cant-V]] ‘we sing’.

These representations exhibit the hierarchical relationship between the suffix and the root. The functional head before the root, suggests that the relationships *Agreement/Time*-Verb or *Gender/Number*-Noun are cases of syntactic order head-complement. The hypothesis here defended is that the linearity is built on the morphemes with an effect retrograde (backwards). The process of syllabification producing the linearization starts in a morphological head and then accesses the dependent of this head so that the hierarchical relationship head-dependent is carried out by an effect of the phonology, such as a result of dependent-head.

What about the status of intermediate morphemes?

Words can have more than one morpheme in them. In regard to the Indo-European languages, the Germanic group presents apophonic phenomena. Strong verbs have alternations of vowels in root non-conditioned, known as *Ablaut* or Apophony. English has some verb forms exhibiting apophony in the base:

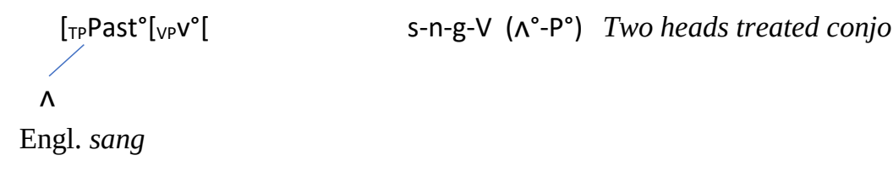
run/ran, swim/swam, come/came, meet/met, speak/spoke, choose/chose….

In German or English apophony, as it is in Italo-Romance Metaphony, discontinued morphemes are heads, treated in our approach by morphology conjointly not successively: through a mechanism we call **interdigitation**. Interdigitation of (non-concatenative) morphology is just a marked case of concatenative morphology. Other languages like the Semitic languages (Arabic, Hebrew), make much heavier and more regular use of interdigitation. In non-concatenative morphology of Semitic languages there is not an immediate correspondence between morphology and syllabification: the phonology produces the morphology.

8. The order within words is construed as an effect of phonology

In the case of apophonic verbs Eng. s**i**ng /s**a**ng/s**u**ng or in the apophonic system of the German strong verbs s**i**ng /s**a**ng/ges**u**ngen (also *h**e**lfe*, *h**a**lf*, *geh**o**lfen*, etc. with complex vowels) the vowels are Tense markers.

Past is a morpheme F° (Fusional morpheme) which is treated conjointly with the dependent: Past°/v°.



s-n-g-V (ʌ°-P°) *Two heads treated conjointly*

This gives a complex content which is a complex morphological identification: ((sʌ°N)(g)).

The categorial root and the vowel heads trigger simultaneously the syllabification; H_1/H_2 are the two competitors forms, both pronounceable.

One of the two morphemes supplies the complementary vocalic support (integrable). The morphological process central to these derivations is apophonic.

In many and central Italian dialects, as in Neapolitan, we observe the coexistence of two opposite morphological strategies: the apophony in competition with a concatenative morphology. Similarly, in the Germanic verbs, the apophonic class of strong verbs (*Ablaut*-class) is in competition with the class of weak verbs, which derives its forms mostly through suffixes.

9. Arabic infixation. Interdigitation of morphemes

The non-concatenative morphology has for effect the *interdigitation* of the head; we see now how this model applies to the morphology of the Arabic language.

In particular, the apophony is part of the morphology (especially verbal) of the semitic language. Our model explains also the archetype of non-concatenative morphology where we have segregation of vocalic heads as in Arabic language, see the following derivations :

a) [katab] ‘write’ perfect active

(a° - AGR (ktb - V)))
(a° - AGR (kv°))((t)v°(b)))
(a°- AGR (kv°))((t)v°(b)))
(ka°))((t)(a°(b)))
b) [kutib] ‘write’ perfect passive

In a), the morpheme *a* occupies two positions, what can be described by as an iteration of an insertion leaving a trace.

c) Classical Arabic [kataba] ‘he wrote’ (cyclic non-concatenative); resolution by *fusion* or *co-syllabification*:

(a-**3MSG** ((a-**T'**) (a-**T/AGR** (k-t-b-**V**) [kataba]
L L
Fus. Fus.

→ (a-**3MSG** ((a-**T'**) (k-t-b-**V/AGR**-a)

k-t-b-**V/AGR**
|
(a-**T'**)
→ k-(tab)
/
(a-T')
→ (ka)(tab)
(a-**3MSG** ([(ka)(tab)])
→ [(ka)(ta)(ba)] (resyllabification)

Morphological resolutions:
Theoretical configuration: [Functional Category [Lexical Category

Successive resolution (concatenative morphology):
[a-Funct.C [k-t-Lex.C
[a°- Funct.C [k-t-Lex.C
[k-(t-a°) < Funct.C-Lex.C>
(k<ə>)(ta°) < FunctC-Lex.C> [k(ə)ta]

Resolution by fusion (co-syllabification) (non-concatenative morphology)
[a-Funct.C [k-t-Lex.C
[a-Funct.C--Lex.C-t-k
[a°- Funct.C--Lex.C (t)-k
[(ka°(t) <Funct.C--Lex.C > [kat]

In Italo-Romance metaphony or in English apophony (*sung*), as in Semitic languages we can have internal functional heads, as in Semitic the Tense Perfective is Head$_1$ and the melodic content v° Head$_2$, two disjoint contents Tense/v° (H_1/H_2), as in ə-k-t : (ə)(ku°(t). I consider that the following morphological resolution applies to Semitic languages as well as to Italo-Romance Metaphony or to Germanic apophony .

11. Italo-Romance Metaphony as Words Syntax

In Italo-Romance Metaphony, the morphology is also a result of phonology.The discontinuous morpheme [+M], the element A, enters in the computation of the root. r-u-$_{\varnothing s}$-s- Adj [rossA] U°/A° ----A
A -Fem

Here above the final morpheme, the primitive element A° (which is here the feminine morpheme), is the head which triggers the process of interdigitation. Its properties are integrated and built into the phonological object, the root: U°/A° = (o°): russ-A → [rossA]. I consider A° as a functional head higher than N, categorially transparent, which identifies the feminine Ge(nder) and the Num(ber) (singular and plural) in the *Adj*.

With the analysis of Metaphony I gave means of treating the integration into phonological constituents of material coming from different morphemes.

The mechanism used here for non-concatenatives morphologies is *incorporation*. My starting point is that inflexion is analysable as a series of hierarchised heads (see already Pollock 1989):

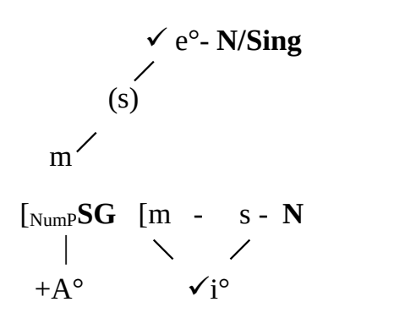
a morpheme can have one or more heads.

If two heads lexically adjacent become heads of two adjacent syllables, their lexical adjacency is preserved.

[$_{NumP}$SG-A Pl-∅ [Ge [N

[✓e°- **Sing** [m - s - **N** ($_I$ T ($_I$ I̲ A)) = [e]
[✓i°- **Pl** [m - s - **N** T(I) = [i] (A → ∅)

A° - **SG** /**N** - s - ✓i° - m



Interdigitation / fusion SG.[mes(ə)] vs. PL. [mis(ə)]

A bracketing is possible within a morphology which treats successively the morphemes, but we have easily also explained the non-concatenative morphology (simultaneous or fusional) of Italo-Romance Metaphony by a bracketing which supposes in one case at the beginning a simple operation of fusion/interdigitation of the morphemic heads.