

Derived Environment Effects and Consistency of Exponence

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Workshop “Freedom of Analysis?”
September 2, 2005

Goal

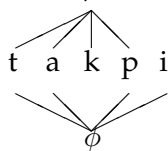
Defend the assumption that Gen is restricted by a principle called Consistency of Exponence (McCarthy & Prince, 1993, 1994); and show how this helps us understand Derived Environment Effects.

1 Coloured Containmentment

Definition 1 (Consistency of Exponence) *No changes in the exponence of a phonologically-specified morpheme are permitted.*

(McCarthy & Prince, 1993, 1994)

Consistency of Exponence gives the following output representations (for /takp/ → [tapi]):



A special case of CoE is:

Definition 2 (Containment) *No element may be literally removed from the input form. The input is thus contained in every candidate form.*

Prince & Smolensky (1993) implemented Containment in one specific way, the Parse & Fill Model:

1. PARSE: Deleted elements are ‘not parsed’ in the phonological structure
2. FILL: Inserted segments are ‘empty’

Instead of this, we propose an alternative implementation, *Coloured Containment* of which the most important constraints are.

- PARSE- $\phi(\alpha)$: The morphological element α must be incorporated into the phonological structure. (No deletion.)
- PARSE- $\mu(\alpha)$: The phonological element α must be incorporated into the morphological structure. (No insertion.)

Correspondence Theory obviously is a more powerful theory of faithfulness than CC. Proponents of CT should thus show that we need this power independently. However, the literature so far has not given uncontested evidence to this effect:

- Output-Output Correspondence: Stratal OT / Derivational OT (has the advantage that it is more restricted and makes predictions about interaction with morphology)
- Intercandidate Correspondence (Sympathy): CC has its own way of dealing with Opacity
- Base-Reduplicant Correspondence: Accounts are available where the copying is morphological rather than phonological Inkelas & Zoll (2005); McCarthy & Prince (1994)

2 The Need for Morphological Colours

- There already is quite some literature which refers to the morphological colours:
 - FAITH-root $\gg$ FAITH-affix
 - FAITH-Noun
 - ALIGN-(M, Φ) (or ANCHOR)
- Whether or not we want to be able to formalize all these distinctions, is an empirical matter; but we can only formalize them with colouring
- The alternative to these approaches are cophonologies
- I am aware of one argumentation against Interface / Indexed Constraints: (Anttila, 2002, 29)
- The arguments are based on vowel mutation and deletion in Finnish:
 - $a \rightarrow o / \{ i, a, e \} . \text{---} -i_{pl,past}$
 - * pala-i $\rightarrow$ palo-i, ‘burn-PAST’
 - $a \rightarrow \emptyset / \{ u, o \} . \text{---} -i_{pl,past}$
 - * otta-i $\rightarrow$ ott-i, ‘tale-PAST’

- However, there are lots of irregularities and subregularities:
 - Differences between suffixes
 - * keitto-la-i-ssa → keitto-lo-i-ssa ‘kitchen-PL-INE’
 - * kerto-ma-i-ssa → kerto-m-i-ssa ‘factorial-PL-INE’
 - Lexical exceptions:
 - * jumala-i-ssa → jumalissa ‘God’
 - * kakara → kakaro-i-ssa ‘brat’
- Anttila argues that a cophonology approach is preferable to ‘interface constraints’

1. Argument I against interface constraints

- ‘the problem is that the ranking of the suffix-specific constraint is phonologically motivated’ (initial consonants have some effect)
 - this argument only holds for a stupid version of IC, where you do not look into the internal structure of these suffixes at all (so the constraints really say DEL-la vs. DEL-ma)

2. Argument II against interface constraints

- ‘nouns tend to mutate, adjectives tend to delete [...] a major problem for this approach is that nouns and adjectives are far from homogeneous classes [...]’
 - we thus cannot refer to the categories N and A in this case, but it is not clear how this necessarily distinguished cophonologies from interface constraints
- ‘in order to fix [this problem], one might resort to lexeme-specific constraints [...] However, recall that the exceptionality of jumala is far from a random fact: jumala ‘God’ can be exceptional precisely because it is a phonologically neutral /a/+coronal stem’
 - again, this affects a stupid version of IC only, which talk about whole words, not about individual structures

3. Argument III against interface constraints

- ‘finally, a general reason for preferring the partial ordering model to the interface constraint model is that the former extend to variation’
 - However, the partial ordering (=cophonologies) model has to deal with the following question: ‘if alternation and variation are two different manifestations of phonological subregularities [...] a further question arises: why do we sometimes get alternation, but no corresponding variation, and conversely, why do we sometimes get variation, but no corresponding alternation?’ (Anttila, 2002, 29).
 - The answer is: ‘Why these two cases should be different is unclear’ (Anttila, 2002, 30)

- The only explicit attack against Consistency of Exponence of which I am aware is Walker & Feng (2004)
- They suggest that CoE is not a restriction of Gen, but actually a set of violable constraints
- The argumentation should therefore be that CoE is sometimes violated in natural language; this is the type of argument Walker and Feng try to provide.

Anxiang Diminutives

Stem	Diminutive	Gloss
p ^h a	p ^h apər	‘claw’
ke	kekər	‘square’
to	totər	‘pile’
p ^h wu	p ^h wup ^w ər	‘shop’
p ^h au	p ^h aup ^h ər	‘bulb’

- ALIGN[σ]: ‘Each morpheme should occupy exactly one syllable and vice versa’
- IDENT-MM (=violable CoE): ‘Let α be a morpheme in the input, and β be its correspondent morpheme in the output. If α has phonological content ϕ , the β has phonological content ϕ and vice versa.’

ke ₁ , r ₂	ALIGN[σ]	IDENT-MM
a. [ke] ₁ [r] ₂	*!	
b. [ke] ₁ kə[r] ₂	*!	
☞ c. [ke] ₁ [kər] ₂		*

But ALIGN[σ] is violated both by *ke-* and by *-r*, so that it has 2 violations. On the other hand, (b) has only 1 (for *r*, but not for *ke*). This means that even if we do not take (c) into consideration – because this is not generated under CoE – the correct surface string *kekər* would still win.

ke ₁ , r ₂	ALIGN[σ]	IDENT-MM
a. [ke] ₁ [r] ₂	**!	
☞ b. [ke] ₁ kə[r] ₂	*	

3 DEE and Colouring

1. Example I: Korean Palatalisation (Iverson, 1993; Polgárdi, 1998)

- t, t^h → tʃ, tʃ^h
- hæ tot+i → hæ doʃi ‘sunrise-NOM’
- mati → madi ‘knot’

2. Example II: Turkish Vowel Harmony (Clements & Sezer, 1982)

- Turkish has VH:

	<i>nom.sg.</i>	<i>gen.sg.</i>	<i>nom.pl.</i>	<i>gen.pl.</i>
'rope'	ip	ipin	ipler	iplerin
'girl'	kız	kızın	kızlar	kızların
'face'	yüz	yüzün	yüzler	yüzlerin
- but roots can be disharmonic: *vali* 'governor', *kitap* 'book', *hareket* 'movement', *hesap* 'bank account', *bobin* 'spool'
- Epenthetic vowels are subject to harmony

	<i>careful form</i>	<i>colloquial form</i>
'fettters'	pranga	piranga
'cruiser'	kruvazör	kuruvazör

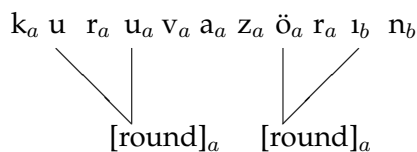
3. Example III: Finnish Vowel Coalescence (Antilla, 2005)

- Colloquial Helsinki Finnish has a rule of Vowel Coalescence: /makea/ 'sweet' → má.ke.a, má.kee
- notes that VC is subject to a quantitative DEE effect:
 - VC is categorically blocked in **non-derived environments** if the structural change is highly marked. If the structural change is unmarked, VC may apply.
 - VC is quantitatively dispreferred in **derived environments** if the structural change is highly marked. If the structural change is unmarked, VC is quantitatively preferred.

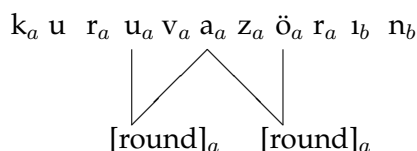
4. Example IV: Polish Spirantisation Rubach (1984); Łubowicz (2000, 2005)

- /brɨj+ek/ → [brɨjek]
- /rog+ek/ → [roʒek], *[rojek]
- In order to have DEE work in constraint-based theory, we need to be able to evaluate both input and output
- We thus need aspects of both faithfulness and markedness
- The advantage of CC is that it offers both in one representation

Allowed



Disallowed

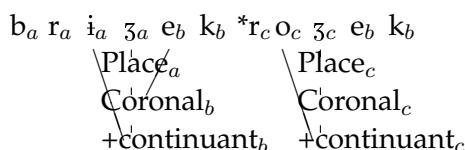


Apparently, association between elements of the same colour is not allowed, unless it is underlying.

Definition 3 (Alternation) : *If an association line links two elements of colour α , the line should also have colour α .*

- Korean and Finnish work in the same way
- The case of Polish is a little more complicated, since it does not involve a completely ‘new’ segment, but a segment which changed
- In this case, ALTERNATE works at a subsegmental level
- We need a theory of Feature Geometry, which can express the intimate connection between [continuant] and Place. E.g. Padgett (1991): [continuant] depends on Place
- In line with the tradition, we assume that palatalisation is ‘assimilation’ with the vowel on the righthand side
- With we also assume (Rubach, 1984) that the relevant context for spirantization is the lefthand side, since it happens after vowels and sonorants, but not after obstruents:
 - róg ‘horn’ → ro[ɕ]ek (DIM), potęga ‘power’ → potę[ɕ]ny (ADJ), skarga ‘complaint’ → skar[ɕ]yć ‘complain’
- I will assume that this is progressive assimilation of continuancy

Colours in Polish



3.1 Comparison to other models

- Constraint Conjunction

The most well-known analysis of DEE within OT is Łubowicz (Łubowicz, 2000). DEE are seen as a result of conjunction of Faithfulness and Markedness constraints. E.g. for Polish this is [*ɕ&IDENT-[CORONAL]]_{segment}. In its original formalation, ConCon did not have a theory of locality: there is no reason why it would be restricted to the segment This predicted unattested long-distance effects:

 - ɕem+ik+ek → ɕemiček

This is repaired in (Łubowicz, 2005), by using McCarthy (2003)’s idea of a locus function (restricting all constraints to the level of the segment). This is incompatible with autosegmental assumptions. Further, morphological and phonological DEE get different treatments.
- Comparative Markedness

DEE can also be accounted for under Comparative Markedness. Like Coloured Containment, CM refers to differences between ‘old’ and ‘new’

material. Markedness constraints can refer to ‘old’ violations (those already underlyingly present) vs. ‘new’ violations (those created by Gen). In the case of Polish, this would involve $*\phi_{New}$. CM is in a certain sense a Correspondence version of Coloured Containment (Colouring was inspired by McCarthy (2003)). Like ConCon, CM is crucially based on the Locus function. In order to describe morphological DEE, CM has to refer to $M-OO_{New}$. This has the undesirable result of deriving anticyclicity:

- Underived form: *kitep* ($_{O}SPREAD$ is applicable, since $_{N}SPREAD$ is not).
- Derived form: *kitep-lar* ($_{O}SPREAD$ applies to stem element, but not to suffixes).
- Derived form: *kitep-ler-an* ($_{O}SPREAD$ applies to *kitepler*, but not to the whole word)
- Root Faithfulness
Root Faithfulness is proposed as a device for DEE in Antilla (2005). It gives very similar effects; e.g. in Turkish, both suffix vowels and epenthetic vowels are not part of the root. This is why they can both assimilate. Root Faithfulness constraints are obviously a type of Interface Constraints. Coloured Containment can be seen as offering an implementation for Root Faithfulness. It is not clear how we could derive the phonological DEE of Polish without taking recourse to more sophisticated phonological representations, since $[\pm\text{continuant}]$ and $[\text{Coronal}]$ represent different dimensions.

- Consistency of Exponence restricts the Generator function
- From this, it follows that Correspondence is probably superfluous
- (Certain types of) opacity follow from containment
- Also Derived Environment Effects are basically expected under Coloured Containment
- None of this can be evaluated without some basic assumptions about representations

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