

My Modest Proposal

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

DEE and CoE

Coloured Containment

Faithfulness and Consistency of Exponence

Coloured Containment and Correspondence

The Need for Morphological Colours

Reference to Morphological Colours in the Literature

Arguments against Indexed Constraints

Consistency of Exponence is Inviolable

DEE and Colouring

Derived Environment Effects

Colours show Derived Environments

Comparison to other models

Conclusions

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Consistency of Exponence

No changes in the exponence of a phonologically-specified morpheme are permitted.

(McCarthy & Prince 1993ab)

Prof. Curt Rice (University of Tromsø)

“Nobody understands Consistency of Exponence.”

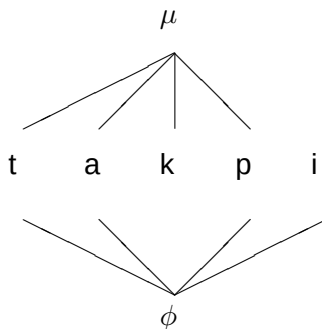
Consistency of Exponence

“[CoE] means that the lexical specifications of a morpheme (segments, prosody, or whatever) can never be affected by Gen. In particular, epenthetic elements posited by Gen will have no morphological affiliation, even when they lie within or between strings with morphemic identity. Similarly, underparsing of segments — failure to endow them with syllable structure — will not change the make-up of a morpheme, though it will surely change how that morpheme is realized phonetically. Thus, any given morpheme’s phonological exponents must be identical in underlying and surface form.”

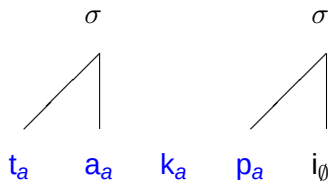
This differs from Bye’s Radical Phonological Conservatism, and also from Morén’s view on morphology-free phonology.

Picturing Consistency of Exponence

/takp/ → [tapi]



Picturing morphological colours



Containment

No element may be literally removed from the input form. The input is thus contained in every candidate form.

The Parse and Fill Model

(Prince and Smolensky 1993)

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

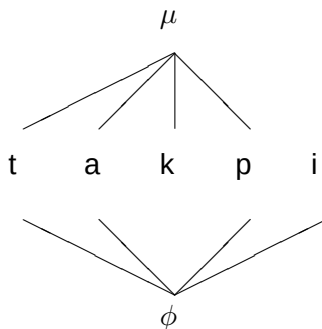
Problems with the P &F Model

The problems with P&F are mainly with the Fill component:

- It falsely predicts that epenthetic segments are empty, and cannot be the target of vowel harmony, assimilation, etc.
- It does not have any theory about insertion of features.

Picturing Consistency of Exponence

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Coloured Containment

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

Comparing CC and Correspondence

- Correspondence Theory obviously is a more powerful theory of faithfulness than CC
- Proponents of CT should thus show that we need this power independently
- There is a vast literature on this

The Power of Correspondence Theory

- Output-Output Correspondence
- Intercandidate Correspondence (Sympathy)
- Base-Reduplicant Correspondence

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Alternative accounts are available

- 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 and Prince 1993b)

Cf. also Uffman, this conference on syntagmatic Correspondence

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Opacity

- Every Correspondence-based account of Opacity further extended the power of the theory, and thus is no proof that we need the original power
- CC gives an enriched phonological representation; in particular, deleted segments can still be present in some sense, blocking or triggering processes
- It is an empirical issue whether or not this power is sufficient

Opacity: Example

(Hellendoorn Dutch; Nijen Twilhaar 1990)

wɛrk_ɪŋ ‘(to) work’ wɛrk_ɪŋ ‘(we) worked’

hop_ɪm ‘(to) hope’ hop_ɪŋ ‘(we) hoped’

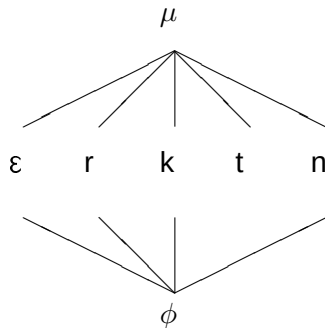
Hellendoorn Rule-Based

	/wɛrk/+/n/ '(to) work'	/wɛrk/+/t/+/n/ '(we) worked'
[+nasal] → [α Place] / [α Place] ___	wɛrk _ɨ ɲ	wɛrk _ɨ tɲ
t → ∅ / C___ C	—	wɛrk _ɨ ɲ
	[wɛrk _ɨ ɲ]	[wɛrk _ɨ ɲ]

Hellendoorn Sympathy-Based

/wɛrk/+/t/+/n/	*CCC	✿ IDENT-Place	SPREAD	★ MAX-C
[wɛrkɿ]		*!		*
☞ [wɛrkɿ]			*	*
✿ [wɛrkɿ]	*!			
[wɛrkɿ]	*!		*	

Hellendoorn Colour-Based



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Colours in the Literature

- There already is quite some literature which refers to the morphological colours:
 - FAITH-root»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 cophonomies

Example: Root stress >> affix stress in Cupeño

(Alderete 1997)

nə-yax	'I say'	pə-háw-pə-qal	'He sang'
pə-yax	'S/he says'	pə-pulín-qál	'She gave birth'
čəm-yax	'We say'	nə-ŋíj-qal-i-pə	'When I go away'

- The phonology needs to 'see' the difference between morphological categories in some way
- This implies colouring

Arguments against Indexed Constraints

- I am aware of one argumentation against Interface / Indexed Constraints: Anttila 2002 (NLLT)
- 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'

Exceptions in Finnish Vowel Mutation

- 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’

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)

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

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)

Summary of arguments against indexed constraints

- None of the arguments against indexed constraints seem particularly convincing
- We clearly need to have a theory of morphological visibility in phonology, independent from our other theoretical choices
- As an aside, notice that Anttila (2005) [!] gives explicit arguments for Root-Faith in Finnish instead of cophonologies.

Consistency of Exponence is Inviolable

- The only explicit attack against Consistency of Exponence of which I am aware is Walker and Feng (2004) (Appeared on ROA yesterday)
- 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

(“a Chinese dialect spoken in the Hunan Province in central China”)

<i>Stem</i>	<i>Diminutive</i>	<i>Gloss</i>
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’

Constraints

- 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. $[ke]_1kə[r]_2$	*!	
☞ c. $[ke]_1[kər]_2$		*

Tableau

But ALIGN[σ] is 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. $[ke]_1kə[r]_2$	*	

No Proof Against CoE

Walker (p.c.): “The $\text{ALIGN}[\sigma]$ constraint is actually a cover constraint for four alignment constraints operating over syllables and morpheme edges, [...]. (a) and (b) each actually incur two violations. (a) incurs 1 violation wrt align $\text{ALIGN}(\mu, L, \sigma, L)$ and 1 wrt $\text{ALIGN}(\mu, R, \sigma, R)$. (b) incurs 1 wrt $\text{ALIGN}(\mu, L, \sigma, L)$ and 1 wrt $\text{ALIGN}(\sigma, L, \mu, L)$. However, (c) obeys each of the four alignment constraints under our interpretation whereby it violates CoE. If the four constraints that compose $\text{ALIGN}[\sigma]$ are tallied together, violation of CoE is crucial. But this has brought to our realization that a ranking of $\text{ALIGN}(\mu, R, \sigma, R) \gg \text{ALIGN}(\sigma, L, \mu, L)$ might obtain the desired result [...].”

Unpublished (and Inaccessible) Evidence

“Violation of Consistency of Exponence has also been observed in Turkish (Karabay, to appear) and in the Jian’ou Chinese dialect (Feng, in prep.). ”

Derived Environment Effects

- Some phonological processes only apply in derived environments.
- Traditionally, two types of derived environment are recognized:
 - phonologically derived environments
 - morphologically derived environments
- In as far as this effect is real, phonological theory needs to account for it

Example I: Korean Palatalisation

(Iverson 1993, Polgárdi 1998)

- $t, t^h \rightarrow tʃ, tʃ^h$
- $hæ \text{ tot}+i \rightarrow hæ \text{ do}dʒi$ ‘sunrise-NOM’
- $mati \rightarrow madi$ ‘knot’

Example II: Turkish Vowel Harmony

- 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>
'fetters'	pranga	pıranga
'cruiser'	kruvazör	kuruvazör

Example III: Finnish Vowel Coalescence

- Colloquial Helsinki Finnish has a rule of Vowel Coalescence: /makea/ 'sweet' → má.ke.a, má.kee
- Anttila (2005) 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.

Example IV: Polish Spirantisation

(Rubach 1984, Łubowicz 2002, 2005)

- /brɨj+ek/ → [brɨjek]
- /rog+ek/ → [roʒek], *[rojek]

Example V: Tuscan Italian

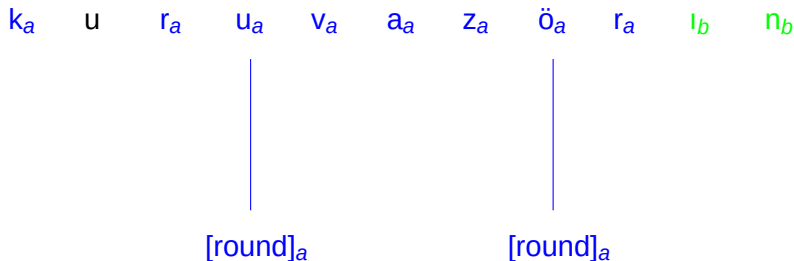
(Krämer 2005)

- *fu[z]o* ‘melted’ - *fu[s]o* ‘spindle’
- *ro[z]a* ‘rose’ - *ro[s]a* ‘itch’
- *di[z]onesto* ‘dishonest’, *di[z]uguale* ‘unequal’

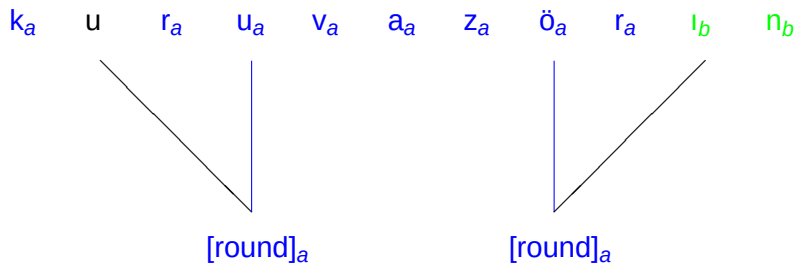
DEE as an effect of colouring

- 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
- In Correspondence, the separation between F and M is too large, causing problems of locality
- From the rule-based work on DEE, we know that there are several diagnostics for DEE-sensitivity (lexical rules, structure-building, etc) but also that there are problems with these diagnostics

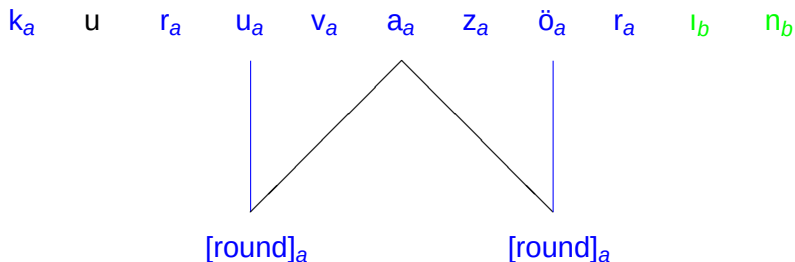
Colours in Turkish



Allowed



Disallowed

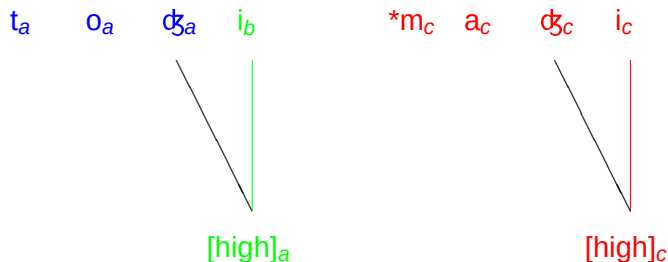


Alternation Constraint

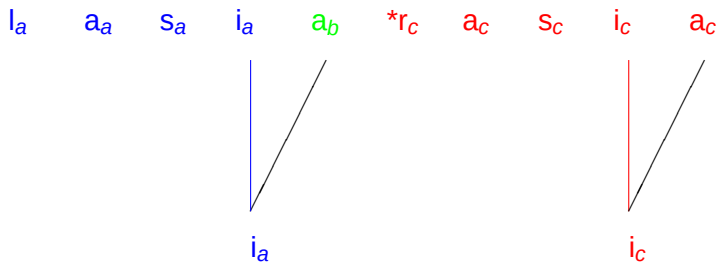
Apparently, association between elements of the same colour is not allowed, unless it is underlying.

- **ALTERNATION:** If an association line links two elements of colour α , the line should also have colour α .

Colours in Korean



Colours in Finnish



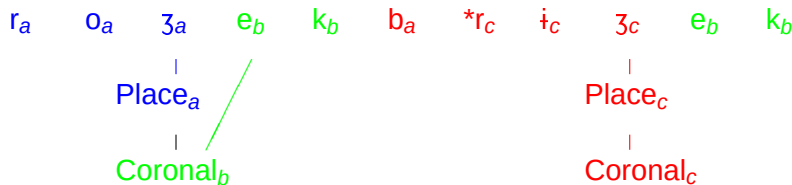
Feature Geometry of Polish

- 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

Polish: More Representational Preliminaries

- In line with the tradition, we assume that palatalisation is ‘assimilation’ with the vowel on the righthand side
- With Rubach (1984) we also assume that the relevant context for spirantization is the lefthand side, since it happens after vowels and sonorants, but not after obstruents:
 - róg ‘horn’ → ro[ʒ]ek (DIM), potęga ‘power’ → potę[ʒ]ny (ADJ), skarga ‘complaint’ → skar[ʒ]yć ‘complain’
- I will assume that this is progressive assimilation of continuancy (cf. Mascaró 1983, Harris 1984)

Colours in Polish



Colours in Polish



Remarks

- Notice that all the cases of DEE can be analysed as instances of spreading
- It remains to be seen whether this is true for all DEE, and if not, how other cases are to be analysed
- This also requires a theory of faithfulness to association lines; Turbidity Theory may be a solution to this (Goldrick 2000, Revitihadou upcoming in two hours from now)

Constraint Conjunction

- The most well-known analysis of DEE within OT is Łubowicz (2002)
- DEE are seen as a result of conjunction of Faithfulness and Markedness constraints
- E.g. for Polish this is [$*\phi$ &IDENT-[CORONAL]]_{segment}

Constraint Conjunction: Evaluation

- 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:
 - $\text{ɖem} + \text{ik} + \text{ek} \rightarrow \text{ɖemi}\check{\text{c}}\text{ek}$
- This is repaired in Łubowicz (2005), by using McCarthy's (2003) 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 * ϕ_{New}
- CM is in a certain sense a Correspondence version of Coloured Containment (Colouring was inspired by McCarthy 2003)

Comparative Markedness: Evaluation

- 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 Anttila (2005)
- This 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

Root Faithfulness: Evaluation

- Coloured Containment can be seen as an implementation of Root Faithfulness
- It is not clear how we could derive the phonological DEE of Polish without taking recourse to more sophisticated phonological representations, since [$\pm$ continuant] and [Coronal] represent different dimensions.

Feature Contiguity

- Feature Contiguity is proposed as a device for DEE in Krämer (2005)
- Underlying sequences of features should be faithful
- This makes the first and the last feature susceptible for change

Feature Contiguity: Evaluation

- Like CC, Feature Contiguity is based on autosegmental phonology
- Different from other approaches, Feature Contiguity predicts that the edges of words are susceptible to change even outside DEE
- It is not clear how CC would deal with phonologically DEE

Conclusions

- 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
- Golston (this conference) will present a more radical version of this