## Classes 10 & 11: Process interaction

**To do**
- Hakha Lai assignment is due Fri., Oct. 29 *[let's discuss next assignment's due date]*
- Work on term paper! Remember to meet with me by end of this week.
- Primary-vs-secondary source report due Nov. 2
- K&K ch. 10 excerpts, Kiparsky reading questions due Tues., Nov. 2

### Overview I: types of process interaction

Last week we saw how a process can interact with itself. Besides feeding-counterfeeding-bleeding-counterbleeding, in what ways can processes interact with each other? Which types of interaction are easy to capture in each theory?

### 1. The classic interaction typology

| *interaction* | *definition* | *schematic derivation* | *result* |
|---|---|---|---|
| R1 feeds R2 | R1 creates environment for R2 to apply to | /bind/<br>d → Ø / __# bin<br>n → Ø / __# bi<br>[bi] | transparent:<br>• no [d#] on the surface<br>• no [n#] on the surface |
| R1 counterfeeds R2 | R1 applies too late to create environment for R2 | /bind/<br>n → Ø / __# --<br>d → Ø / __# bin<br>[bin] | opacity—*underapplication*:<br>• [n#] on surface, despite rule targeting *n#* |
| R1 bleeds R2 | R1 destroys environment for R2 to apply to | /bind/<br>d → Ø / __# bin<br>Ø → i/ C__C# --<br>[bin] | transparent:<br>• no [d#] on the surface<br>• no [i] inserted, because no surrounding *C__C#* |
| R1 counterbleeds R2 | R1 applies too late to destroy environment for R2 | /bind/<br>Ø → i/ C__C# binid<br>d → Ø / __# bini<br>[bini] | opacity—*overapplication*:<br>• [i] inserted, despite lack of surrounding *C__C#* |

- A rule *underapplies* if there are surface instances of its structural description.
- A rule *overapplies* if there are instances in which it has applied, although the non-affected part of the structural description (the environment) is no longer present.

(The terms *underapplication* and *overapplication* come from Wilbur's (1973) discussion of reduplication. McCarthy 1999 adapts them for discussing opacity.)

As we've seen, both forms of opacity can be hard to analyze in OT.

## 2. Baković 2007, to appear: dissociating opacity-vs-transparency from interaction type

Baković argues that the typology is **not**...

| | transparency | underapplication opacity | overapplication opacity |
|---|---|---|---|
| feeding | ✓ | | |
| bleeding | ✓ | | |
| counter-feeding | | ✓ | |
| counter-bleeding | | | ✓ |
| other | ✓ | | |

...but rather (at least)...

| | transparency | underapplication opacity | overapplication opacity |
|---|---|---|---|
| feeding | ✓ | ✓ | ✓ |
| bleeding | ✓ | | |
| counter-feeding | ✓ | ✓ | |
| counter-bleeding | ✓ | | ✓ |
| other | ✓ | ✓ | |

...so process-interaction types actually don't account for opacity vs. transparency.

**<u>Let's go through Baković's typology:</u>**

## 3. Counterfeeding-on-environment[1] → underapplication

*Bedouin Arabic*

| | | | |
|---|---|---|---|
| UR | badw | | |
| a → i / __ σ | *n/a* | = ℙ | |
| G → V/ C __ # | badu | = ℚ | |
| SR | badu | 'Bedouin' | (Baković 2007, p. 222; from McCarthy 1999) |

- What would be the transparent outcome?

## 4. Counterfeeding-on-focus → underapplication

*Bedouin Arabic again*

| | | | |
|---|---|---|---|
| UR | katab | | |
| i → ∅ / __ σ | *n/a* | = ℙ | |
| a → i / __ σ | kitab | = ℚ | |
| SR | kitab | 'he wrote' | (Baković 2007, p. 222; from McCarthy 1999) |

- What would be the transparent outcome?
- Both of these counterfeedings are hard for OT (why?). But counterfeeding-on-focus is not so bad. Let's discuss some options...

[1] Term from McCarthy 1999.

**5. "Surface-true counterfeeding" → transparency!**

*Educated Singapore English*: Baković to appear p. 16; from Mohanan 1992, Anttila et al. 2008

Epenthesis: /reɪz/ → [reɪz + əz] (and, I infer, /reɪs/ → [reɪs + əz])

Deletion: /test/ → [tes] cf. /tɛst+ɪŋ/ → [tɛst+ɪŋ]

no data, but Degemination "deletes one of two tautosyllabic near-identical consonants" (p. 16)

/lɪst+z/ → [lɪs]

- In an SPE analysis, what rule order do we need to get [lɪs]? Why does B. call this result "transparent"?

- OT analysis?

**6. Underapplication without counterfeeding** (**Baković to appear** p. 8ff.)

"Disjunctive blocking" (p. 8)

- How would this rule schema apply to these words: V → [+stress] / __ $(C_2V)C_0$ # ?

/badupil/ /pikomsak/

Remember how expansion conventions work—abbreviates two rules, disjunctively ordered.

- In what sense does underapplication result?

Nonderived-environment blocking—we'll save that till next week, but essentially it's when a rule can't apply if its structural description was already met in the underlying form:

e.g. a → i / __ C# /likat/ *fails to apply* /noka+l/ → [nokil]

Blocking by phonotactic constraint (p. 12)

- Think of vowel deletion in Yokuts, and the constraint that can block it. If we formulate the simple deletion rule (what was it?), then what would be some surface forms in which it underapplies?

(Non-)triggering by phonotactic constraint (p. 13)

- Think of consonant deletion in Yokuts, and the constraint that triggers it. If we formulate the simple deletion rule (what was it?), then what would be some surface forms in which it underapplies?

Restriction to certain morphological classes (Estonian V deletion in nominative singular only)

Optionality (French schwas may or may not delete)

Lexical exceptions (English *obesity* fails to undergo 'trisyllabic shortening')

## 7. "Fed counterfeeding"[2] on environment→ underapplication

*Lardil*

| | | a. /dibirdibi/ | b. /yiliyili/ | c. /wangalk/ |
|---|---|---|---|---|
| **Apocope:** | V ⟶ ∅ / σ σ __ # | ∅ | ∅ | |
| **Deletion:** | [–apical] ⟶ ∅ / __ # | ∅ | | ∅ |
| | | [dibirdi] | [yiliyil] | [wangal] |

Glosses: (9a) 'rock cod', (9b) 'oyster species', (9c) 'boomerang'

(Baković to appear, p. 6; from Hale 1973)

- Why "fed counterfeeding" here?
- Ways to do this in OT?

## 8. Fed counterfeeding on focus = "Duke of York" derivations[3]→ underapplication

*Nootka*

| | a. /mu: q / | b. /ħaju+ q i/ | c. /ɬa:kʷ+ʃitɬ/ |
|---|---|---|---|
| **Labialization:** | | | |
| [+dors] ⟶ [+rnd] / [+rnd] __ | qʷ | qʷ | |
| **Delabialization:** | | | |
| [+dors] ⟶ [–rnd] / __ ]σ | q | | k |
| | [mu: q ] | [ħaju+qʷi] | [ɬa: k +ʃitɬ] |

Glosses: (11a) 'throwing off sparks', (11b) 'ten on top', (11c) 'to take pity on'

(Baković to appear, p. 7; from Sapir & Swadesh 1978, McCarthy 1999, 2003, 2007a, 2007b)

- Why "fed counterfeeding"?
- Ways to do this in OT?

## 9. Counterbleeding → overapplication

*Yokuts*

| | | | |
|---|---|---|---|
| UR | ʔili:+l | | |
| [+long] → [–high] | ʔile:l | = ℙ | cf. /ʔili:+hin/ → [ʔile:hin] 'fans' |
| V → [–long] / __ C# | ʔilel | = ℚ | cf. /pana:+l/ → [panal] 'might arrive' |
| SR | ʔilel | 'might fan' | |

(Baković 2007, p. 223; from McCarthy 1999)

- What would be the transparent outcome?
- Any ideas for how to do this in OT?

[2] Baković gets the term from Kavitskaya & Staroverov 2009
[3] Term from Pullum 1976

**10. Counterbleeding by mutual bleeding → transparent!**

*Lardil*

| | | a. /papi+ ɯɻ/ | b. /tʲæmpæ+ɯɻ/ |
|---|---|---|---|
| **Epenthesis:** | ∅ ⟶ w / i __ u | w | |
| **Elision:** | V ⟶ ∅ / V __ | | ∅ |
| | | [papi+wɯɻ] | [tʲæmpæ+ɻ] |

Glosses: (25a) 'father's mother (acc. fut.)', (25b) 'mother's father (acc. fut.)'

(Baković to appear, p. 22; from Hale 1973)

- In what sense is this mutual bleeding?
- OT analysis?

**11. "Self-destructive feeding"→ overapplication!**

*Turkish*

| UR | bebek+n | | |
|---|---|---|---|
| ∅ → i / C__C# | bebekin | = ℙ | cf. /ip+n/ → [ipin] 'your rope' |
| k → ∅ / V__+V | bebein | = ℚ | cf. /bebek+i/ → [bebei] 'baby (ACC)' |
| SR | bebein | 'your baby' | |

(Baković 2007, p. 226; from Sprouse 1997)

| UR | ajak+sɯ | | |
|---|---|---|---|
| [+cont] → ∅/ C__ | ajakɯ | = ℙ | cf. /arɯ+sɯ/ → [arɯsɯ] 'his bee' |
| k → ∅ / V__+V | ajaɯ | = ℚ | cf. /ajak+ɯ/ → [ajaɯ] 'foot (ACC)' |
| SR | ajaɯ | 'his foot' | |

(Baković 2007, p. 227; from Kenstowicz & Kisseberth 1979)

- What would be the transparent outcome?
- Any ideas for how to do it in OT?

**12. "Non-gratuitous feeding" → overapplication**

*Classical Arabic*

| UR | ktub | | |
|---|---|---|---|
| ∅ → $V_i$ / #__C$CV_i$ | uktub | = ℙ | |
| ∅ → ʔ / #__V | ʔuktub | = ℚ | cf. /al-walad-u/ → [ʔalwaladu] |
| SR | ʔuktub | 'write (MASC SG)!' | 'the boy (NOM)' |

(Baković 2007, p. 231; from McCarthy 2007b)

- What would be the transparent outcome?
- Ideas for how to do this in OT?

## 13. "Cross-derivational feeding" → overapplication, in a sense

*Lithuanian*: Baković 2007, p. 234ff.; see there for references

prefix obstruents assimilate in voicing and palatalization :

| | | | |
|---|---|---|---|
| at-ko:pʲtʲi | 'to climb up' | ap-kalʲbʲetʲi | 'to slander' |
| ad-gautʲi | 'to get back' | ab-gautʲi | 'to deceive' |
| atʲ-pjʲautʲi | 'to cut off' | apʲ-tʲemʲdʲi:tʲi | 'to obscure' |
| adʲ-bʲekʲtʲi | 'to run up' | abʲ-gʲi:dʲi:tʲi | 'to cure (to some extent)' |

(p. 234)

epenthesis between stops of the same place (also palatalization before [i]):

| | | | |
|---|---|---|---|
| atʲi-taikʲi:tʲi | 'to make fit well' | apʲi-putʲi | 'to grow rotten' |
| atʲi-tʲeisʲtʲi | 'to adjudicate' | apʲi-pʲi:lʲtʲi | 'to spill something on' |
| atʲi-duotʲi | 'to give back' | apʲi-barʲtʲi | 'to scold a little bit' |
| atʲi-dʲetʲi | 'to delay' | apʲi-bʲerʲtʲi | 'to strew all over' |

(234)

- Baković 2005 argues that the right analysis here (and in English epenthesis before /-d/ and /-z/) should capture the idea that epenthesis occurs where a geminate *would have occurred* otherwise (because of assimilation).

- Assimilation would have fed epenthesis (which in Baković's analysis is only triggered between identical segments), but assimilation doesn't end up needing to apply (bleeding).

- He's making a typological prediction: epenthesis processes that break up sequences of identical or near-identical segments can apply to near-identical segments only when an independently needed assimilation process in the language would have made them identical.

  - Let's try to reconstruct Baković's OT analysis.

  - Any ideas for how to capture Baković's idea in SPE? Are we stuck with an epenthesis rule that recapitulates the assimilation facts?

That completes our tour of Baković's typology (I skipped "concealed free rides").

## 14. Global power

- Lithuanian (#13) raises the issue of whether a rule can "see" anything other than its immediate input.
- In SPE, rules aren't supposed to have *global power* (term from Lakoff (1970))
- Cf. Hill 1970 for a proposal that Cupeño has a "peeking rule" that can look ahead in the derivation.
- But global power follows naturally in OT: every candidate sees all the way to the end of the derivation. So now we have a type of phenomenon that OT can handle easily but SPE can't. So how robust are the claimed cases?

## 15. Paper-topics recap

Here's a summary of areas we've seen so far where different theories make different predictions, or differ in how easily they can handle cases:

- (self-)feeding vs. (self-)counterfeeding
- (self-)bleeding vs. (self-)counterbleeding
- iterative vs. non-iterative rule application
- interaction (or not) of multiple rule targets
- directional rule application
- optionality: global vs. local vs. unique-target; iterative vs. all-or-nothing
- look-ahead: myopic vs. fell-swoop/global-power/peeking derivations (cf. "sour grapes" phenomena)
- conspiracies vs. constraint-specific repairs (see Spanish /ʎ/ case below)
- rule-ordering paradoxes; constraint-ranking paradoxes
- *one we didn't cover but that has turned up in your bibliographic exercises*: exchange rules

## 16. Case in Walker 2010

Basic metaphony rule seen in many Romance "dialects":

$$\{\text{é,ó}\} \rightarrow [+\text{high}] \,/\, \_\_C_0+C_0\begin{bmatrix}+\text{syll}\\+\text{high}\end{bmatrix}$$

Venetan version (inventory: [ i,e,ɛ,a,u,o,ɔ])

| | | | |
|---|---|---|---|
| *tense Vs rais*e | kals-ét-o | kals-**í**t-i | 'sock (m. sg/pl)' |
| | móv-o | m**ú**v-i | 'move (1 sg/2 sg)' |
| *lax or low Vs don't* | gát-o | g**á**t-i | 'cat (m sg/pl)' |
| *can spread <u>through</u> unstressed V* | órden-o | **ú**rd**i**n-i | 'order (1 sg/2 sg)' |
| *unless it's /a/* | lavór-a-v-a | lav**ó**r-**a**-v-i | 'work (1 sg perf/2 sg impf)' |
| | | | |
| *no spreading if there's "no point"* | ángol-o | **á**ng**o**l-i | 'angel (m sg/pl)' |
| | pérseg-o | p**é**rs**e**g-i | 'peach (m sg/pl)' |

In other words, spreading is "non-myopic"—it sees all the way to the end of its iterative application (hypothetical ****á**ng**u**l-i, **p**é**rs**i**g-i), and if the result doesn't solve the fundamental problem of the unraised stressed vowel, then no spreading is done at all.

**For more, come to Walker's phonology-seminar talk next week!!**

**Overview II: Extrinsic vs. intrinsic ordering**

SPE assumes that a language can impose any order it wants on rules. Many researchers have proposed that this is not the case—that at least sometimes, rules are *intrinsically* ordered.

Koutsoudas, Sanders, & Noll 1974: simultaneous repeated application, plus "proper inclusion precedence"

**17. Simultaneous repeated application**

= all rules apply simultaneously to the UR, then again to the result, and again until no more application is possible. This results in *maximal application* (feeding rather than counterfeeding, counterbleeding rather than bleeding).

- Let's refresh our memories using the schematic examples from the beginning of the handout.

**18. Proper inclusion precedence**

Latin American varieties of Spanish, rather abstract analysis (Harris 1983?):

| | /akeʎ/ | /akeʎ+os/ | |
|---|---|---|---|
| 1. ʎ → l / __ # | akel | --------- | |
| 2. ʎ → j | ---- | akej+os | |
| | 'that' | 'those' | (but see Lloret & Mascaró 2007) |

- What kind of rule ordering is this?

- Try to apply these rules simultaneously and repeatedly to /akeʎ/—what's the issue?

Koutsoudas & al. propose (p. 9):

> "For any representation R, which meets the structural descriptions of each of two rules A and B, A takes applicational precedence over B with respect to R if and only if the structural description of A properly includes the structural description of B."

*the structural description (SD) of A properly includes the SD of B* = you can match B's SD up with part of A's SD that it is nondistinct from, and still have part of A's SD left over.

- How does the definition apply to the two Spanish rules? Which rule is A and which is B?

- Possible gap in the definition: can you invent a situation where A should take precedence over B, but also vice versa? (at least one has to be a rule schema, so that its length can vary)

Aside: if we adopt the analysis above I think it's a bit of a problem for OT. Why is the problematic /ʎ/ resolved by changing place in one instance, and manner in the other?

| /akeʎ/ | *ʎ | *ʎ# | *ʎV | IDENT(place) | IDENT(manner) | *j# | *lV |
|---|---|---|---|---|---|---|---|
| *a* akeʎ | *(!) | *(!) | | | | | |
| ☹*b* akel | | | | *! | | | |
| 💣*c* akej | | | | | * | * | |

| /akeʎ+os/ | *ʎ | *ʎ# | *ʎV | IDENT(place) | IDENT(manner) | *j# | *lV |
|---|---|---|---|---|---|---|---|
| *a* akeʎos | *(!) | | *(!) | | | | |
| *b* akelos | | | | *! | | | * |
| ☞*c* akejos | | | | | * | | |

- The constraints at the bottom can't be ranked any higher, because of forms like *cielo* and (rarer) *ley*.
- Such "constraint-specific repairs" are predicted in SPE or in some versions of rules+constraints, but not in OT.
- I'm not saying OT can't capture the Spanish data—it just can't directly translate the analysis with ʎ → l / __ # and ʎ → j.

**19. Bleeding: example originally from Kiparsky (1968?)**

Schaffhausen dialect of Swiss German:

| | /bogə/ | /bodə/ | /bogə+PL/ | /bodə+PL/ |
|---|---|---|---|---|
| 1. V → [–back] / *complicated 'umlaut' context, including plurals* | ---- | ---- | bøgə | bødə |
| 2. o → ɔ / __ $\begin{bmatrix}+\text{cons}\\+\text{cor}\\–\text{lat}\end{bmatrix}$ [4] | ---- | bɔdə | ---- | ---- |

- Why is this ordering crucial?
- What happens if we use the Koutsoudas & al. approach?

K & al. propose that in all apparent cases of bleeding (and counterfeeding?), the rules need to be revised. In this case, they propose a context-free rule œ → ø (remember Myers's persistent rules, which apply everywhere in the derivation that they can).

- Apply this solution to /bodə+PL/.
- What additional fact needs to be true in Schaffhausen for this to work?

[4] In the original it's not [+cor] but [–grave]. *Grave* is an acoustic feature (roughly, lower frequencies are stronger for [+grave] segments), not much used these days. Labials and velars are [+grave]; dentals and alveolars are [–grave] (a.k.a. *acute*).

## 20. The Elsewhere Condition (Anderson 1969, Kiparsky 1973...)

Recall once more disjunctive ordering of the rules that a schema expands into:

$$V \rightarrow [+stress] / \_\_ C_0(VC_0)\# \Rightarrow \quad V \rightarrow [+stress] / \_\_ C_0VC_0\#$$
$$\textit{else } V \rightarrow [+stress] / \_\_ C_0\#$$

Kiparsky argues that disjunctive ordering doesn't really have anything to do with expansion conventions. He proposes that what really drives disjunctive ordering is...

*Elsewhere Condition (revised in later Kiparsky works)*
(p. 94) "Two adjacent [in the ordering] rules of the form

$A \rightarrow B / P \_\_ Q$
$C \rightarrow D / R \_\_ S$

are disjunctively ordered if and only if:
(a) the set of strings that fit [are nondistinct from] *PAQ* is a subset of the set of strings that fit *RCS*, and
(b) the structural changes of the two rules are either identical or incompatible"

We also need to define 'incompatible'—probably it means that the results of applying the two rules are *distinct*, in our technical sense.

- What does the Elsewhere Condition say about our pair of stress rules above?
- How does the Elsewhere Condition compare to proper inclusion precedence? Are there cases where the two conditions apply differently?

- Does this help with our mutual bleeding case? Duke of York?

## 21. Anderson 1974 ch. 10: natural order

Example from Icelandic (Indo-European language from Iceland with 250,000 speakers)

*syncope, roughly*: certain unstressed Vs → Ø / C __ {l,r,n,ð,s}+V
u-*umlaut*: a → ö / __ $C_0$ u (where "u" usu. = [ʏ], "ö" = [œ])

| | | | |
|---|---|---|---|
| barn | 'child' | b**ö**rn+um | 'child-dat.pl.' |
| svangt | 'hungry-neut.nom.sg.' | sv**ö**ng+u | 'hungry-neut.dat.sg.' |
| kalla | '[I] call' | k**ö**ll+um | '[we] call' |

*(lax, unstressed vowels delete __V)*

| | | | |
|---|---|---|---|
| ham**a**r | 'hammer' | hamr+i | 'hammer-dat.sg.' |
| fíf**i**ll | 'dandelion' | fífl+i | 'dandelion-dat.sg.' |
| morg**u**nn | 'morning' | morgn+i | 'morning-dat.sg.' |

*(ll, nn* stand for long *l*s and *n*; syncope is meant to be applicable)

- If syncope precedes umlaut, what kind of process interaction results for the UR /katil+um/ 'kettle-dat.pl'? For /jak+ul+e/ 'glacier-dat.sg.'?

- What about umlaut before syncope for /katil+um/? /jak+ul+e/?

➔ Whether a rule ordering is feeding, bleeding, etc. depends on the particular forms involved!

| | *+r/Ø* | | *+um* | |
|---|---|---|---|---|
| /katil/ | ketil+l | 'kettle' | k**ö**tl+um | 'kettle-dat.pl' |
| /ragin/ | regin | 'gods' | r**ö**gn+um | 'gods-dat.pl' |
| /alen/ | alin | 'ell of cloth' | **ö**ln+um | 'ell of cloth-dat.pl' |

| | *+ul+r* | | *+ul+e*, *+ul+an* | |
|---|---|---|---|---|
| /bagg/ | bögg+ul+l | 'parcel' | b**ö**gg+l+i | 'parcel-dat.sg.' |
| /jak/ | jök+ul+l | 'glacier' | j**ö**k+l+i | 'glacier-dat.sg.' |
| /þag/ | þög+ul+l | 'taciturn' | þ**ö**g+l+an | 'taciturn-masc.acc.sg.' |

If the rules are right, we have an ordering paradox!
Here's how Anderson resolves it: Some pairs of rules are left unordered by a language's grammar and so apply in their **natural order** in each case. Other rules are ordered, but only pairwise (so ordering is not transitive, for instance).

> "where only one of the two possible orders for a given pair of rules is feeding, the feeding order is the natural one; and that where only one of the two possible orders is bleeding, the other order [i.e. counterbleeding] is the natural one. In all other cases […] no natural order is (yet) defined." (p. 147)

- Is this different from the Koutsoudas & al. proposal? (Let's apply their theory to the crucial forms.)

- If a grammar consists of a list of rules and some statements about their orderings, what does a diachronic change from, say, counterfeeding to feeding involve? (Notice the extension of the evaluation metric to rule orderings, and not just the rules themselves.)

**22. More Icelandic (Kiparsky 1984)**

Additional fact: syncope applies before case and derivational endings, but not before the enclitic articles *–inn* and *–ið*.

| | | | | | |
|---|---|---|---|---|---|
| ham**a**r | 'hammer *nom.sg.*' | ak**u**r[5] | 'acne *nom.sg.*' | höf**u**ð | 'head *nom.sg.*' |
| hamr+i | 'hammer *dat.sg.*' | akr+i | 'acne *dat.sg.*' | höfð+i | 'head *dat.sg.*' |
| hamr+a | 'to hammer' | | | | |
| ham**a**r#inn | 'the hammer *nom.sg.*' | ak**u**r#inn | 'the acne *nom.sg.*' | höf**u**ð#ið | 'the head *nom.sg.*' |
| | | ökr+um | 'acne *dat.pl.*' | | |

- Why no *u*-umlaut in *akur*? As we'll discuss next week, certain rules don't seem to apply directly to monomorphemic underlying forms. For now, we'll just accept that. (Similarly, there's no syncope in *Nikulas* 'Nicholas')

- Do these facts help us decide between analyses?

[5] Anderson treats this [u] as epenthesized (see below), which would be another reason why no umlaut.

**23. Another Icelandic ordering paradox** (Anderson ch. 11)

Icelandic has **initial stress** (not marked belwo). When umlaut applies to unstressed vowels, the result is not *ö* but *u*:

| | | | |
|---|---|---|---|
| dómari | 'judge *nom.sg.*' | dóm**u**r+um | 'judge *dat.pl.*' |
| hérað | 'region *nom.sg.*' | hér**u**ð + um | 'region *dat.pl.*' |

Iterativity:

| | | | | |
|---|---|---|---|---|
| | bakari | 'baker *nom.sg.*' | b**ö**k**u**r+um | 'baker *dat.pl.*' |
| | fatnað | 'suit of clothes *nom.sg.*' | f**ö**tn**u**ð+um | 'suit of clothes *dat.pl.*' |
| *cf.* | akkeri | 'anchor *nom.sg.*' | akker+um | 'anchor *dat.pl.*' |

- Normally [ö] can occur only in stressed syllables. How could we exploit that fact?

There are some exceptions to this restriction, and they show that [ö] can't spread umlaut:

| | | | | |
|---|---|---|---|---|
| akarn | 'acorn *nom.sg.*' | | ak**ö**rn+um | 'acorn *dat.pl.*' |
| japani | 'Japanese *nom.sg.*' | | jap**ö**n+um | 'Japanese *dat.pl.*' |
| almanak | 'calendar *nom.sg.*' | | alman**ö**k+um | 'calendar *dat.pl.*' |
| fargan | 'racket *nom.sg.*' | | farg**ö**n+um | 'racket *dat.pl.*' |
| | | *or* | f**ö**rg**u**n+um | *but not* *f**ö**rg**ö**n+um |

- What's the ordering paradox? How do you think Anderson resolves it?

**24. Two more Icelandic rules** (still from Kiparsky 1984)

*u-epenthesis*: Ø → u / C __ r#

| | | | | |
|---|---|---|---|---|
| dag+**u**r | 'day *m.nom.sg.*' | *cf.* | bæ+r | 'farm *m.nom.sg.*' |
| tek+**u**r | 'take *2/3sg.pres.ind.*' | | næ+r(ð) | 'reach *2/3sg.pres.ind.*' |

- How should *u*-epenthesis be ordered with respect to *j*-deletion (j → Ø / C __ #):

| | | | |
|---|---|---|---|
| byl**j**+ar | 'snowstorm *gen.sg.*' | kref**j**+i | 'request *2pl.*' |
| byl**j**+ir | 'snowstorm *nom.pl.*' | kref**j**+a | 'request *3pl.*' |
| byl**j**+i | 'snowstorm *acc.pl.*' | kref**j**+um | 'request *1pl.*' |
| byl**j**+a | 'snowstorm *dat.pl.*' | kref | 'request *1sg.*' |
| byl**j**+um | 'snowstorm *dat.pl.*' | kref+**u**r | 'request *2/3sg.*' |
| byl | 'snowstorm *acc.sg.*' | | |
| byl+s | 'snowstorm *gen.sg.*' | | |
| byl+**u**r | 'snowstorm *nom.sg.*' | | |

- How does this fare under an Andersonian analysis? Kiparskyan?

**25. Is *u*-umlaut just an 'anywhere' rule?** (from Anderson ch. 12, with additional data from Kiparsky)

From what we've seen so far, we might think that *u*-umlaut just tries to apply at every point in the derivation. Not so, says Anderson:

| | | | | | |
|---|---|---|---|---|---|
| | | | /harð+um/ | h**ö**rð + um | 'hard *dat.pl.*' |
| | | | /saga+ur/ | s**ö**g+ur | 'sagas *nom.pl.*' |
| | | | /kalla+um/ | k**ö**ll+um | 'call *1sg.*' |
| /kalla+ð+r / | kall**a**+ð+**u**r | 'called *m. nom.sg.*' | / kalla+ð+um / | k**ö**ll**u**+ð+um | 'called *m.*' |
| /dag+r/ | d**a**g+**u**r | 'day *nom.sg.*' | | | |
| /hatt+r/ | h**a**tt+**u**r | 'hat *nom.sg.*' | /hatt+um/ | h**ö**tt+um | 'hat *dat.pl.*' |
| /stað+r / | st**a**ð + **u**r | 'place *nom.sg.*' | /stað+um/ | st**ö**ð+um | 'place *dat.pl.*' |
| /snarp+r/ | sn**a**rp+**u**r | 'rough *m. nom.sg.*' | /snarp+um/ | sn**ö**rp+um | 'rough *m. dat.pl.*' |
| /ryðga+ð+r / | ryðg**a**+ð+**u**r | 'rusted *m. nom.sg.*' | /ryðga+ð+um/ | ryðg**u**+ð + um | 'rusted *m. dat.pl.*' |

*[See Anderson for the arguments that these are the right underlying forms.]*

- What ordering(s) would be needed?

- Kiparsky gives another distinction between inflection/derivation and enclitic determiners—your thoughts?

| | | | |
|---|---|---|---|
| fóð**u**r | 'lining *nom.sg.*' | dag+**u**r (/dag+r/) | 'day *nom.sg.*' |
| fóðr+i | 'lining *dat.sg.*' | dag+r+i | 'day *dat.sg.*' |
| fóðr+a | 'to line' | | |
| fóð**u**r#ið | 'the lining *nom.sg.*' | dag+**u**r#inn | 'the day *nom.sg.*' |

If you find this predicting-rule-order stuff fun and want to find a paper topic along these lines, things to check out besides Anderson are...

Wallace Chafe, "The ordering of phonological rules," *International Journal of American Linguistics* 24 (1968): 115–136. (a theory of "rule depths")

works discussed in this history article: Victor M. Longa, "The abandonment of extrinsic rule ordering in generative grammar," *Historiographia Linguistica* 28 (2001): 187-198.

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