

Introduction to Interface theories (phonology / morpho-syntax)

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Outline

- 1 Intro
- 2 Day 1: SPE and sons
- 3 Day 2: The prosodic hierarchy and morphology
- 4 Day 3: Morphology within OT
- 5 Day 4: GP and CVCV-phonology
- 6 Day 5: DM-inspired approaches

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This class deals with

This course revolves around the following question: how is morpho-syntactic information represented (and computed) in phonology? More specifically, it aims at introducing the most important proposals on how to deal with morpho-syntactic information within a theory of phonology. Each day we treat a distinct topic focusing on well-known analyses, and highlight both their strengths and weaknesses.

Rough timeline of topics to be covered

- Today (and maybe Tomorrow). SPE, Lexical Phonology: the cycle. Kiparsky (1982), Vaux (2008), Bermúdez-Otero (2011).
- Tuesday. The prosodic hierarchy and morphology: Libermann & Prince (1977), Selkirk (1981), McCarthy & Prince (1996).
- Wednesday. Doing morphology within OT: Raffelsiefen (1999), Burzio (1998), Wolf (2016)
- Thursday. GP and CVCV-phonology: Kaye (1995), Lowenstamm (1999), Scheer (2014).
- Friday. DM-inspired approaches: Lowenstamm (2014), Newell (2016), Faust (2014).

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Morphosyntactic conditioning in phonology

■ Bermúdez-Otero (2011:2019)

Table 85.1 Two types of morphosyntactic conditioning acknowledged throughout the history of generative phonology

<i>Theory</i>	<i>Representational effects</i>	<i>Procedural effects</i>	<i>Sample reference</i>
<i>SPE</i>	boundary symbols (+, #)	the cycle	Chomsky & Halle (1968)
Lexical Phonology	prosodic units (built by rules)	the cycle (with levels)	Booij & Rubach (1984)
Stratal OT	prosodic units (controlled by ALIGN)	the cycle (with levels)	Bermúdez-Otero & Luís (2009)
Classical OT	prosodic units (controlled by ALIGN)	OO-correspondence	Raffelsiefen (2005)
Lateral Phonology	empty CV units	the cycle (phases)	Scheer (2008)

SPE

- In chapter 3, the phonological cycle is discussed (nota: it has been introduced by Chomsky, Halle and Lukoff (1956)).
- Main hypothesis: stress is a phonological feature.
- “Our attention here will be directed rather to the cyclical transformational rules that apply in contexts determined by major syntactic categories—rules that therefore reapply, in general, at successive stages of the transformational cycle.” (SPE: 60)
- The feature [segment] distinguishes segments from boundaries.

SPE

- (1) Boundaries (chap. 8:364-ff)
 - a. Formative boundary + (morpheme boundary)
 - b. The boundary #
 - c. The boundary =
- (2)
 - a. Why are these boundaries important in SPE?

SPE

- (1) Boundaries (chap. 8:364-ff)
 - a. Formative boundary + (morpheme boundary)
 - b. The boundary #
 - c. The boundary =
- (2)
 - a. Why are these boundaries important in SPE?
 - b. Because a number of stress assigning rules make reference to these boundaries.

SPE

Stress in verbs (SPE:69)

I

astónish

édit

consíder

imáagine

intérpret

prómise

embárrass

elícit

detérmine

cáncel

II

maintáin

eráse

caróuse

appéar

cajóle

surmíse

decíde

devóte

achíeve

caréén

III

colláapse

tormént

exháust

eléct

convínce

usúrps

obsérve

cavórt

lamént

adápt

SPE

- (19) Assign main stress to
- (i) the penultimate vowel if the last vowel in the string under consideration is non-tense and is followed by no more than a single consonant;
 - (ii) the last vowel in the string under consideration if this vowel is tense or if it is followed by more than one consonant.¹⁵

(20)

$$\downarrow \text{V} \rightarrow [\text{1 stress}] \left/ \begin{array}{l} \left(\text{---} C_0 \left[\begin{array}{c} -\text{tense} \\ \text{V} \end{array} \right] C_0^1 \right) \quad \text{(i)} \\ \left(\left\{ \left[\begin{array}{c} \text{---} \\ +\text{tense} \end{array} \right] \right\} C_0 \right) \\ \left(\text{---} C_2 \right) \end{array} \right. \quad \text{(ii)}$$

SPE

Stress in nouns (SPE:71)

I

América
cínema
aspáragus
metrópolis
jávelin
vénison
ásterisk
ársenal
lábyrinth
análysis

II

aróma
balalaíka
hiátus
horízon
thrombósis
coróna
aréna
Minnesóta
angína
factótum

III

veránda
agénda
consénsus
synópsis
amálgam
uténsil
asbéstos
phlogíston
appéndix
placénta

SPE

Derivational affixes found in adjectives (SPE:81-82)

I	II	III
<i>pérsónal</i>	<i>anecdótal</i>	<i>dialéctal</i>
<i>máximal</i>	<i>adjectíval</i>	<i>incidéntal</i>
<i>medícinal</i>	<i>sacerdótal</i>	<i>fratérnal</i>
<i>municipal</i>	<i>polyhédral</i>	<i>univérsal</i>
<i>éphémeral</i>	<i>mediéval</i>	<i>abýsmal</i>
<i>magnánimous</i>	<i>desírous</i>	<i>moméntous</i>
<i>polygamous</i>	<i>polyhédrous</i>	<i>amórphous</i>
<i>rígorous</i>		<i>polyándrous</i>
<i>precípitous</i>	<i>sonórous</i>	<i>treméndous</i>
<i>calámitous</i>	<i>decórous</i>	<i>stupéndous</i>
<i>vígílant</i>	<i>compláisant</i>	<i>repúgnant</i>
<i>méndicant</i>	<i>defíant</i>	<i>relúctant</i>
<i>signíficant</i>	<i>clairvóyant</i>	<i>obsérvant</i>
<i>árrogant</i>	<i>obeísant</i>	<i>indígnant</i>
<i>díssonant</i>	<i>adjácent</i>	<i>redúndant</i>
<i>innocent</i>	<i>complácent</i>	<i>depéndent</i>
<i>díffident</i>	<i>antecédent</i>	<i>contingent</i>
<i>benévólent</i>	<i>inhérent</i>	<i>recúmbent</i>

SPE

(44)

$$+C_0 \left[\begin{array}{c} -\text{tense} \\ \text{V} \end{array} \right] C_0]_{\mathbf{A}} \quad (\text{a})$$

$$\left[\begin{array}{c} -\text{tense} \\ \text{V} \end{array} \right] C_0]_{\mathbf{N}} \quad (\text{b})$$

- (4) Condition (a) applies to “an adjective with a monosyllabic suffix containing a lax vowel.”

SPE

- (5) Affix classes, first generalization found in SPE: 84-85:
“Alongside of the affixes that affect stress placement and that are subject to condition (a), there are other **neutral affixes** which characteristically play no role in the placement of stress, for example, the adjective-forming affixes *-y*, *-like*, *-able*, *-ish* and affixes such as *-ing*, *-past tense*, *-hood*, *-ness*, *-ly*, *-wise*. We can indicate the fact that an affix is neutral by making use of the # boundary [...]”

SPE

(6) *soliloquizing*

- a. First cycle: $[\mathbf{v} \text{sol}^{\bar{1}} \text{iloqu}^{\bar{2}} \mathbf{Iz}]_{\mathbf{v}}$
- b. Second cycle: *-ing* is added, condition (e) is prevented to apply by the qualification below.
- c. Surface structure: $[[\mathbf{v} \# \text{soliloquIz} \#]_{\mathbf{v}} \text{ing}]$

Chomsky & Halle need to introduce the following qualification (SPE: 85):

(7) “X contains no internal boundary #”

SPE

Crucially, according to Chomsky & Halle:

- (8) a. The affixes that carry # are, to a certain extent, syntactically distinguished.
- b. [...] The derivational affixes that affect stress placement are, largely, internal to the lexicon.

SPE

(59)	$[\text{N} [\text{A} [\text{N} \theta e \text{æ} \text{tr}]_{\text{N}} \text{ik} + \text{æ} \text{l}]_{\text{A}} \text{i} + \text{ti}]_{\text{N}}$	
	1	RULE (50bii)
	<hr style="width: 50%; margin: 0 auto;"/>	
	2 1	RULE (50ai)
	<hr style="width: 80%; margin: 0 auto;"/>	
	3 2 1	RULE (50ai)
	4 3 1	RULE (52)
	<hr style="width: 80%; margin: 0 auto;"/>	

(60)	$[\text{N} [\text{v} \text{i} \text{n} \text{d} \text{e} \text{m} \text{n} + \text{i} + \text{f} \text{l} \text{k}]_{\text{v}} \text{A} \text{t} + \text{i} \check{\text{v}} \text{n}]_{\text{N}}$	
	1	RULE (50eii)
	1 2	RULE (51)
	<hr style="width: 50%; margin: 0 auto;"/>	
	2 3 1	RULE (50bi)
	3 4 1	RULE (52)
	<hr style="width: 80%; margin: 0 auto;"/>	

(51)=Alternating Stress Rule; (52)=Stress Adjustment

SPE

Given the verbs:

(9) *permít, concúr, compél, detér, tansfér*

We expect they behave like those in column I in the first table above, that is like *fúrnish, wórship*. Chomsky & Halle (1968:94) claim that “we must identify the complex verbs in some manner that will account for their exceptional behavior”. This ‘manner’ is the boundary =, which is distinct from both + and #: [-segment, -FB, -WB]. These stems and affixes are neither separate lexical items, nor independent words. (condition (e) above correctly assigns stress to these items)

(10) *per=mít, con=cúr, com=pél, de=tér, tans=fér*

Brackets vs. boundaries in SPE

Chomsky & Halle (1968:366-ff) claim that “every language has a boundary characterized by the feature complex:

(11) [-segment, -formative boundary, +word boundary]

This boundary, # appears in the phonological representation as the result of what they call **a general convention** (115, p. 366):

(12) Convention (115): The boundary # is automatically inserted at the beginning and end of every string dominated by a major category [...]

Brackets vs. boundaries in SPE

Brackets vs. boundaries: two different things

(13) Condensation vs. compensation

a. condensation

$[_N\# [_V\# \text{condens } \#]_V \text{at}^+\text{ion } \#]_N$

b. compensation

$[_N\# [_V\# \text{compensat } \#]_V \text{ion } \#]_N$

These are instances where word boundaries must be deleted but constituent structure maintained (Chomsky & Halle 1968:370).

Brackets vs. boundaries in SPE

Scheer (2011:82) writes: “[...], on the inner cycle, [condéns] receives stress on the second vowel (counting from the left margin), while [compensát] is stressed on the third vowel. According to Chomsky & Halle, this is the reason why the reduction of the e is blocked in *condensátion*: the vowel was stressed on an earlier cycle and is therefore protected. This is not the case for *compensátion*, whose second vowel has never been stressed.”

As Chomsky & Halle (1968:370) admit, the the right boundary of [# condens #] must be erased and cannot be the edge of the inner cycle: the diagnostics is the stress shift.

Lexical Phonology

Kiparsky (1982:31):

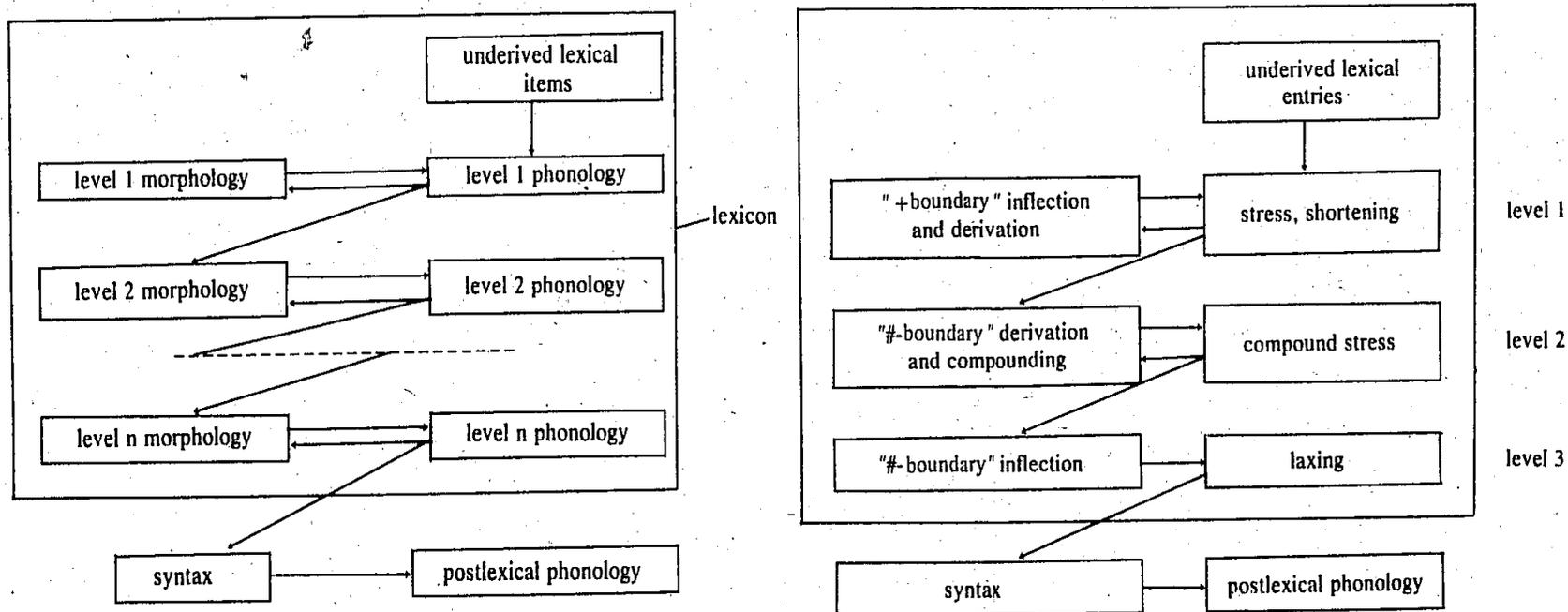
“[...] the derivational and inflectional processes of language can be organized in a series of levels. Each level is associated with a set of rules for which it defines the domain of application.”

“[...] the rules of *lexical phonology*, are intrinsically cyclic because they reapply after each step of word-formation at their morphological level.”

- Level 1: affixes traditionally associated with + boundary: derivation suffixes (-*al*, -*ous*, -*ity*, etc.), inflectional suffixes (such as those in *kept*, *met*, *hidden*, *children*, *teeth*, “ablaut”, etc..
- Level 2: # boundary derivation and compounding: -*hood*, -*ness*, -*er*, -*ism*, -*ist*, etc.
- Level 3: The remaining regular inflection: -*ed*, -*s*, etc.

Lexical Phonology

Kiparsky's (1982:132-133) structure of the lexicon:



Lexical Phonology

In Lexical Phonology, there is a misbalance between representation and procedure: the latter is much more central than the former (see Scheer 2011:123-ff.)¹

Kiparsky (among other papers see Kiparsky 1982) participated into the debate on overgeneration and abstractness set up by post-SPE discussions. The observation stems from the very well-known cases of English trisyllabic shortening (or laxing) to which SPE dedicated a specific rule. This rule overgenerates. To avoid such a problem, Kiparsky first proposed the Alternation Condition:

- (14) Obligatory neutralization rules cannot apply to all occurrences of a morpheme.

The general effect of this rule is to limit the “abstracness” of underlying representations to cases motivated by phonological alternations. (For instance, be the relation between *tooth* and *dental*: is *dent-* derived from/ morphologically related to *tooth*???)

¹ Scheer (2011:123) notes that “[c]yclic derivation (of which Bermúdez-Otero [2011] provides an overview) is thus a specifically prominent feature of Lexical Phonology, a theory that has shaped its face under the stratal banner for generations of phonologists.”

Lexical Phonology

Trisyllabic shortening:

- (15)
- a. *opacity, declarative, tabulate*
 - b. *opaque, declare, table*
 - c. The rule: $V \rightarrow [-\text{long}] / _ _ C_0 V_i C_0 V_j$ where V_i is not metrically strong.
 - d. This rule must be assigned to Level 1.
- (16)
- a. What about these items? *nightingale, ivory, Oedipus, Oberon, stevedore, Goolagong*
 - b. These words must be exempted from undergoing Trisyllabic shortening.
 - c. SPE solution: readjustment rules, abstract underlying representation ($/\text{nixtVng}\bar{\text{æ}}l/$), and ad-hoc rules. Not satisfying at all!

Kiparsky admits that the original Alternation Condition raises a number of problems (listed in Kiparsky 1982:148-152).

Lexical Phonology

Kiparsky (1981:152) proposes a procedural solution: “The germ of truth in the morphologization idea is that instead of stating a constraint on underlying representations directly, it should be made derivative of a primary constraint on the operation of phonological rules, which limits certain rules to ‘derived’ inputs’.

In other words, Kiparsky wants Trisyllabic shortening fail to apply to cases like *nightingale*.

Notion of “derived environment”: “An environment is derived iff it is produced either by the concatenation of two morphemes or by the application of a phonological rule (Scheer 2011:109).

- (17) *The Revised Alternation Condition*
 Obligatory Neutralization rules apply only in derived environments

Lexical Phonology

Trisyllabic shortening is a cyclic rule (see Mascarò's 1976 dissertation: "derived-environment only behavior rules"); since *nightingale* is underived, Trisyllabic shortening cannot apply.

According to Kiparsky (1982:159), the Revised Alternation Condition "follows from the Elsewhere Condition under the assumption [...] that every lexical entry constitutes an identity rule whose structural description is the same as its structural change":

I $[[s\bar{a}e\ n]_{Aiti}]_N$
 [—]
 II $[[s\check{a}e\ n]_{Aiti}]_N$
sanity

$[[n\bar{i}tVng\bar{a}e\ l]_N$
 (blocked by E.C.)

nightingale

Lexical Phonology

(18) *paréntal* vs. *párenthood* (ex. from Scheer 2011:129)

párent - *parént-al* vs. *párent-hood* in Lexical Phonology

		parent	parént-al	párent-hood
lexicon		parent	parent	parent
level 1	concatenation	—	parent-al	—
	stress assignment	párent	parént-al	párent
level 2	concatenation	—	—	párent-hood
	rule application	—	—	—

- (19) a. Interactionism: “the idea of interspersing word formation rules with phonological rules” (Scheer 2011:127).
- b. Morpheme-specific mini-grammars: a central tenet of Lexical Phonology
- (i) Phonology 1 applies at Level 1 once concatenation has occurred, then phonology 2 applies at Level 2, and so on.
- (ii) Each level possesses a specific set of rules.

Lexical Phonology

(20) Trisyllabic shortening (ex. from Scheer 2011:143)

Trisyllabic Shortening in Lexical Phonology

		san-ity	maiden-hood
lexicon		sejn	mejdən
level 1	concatenation	sejn-iti	—
	Trisyll. Short.	sæn-iti	—
level 2	concatenation	—	mejdən-hud
	rule application	—	—

(21) Nasal assimilation (ex. from Scheer 2011:143)

nasal assimilation in Lexical Phonology

		im-possible	un-predictable
lexicon		possible	predictable
level 1	concatenation	in-possible	—
	nasal assimilation	im-possible	—
level 2	concatenation	—	un-predictable
	rule application	—	—

Cyclicity vs. OO-correspondence

Bermúdez-Otero (2011:2040-ff) points out that OO-correspondence is *sic et simpliciter* unable to account for opaque stress rules in non-canonical paradigms such as those of Albanian verbs (Trommer 2006, 2009).

(22) Albanian stress:

- | | | |
|----|---------------|------------------|
| a. | [ɟu.hə.'si] | 'linguistics' |
| | [a.kə.'ku] | 'here and there' |
| | [ri.'ɟʒa] | 'prayer' |
| b. | [aɾ.'mik] | 'enemy' |
| | [ʧi.'fut] | 'gipsy' |
| | [re.zul.'tat] | 'result' |
| c. | [a.'det] | 'habit' |
| | [pa.'tok] | 'gander' |
| d. | ['ho.le] | 'swing' |
| | ['ba.bo] | 'midwife' |
| | ['hə.nə] | 'moon' |
| e. | ['a.fər] | 'near' |

Stress is antepenultimate unless: (a) the final syllable is headed by a non-mid vowel (i.e. by /i/, /u/, or /a/), (b) the final syllable is both headed by a full vowel (i.e. by a vowel other than schwa) and closed by a consonant.

Cyclicity vs. OO-correspondence

In word-forms containing overt inflectional markers, however, stress assignment often misapplies.

Table 85.2 The present indicative of the Albanian verb *formoj* 'form' (NACT denotes 'non-active')

			<i>UR</i>	<i>SR</i>	<i>opaque stress?</i>
ACT	SG	1	GWord[Stem[formo-j]]	[for.'moj]	no
		2	GWord[Stem[formo-n]]	[for.'mon]	no
		3	GWord[Stem[formo-n]]	[for.'mon]	no
	PL	1	GWord[Stem[formo-j] Affix[mə]]	[for.'moj.mə]	no
		2	GWord[Stem[formo-n] Affix[ni]]	[for.'mo.ni]	yes: *[for.mo.'ni]
		3	GWord[Stem[formo-j] Affix[nə]]	[for.'moj.nə]	no
NACT	SG	1	GWord[Stem[formo-j] Affix[he-m]]	[for.'mo.hem]	yes: *[for.mo.'hem]
		2	GWord[Stem[formo-j] Affix[he-f]]	[for.'mo.hef]	yes: *[for.mo.'hef]
		3	GWord[Stem[formo-j] Affix[he-t]]	[for.'mo.het]	yes: *[for.mo.'het]
	PL	1	GWord[Stem[formo-j] Affix[he-mi]]	[for.'mo.he.mi]	yes: *[for.mo.he.'mi]
		2	GWord[Stem[formo-j] Affix[he-ni]]	[for.'mo.he.ni]	yes: *[for.mo.he.'ni]
		3	GWord[Stem[formo-j] Affix[he-n]]	[for.'mo.hen]	yes: *[for.mo.'hen]

Cyclicality vs. OO-correspondence

(23) Opacity arises as a consequence of the fact that the domain of stress assignment is the stem, not the word

a. *Internal sandhi processes*

$nn \rightarrow n$

$j \rightarrow \emptyset / _ h$

b. *Sample derivations*

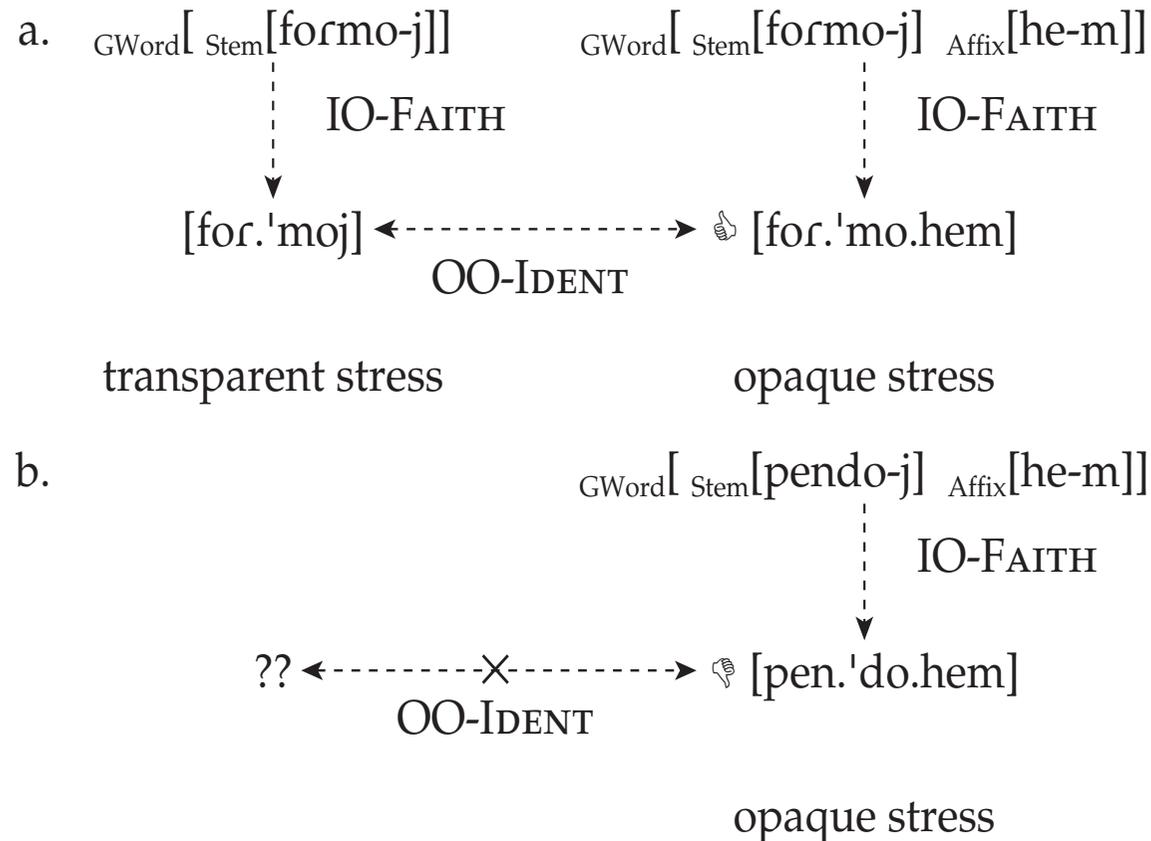
	$_{WL}[_{SL}[formo-j]]$	$_{WL}[_{SL}[formo-j]] \ _{SL}[he-m]$
SL (stress assignment)	[for.'moj]	[for.'moj] [hem]
WL (internal sandhi)	—	[for.'mo.hem]
	'form (ACT 1SG)'	'form (NACT 1SG)'

(24) Opacity in deponent verbs:

	$_{WL}[_{SL}[pendo-j]] \ _{SL}[he-m]$
SL (stress assignment)	[pen.'doj] [hem]
WL (internal sandhi)	[pen.'do.hem]
	'regret (1SG)'

Cyclicality vs. OO-correspondence

As Bermúdez-Otero (2011:2040-ff) points out, Trommer's analysis suggests that morphologically induced misapplication depends on syntagmatic structure, not on the contents of paradigms.



RBP vs. OT

We end today's class with an observation: Vaux (2008:21-23) lists 15 arguments adduced in favor of OT over RBP that he found in the literature. Curiously, none of these arguments involves primarily the way how morpho-syntactic information is treated in either approach.

References of today's class:

- Bermúdez-Otero, R. 2011. Cyclicity. In *The Blackwell Companion to Phonology*, (eds) M. van Oostendorp, C. Ewen, E. Hume & K. Rice, 2019-2048. Malden, MA: Wiley-Blackwell.
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