Allomorphy

an introduction to the phonology-morphology interface
3rd Class: the architecture of grammar

Syntax

Semantics  Phonology
The Inverted Y architecture

Syntax

Semantics  Phonology
The Inverted Y architecture

Verb + past

Syntax

Morphology, matching syntactic information with URs

Semantics

Phonology
The Inverted Y architecture

- **Semantics**
  - Smiling Verb + past

- **Syntax**
  - Morphology,
    - Smiling Verb = /smail/
    - Past = /d/

- **Phonology**
The Inverted Y architecture

Semantics

Syntax

Morphology,

Phonology

\( \text{Verb}^{+ \text{past}} \)

\[ \text{Verb} = /\text{smaɪl}/ \]

Past = /d/

\[ /\text{smaɪl}+d/ \Rightarrow [\text{smɑɪld}] \]
The Inverted Y architecture

Syntax

Semantics

Where does phon-con allomorphy occur?

Phonology
Reminder

Recall the simple case of allomorphy from French

[de-buʃe] but [dez-okype]
‘uncapped’ ‘freed’
No allomorph selection in this case!

**UN+CAPPED**

**Syntax**

**Semantics**

Where does phon-<cons> allomorphy occur?

**Phonology**

UN = /deʃ/  
CAPPED = /buʃe/

Morphology,

/deʃbuʃe/ => [debuʃe]
In the phonology?

Un + Capped

Syntax

Morphology,

UN = { /de/, /dez/ }
CAPPED = /buʃe/

Where does phon-con allomorphy occur?

Semantics

Phonology

/{de,dez} buʃe/ => [debuʃe]
In the morphology ("spell-out")?

Where does phon-con allomorphy occur?

\[ \text{UN+CAPPED} \rightarrow \text{Syntax} \]

\[ \text{Syntax} \rightarrow \text{Morphology,} \]

\[ \text{UN} = /de/ /\_\_C \]

\[ = /dez/ /\_\_V \]

\[ \text{CAPPED} = /buʃe/ \]

\[ /	ext{debuʃe}/ \rightarrow [\text{debuʃe}] \]
Phon-con Vocabulary Insertion

UN+CAPPED

Syntax

Morphology,

UN = /de/  /__C
= /dez/  /__V
CAPPED = /buʃe/

(phon-con) "Vocabulary Insertion"

Semantics

Phonology

/debuʃe/ => [debuʃe]
Phon-con Vocabulary Insertion

**Syntax**

**Morphology,**

\[ U_N = /de/ \quad /\_C \]
\[ = /dez/ \quad /\_V \]
\[ CAPPED = /buʃe/ \]

**Phonology**

\[ /debuʃe/ \rightarrow [debuʃe] \]

**UN+CAPPED**

Does not express the optimizing nature of the selection.
Phon-con Vocabulary Insertion

**UN+CAPPED**

**Syntax**

**Morphology,**

\[ \text{UN} = /\text{dez}/ \quad \text{_/\text{C}} \]
\[ = /\text{de}/ \quad \text{_/\text{V}} \]
\[ \text{CAPPED} = /\text{buʃe}/ \]

Does not express the optimizing nature of the selection

\[ /\text{dezbuʃe}/ \Rightarrow *[\text{dezbuʃe}] \]
Phon-con Vocabulary Insertion

• Proponents of this view recruit supposedly non-optimizing cases, e.g. Modern Hebrew /raχ, rak-im, rak-ut/ ‘soft (sg,pl), softness’
Phon-con Vocabulary Insertion

Syntax

Morphology,

SOFT = /raχ/
   = /raK/  /__V
PL = /im/
ABST = /ut/

Phonology

=> [raχ, rak-im,rak-ut]

Semantics

SOFT (SG, PL, ABSTRACT)
Phon-con Vocabulary Insertion

- **SOFT**
  - (SG, PL, ABSTRACT)
- **Syntax**
- **Morphology**
  - SOFT = /raχ/ = /raK/ /__V
  - PL = /im/
  - ABST = /ut/

**Phonology**

Sensitivity to phon of adjacent UR without optimization

=> [raχ, rak-im, rak-ut]
Phon-con Vocabulary Insertion

An argument from **economy** (again): given that

- in some cases, phon-con allomorphy is not allomorphy, **and**
- in other cases, phon-con is not optimizing **and**
- If we want phon-con selection to be done in the phonology we derive an undesirably strong phonology, as opposed to a blind filter,

Then why not spare us all the trouble and simply assume that all real phon-con allomorphy is simply phon-con vocabulary insertion.
Phon-con Vocabulary Insertion

In other words, the fact that some processes appear to be optimizing does not mean that the purported optimization is really a synchronic process and forms part of the grammar.
Phon-con Vocabulary Insertion

In other words, the fact that some processes appear to be optimizing does not mean that the purported optimization is really a synchronic process and forms part of the grammar.

Recall we are asking what the speaker knows, not what s/he needs to know or what it would be neat if they s/he knew.
Phon-con Vocabulary Insertion

Given the inverted Y architecture, any approach that denies allomorph selection in the phonology would be falsified if

Information that is clearly not present at the stage of vocabulary insertion is shown to be the condition in a case of uncontroversial allomorph selection.
The Inverted Y architecture

If there are clearly two URs

Syntax

Morphology,

AND the relevant information for getting the right candidate is not present here...

Semantics

Phonology

AND can be shown to be present here, then the selection must be taking place here
A Case Study: Surmiran (Anderson 2008)

<table>
<thead>
<tr>
<th>Person</th>
<th>Pronoun</th>
<th>Verb</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg</td>
<td>(ia)</td>
<td>cant</td>
<td>[kant]</td>
</tr>
<tr>
<td>2sg</td>
<td>(te)</td>
<td>cantas</td>
<td>['kantəs]</td>
</tr>
<tr>
<td>3sg</td>
<td>(el)</td>
<td>canta</td>
<td>['kantə]</td>
</tr>
<tr>
<td>1pl</td>
<td>(nous)</td>
<td>cantagn</td>
<td>[kən'taŋ]</td>
</tr>
<tr>
<td>2pl</td>
<td>(vous)</td>
<td>cantez</td>
<td>[kən'tɛts]</td>
</tr>
<tr>
<td>3pl</td>
<td>(els)</td>
<td>cantan</td>
<td>['kantən]</td>
</tr>
</tbody>
</table>
A Case Study: Surmiran

Two realizations:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Form</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg</td>
<td>(ia) cant</td>
<td>[kant]</td>
</tr>
<tr>
<td>2sg</td>
<td>(te) cantas</td>
<td>['kantəs]</td>
</tr>
<tr>
<td>3sg</td>
<td>(el) canta</td>
<td>['kantə]</td>
</tr>
<tr>
<td>1pl</td>
<td>(nous) canta</td>
<td>[kɔ̃tɔ̃]</td>
</tr>
<tr>
<td>2pl</td>
<td>(vous) cantez</td>
<td>[kɔ̃tɛts]</td>
</tr>
<tr>
<td>3pl</td>
<td>(els) cantan</td>
<td>['kantɔ̃]</td>
</tr>
</tbody>
</table>

Stressed [kánt] Unstressed [kənt]
A Case Study: Surmiran

<table>
<thead>
<tr>
<th></th>
<th>‘praise’</th>
<th>‘sleep’</th>
<th>‘get up’</th>
<th>‘finish’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[lód], [lʊd]</td>
<td>[dór], [dʊr]</td>
<td>[lév], [ləv]</td>
<td>[fέt(t)], [fίt(t)]</td>
</tr>
<tr>
<td>1sg</td>
<td>lód</td>
<td>dór</td>
<td>lév</td>
<td>fέt</td>
</tr>
<tr>
<td>2sg</td>
<td>lóðəs</td>
<td>dórəs</td>
<td>lévəs</td>
<td>fέttəs</td>
</tr>
<tr>
<td>3sg</td>
<td>lóda</td>
<td>dórə</td>
<td>lévə</td>
<td>fέttə</td>
</tr>
<tr>
<td>1pl</td>
<td>lʊðάŋ</td>
<td>dʊrάŋ</td>
<td>ləvάŋ</td>
<td>fίttάŋ</td>
</tr>
<tr>
<td>2pl</td>
<td>lʊðέts</td>
<td>dʊrέts</td>
<td>ləvέts</td>
<td>fίttέts</td>
</tr>
<tr>
<td>3pl</td>
<td>lóðən</td>
<td>dórən</td>
<td>lέvən</td>
<td>fέttən</td>
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A Case Study: Surmiran

<table>
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<th>‘sleep’ [dór], [dʊr]</th>
<th>‘get up’ [lév], [ləv]</th>
<th>‘finish’ [fɛt(t)], [fɪt(t)]</th>
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<td>dór</td>
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<td>fét</td>
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<td>fέttəs</td>
</tr>
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<td>dórə</td>
<td>lévə</td>
<td>fέttə</td>
</tr>
<tr>
<td>1pl</td>
<td>lʊdάŋ</td>
<td>dʊrάŋ</td>
<td>ləvάŋ</td>
<td>fίttάŋ</td>
</tr>
<tr>
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<td>lʊdέts</td>
<td>dʊrέts</td>
<td>ləvέts</td>
<td>fίttέts</td>
</tr>
<tr>
<td>3pl</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Anderson shows that the choice of the stem is not based on morphological information, but depends only on stress.
A Case Study: Surmiran

Stress is completely regular in this language:

it falls on the penult if the rhyme of the final syllable consists of [ə], possibly followed by [r], [l], [n] or [s]:  [kántən], [kántə]

And on the final vowel if it is not [ə], or if it is [ə] followed by some other consonant: [kəntéts]
A Case Study: Surmiran

Stress is completely regular in this language:

Therefore, stress must be an output of the phonological computation: it is *not* in the UR that is fed to the phonology.
A Case Study: Surmiran

Vowels to be found in stressed syllables:

\[ [i,u,a,o,ɛ,e,ε] + \text{diphthongs} \]

Vowels to be found in unstressed syllables:

\[ [ɪ,ʊ,ə] + (\text{rarely})[ɛ,ɔ] \]
It is therefore tempting to analyse all of the alternations as **underlyingly the same**. For instance:

**UR**

/kant-a/   /kant-ɛts/

**Stress assignment**

/kánta/   /kantéts/

**Reduction**

[kántə]   [kəntéts]
A Case Study: Surmiran

It is therefore tempting to analyse all of the alternations as underlyingly the same. For instance:

<table>
<thead>
<tr>
<th>UR</th>
<th>/kant-a/</th>
<th>/kant-na/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress assignment</td>
<td>/kánta/</td>
<td>/kantéts/</td>
</tr>
<tr>
<td>Reduction</td>
<td>[kántə]</td>
<td>[kəntéts]</td>
</tr>
</tbody>
</table>

If this is true, then there is no allomorphy at all.
A Case Study: Surmiran

It is pretty sure, on the basis of comparative studies, that this is certainly the historical reason for the reduction.

However,

Anderson shows convincingly that this cannot be a synchronic analysis:
A Case Study: Surmiran

It is impossible to predict the unstressed vowel from the stressed one, or vice-versa:

<table>
<thead>
<tr>
<th>Alternation</th>
<th>Infinitive</th>
<th>3sg Pres.</th>
<th>Indic.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ū]/[a]</td>
<td>v[ʊ]rdar</td>
<td>varda</td>
<td></td>
<td>‘watch’</td>
</tr>
<tr>
<td>[ũ]/[ɔ]</td>
<td>d[v]rmeir</td>
<td>dorma</td>
<td></td>
<td>‘sleep’</td>
</tr>
<tr>
<td>[ũ]/[o]</td>
<td>cr[v]dar</td>
<td>croda</td>
<td></td>
<td>‘fall’</td>
</tr>
<tr>
<td>[ũ]/[oː]</td>
<td>p[v]ssar</td>
<td>possa</td>
<td></td>
<td>‘rest’</td>
</tr>
<tr>
<td>[ũ]/[oi]</td>
<td>l[ʊ]ier</td>
<td>loiā</td>
<td></td>
<td>‘arrange’</td>
</tr>
</tbody>
</table>
A Case Study: Surmiran

It is impossible to predict the unstressed vowel from the stressed one, or vice-versa:

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<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]/['a]</td>
<td>(sa) tgil[ɪ]ttar</td>
<td>tgilatna</td>
<td></td>
<td>‘sit down (scornfully, as of a cat)’</td>
</tr>
<tr>
<td>[i]/['aʝ]</td>
<td>spisg[ɪ]ntar</td>
<td>spisgiainta</td>
<td></td>
<td>‘feed’</td>
</tr>
<tr>
<td>[i]/['ɛ]</td>
<td>p[ɪ]glier</td>
<td>peglia</td>
<td></td>
<td>‘take’</td>
</tr>
<tr>
<td>[i]/['ɛ]</td>
<td>f[ɪ]mar</td>
<td>fema</td>
<td></td>
<td>‘smoke’</td>
</tr>
<tr>
<td>[i]/['eʝ]</td>
<td>anv[ɪ]dar</td>
<td>anveida</td>
<td></td>
<td>‘invite’</td>
</tr>
<tr>
<td>[i]/['i]</td>
<td>tg[ɪ]rar</td>
<td>tgira</td>
<td></td>
<td>‘guard’</td>
</tr>
</tbody>
</table>
# A Case Study: Surmiran

<table>
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<tr>
<th>Alternation</th>
<th>Infinitive</th>
<th>3sg Pres. Indic.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ø]/[a]</td>
<td>l[ø]var</td>
<td>lava</td>
<td>‘wash’</td>
</tr>
<tr>
<td>[œ]/[aɪ]</td>
<td>[œ]ntrar</td>
<td>aintra</td>
<td>‘enter’</td>
</tr>
<tr>
<td>[ø]/[ɛ]</td>
<td>t[ø]dlar</td>
<td>tedla</td>
<td>‘listen’</td>
</tr>
<tr>
<td>[œ]/[e]</td>
<td>l[œ]var</td>
<td>leva</td>
<td>‘get up’</td>
</tr>
<tr>
<td>[œ]/[ɛi]</td>
<td>p[œ]sar</td>
<td>peisa</td>
<td>‘weigh’</td>
</tr>
<tr>
<td>[œ]/[ei]</td>
<td>antsch[œ]dar</td>
<td>antscheida</td>
<td>‘start yeast’</td>
</tr>
<tr>
<td>[œ]/[i]</td>
<td>surv[œ]gneir</td>
<td>survigna</td>
<td>‘receive’</td>
</tr>
<tr>
<td>[œ]/[o]</td>
<td>cl[œ]mar</td>
<td>cloma</td>
<td>‘call’</td>
</tr>
</tbody>
</table>
A Case Study: Surmiran

If so, for every verbal stem in Surmiran, the speaker must retain two stems.

1) the unstressed version
2) the stressed version

But stress is decided in the phonology...
A Case Study: Surmiran

If so, for every verbal stem in Surmiran, the speaker must retain two stems.

1) the unstressed version
2) the stressed version

But stress is decided in the phonology...

In consequence, **both stems** must be accessible to the phonological computation. The decision of which stem to take **cannot precede** the phonological computation
Anderson’s analysis

*\( \hat{V}_{\text{lax}} \):
Do not stress [ɪ,ʊ,ə]

*\( V_{\text{-lax}} \):
Punish non-lax vowels
Anderson’s analysis in our architecture

Syntax

SING+2PL

Semantics

Phonology

Morphology,

SING = /kant/, /kənt/
2PL = /ɛʦ/

/{kant, kənt}+ɛʦ/ => [kəntɛʦ]
Anderson’s analysis

Syntax

Semantic

Phonology

S\text{ING} + 2\text{PL}

Note that stress is not mentioned in the UR!!

\text{SING} = /kant/, /kənt/
\text{2PL} = /ɛʦ/

\{kant, kənt\} + ɛʦ/ => [kəntɛʦ],

S\text{ING} = /kant/, /kənt/

Morphology,
Anderson’s analysis

Syntax

SING+2PL

Note that stress is not mentioned in the UR!!

Semantics

Phonology

Morphology,

SING = /kant/, /kənt/
2PL = /ɛʦ/

/{kant, kənt}+ɛʦ/ => [kəntɛʦ], *[kantɛʦ]

*V[-lax]
Anderson’s analysis

Syntax

**SING+3PL**

Note that stress is not mentioned in the UR!!

Semantics

Phonology

Morphology,

SING = /kant/, /kənt/
2PL = /ən/

/\{kant, kənt\}+ən/ ⇒ [kántən]
Anderson’s analysis

Note that stress is not mentioned in the UR!!

SING+3PL

Syntax

Morphology,

SING = /kant/, /kənt/
2PL = /ən/

Semantics

Phonology

*/[vlax]*

/{kant, kənt}+ən/ => [kántən], *[kάntən]
Anderson's analysis

<table>
<thead>
<tr>
<th>/{vurd, vard}-ar/</th>
<th>Stress</th>
<th>*'u, 'i, 'o</th>
<th>*ã, ã, Ż</th>
</tr>
</thead>
<tbody>
<tr>
<td>'vurdâr</td>
<td>!*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'vardâr</td>
<td>!*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>vũr'dar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>văr'dar</td>
<td></td>
<td></td>
<td>!*</td>
</tr>
</tbody>
</table>
Anderson’s analysis

<table>
<thead>
<tr>
<th></th>
<th>Stress</th>
<th>*(u, i, ə)</th>
<th>*(a, i, ū)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/{vurd, vard}-ə/</td>
<td><strong>vurdə</strong></td>
<td>!*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;vurdə&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vûr'də</td>
<td>!*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>văr'də</td>
<td>!*</td>
<td></td>
</tr>
</tbody>
</table>


Anderson’s analysis

• Stress is determined **in the phonology**.

• Only when stress is considered can the allomorph be selected, so it can’t happen before the phonology.

• Anderson presents this as a decisive argument for allomorph selection in the phonology.
Autosegmental alternative with a single UR
Autosegmental alternative with a single UR

\[
\begin{array}{ccccccc}
\text{v ð a r d} & \ddot{e} & \ddot{t} \\
\text{C V C V C V} & & & & & \\
\end{array}
\]

\[
\begin{array}{ccccccc}
\text{v ð a r d n} \ \ \ \ \ \ \ \\
\text{C V C V C V} & & & & & \\
\end{array}
\]
Autosegmental alternative with a single UR

Every verb in Surmiran would have to have such an indeterminate representation.
Whether one is content with this solution or not, it too crucially involves the selection of the better vowel among the two in the phonology.
Summary

If all phon-con allomorphy precedes phonology, it is predicted that purely phonological processes will not be able to interact with it.
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This view is falsified by the Surmiran case.
Summary

If all phon-con allomorphy precedes phonology, it is predicted that purely phonological processes will not be able to interact with it.

This view is falsified by the Surmiran case.

Unless one accepts massive floating, there must be phon-con allomorph selection in the phonology.
In other words, it must be possible for the morphology to provide more than one UR, "leaving the choice" for the phonology.
Annex: feature-sensitive allomorphy and modularity

A recurrent feature in the study of allomorphy is its limits.

Scheer (2016) makes a generalization that is quite remarkable in this respect, namely that

Pure melody (segments, features) cannot be the trigger of allomorph-selection (or of any syntactic operation)
Annex: feature-sensitive allomorphy and modularity

Pure melody (segments, features) cannot be the trigger of allomorph-selection (or of any syntactic operation)

Scheer claims that all of the cases that we saw of this are amenable to an analysis with floaters and one UR.
Annex: feature-sensitive allomorphy and modularity

Pure melody (segments, features) cannot be the trigger of allomorph-selection (or of any syntactic operation)

Ok, but why?
Annex: feature-sensitive allomorphy and modularity

Pure melody (segments, features) cannot be the trigger of allomorph-selection (or of any syntactic operation)

Ok, but why? **Modularity**

“...items that are processed by a given module cannot be read, parsed or understood by another module.”
Annex: feature-sensitive allomorphy and modularity

Modularity

“...items that are processed by a given module cannot be read, parsed or understood by another module.”

Phonology processes segments and features. Therefore Morphology can’t understand these.
Annex: feature-sensitive allomorphy and modularity

But nothing prevent morphology from understanding the structures created by phonology, or simply present in the representation, such as

- Skeletal C/V distinction,
- Syllabic structure,
- Sonority (e.g. a<i,u)
Annex: feature-sensitive allomorphy and modularity

But nothing prevent morphology from understanding the structures **created** by phonology, or simply present in the representation, such as

- Skeletal C/V distinction,
- Syllabic structure,
- Sonority (e.g. a<i,u>)

Although how this happens is not very clear in Scheer’s account, which concentrates on apparent counter-examples to his first generalization
Annex: feature-sensitive allomorphy and modularity

Pure melody (segments, features) cannot be the trigger of allomorph-selection (or of any syntactic operation)

=> a problem for OT accounts of allomorphy, because the entire phonology in principle interacts with allomorph selection (these accounts are non-modular wrt phonology and morphology)