Linearisation as syntax-phonology mapping

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Syntax theory

- Syntactic structure is essentially hierarchical: it represents constituent structure.
- Utterances are essentially linear.
- What is the relation between the hierarchical and the linear structure?

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Syntax just represents hierarchical structure.

Linear order is a requirement of the modality of language.

Chomsky thinks so too:

“(…) that order does not enter into the generation of the C-I interface, and that syntactic determinants of order fall within the phonological component.”

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The solution — or is it?

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First assumption

Any approach within generative grammar toward linearisation makes three assumptions.

- Totality (Kayne 1994):
  Given a tree $K$ and the set $T$ of terminals in $K$, for every pair $x, y \in T$, an ordering is defined, either $x > y$ or $y > x$. 
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- Linear Correspondence (Ackema & Neeleman 2004): If X is structurally external to Y, then Ph(X) is linearly external to Ph(Y).
  - Ph(X): the phonological material associated with X. (Kremers 2007)

```
  X   Y
   \  /
    z abc
```

/\zabc/  
/\abcz/  
*/azbc/  
*/abzc/
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The most conspicuous data comes from sign languages:

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- Totality
  - There is no precedence relation between Ph(AdvP) and Ph(V).

- Linear Correspondence
  - Ph(AdvP) is linearly internal to Ph(VP).
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Spoken languages show similar phenomena:

(2) \[ \text{wh} \quad \text{tu sais danser?} \]
\[ \text{you know.2SG dance} \]
\[ \text{‘do you know how to dance?’} \]
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**How can synchronicity be handled?**
The Language Faculty

(3)

SEMANTICS

phrasal semantics

word semantics

SYNTAX

phrasal syntax

word syntax

PHONOLOGY

phrasal phonology

word phonology


Joost Kremers
Linearisation as syntax-phonology mapping
Lexical mapping rules

- Lexical items are language-specific mapping rules:
  \[ \text{tree}(x) \leftrightarrow [\text{N}, \text{count}]\langle \nu \rangle \leftrightarrow /\text{t}i:/ \]

- The same is true for affixes:
  \[ \lambda P[P(x)] \leftrightarrow [\text{N}, \text{count}]\langle \nu \rangle \leftrightarrow /-\text{v}^1/ \]
Prosodic hierarchy

Utterance (U)
Intonational Phrase (IntP)
Phonological Phrase (φ) ←
Prosodic Word (ω) ←
Foot (Ft)
Syllable (σ) ←
Mora (µ) ←
Arabic non-linear morphology is synchronous.

The deverbal noun *nfiṣāl* ‘agitation’ has four morphemes:

- **Root** $/fṢl/$
- **Verb Stem VII** $(\sigma_{\mu}) \sigma_{\mu}$
- **Nominaliser** $/i\ a/$
- **Non-finite** $-\sigma_{\mu\mu}$
Arabic morphology

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Putting the morphemes together yields the following form:

- (syllabic tier)

- (segmental tier)

The linear order of the segments is derived in phonology:
- Lexically specified: root and nominaliser morphemes; non-finiteness morpheme.
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\[
(\sigma) \quad \sigma \quad \sigma \quad (\sigma)
\]

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\[
\begin{array}{cccc}
\mu & \mu & \mu \\
n & f & i & a & l
\end{array}
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\/ \ / \ /  
\ / \ / \ /  
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```
(σ)
\/  
\ /  
fi Qa l
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Back to the original problem: linearisation.

Arabic has syllabic morphemes, i.e. (morpho)syntactic elements that map onto a syllabic structure.

Proposal: syntactic structures map onto phonological structures consisting of $\varphi$’s and $\omega$’s.

For example, the head parameter (head-first):

$$[x', \ X^a \ YP^b] \leftrightarrow \{ \omega^a \ \varphi^b \}$$
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- **\text{WRAP-XP}:** $X^a \leftrightarrow \varphi^a$
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