

Morphology —like syntax— is in the eye of the beholder

Joost Kremers
University of Göttingen, Germany
joost.kremers@phil.uni-goettingen.de

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Introduction

- ▶ Architecture of the grammar:
 - ▶ Phonology
 - ▶ Morphology
 - ▶ Syntax
 - ▶ Semantics
- ▶ Language as a pairing of form and meaning:

form	≈	phonology
meaning	≈	semantics
pairing	≈	syntax+morphology

Goals of the talk

- ▶ Synthesis of morphology and syntax.
- ▶ Account for the morphology/syntax distinction through phonology.
- ▶ Discuss consequences for the architecture of the grammar.

Syntax vs. Morphology

Syntax vs. Morphology

Conceptual and theoretical arguments in favour of a unified module:

- ▶ There is no obvious functional distinction.
- ▶ Both are generative systems manipulating the same objects.
- ▶ Morphology can be highly regular (e.g., Turkish).
- ▶ What is a word?

MWd and SWd

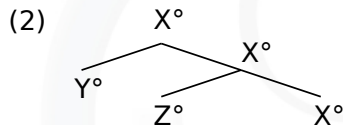
Embick & Noyer (2001) define the *Morphological Word* and the *Subword* as follows:

- (1) a. *Morphological Word*:
At the input to Morphology, a node X° is (by definition) a morphosyntactic word (MWd) iff X° is the highest segment of an X° not contained in another X° .
- b. *Subword*:
A node X° is a subword (SWd) if X° is a terminal node and not an MWd.

Bare Phrase Structure

- ▶ *Merge* as the only structure-building operation.
- ▶ X° : minimal (non-projecting) head.
- ▶ XP : maximal projection of X .

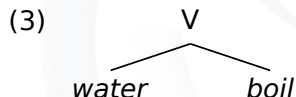
MWd and BPS



- ▶ The definition of MWd (and indirectly SWd) refers to a “segment of an X° ”.
- ▶ In BPS, X° by definition cannot have segments.
- ▶ MWd and SWd cannot be defined in a BPS-approach.

Bare Phrase Structure

- ▶ Suppose we have the structure in (3):

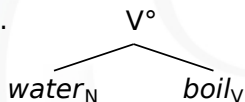


- ▶ We do not know at this point whether the derivation is going to yield *to boil water* or *water boiler*.

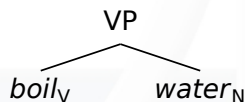
Bare Phrase Structure

Representations such as those in (4) and (5) are not distinguished in BPS:

(4) a.



b.



Models of grammar are based on the intuition that there is a distinction between the word level and the phrasal level.

Making sense of the intuition

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Prosodic hierarchy

Phonological structure contains a hierarchy of *prosodic constituents*:

- (5) Utterance (U)
- Intonational Phrase (IntP)
- Phonological Phrase (φ)
- Prosodic Word (ω)
- Foot (Ft)
- Syllable (σ)
- Mora (μ)

(cf. Nespors & Vogel 1986)

Prosodic hierarchy

There are well-known correspondences between syntax and the prosodic hierarchy:

- ▶ Syntactic structures are mapped onto phonological (and intonational) phrases.
- ▶ Morphological structures are mapped onto prosodic words.

Makes sense.

Really?

(A moment of silent contemplation...)

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Optical illusion

It is not the structure-building mechanism that determines whether a structure is mapped onto prosodic words or phonological phrases.

Rather, it is the prosodic level onto which a structure is mapped that makes us perceive a structure as “morphological” or “syntactic”.

Optical illusion

It is not the structure-building mechanism that determines whether a structure is mapped onto prosodic words or phonological phrases.

Rather, it is the prosodic level onto which a structure is mapped that makes us perceive a structure as “morphological” or “syntactic”.

Proposal

- ▶ An optical (or rather acoustic) illusion:
- (6) a. PWd \approx “Morphology”
b. PPhr \approx “Syntax”
- ▶ *Separation Hypothesis* (Beard 1988; cf. Halle & Marantz’s (1993) *Late Insertion*).
 - ▶ Syntax combines heads (i.e., feature bundles).
 - ▶ Word formation is not a morphological/syntactic matter.

Data

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Arabic deverbal nouns

- (7) *ʔaqlaqa-nī -ntiqād-u -l-rajul-i -l-mašrūf-a*
annoy-1sg.O criticising-NOM DEF-man-GEN DEF-project-ACC
'The man's criticising the project annoyed me.'

Properties:

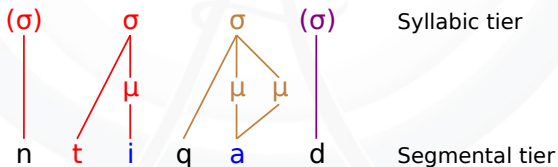
- ▶ Regular form (in most verb stems).
- ▶ *Event-Structure*.
- ▶ Subject takes genitive case.
- ▶ Object takes genitive case when no subject is present, otherwise accusative or PP.
- ▶ In other words: *Poss-ing* or *Ing-of* (Abney 1987).

Arabic deverbal nouns

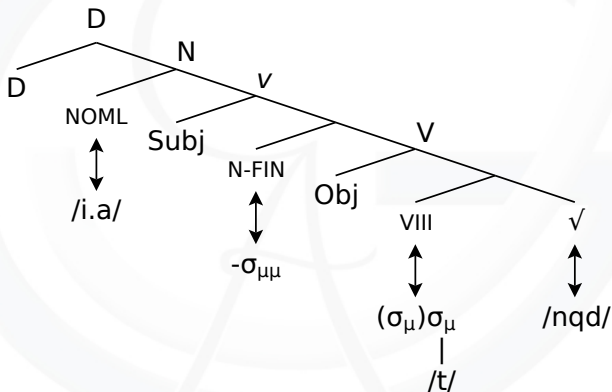
McCarthy & Prince's (1990) account:

Form: 'ntiqād

Root:	/nqd/	Nominalizer:	/i.a/
Stem VIII:	(σ) σ_{μ} t	Non-finite:	- $\sigma_{\mu\mu}$



Arabic deverbal nouns



Arabic deverbal nouns

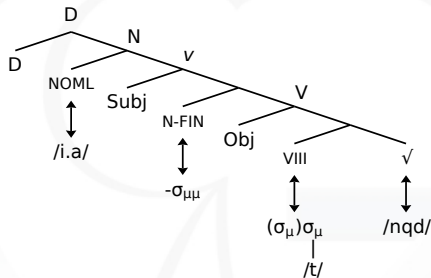
- ▶ The four morphemes in the word form *intiḡād* need to be combined.
- ▶ A syntactician's standard answer: head movement.
- ▶ Phonology needs to “know” that the four morphemes need to be combined; syntax does not.
- ▶ Syntax/phonology mapping principle:

(8) *Input Correspondence*:

If A selects (a projection of) B, $\Phi(A)$ selects $\Phi(B)$.

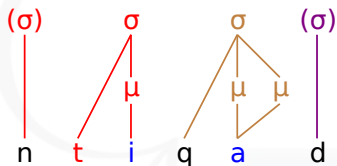
(Ackema & Neeleman 2004, cf. also Sadock 1992)

Arabic deverbal nouns



- ▶ VIII selects \check{v} , N-FIN selects VIII, and NOML selects N-FIN.
- ▶ There is no need for a distinct subtree containing these four heads.
- ▶ By Input Correspondence, all four morphemes must be realised in a single form.

Arabic deverbal nouns



- ▶ The phonology orders the four morphemes.
- ▶ *Segments* are linearised, *not* morphemes.
- ▶ Linear order is determined by phonological factors.
- ▶ The phonological form of a morpheme may (arbitrarily) require a specific linearisation (prefix, suffix).

Phonological composition

- ▶ Syntax creates hierarchical feature structures (BPS, no linear order).
- ▶ The phonological chunks associated with syntactic heads are assembled into a phonologically licit form.
- ▶ Principles relevant to phonological composition:

- (9) a. Phonological principles
- b. Mapping principles

Phonological composition

Phonological principles:

- ▶ Alignment
- ▶ Left-to-Right Association
- ▶ Language-specific rules and facts

Mapping principles:

- ▶ Input Correspondence
- ▶ Linear Correspondence

Syntactic structure only has an indirect influence on phonological form (including linear order).

Nonmanuals in sign language

Sign languages have so-called *nonmanual components*:

(10) **face:** presumably DGS

hands: (POSSIBLE) SVEN WORK:3 GO:Perf:3
'Presumably, Sven has gone to work already.'

(11) **face:** possible

hands: (POSSIBLE) SVEN WORK:3 GO:Perf:3
'Sven has possibly gone to work already.'
(Happ & Vorköper 2006: 363)

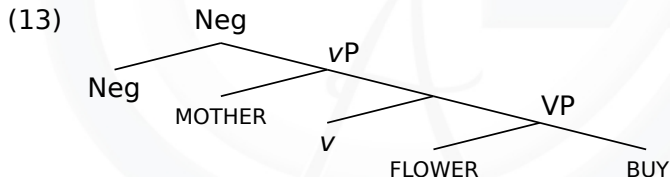
Nonmanuals in sign language

- (12) a. **head:** *neg* DGS
hands: MOTHER FLOWER BUY
- b. **head:** *neg*
hands: MOTHER FLOWER BUY
'Mother does not buy a flower'
- c. * **head:** *neg*
hands: MOTHER FLOWER BUY
'Mother does not buy a flower'
(Pfau 2002)

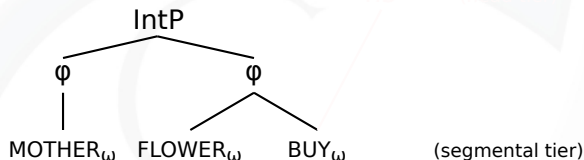
- ▶ In both sentences, negation is sentential.

Nonmanuals in sign language

- ▶ Negation takes the form of a head shake and must be represented as an autosegmental feature.
- ▶ Assuming that the negation selects vP , the structure is as follows:



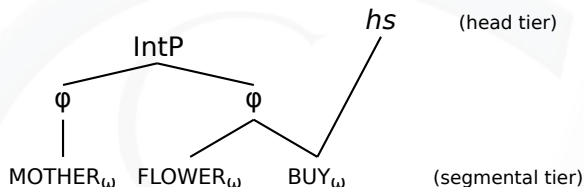
Nonmanuals in sign language



$$(14) \quad \neg \leftrightarrow \begin{bmatrix} \text{Neg} \\ uV \end{bmatrix} \leftrightarrow \begin{matrix} hs \\ | \\ \omega \end{matrix}$$

- ▶ *hs* is realised autosegmentally.
- ▶ Left-to-Right Association and Input Correspondence associate *hs* with BUY.

Nonmanuals in sign language

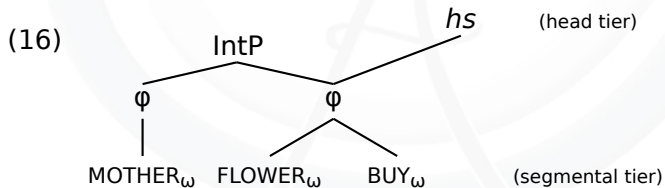
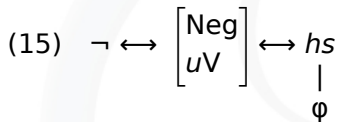


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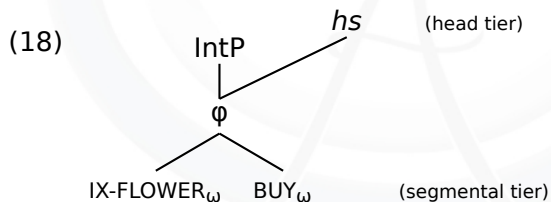
Nonmanuals in sign language

Alternative realisation:



Nonmanuals in sign language

- (17) **head:** *neg*
hands: INDEX₃ FLOWER BUY
'She does not buy a flower'
(Pfau 2008: 26)



Latin *-que*

(19) *bonī puerī bonae-que puellae*
good boys good-and girls
'good boys and good girls'

- ▶ Embick & Noyer (2001) argue that *-que* attaches to the first MWd of its complement.

Latin *-que*

Note the following data (Embick & Noyer 2001: 576):

(20) a. *circum-que ea loca*
around-and those places
'and around those places'

b. *contrā-que lēgem*
against-and law
'and against the law'

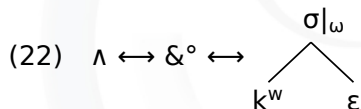
(21) a. *in rēbus-que*
in things-and
'and in things'

b. *dē prōvinciā-que*
from province-and
'and from the
province'

-que attaches after the first PWD (Agbayani & Golston 2010).

Latin *-que*

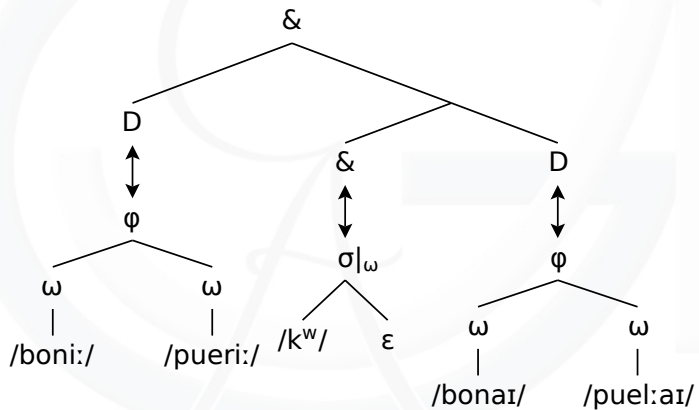
- ▶ Latin *-que* is a *prosodic* morpheme:



- ▶ The phonological form of *-que* specifies that it is a syllable that must appear at the right edge of a PWd.

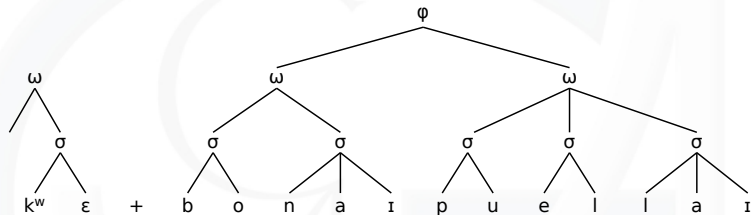
Latin -que

(23)

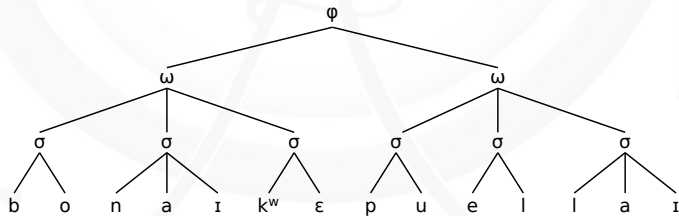


Latin *-que*

(24)



(25)



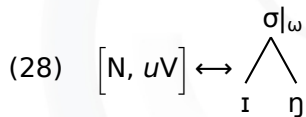
Tagalog *-um-*

- (26) a. *aral - um·aral*
b. *sulat - s·um·ulat*
c. *gradwet - gr·um·adwet*

(27) $[v, +ag] \leftrightarrow$

ω		σ		σ
		u		m

English *-ing*



Syntax vs. Morphology

- ▶ The phonological form of lexical items plays a role in phonological composition.
- ▶ There is no need to “prepare” a tree for phonology.
- ▶ There is no need to distinguish between syntactic and morphological structures.
- ▶ “Morphemes” may specify additional phonological properties, such as alignment (pre-/suffix) or prosodic structure.

Syntax above the word

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Syntax above the word

- ▶ The data so far are morphological data.
- ▶ A syntactic analysis of these is possible by assuming the phonological form of “morphemes” is partially prosodic.
- ▶ Question: Does this analysis extend above the “word” level?

Linearisation

Linearisation seems a prime candidate:

- ▶ Linear order is primarily a modality requirement (an “external factor”).
- ▶ Syntactic structure is underspecified for linear order.
- ▶ There are item-specific (i.e., irregular) linearisations (Jackendoff 2002):

- (29) a. **so/how/very/too** good
b. good **enough**

Linearisation: head/comp

Truckenbrodt (1995):

- (30) a. Head-initial VP \leftrightarrow φ -final stress (*read the **book***)
b. Head-final VP \leftrightarrow φ -initial stress (*das **Buch** lesen*)

Nespor et al. (2008):

- (31) a. Stress realised as pitch/intensity: φ -initial stress, comp-head
b. Stress realised otherwise: φ -final stress, head-comp

Linearisation: focus

Samek-Lodovici (2005) (cf. also Féry 2010):

- (33) a. *[Gianni ha RISO]_f*
Gianni has laughed
'Gianni laughed' (context: *What happened?*)
- b. *Ha riso GIANNI_f*
has laughed Gianni
'Gianni has laughed' (context: *Who laughed?*)

- (34) Focus alignment: ϕ |_{IntP}
|
foc

Intonational contours

- (35) a. John left for Rome. (L%)
b. John left for Rome? (H%)

Suppose (35b) differs syntactically from (35a) in having a [+wh] C head. Then we can say:

- (36) $[C, +wh] \leftrightarrow \dots |_{\text{IntP}}$
 |
 H

Counterarguments

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Counterarguments

- ▶ No free affix order languages.
- ▶ No LD-dependencies within words (e.g., no movement).
- ▶ Affixes are functional, i.e., no need for IS- or checking-driven movement.
- ▶ Affixes specify alignment restrictions in their phonological forms.

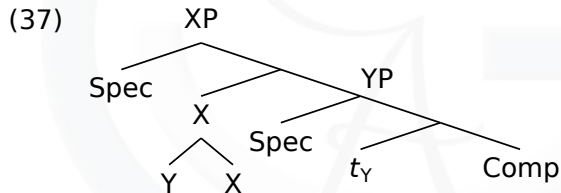
Counterarguments

Ackema & Neeleman (2004, 2007) discuss various arguments in favour of a separate morphology module:

- ▶ Stranding and licensing
- ▶ Syntactic vs. morphological complex heads

Stranding and licensing

Ackema & Neeleman (2007) assume that syntactic word formation involves movement:



Stranding and licensing

Accordingly, word formation should allow stranding of modifiers:

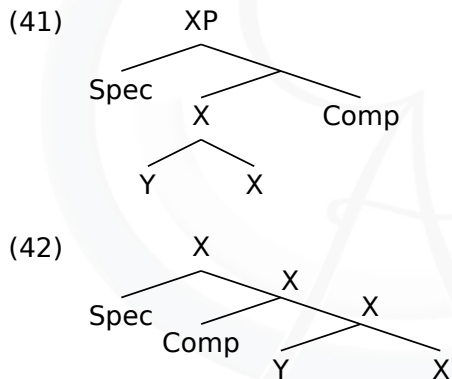
- (38) a. *the [city_i centre] [of [a prosperous medieval [t_i [in Northern Italy]]]]
b. *[parent_i hood] [(of) [a [responsible [t_i [from Glasgow]]]]]

And licensing of arguments:

- (39) driver *(of) a truck

Stranding and licensing

However, BPS allows us to do “syntactic” word formation *without* movement:



Lexical Integrity

One difference between syntactic and morphological complex heads is *Lexical Integrity*:

- ▶ Subextraction of parts of words is not possible.
- ▶ Features of parts of words are not accessible for syntax.

Lexical Integrity

For example, a compound cannot be split up:

(43) *Tea_i, I have bought a t_i pot.

However, the same is true for certain phrases:

(44) *Blue_i, I have bought a t_i tea pot.

Lexical Integrity

Consider also the following data:

- (45) a. *Černogo_i ja rešila ne pokupat' [NP t_i xleba]!*
black I decided not to.buy bread
'I decided not to buy black bread.'
- b. *V vagon ona xodila restoran obedat'.*
to carriage she went restaurant to.dine
'She used to go dine in a carriage restaurant.'
(Pereltsvaig 2008: 8, 10)

Lexical Integrity

Sometimes selectional restrictions of nonheads do percolate up:

- (46) a. *verbouw-plannen* *aan het huis*
reconstruction-plans on the house
'reconstruction plans for the house'
- b. ... *Benghazi, the grootste door opstandelingen tegen*
... Benghazi, the largest by revolvers against
Gaddafi bestuurde stad
Gaddafi governed city
'... Benghazi, the largest city governed by opposition forces
against Gaddafi'

Lexical Integrity

Hebrew compounds (Borer 1989, 2009) are construct states with certain restrictions:

- ▶ Nonhead cannot be modified.
- ▶ Nonhead cannot be coordinated.
- ▶ Nonhead is not referential.
- ▶ Meaning is nontransparent.
- ▶ Pronominal reference to head or nonhead separately is not possible.
- ▶ Head+nonhead complex is semantically opaque, i.e., a semantic unit.

Generalised Structural Integrity

- (47) *Generalised Structural Integrity*
A unit on one level of representation (semantic, syntactic, phonological) corresponds to units on the other two levels of representation.

SEM ↔ SYN ↔ PHON

- ▶ This principle is violable, as e.g. movement shows.
- ▶ The lower on the prosodic hierarchy, however, the stronger it becomes.

Generalised Structural Integrity

Isn't this trivial?

- ▶ There are several special cases:
 - ▶ Sem. simplex \leftrightarrow syn. head \leftrightarrow PWd
 - ▶ Sem. complex \leftrightarrow syn. phrase \leftrightarrow PPhr
 - ▶ Proposition \leftrightarrow clause \leftrightarrow U
- ▶ Because GSI is violable, so are these.
- ▶ Deviations are generally language-specific and must be learnt.

Parallel domains?

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Phonological composition

- ▶ Phonological composition appears non-local.
- ▶ Phonological restrictions can influence syntax: Heavy-NP Shift, focus alignment, wh-movement (Richards 2006).
- ▶ Feedback from phonology to syntax seems required.

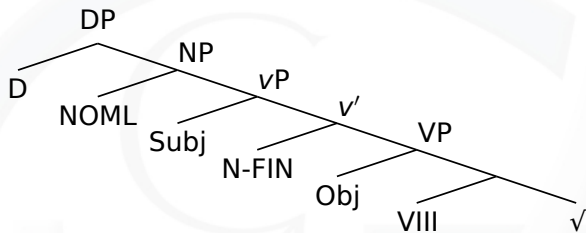
Architecture of the grammar

- ▶ Phonological structure is composed in parallel with syntactic structure.
- ▶ Phonological structure may feed back into syntax, forcing the selection of two competing syntactic structures.
- ▶ A parallel architecture such as that of Jackendoff (1997, 2002) seems adequate to express this.
- ▶ Note: Jackendoff does not account why *syntactic* structure is the way it is (semantics and phonology get their own “system”, so should syntax).

Architecture of the grammar

- ▶ Syntax is a combinatorial, symbolic system (cf. Boeckx 2010, Deacon 1997).
- ▶ Semantics and phonology are similarly combinatorial systems, with their own principles.
- ▶ On top of this sits a system of constructions, somewhat like Jackendoff's.

Phonological composition

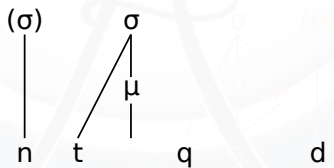


Phonological composition

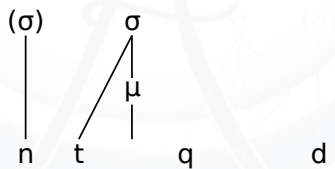
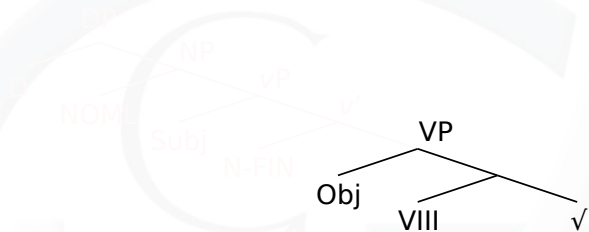


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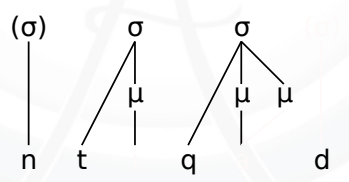
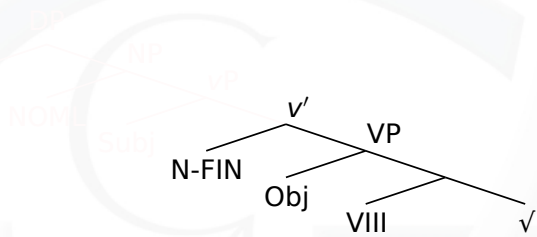
Phonological composition



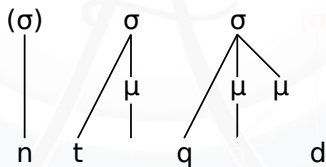
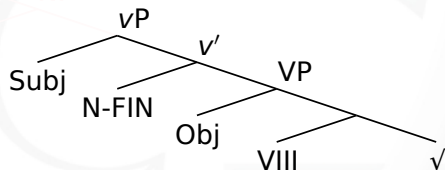
Phonological composition



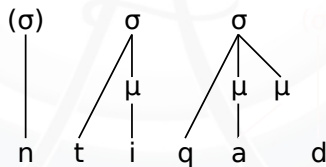
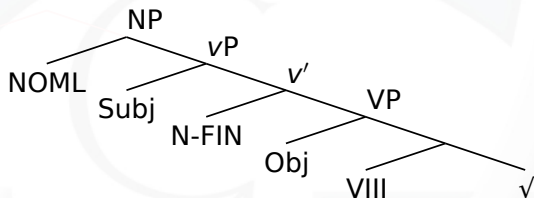
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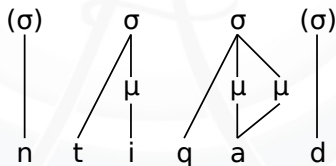
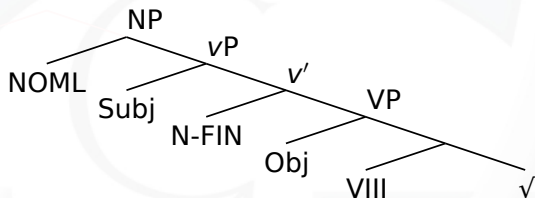
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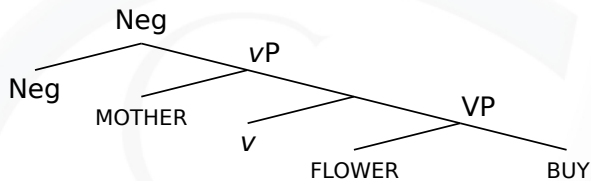
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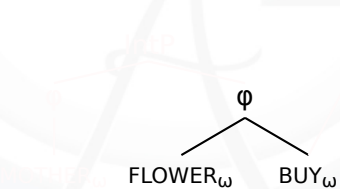
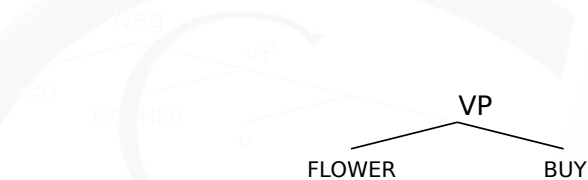
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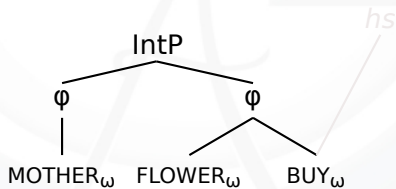
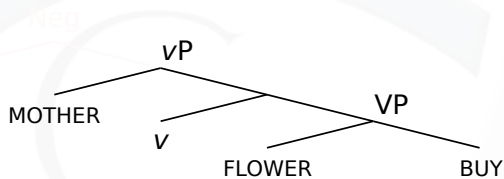
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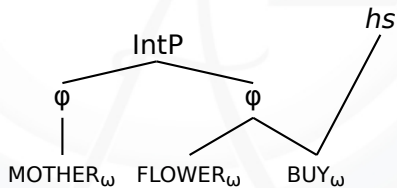
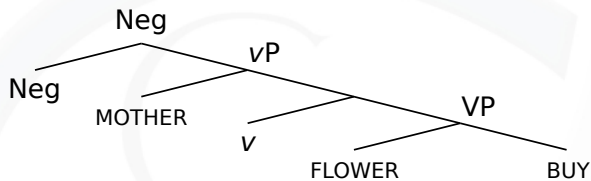
Phonological composition



Phonological composition



Phonological composition



Summary

- ▶ The syntax/morphology distinction is an optical illusion.
- ▶ Differences between “word-level” and “phrasal level” structures must be accounted for phonologically.
- ▶ The influence of phonology on the form of a linguistic structure is much larger than generally assumed; e.g., linearisation is phonological.

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