

# Linguistic contrasts

How vertical and horizontal asymmetries create  
linear order effects in prosody and in syntax

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# Conclusion

**Linguistic Contrast Principle:** maximize contrasts in language

- **horizontal**      alternate features on units in the linear string ('OCP')
- **vertical**        alternate hierarchical headedness

# Background

- acoustic prominence distinctions
- stress shifts
- haplology (also of adjacent functional words)
- perception of sounds like a ticking clock
- endocentricity in morphology
- binary Merge + projection in syntax
- binary oppositions in lexical semantics

⇒ disfavor adjacent sames

⇒ binarity

# Distribution of stress in Dutch

=> Evidence for a **vertical disharmonic hierarchy** in phonology

...

level i+3      [ dependent      head]

level i+2      [ head              dependent]

level i+1      [ dependent      head]

level i        [ head              dependent]

...

# Stress in phonology

## ***Prosodic hierarchy:***

( Intonational phrase ( $\iota$ ) > )

Phonological phrase ( $\phi$ ) >

Compound >

Prosodic word ( $\omega$ ) >

Foot ( $\Sigma$ ) >

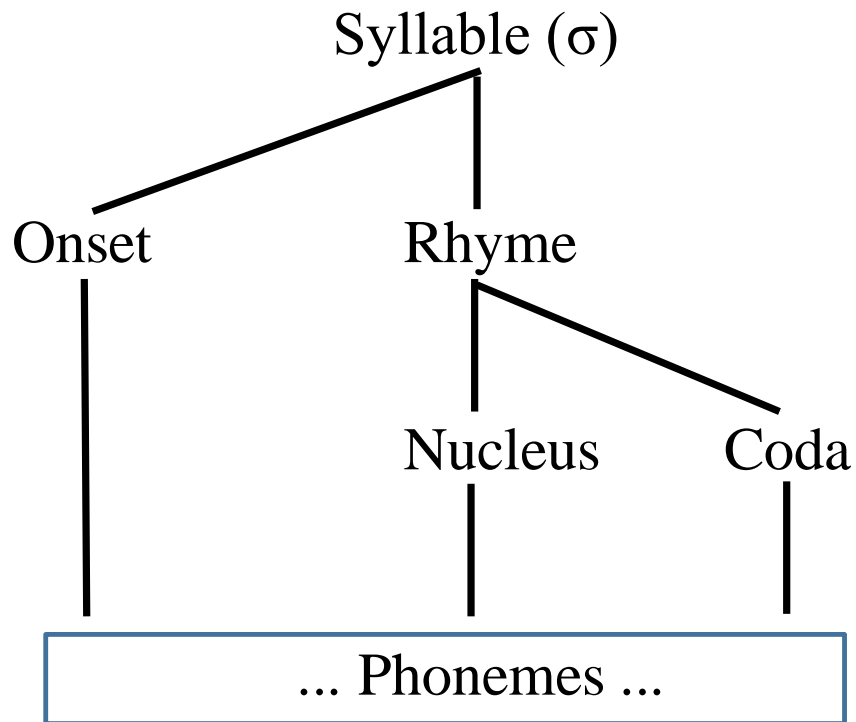
Syllable ( $\sigma$ ) >

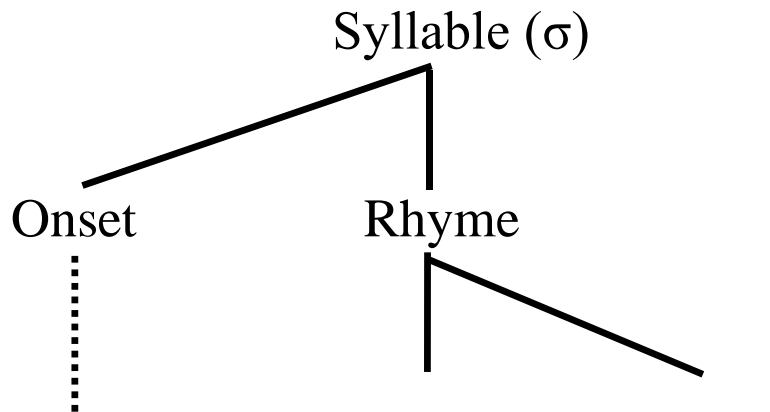
    Rhyme >

    Nucleus >

    (Phoneme)

# The disharmonic syllable

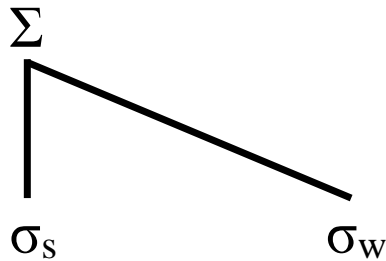




syllable: head right

rhyme: head left

	Nucleus	Coda		
	/a/	/ls/	<i>als</i>	‘if’
	/ʌy/	/l/	<i>uil</i>	‘owl’
/b/	/a/	/l/	<i>bal</i>	‘ball’
/k/	/ei/	/n/	<i>klein</i>	‘small’
/l/	/a/		<i>la</i>	‘drawer’
/v/	/o/		<i>vlo</i>	‘flea’

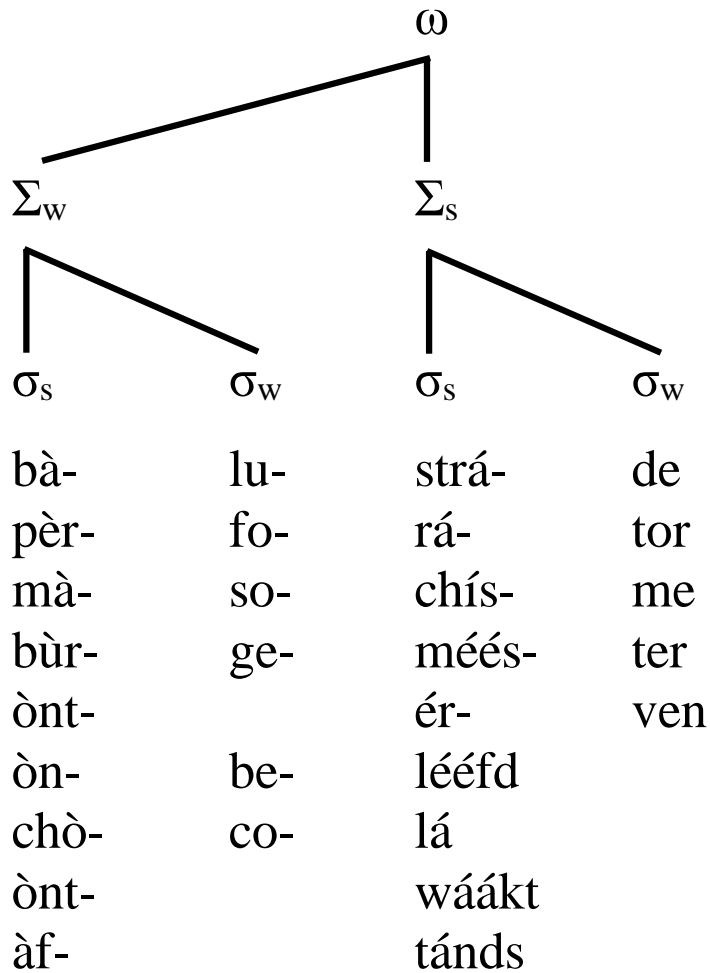


foot: head left

pá-	pa
hé-	ter
ách-	ter
sló-	pen
tá-	fel
Níén-	ke

<i>papa</i>	‘daddy’
<i>heter</i>	‘hotter’
<i>achter</i>	‘behind’
<i>slopen</i>	‘demolish’
<i>tafel</i>	‘table’
<i>Nienke</i>	[proper name]

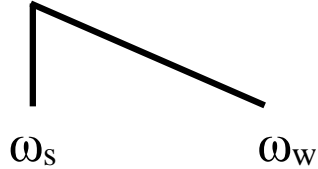




prosodic word: head right

<i>balustrade</i>	‘balustrade’
<i>perforator</i>	‘hole puncher’
<i>masochisme</i>	‘masochism’
<i>burgemeester</i>	‘mayor’
<i>onterven</i>	‘disinherit’
<i>onbeleefd</i>	‘impolite’
<i>chocola</i>	‘chocolate’
<i>ontwaakt</i>	‘awakened’
<i>aftands</i>	‘tatty’

## Compound



húis-	dèur	<i>huisdeur</i>	‘front door’ ( <i>lit.</i> house door)
vóét-	bàllen	<i>voetbal</i>	‘[to] play soccer / soccer balls’
béésten-	bòel	<i>beestenboel</i>	‘shambles’ ( <i>lit.</i> beasts’ doings)
árends-	òòg	<i>arendsoog</i>	‘eagle eye’
nácht-	làmpje	<i>nachtlampje</i>	‘nightlight’
áchter-	hòuden	<i>achterhouden</i>	‘withhold’
wég-	làten	<i>weglaten</i>	‘leave out’
piáno-	spèlen	<i>pianospelen</i>	‘play the piano’

compound: head left

### *Compound Stress Rule:*

In a compound  $[[X][V/N]]_{V/N}$ ,  $[X]$  is prosodically strong.

# metrical phonological analysis of a completely filled compound

		*					
		*					*
*		*		*		*	
*	*	*	*	*	*	*	*
<i>e-</i>	<i>lek-</i>	<i>tró-</i>	<i>nen-</i>	<i>mi-</i>	<i>cros-</i>	<i>cò-</i>	<i>pen</i>
<i>o-</i>	<i>ver-</i>	<i>nách-tings-</i>	<i>de-</i>	<i>cla-</i>	<i>rà-</i>	<i>tie</i>	

[  $\omega_s \ \omega_w$  ]

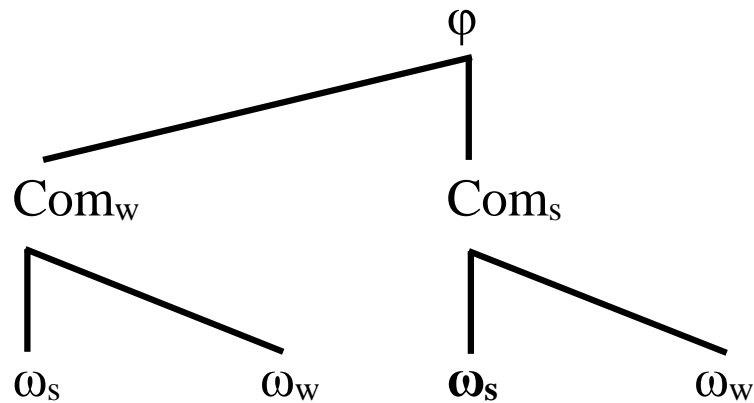
[  $\omega \ \Sigma_w \ \Sigma_s$  ] [  $\omega \ \Sigma_w \ \Sigma_s$  ]

[  $\Sigma \ \sigma_s \ \sigma_w$  ] [  $\Sigma \ \sigma_s \ \sigma_w$  ] [  $\Sigma \ \sigma_s \ \sigma_w$  ] [  $\Sigma \ \sigma_s \ \sigma_w$  ]

‘electron microscopes’

‘overnight stay declaration’

phrase: head right



<i>zwàrt-</i>	<i>witte</i>	<i>vóét-</i>	<i>ballen</i>	‘black and white soccer balls’
<i>èiken-</i>	<i>houten</i>	<i>húís-</i>	<i>deur</i>	‘oak [wooden] front door’
<i>ròde</i>		<i>bák-</i>	<i>stenen</i>	‘red bricks’
<i>lèùke</i>		<i>fílm-</i>	<i>trailer</i>	‘nice movie trailer’
<i>blàùw-</i>	<i>groene</i>	<i>zée</i>		‘blue-green sea’
<i>kòper-</i>	<i>kleurige</i>	<i>lámp</i>		‘copper-colored lamp’
<i>grìjze</i>		<i>lúcht</i>		‘grey sky’
<i>slèchte</i>		<i>dág</i>		‘bad day’

*Nuclear Stress Rule* (improved):

In a phonological phrase [ $\varphi$  [Com/ $\omega$  A] [Com/ $\omega$  B]], B is prosodically strong, where A and B can be a compound (Com) or a phonological word ( $\omega$ ).

# Summary: stress assignment in Dutch

Phonological phrase ( $\phi$ )	:	head-final
Compound (Com)	:	head-initial
Prosodic word ( $\omega$ )	:	head-final
Foot ( $\Sigma$ )	:	head-initial
Syllable ( $\sigma$ )	:	head-final
Rhyme	:	head-initial

⇒ The Dutch prosodic system up to the phonological phrase is *perfectly* disharmonic.

⇒ This pattern is not universal, but is vertical disharmony just a strange exception?

# Crosslinguistic evidence for disharmony?

- $\omega$  head-final vs. Com head-initial

Turkish: *kará* 'sea', *deníz* 'black'

*[kará-deniz]* 'the Black Sea'

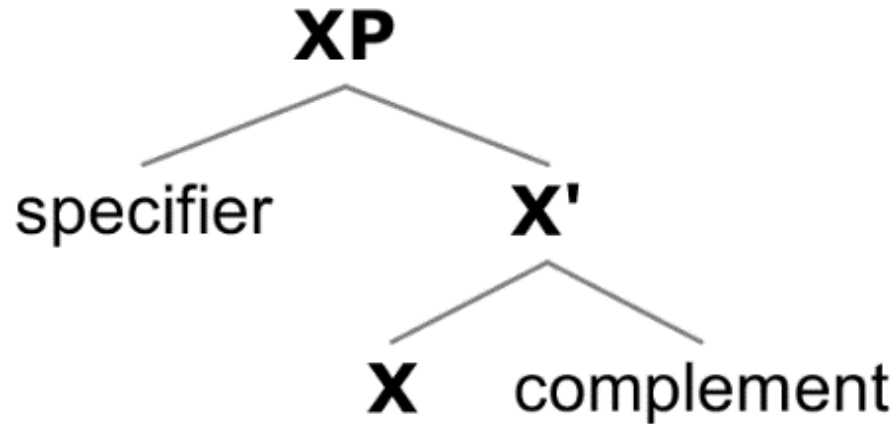
- Com head-final vs.  $\phi$  head-initial

English: *bláckbird*, *[black bírd]*

- Vigário (2010) reports contrastive behavior between prosodic words and Prosodic Word Groups [= Compound level] in a variety of languages for a variety of different phonological features:

*Arrernt, Bantu languages, Basque, Baule, Bengali, English, European Portuguese, French, German, Hungarian, Icelandic, Irish, Japanese, Korean, Shanghai Chinese, Swedish, Turkish, Warlpiri*

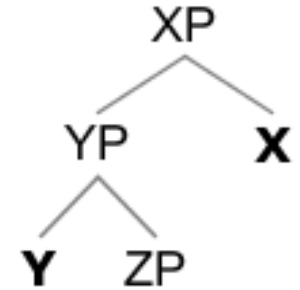
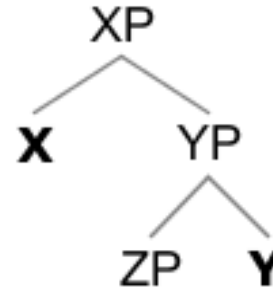
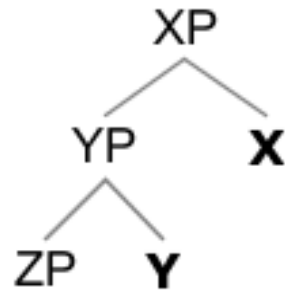
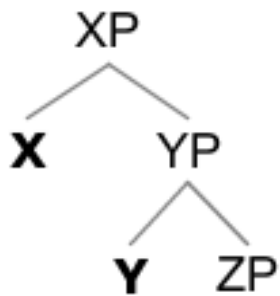
# Headedness and (dis)harmony in syntax



- Is syntactic structure inherently asymmetric?
- Perhaps (not), but at least at PF: yes
- Similarities with the syllable?

# Final over final constraint

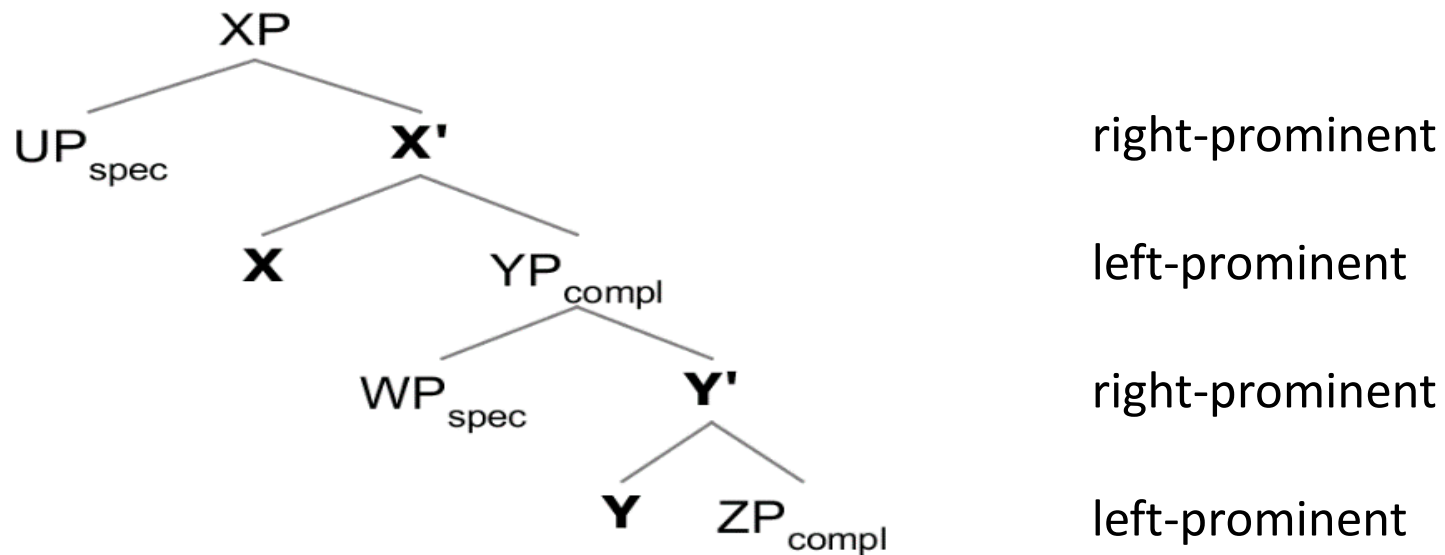
(i) *harmonic initial* (ii) *harmonic final* (iii) *disharm. i-over-f* (iv) *\*disharm. f-over-i*



- For verbal and nominal domain separately:  
extended projections



- specifiers
- all projections?



- Now consider adjacent elements in the output string, in terms of their category

# The Head Final Filter

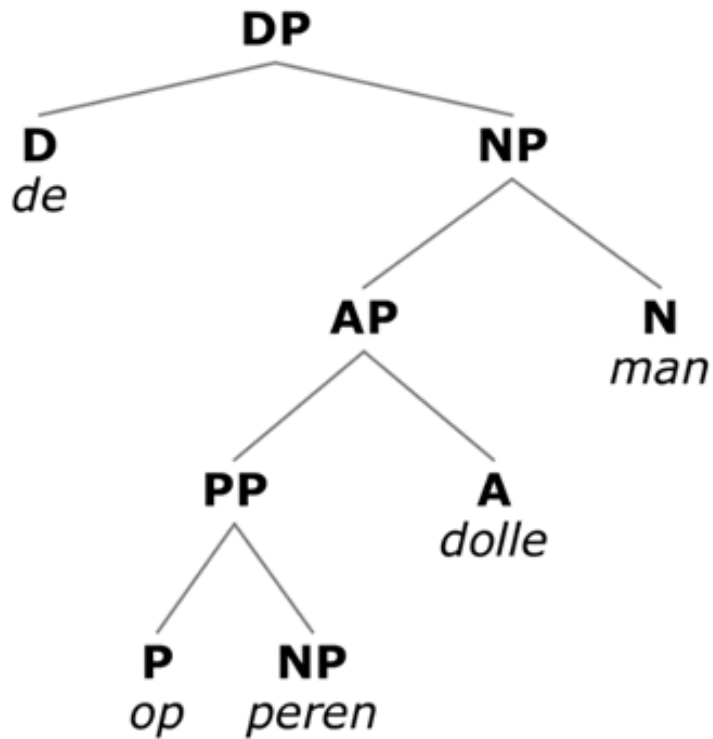
*\* a dressed in red lady; \* the sick of waiting patient*

- a.     \* de   dol(le)       *op peren*   man           (Dutch)  
          the fond(AGR) on pears   man  
          ‘[\*] the fond of pears man’
- b.     De    man is   dol   *op peren*.  
          the  man is   fond on pears  
          ‘The man loves pears.’
- c.     de    *op peren (nogal)*   dolle   man  
          the  on pears rather   fond   man  
          (lit.) ‘the of pears (rather) fond man’

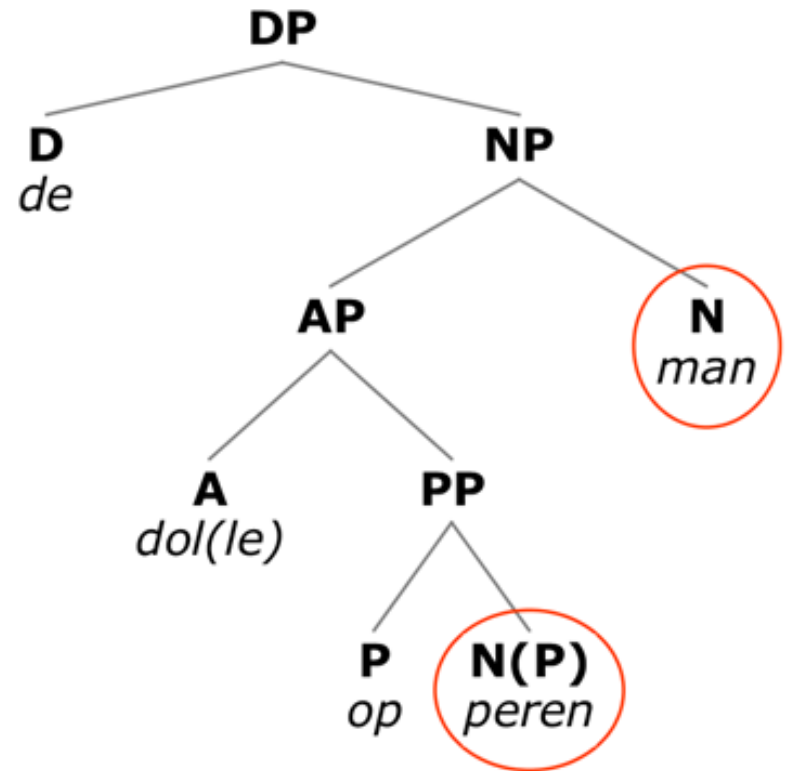
LCP<sub>hor</sub>: a/\*b

FOFC: \*a/\*b

c.



a. \*



(1) *The Head Final Filter explained as an LCP effect*

\* [XP [YP Y ... Z(P)] X] if Cat(Z) = Cat(X)

If, say, X is verbal and Y and Z are nominal, the same configuration is fine:

(2) [VP [DP een man met [DP een hoed]] zien]

a man with a hat see

‘to see a man with a hat’

How about LCP-vertical?

- Within AP: a/\*b but if PP is a separate domain, nothing can be excluded
- Within NP/DP: a/b

# verb / object placement in Dutch

- main clause V2 + OV

a. Jan **kocht** *een boek* \_.

Jan bought a book

‘Jan bought a book.’

b. Jan **zal** *een boek* **kopen**.

Jan will a book buy

‘Jan will buy a book.’

c. ... dat Jan *een boek* **koopt**.

that Jan a book buys

‘... that Jan buys a book.’

# surface order

[<sub>TP</sub> subject [<sub>T'</sub> [<sub>T</sub> **AUX**] [<sub>VP</sub> object **V**]]]

[<sub>TP</sub> subject [<sub>T'</sub> [<sub>T</sub> **AUX**] [<sub>VP</sub> **V** object]]]

[<sub>TP</sub> subject [<sub>T'</sub> [<sub>VP</sub> object **V**] [<sub>T</sub> **AUX**]]]

disharmonic

harmonic head-initial

harmonic head-final

LCP-hor: \*adjacent verbs

=> disharmonic organization at PF preferred

A puzzle: clausal object => VO (obligatorily)

- a. Jan heeft vandaag *geen woord* **gezegd**.  
Jan has today no word said  
'Jan didn't say a word today.'
- b. Jan heeft vandaag **gezegd** *dat hij een boek leest*.  
Jan has today said that he a book reads  
'Jan said today that he is reading a book.'

For b.: the 2nd configuration would prevent a LCP-hor violation:

\* [TP subject [T' [T AUX] (adv) [VP [TP subject object **V**] **V**]]  
[TP subject [T' [T AUX] (adv) [VP **V** [TP subject object **V**]]]

# inevitable violations of LCP-hor

- V-clusters
- series of adjectives
- X-X compounds

=> LCP must be violable



# Recursion of levels in phonology ~ adjunction in syntax?

recursion of compounding => no disharmony

[[ húís-deur]-slèùtel]	‘key of the front door’
[[ dwérg-hamster]-kòòì]	‘dwarf hamster cage’
[ póézen- [ ètens-bakje]]	‘little food bowl for cats’
[ wíld- [òversteek-plaats]]	‘wildlife crossing place’

Adjunction => harmonic projection

[ the [ *nice* [ *big* [ *red* [ ball ]]]]]

[ Jan [ heeft [ *gisteren* [ *waarschijnlijk* [ *snel* [ gefietst ]]]]]]

Jan has yesterday probably fast cycled

# Conclusions and questions

=> Linguistic contrasts, both horizontally and vertically, play a role in phonology and in syntax.

- What exactly is the status of the LCP?
    - How can we explain differences between languages?
    - How can we explain violations?
- => Implementation of a 'third factor' principle in terms of a series of violable subconstraints?

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