

# Handout 1: Mirror Symmetry and Precedence

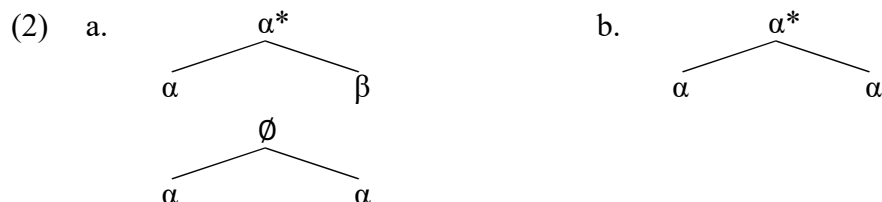
## 1. The rise of asymmetry in syntax

There are three core assumptions that reduce symmetry in syntax.

(1) *Endocentricity*

Every category has exactly one head.

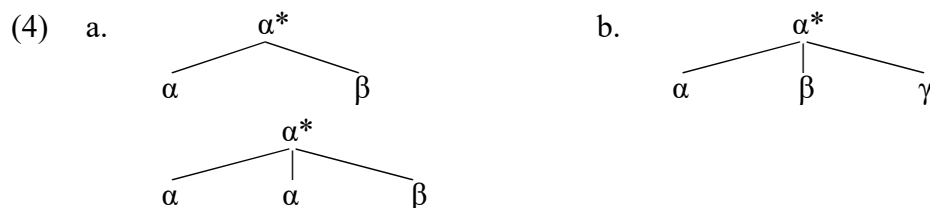
Endocentricity implies that the structure in (2a) is grammatical, but (2b) and (2c) are not. The structures in (2b) and (2c) are internally symmetric, but (2a) is not.



(3) *Binary Branching*

Every category has exactly one head.

Binary Branching implies that (4a) is grammatical, but (4b) and (4c) are not. The structures in (4b) and (4c) have internally symmetric substructures, but (4a) does not. So, Endocentricity and Binary Branching jointly imply that syntax has no internally symmetric structures or substructures.



These restrictions seem to be largely correct. Most syntactic structures are endocentric and binary branching.

(5) *Antisymmetry*

All syntactic structure fits the scheme [<sub>XP</sub> Specifier [<sub>XP</sub> X Complement]].

The structures in (6a) and (6b) form a symmetric pair. Antisymmetry implies that for any  $\alpha^*$ , either (6a) or (6b) is grammatical, but not both. So, Antisymmetry implies that syntax has no symmetric pairs.



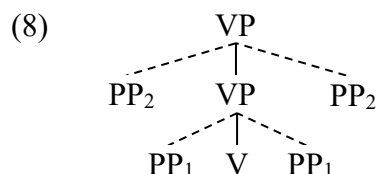
Antisymmetry is motivated by syntactic left-right asymmetries (such as the constraint that head movement to C is leftward). These certainly exist and certainly require an explanation.

One aim of this course is to argue that Endocentricity and Binary Branching are incorrect. They are good approximations of the truth, but they are violated by certain grammatical structures (namely coordinate structures). But if Antisymmetry is correct, Endocentricity and Binary Branching must be correct as well. So, I will focus on data bearing on Antisymmetry in this first lecture.

## 2. Mirror image effects

PP extraposition gives rise to mirror image effects (Koster 1974, Weerman 1989, Barbiers 1995), here with a selected PP and a PP modifier:

- (7) a. Jan heeft <??aan zijn vader><sub>1</sub> [tijdens de pauze]<sub>2</sub> <aan zijn vader><sub>1</sub> **gedacht**.  
*John has of his father during the break of his father thought*  
 ‘John thought of his father during the break.’  
 b. Jan heeft **gedacht** <aan zijn vader><sub>1</sub> [tijdens de pauze]<sub>2</sub> <??aan zijn vader><sub>1</sub>.  
*John has thought of his father during the break of his father*



The marked orders in (7) are acceptable in the presence of an information-structural license (contrast). We assume that they are derived by A'-movement of the PP-complement. Evidence comes from VP fronting (Barbiers 1995:113ff, Ackema and Neeleman 2002:223).

- (9) a. [Aan zijn vader]<sub>1</sub> **denken** (dat) heeft Jan alleen [tijdens de pauze]<sub>2</sub> **gedaan**.  
*of his father think (that) has John only during the break done.*  
 ‘Think of his father John only did during the break.’  
 b. \*[Tijdens de pauze]<sub>2</sub> **denken** (dat) heeft Jan alleen [aan zijn vader]<sub>1</sub> **gedaan**.  
*during the break think (that) has John only of his father done.*  
 c. **Denken** [aan zijn vader]<sub>1</sub> (dat) heeft Jan alleen **gedaan** [tijdens de pauze]<sub>2</sub>.  
*think of his father (that) has John only done during the break*  
 d. \***Denken** [tijdens de pauze]<sub>2</sub> (dat) heeft Jan alleen **gedaan** [aan zijn vader]<sub>1</sub>.  
*think during the break (that) has John only done of his father*

In what follows, we will abstract away from the possibility of A'-scrambling.

The pattern repeats itself for external and internal modifiers (in the sense of Maienborn 2001, 2003):

- (10) a. De dieven zijn <??op een fiets><sub>1</sub> [in Amsterdam]<sub>2</sub> <op een fiets><sub>1</sub> **gevlucht**.  
*the thieves are on a bike in Amsterdam on a bike fled*  
 ‘The thieves fled on a bike in Amsterdam.’  
 b. De dieven zijn **gevlucht** <op een fiets><sub>1</sub> [in Amsterdam]<sub>2</sub> <??op een fiets><sub>1</sub>.  
*the thieves are fled on a bike in Amsterdam on a bike*

Scope relations, too, can be used to argue for ascending postverbal structure (Barbiers 1995:104ff, Ackema and Neeleman 2002:224ff):

- (11) a. We gingen <op vrijdag> volgens plan <op vrijdag> op vakantie **tv**.  
*we went on Friday as.per plan on Friday on holiday*  
 ‘As planned, we went on holiday on Friday.’  
 b. We gingen op vakantie **tv** <op vrijdag> volgens plan <op vrijdag>.  
*we went on holiday on Friday as.per plan on Friday*

### 3. Pas

The claim that postverbal PPs are hosted in an ascending structure is confirmed by the distribution of the temporal focus particle *pas* (temporal *only*).

- (12) Kim kon *pas* <na tien minuten> weer **lachen** <na tien minuten>.  
*Kim could PAS after ten minutes again laugh after ten minutes*  
 ‘Kim was only able to laugh again after ten minutes.’

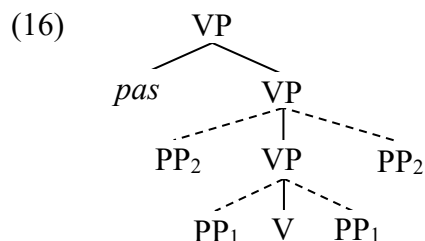
Crucially the interaction between *pas* and the temporal modifier obeys a very strict locality condition. Barbiers (1995:65) demonstrates that *pas* must immediately c-command the temporal modifier:

- (13) *Pas* can interact with a temporal XP iff it c-commands XP and there is no YP such that

*pas* asymmetrically c-commands YP and YP asymmetrically c-commands XP.

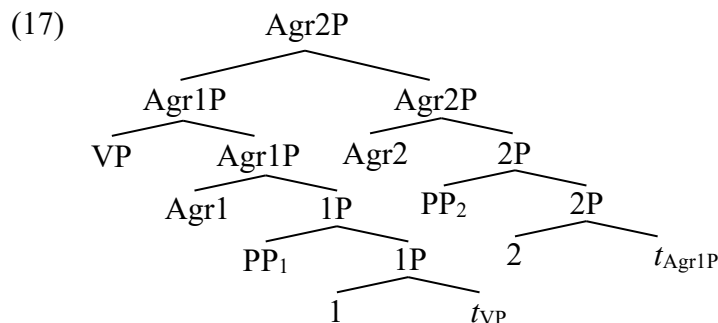
- (14)a. Kim kon [volgens mij]<sub>2</sub> pas [na tien minuten]<sub>1</sub> weer **lachen**.  
*Kim could according me PAS after ten minutes again laugh*  
 ‘According to me, Kim was only able to laugh again after ten minutes’
- b. \*Kim kon pas [volgens mij]<sub>2</sub> [na tien minuten]<sub>1</sub> weer **lachen**.  
*Kim could PAS according me after ten minutes again laugh*
- (15)a. Kim kon pas [zonder blozen]<sub>1</sub> **praten** [na tien jaar therapie]<sub>2</sub>.  
*Kim could PAS without blushing talk after ten year therapy*  
 ‘Kim was able to talk without blushing only after ten years of therapy.’
- b. Kim kon pas **praten** [zonder blozen]<sub>1</sub> [na tien jaar therapie]<sub>2</sub>.  
*Kim could PAS talk without blushing after ten year therapy*

This pattern follows on the symmetric account, because *pas* can immediately c-command a postverbal PP if that PP is attached higher than other material in the c-command domain of the particle:

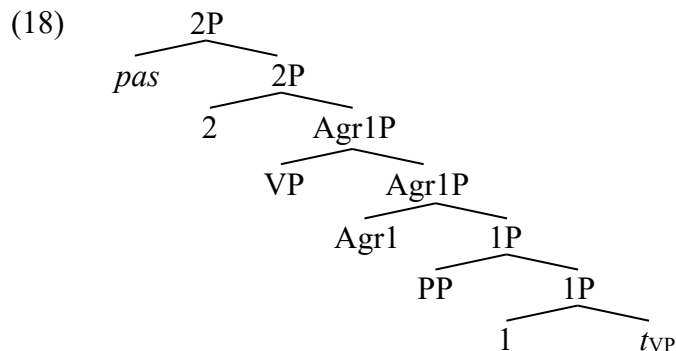


An account in which the postverbal domain has a descending structure cannot account for the data, because in a string *pas*-V-PP<sub>1</sub>-PP<sub>2</sub>, PP<sub>2</sub> would be separated from *pas* by PP<sub>1</sub>.

An alternative account of mirror image effects is provided by roll-up movement of the type proposed in Koopman and Szabolcsi (2000) and Cinque (2005, 2010):



An antisymmetric account cannot explain why *pas* can interact with postverbal PPs (Neeleman 2017). In the structure below, VP intervenes between *pas* and a postverbal temporal expression, making association impossible (see (18)).



#### 4. Postverbal dependencies

The findings of the previous sections lead to the prediction that NPI licensing should display mirroring effects: preverbally, the trigger should precede the NPI, while postverbally it should follow it. However, what we find is that an NPI contained in a PP can be licensed by a trigger contained in a PP, if and only if the latter precedes the former:

- (19) ‘Mary is very shy. I have seen her at lots of parties, but ...’
- ze heeft [op geen van die feestjes]<sub>2</sub> [met welke man dan ook]<sub>1</sub> **gedanst**.  
*she has at none of those parties with which man then also danced*  
‘at none of those parties did she dance with any man whatsoever.’
  - \*ze heeft **gedanst** [met welke man dan ook]<sub>1</sub> [op geen van die feestjes]<sub>2</sub>.  
*she has danced with which man then also at none of those parties*
  - ze heeft [op geen van die feestjes]<sub>2</sub> **gedanst** [met welke man dan ook]<sub>1</sub>.  
*he has at none of those parties danced with which man then also*
  - \*ze heeft [met welke man dan ook]<sub>1</sub> **gedanst** [op geen van die feestjes]<sub>2</sub>.  
*she has with which man then also danced at none of these parties*
- (20) ‘Mary is very shy. I have seen her talk with lots of men, but ...’
- \*ze heeft [op welk feestje dan ook]<sub>2</sub> [met geen van die mannen]<sub>1</sub> **gedanst**.  
*she has at which party than also with none of those men danced*
  - ze heeft **gedanst** [met geen van die mannen]<sub>1</sub> [op welk feestje dan ook]<sub>2</sub>.  
*she has danced with none of those men at which party than also*  
‘she danced with none of those men at any party whatsoever.’
  - \*ze heeft [op welk feestje dan ook]<sub>2</sub> **gedanst** [met geen van die mannen]<sub>1</sub>.  
*she has at which party than also danced with none of those men*
  - ze heeft [met geen van die mannen]<sub>1</sub> **gedanst** [op welk feestje dan ook]<sub>2</sub>.  
*she has with none of those men danced at which party than also*

If we want to reconcile the grammaticality of (20b,d) with the structures we have argued for, then we must allow the negative component of a negative quantifier to take wider scope than its surface c-command domain (Iatridou and Sichel 2011).

If NQPs can indeed extend their scope, then scope cannot be the factor that determines the ungrammaticality of (20a). Rather, what distinguishes the grammatical and ungrammatical examples in the preverbal domain is the order of trigger and NPI. Shan and Barker 2006, Barker and Shan 2008, and Barker 2009, 2012 attribute the precedence constraints on variable binding – modulo reconstruction – to a requirement to evaluate a quantifier (in a specific technical sense) before any pronoun that it binds. This proposal, including its treatment of reconstruction in terms of delayed evaluation, can be straightforwardly extended to NPI licensing.

The data in (19) and (20) can be replicated with bound variable pronouns, as expected:

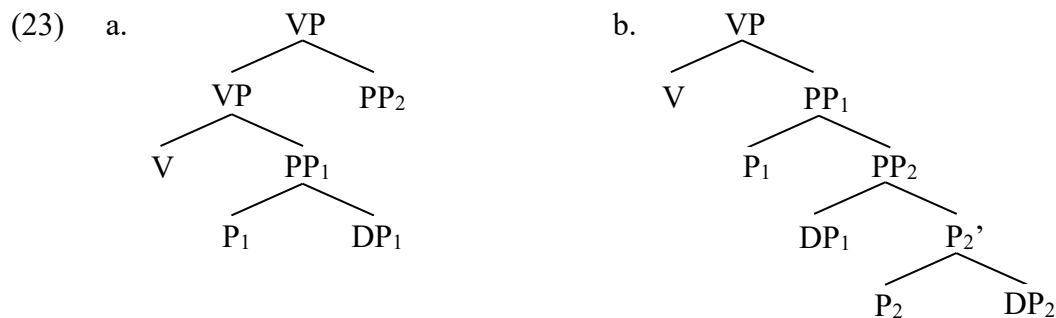
- (21)a. Jan zal [met ieder meisje]<sub>2</sub> [over haar vader]<sub>1</sub> **praten**.  
*John will with every girl about her father talk*  
‘John will talk with every girl about her father.’
- \*Jan zal **praten** [over haar vader]<sub>1</sub> [met ieder meisje]<sub>2</sub>.  
*John will talk about her father with every girl*
  - Jan zal [met ieder meisje]<sub>2</sub> **praten** [over haar vader]<sub>1</sub>.  
*John will with every girl talk about her father*
  - \*Jan zal [over haar vader]<sub>1</sub> **praten** [met ieder meisje]<sub>2</sub>.  
*John will about her father talk with every girl*
- (22)a. \*Jan zal [met haar vader]<sub>2</sub> [over ieder meisje]<sub>1</sub> **praten**.  
*John will with her father about every girl talk*

- b. Jan zal **praten** [over ieder meisje]<sub>1</sub> [met haar vader]<sub>2</sub>.  
*John will talk about every girl with her father*  
 ‘John will talk about every girl with her father.’
- c. \*Jan zal [met haar vader]<sub>2</sub> **praten** [over ieder meisje]<sub>1</sub>.  
*John will with her father talk about every girl*
- d. Jan zal [over ieder meisje]<sub>1</sub> **praten** [met haar vader]<sub>2</sub>.  
*John will about every girl talk with her father*

Note that the conclusions drawn here also hold under the standard antisymmetric account of mirror-image effects. Recall from section 3 that PP<sub>1</sub> does not c-command PP<sub>2</sub> in a string V-PP<sub>1</sub>-PP<sub>2</sub> if that string is generated through roll-up movement (see (17)).

### 5. The infeasibility of a dual-representation account

Are the Dutch data (mirror image effects, the distribution of *pas*, and left-right effects in binding and NPI licensing) amenable to a treatment along the lines of Pesetsky 1995?



Note that DP<sub>1</sub> is the complement of P<sub>1</sub> in the layered structure but the specifier of PP<sub>2</sub> in the cascade structure. This explains why the structure introduced by P<sub>1</sub> does not affect c-command.

We see two problems. (i) We can create a Pesetsky paradox using *pas* and variable binding:

- (24)a. Ik heb *pas* [[**gepraat** [over elke student]<sub>1</sub>] [na zijn schriftelijk akkoord]<sub>2</sub>].  
*I have pas spoken about each student after his written consent*  
 ‘Each student is such that only after their written consent I spoke with them.’
- b. Ik heb *pas* [[[over elke student]<sub>1</sub> **gepraat**] [na zijn schriftelijk akkoord]<sub>2</sub>].  
*I have pas about each student spoken after his written consent*

A dual-representation analysis of (24a) works but requires that interaction with *pas* is sensitive to layered structures. This is unexpected (the division of labour proposed by Pesetsky (1995:248, ex.609) assigns XP-movement, XP-ellipsis and modification to layered structures, and everything else to cascade structures.)

(ii) The proposed account for the invisibility of prepositional structure for variable binding cannot be extended to the full range of Dutch data. If two PPs straddle the verb, the extreme cascading assumed for PP sequences is unavailable. Nonetheless the complement in the preverbal PP can bind a variable in the postverbal PP (see (21c), (22d), and (24b)).

This problem is compounded by the further observation that a reflexive cannot be bound by the complement of a preposition:

- (25)a. Ik heb [met Jan]<sub>2</sub> [over hemzelf/\*zichzelf]<sub>1</sub> **gepraat**.  
*I have with John about him-self/SE-self talked*  
 ‘I have spoken with John about himself.’
- b. Ik heb **gepraat** [over Jan]<sub>1</sub> [met hemzelf/\*zichzelf]<sub>2</sub>  
*I have spoken about John with him-self/SE-self*  
 Literally: ‘I have spoken about John with himself.’

- c. Piet zei dat de regen foto's van hemzelf/\*zichzelf beschadigd had.  
*Peter said that the rain pictures of him-self/SE-self damaged had*  
'Peter said that the rain had damaged pictures of himself.'

These facts indicate that the structure introduced by prepositions counts for anaphoric binding.  
In conclusion:

- Mirror symmetry is a property of syntactic structure.
- Syntactic dependencies can be subject to precedence constraints (in addition to structural constraints).