# WORD ORDER: LINEARISING SYNTACTIC STRUCTURE

## 1. BACKGROUND: COMPONENTS OF SYNTACTIC STRUCTURE

- 2 "dimensions" of syntactic structure: linear ordering (cf. "word order") and hierarchical structure
- pre-GB: no specific account of linearisation – PS-rules simply stated (i.e. stipulated) linear ordering and constituency as part of the same rule.

(1) a. **VP → V NP** (English, etc.)

b.
```
      VP
    ru
V          NP
```

(2) a. **VP → NP V** (Japanese, etc.)

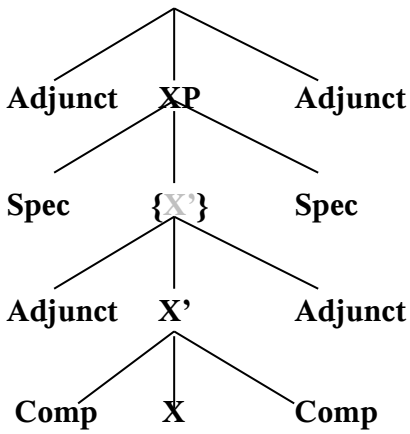
b.
```
      VP
    ru
NP         V
```

- GB: (a) hierarchical ordering determined and constrained by **X-Bar Theory**
  (b) linear ordering determined by the **Head Parameter**

(3) **X-Bar Schemata:**

a. **XP → Spec; X'**
b. **{X' → X'; Adjunct}**
c. **X' → X; Comp**

(4) **{XP}**




(optionally recursive structure indicated in { })

**Configurationally defined components of structure:**

- **Specifier** = the sister of X' and the daughter of XP
- **Complement** = the sister of X and the daughter of X'
- **Adjunct** = the sister and daughter of the same type of category (XP or X')

(5) **Head Parameter** (cf. Chomsky 1986)
Heads X PRECEDE/FOLLOW their complements

a. **X'** ru **X** **Comp**

PRECEDES → HEAD-INITIAL

b. **X'** ru **Comp** **X**

FOLLOWS → HEAD-FINAL

➔ what about the linearisation of specifiers?

(6) **Spec Parameter**
Specifiers PRECEDE/FOLLOW the intermediate category X'

a. **XP** ru **Spec** **X'**

PRECEDES → SPEC-INITIAL

b. **XP** ru **X'** **Spec**

FOLLOWS → SPEC-FINAL

(7) English-style implementation of the basic X-Bar Schemata

**XP**
ru
**Spec** **X'**
ru
**X** **Comp**

i.e. SPEC- and HEAD-INITIAL

(8) Japanese-style implementation of the basic X-Bar Schemata

**XP**
ru
**Spec** **X'**
ru
**Comp** **X**

i.e. SPEC-INITIAL and HEAD-FINAL

(9) German-style implementation of the basic X-Bar Schemata

a. **XP**
**ru**
**Spec** **X'**
**ru**
**X** **Comp**

where X = C, D, N
(and most A & P)

b. **XP**
**ru**
**Spec** **X'**
**ru**
**Comp** **X**

where X = V and I
(and some A & P?)

i.e. all SPEC-INITIAL, but partially HEAD-INITIAL and partially HEAD-FINAL

(9') a. *... dass er das Buch gelesen hat* [CP, DP, TP, VP]
that he the book read has
"… that he has read the book"

b. *Du bist sehr **müde*** vs *Ist dir das kalt **genug**?* [AP]
you are very tired is you-$_{DAT}$ that cold enough
"You are very tired" "Is that cold enough for you?"

c. ***mit** großem Trara* vs *den Fluss **entlang*** [PP]
with great fanfare the-$_{ACC}$ river along
"with great fanfare" "along the river"

[Aside 1: Some German adpositions can occur both pre- and post-nominally, without there being any change meaning – free variation/ "true optionality":

(9'') a. ***gegenüber** der Kirche* b. *der Kirche **gegenüber***
across.from the church the church across-from
"opposite the church" "opposite the church"

Aside 2: Closely related Dutch and particularly Afrikaans systematically make use of the preposition/postposition distinction for semantic purposes:

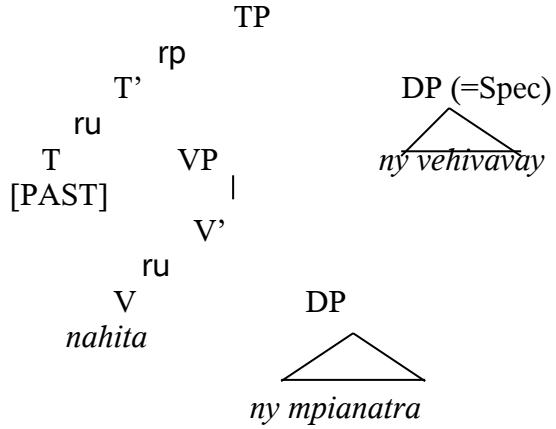
(9''') a. *Hy hardloop **in** die woud* b. *Hy hardloop die woud **in***
he hard-walk in the forest he hard-walk the forest in
"He runs in the forest" "He runs into the forest"

Aside 3: Even uniformly head-initial English has some adpositional elements that surface postpositionally:
(9'''') a. *The searched the whole world **over***
b. *The worked the whole year **through*** ]

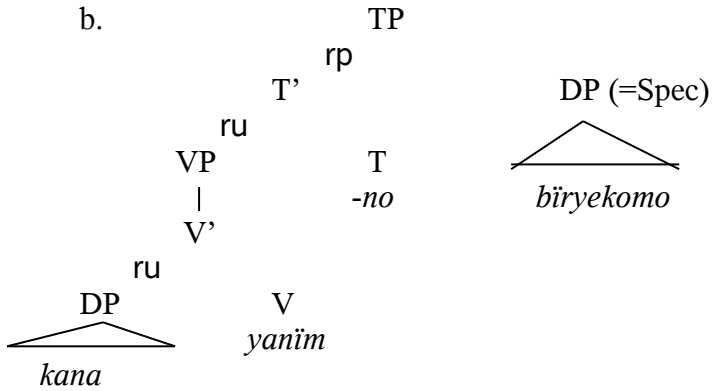
→ it appears to be possible for the Head Parameter to be set differently depending on the nature of X

- What about the Spec-parameter?
  The world's languages seem to be predominantly spec-initial – VOS languages (2.99% of the world's languages, according to Tomlin 1986; e.g. Malagasy) and OVS (1.2%, *ibid.*; e.g. Hixkaryana) are the only ones that researchers have tried to analyse as spec-final.

(10) a. *Nahita ny mpianatra ny vehivavay* (Malagasy)
$_{AT}$-saw the student the woman [AT = Actor Theme]
"The woman saw the student"

b.



(11) a. *Kana yanïm-no bïryekomo* [Hixkaryana]
fish caught-$_{DIST.PAST}$ boy
"The boy caught a fish"

b.


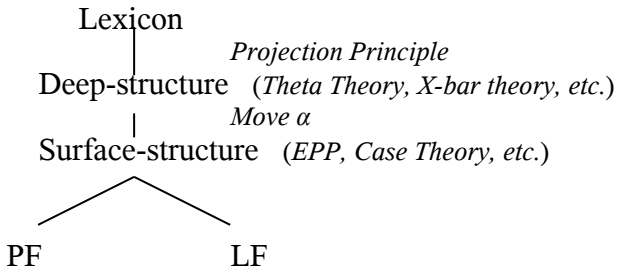

- Minimalism: 2 major approaches to phrase structure –

(a) Bare Phrase Structure/BPS (cf. Chomsky 1995b); and
(b) Antisymmetry (cf. Kayne 1994).

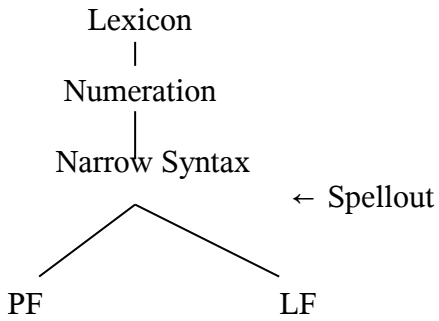
## 2. BARE PHRASE STRUCTURE/BPS AND LINEARISATION [ROUND 1]

- "There is no linear order in the N[umeration] → LF computation" (Chomsky 1995a: 335)

(12) *GB architecture of the Language Faculty (roughly)*




(13) *Minimalist architecture of the Language Faculty (roughly)*




- Linear ordering is viewed as the domain of the PF component: "We take the LCA [i.e. Kayne's linearization algorithm, see below – TB] to be a principle of the phonological component that applies to the output of Morphology." (Chomsky 1995a: 340), i.e. it is an **interface** matter that is irrelevant in the context of the syntactic computation (Narrow Syntax/NS) (cf. also Nunes 1999)
- Why BPS is incompatible with Kayneian Antisymmetry: standard X-Bar theoretic assumptions no longer hold in BPS – cf. *inter alia*:
  (a) the possibility of multiple specifiers;
  (b) the absence of vacuous structure (i.e. unary branching structures are possible – cf. the possibility of categories that are both minimal and maximal);
  (c) the rejection of a head-terminal distinction: BPS is a labelless theory (cf. Collins 2002); and, more generally,
  (d) the revised view of projection: the categorial features of terminals aren't assumed to project to form a head (e.g. *hit* projects its categorial feature,V) and, thereafter, ever larger categories (e.g. V' and ultimately VP).

  ➔ the deterministic templatic structure of X-Bar Theory is no longer assumed in BPS

## 3. Antisymmetry and Linearisation

- "the human language faculty is … rigidly inflexible when it comes to the relation between hierarchical structure and linear order. Heads must always precede their associated complement position. Adjunctions must always be to the left, never to the right. … specifier positions must invariably appear to the left of their associated head, never to the right." Kayne (1994: xii)
  - ➔ the "mapping between hierarchical structure and observed linear order … is rigid" (Kayne 1994: xiv)
- Key idea: asymmetric c-command always maps onto linear precedence

[Roberts 1997: 50 – 54 provides an outline description of how this system works.]

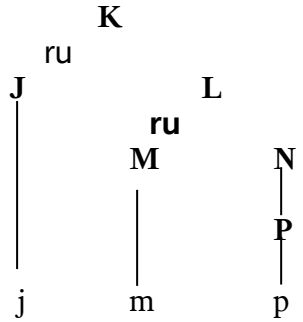
(14) **Linear Correspondence Axiom (LCA)**
If a non-terminal node A asymmetrically c-commands another non-terminal node B, then all the terminals *a* … dominated by A precede all terminals *b* … dominated by B

i.e. d(A) is a linear ordering of T (Kayne 1994: 6)
(or: the hierarchically structured domain dominated by node A allows one to "read off" the linear ordering of the terminals (T) dominated by A)

(15) **Asymmetric c-command**
A asymmetrically c-commands B iff A c-commands B and B does not c-command A.
… where c-command is defined as follows:
A c-commands B iff:
(a) A does not dominate B; and
(b) the first node dominating A also dominates B

Thus:

(16)



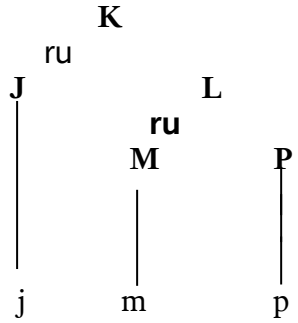

(where CAPITALS indicate NON-TERMINALS and small letters represent terminals)

A = {<J,M>, <J,N>, <J,P>, <M,P>}
*d*(A) = {<j,m>, <j,p>, <m,p>}

➔ the ordering between the pairs above is **total** (i.e. covers all the terminals), **transitive** (all the terminals are ordered with respect to one another) and **antisymmetric** (the ordering relations are unidirectional)

Compare (17):

(17)

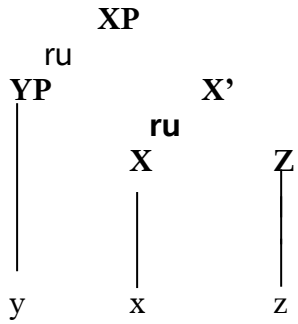



A = {<J,M>, <J,P>}
*d*(A) = {<j,m>, <j,p>}

➔ the ordering between the pairs above is **non-total** (m is not ordered with respect to p), **non-transitive** (the m/p "link" is missing) and only **partially asymmetric** (we only know how j is ordered with respect to m and p; m and p mutually c-command one another and therefore can't be ordered)

Substituting more familiar X-Bar categories:

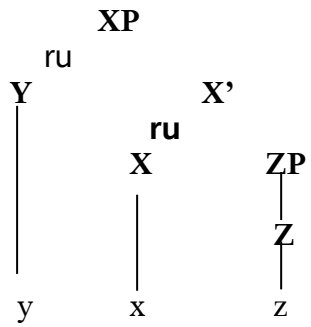
(18)




Problem: the LCA-violating structure involves a head which takes another head as its complement, i.e. a structure which is not uniquely endocentric.

By contrast, (16) "translates" into an endocentric X-Bar structure – cf. (19):

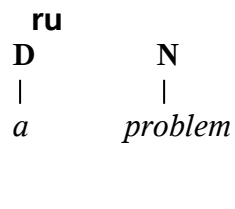
(19)



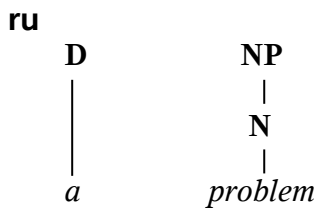

➔ **endocentricity** is a strict requirement for Kayne's theory to work

➔ an important consequence of this fact: all XPs must be assumed to have **internal structure** – i.e. (20a) is not a possible structure (it's too symmetrical as D and N mutually c-command one another); Antisymmetry requires (20b):

(20) a.

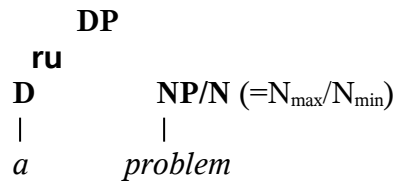



b.




➔ (20c) is also impossible owing to its lack of internal structure (D and NP mutually c-command one another):

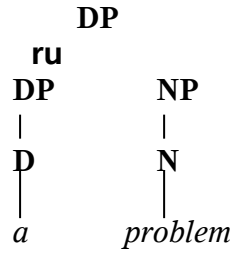
c.




Thus: intermediate structure must always be assumed in Kaynian structures

An extension: another mutual command structure that's excluded by the LCA (21), where DP and NP mutually c-command one another and therefore their respective heads do too, is also incompatible with the LCA:

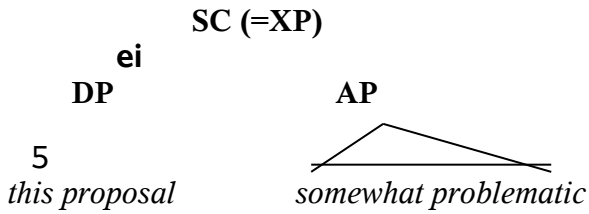
(21)




➔ an XP cannot take an XP complement (cf. X-Bar Theory and the problem of so-called "small clauses"/SCs)

➔ how does Kayne deal with SCs like (22)?

(22) *I consider* [$_{SC}$ [$_{NP}$ *this proposal]* [$_{AP}$ *somewhat problematic]]*



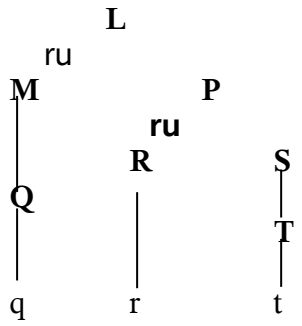

➔ he postulates a **null functional head** and (re)introduces May's (1985) distinction between **categories** and **segments** in order to eliminate a set of c-command relations that would otherwise make it impossible to introduce specifiers into any structure

The **segment/category distinction:**

(23) X c-commands Y iff **X and Y are categories** and X excludes Y and every category that dominates X dominates Y

Thus:

(24)



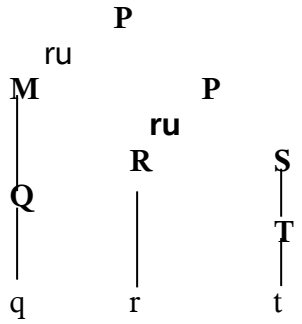

A = {<M,R>, <M,S>, <M,T>, <P, Q>, <R,T>}
*d*(A) = {**<q,r>**, <q,t>, **<r,q>**, <r, t>}

Therefore: this structure can't be linearised because there are conflicting linearisation instructions for q and r (conflicting asymmetric c-command instructions)

**BUT:** M corresponds to an XP specifier!!

➔ drawing on (23) and bearing in mind what happens phrase-structurally when one merges a specifier, Kayne (1994: 16) proposes a reanalysis as (25):

(25)




The difference: merging of the specifier is viewed as an **adjunction** operation which simply extends the existing phrasal category (P in (24) and (25)). The lower P is therefore viewed as a **segment** and not a **category** and, as such, it doesn't asymmetrically c-command Q anymore, so <r,q> can be eliminated from *d*(A). And then we don't have conflicting linearisation instructions anymore!
A = {<M,R>, <M,S>, <M,T>, <R,T>
*d*(A) = <q,r>, <q,t>, <r,t>
i.e. a total, transitive and antisymmetric ordering!

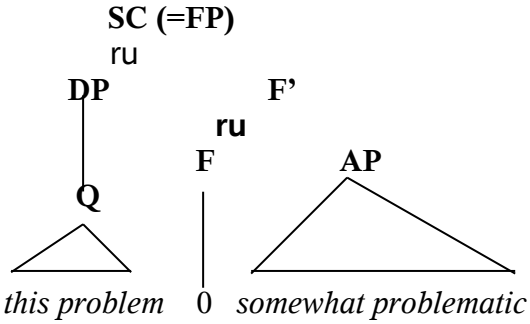
➔ "the segment/category distinction [is] forced upon UG by the need to permit specifiers and adjoined phrases" (Kayne 1994: 16)

Note: only 1 specifier/adjunct per head is permitted (i.e. no multiple specifiers or X-Bar-type "stacking" of adjuncts)

➔ implication: for each specifier/adjunct in a clause, we must postulate a corresponding head, regardless of whether these heads are ever lexicalised (cf. *inter alios* Rizzi 1997, Alexiadou 1997, Cinque 1999)
(on the question of specifiers more generally, cf. the contributions in Adger et al. 1999; also: Starke 2004)

Back to (22): note that we need to postulate a null head to "rescue" the SC structure:

(26)




(where DP and AP are X-Bar structures featuring the appropriate internal structure, as illustrated above)

➔ "functional heads make landing sites available … there must, for every moved phrase, be a distinct head to whose projection it can adjoin as specifier" (Kayne 1994: 30)
➔ there should be matching/agreement between XPs and the functional heads they land in (*ibid.*)
➔ "In cases where movement is called for, but where no contentful head [e.g. Tense or Aspect – TB] is available, the moved phrase must become the specifier of a head lacking intrinsic content" (*ibid.*) → "ghost" heads which are "imposed upon phrase structure markers by the paucity of available adjunction sites, with this paucity following from the present theory" !!!!!

Null heads and Minimalism?

- generalisation: for Antisymmetry to work (i.e. for it to deliver unambiguously linearisable structures), we have to assume that $C_{HL}$ operates with a **very restricted version of X-Bar Theory**

- a universal underlying word order?

(27) The **Universal Base Hypothesis** (cf. Kayne 1994: chapter 4 and also Zwart 1997):
SPEC-HEAD-COMP is the structure universally exhibited by all natural language XPs

Note: SPEC-HEAD-COMP, **not** SVO!

- Kayne's argumentation in favour of S-H-C as opposed to C-H-S, the other logical possibility:
  - ➔ empirical/typological facts (cf. Kayne 1994: 35)
    specifier-head orders appear to dominate strongly in the world's languages:
    - *wh*-structures: *wh*-elements raise to an initial Spec-CP in languages exhibiting overt movement;
    - Spec-IP is also most commonly clause-initial – cf. the high percentage of SVO, SOV and VSO languages in the world

    Thus: "specifier-head-complement … is a significantly more plausible universal than [complement-head-specifier]" (Kayne *ibid.*)
  - ➔ conceptual "asymmetry of time" argument (!) (Kayne 1994: 36ff.)

- implications: subject, verb and object effectively start off in an "SVO" configuration (bearing in mind the qualification that SVO here does not mean "English-style surface SVO" here). Non-SVO surface orders therefore have to be derived via movement (i.e. they cannot be "basic" or "underlying" in the sence of Koster (1975), for example) … and **consistently head-final** languages like Japanese presumably involve a lot more movement than a language like English …

**BIG QUESTION:**
Do we really need **linear ordering all the way through NS?**

**2 NEGATIVE ANSWERS:**

A. **the BPS camp** (cf. Chomsky 1995a: 334 and also *inter multos alios* Uriagereka 1998: 217 – 218; Nunes 1999: 222- 223, Brody 2000 and Richards 2004)
   Syntactic operations/relations make no reference to notions of linear ordering and directionality, and linear ordering should therefore be kept out of Narrow Syntax (NS)
   i.e. the LCA should be viewed as an **interface condition**; otherwise there's a **redundancy** in the system → **precedence relations are established twice** (cf. Chametzky 2000: 109; cf. also Brody 2000 on redundancy in syntactic representation more generally)

B. **Moro (2000)**: Syntactic structures don't need to be exceptionlessly asymmetric; symmetrical structures trigger movement (NB: a non-standard idea in the Minimalist context)

## 3. Reconsidering the LCA and its Place in the Grammar: Moro (2000)

- only 1 of the 2 "dimensions" that linguistic expressions clearly have is actually relevant in the context of the grammar: the hierarchical dimension is involved in grammatical relations (e.g. binding, agreement, θ-role assignment, etc.), but the linear one is not
  Therefore: it's correct to maintain the independence of linear order and hierarchy as has traditionally been done (cf. Section 1 above)
  Contrast Kayne: antisymmetry is a property of all levels of representation
- Moro: symmetric structures or *points of symmetry* are permitted in NS, but the LCA does play a role in that structure is necessarily asymmetric at the level at which it must be linearised, i.e. the LCA comes into play at PF
  ➔ "movement is driven by the search for antisymmetry" (2000: 28)
- 3 different types of *points of symmetry*:
  (a) where 2 XPs are sisters – cf. the small clause in (22) above
  (b) where a structure contains 2/more specifiers/adjuncts; and
  (c) where 2 heads are sisters.
- 2 core ideas:
  (a) points of symmetry can be created by Merge
  (b) movement can neutralise points of symmetry.
- assumptions about movement: it leaves behind **traces** and, following Chomsky (1995a: 337), Moro proposes that "there is no reason for the LCA to order an element that will disappear at PF, for example, a trace". (cf. also Nunes 1999, 2004 on this point). So the **copy theory of movement** isn't assumed.
- how do points of symmetry arise?
  When you're dealing with Small Clauses (SCs; cf. (22) above):

(28) a. *Kayne's proposal is somewhat problematic*
b. [I *is* [SC [DP *Kayne's proposal*] [AP *somewhat problematic*]]]]

➔ obligatory movement of 1 of the XPs in the SC (a point of symmetry) dictated by Dynamic Antisymmetry. Note that either XP may move – cf. (28a) above (**ordinary copula**) and (28c) below (a so-called **inverse copula**):

c. *Somewhat problematic is Kayne's proposal*

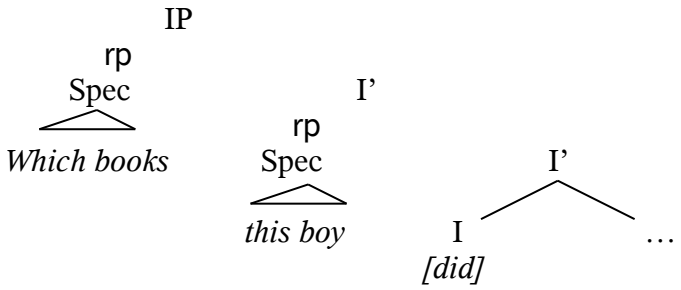
[Aside: Clearly, Moro has to draw a distinction between the kind of SC in (28) and the "richer" type, featuring an overt head – e.g. *I consider Moro's proposal* ***to be*** *somewhat problematic* or *I view Moro's proposal* ***as*** *somewhat problematic*. For Kayne, by contrast, the "extra riches" are indicators of a head/heads that are always present. So another difference of analysis here …]

➔ another empirical correlate, this time for XP-XP adjunction (b) above) = object *wh*-interrogatives in matrix clauses – cf. (29):

(29) a. *Which boy read this book?*
b. *Which book did this boy read?*

Moro assumes that *wh*-elements must move successive-cyclically through the IP domain (contrast recent phase-based Minimalist views; Moro's ideas can just be "translated" to the *v*P domain in Minimalist analyses, though, so the "point of symmetry" idea goes through); thus object *wh*-interrogatives involve a derivational stage where IP features **multiple specifiers** – cf. (30):

(30)




(*do*-support is viewed as an overt signal of the neutralisation of this point of symmetry – cf. Moro 2000: 65)

➔ and a third one, this time for head-head adjunction = clitic-verb combinations – cf. (31):

(31) a. *Gianni fotografa lei* (tonic pronoun)
Gianni photographs her
"Gianni photographs her"

b. *Gianni la fotografa* (clitic pronoun)
Gianni her photographs
"Gianni photographs her"

*lei* = a stressable pronoun (i.e. a strong pronoun); it is an XP
*la* ≠ stressable; it is a clitic and thus, for Moro, a head

So First Merge of *fotografa* and *la* results in a head-head adjunction structure, i.e. a point of symmetry. Movement is therefore required, delivering (31b). Movement is not required in (31a) as this is an asymmetric head-complement structure

## 4. Bare Phrase Structure/BPS and Linearisation [Round 2]

- BPS and the LCA are **not** inherently compatible:

"… order determined by [PF]. The worst case is that it is construction-specific. A better possibility is that it is fixed once and for all for L [a specific language – TB]: the head-parameter, along with the principle that determines that specifier (SPEC) precedes head --- perhaps, as has sometimes been proposed, a reflection of a more general property that holds at other levels too (specifically, syllable structure: C-VC [ONSET –NUCLEUS&CODA – TB] rather than CV-C [ONSET&NUCLEUS – CODA – TB]), and may reduce to a more general cognitive principle. An alternative, developed by Kayne (1994) and a great deal of subsequent work, is that order reflects hierarchy. That approach eliminates the head-parameter, but at the cost of introducing many others (options for movement required to yield the proper hierarchies), and also some technical complications.

Hence the proposal requires empirical rather than conceptual argument, and that is the approach that has properly been adopted in pursuing these ideas. If correct, it appears to be **a departure from SMT** [the Strong Minimalist Thesis, i.e. that Language is an optimal solution to the "legibility conditions" imposed by the interfaces – TB], contrary to what has commonly been assumed (by me in particular)" (Chomsky 2001: 7)

- retaining a Minimalist Head Parameter?

(1) Saito & Fukui (1998): Parametrized Merge
Merge (α, β) → K = {γ, <α, β>}, where γ ∈ {α, β}
γ = α: head-initial
γ = β: head-final

(2) Richards (2004):
Fukui & Saito's proposal still places linearisation in the syntax, and it also duplicates information we already get "for free", namely which element projects (it is always the selector that projects – cf. Chomsky 1998: 133 – 134)
Thus: the head parameter must be located at PF.

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