# Handout 2: Coordination as Mutual Adjunction

## 1. Introduction

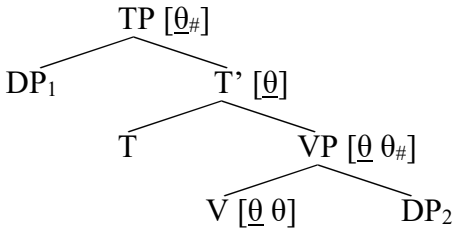
When two elements combine, the result is – in the typical case – asymmetric in both its syntax and its interpretation. Is this asymmetry a general property of syntactic representations? We argue that it is not: Coordination is syntactically symmetric. This means that Endocentricity does not hold in general, even if it hold for the majority of structures. Moreover, we argue that binary branching is only required for endocentric structures (so that coordination allows *n*-ary branching). The contrast between coordination and more familiar endocentric binary-branching structures is, we suggest, a consequence of the *Generalized Licensing Criterion*.

## 2. The Effects of Licensing

### *2.1 The Generalized Licensing Criterion*

It is widely assumed that structure must be licensed, at least in some circumstances. We develop a generalized version of the θ-criterion that makes explicit when this is necessary and how it happens.

(1)

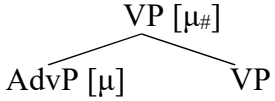



We take the θ-criterion to be a specific incarnation of a more general abstract principlePart A of this principle states under what circumstances structure must be licensed (see also Watanabe 1996, Collins 1997, 2002, Chomsky 2000, Abels 2003 and Pesetsky and Torrego 2006, Wurmbrand 2014):

(2) *Generalized Licensing Criterion* (Part A; to be revised)
Asymmetric merger of $X^n$ and YP must establish a licensing relation between $X^n$ and YP.

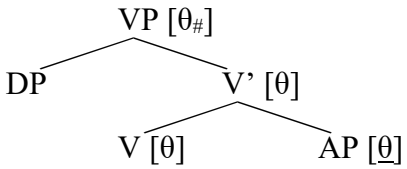
In (1), licensing of TP and VP is through θ-role assignment. But it is not necessary that the selectional requirement that licenses asymmetric merger is introduced by the projecting node. Modifiers select the category they adjoin to (see Ernst 2002). Satisfaction of μ licenses asymmetric merger in (3).

(3)




Both (1) and (3) are licensed through the *satisfaction* of a selectional requirement. However, we assume that asymmetric merger may also be licensed through *identification* of selectional requirements (see Higginbotham 1985, Williams 1980, 1983, 1994:88ff. and Rothstein 2017.):

(4)

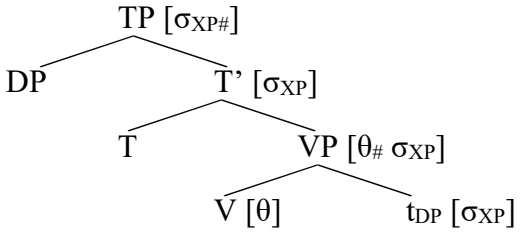



Thus, there are three modes of discharge of a selectional requirement that license asymmetric merger of $X^n$ and YP: satisfaction by YP, satisfaction by $X^n$ and identification.

Not all syntactic dependencies can be used to license asymmetric merger. For example, it is not possible to project a position that hosts a DP if that DP merely binds an anaphor. Thus, the effects of the Generalized Licensing Criterion depend which selectional requirements have a licensing capacity.

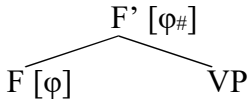
So far, we have assumed that θ and μ do. But asymmetric merger can also be licensed through movement:

(5)

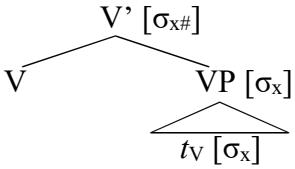



Two further licensing selectional requirements must be postulated to deal with functional structure. A base-generated functional head must select its complement (through φ.) Moved heads, we assume, are created through *self-attachment* (see Ackema et al. 1993, Koeneman 2000, Hornstein and Uriagereka 2002, Bury 2003, Fanselow 2003, Surányi 2005, and Bayer and Brandner 2008, among others). They connect to their trace through $\sigma_x$:

(6) a.




b.



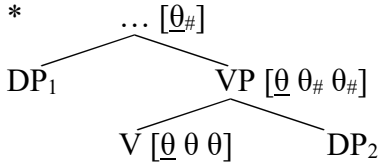

(7) *Generalized Licensing Criterion* (Part A; final version)
Asymmetric merger of $X^n$ and YP must establish a relation between $X^n$ and YP that discharges a selectional requirement α (with $\alpha \in \{\theta, \mu, \sigma_{xp}, \varphi, \sigma_x\}$).

The standard θ-criterion banned multiple θ-role assignment to a single position. Within the current framework, this means that no node can be specified as [θ# θ#]. We propose this generalizes, too:

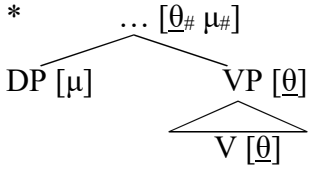
(8) *Generalized Licensing Criterion* (Part B)
No node created through asymmetric merger may be the locus of discharge of two selectional requirements α and β (with $\alpha, \beta \in \{\theta, \mu, \sigma_{xp}, \varphi, \sigma_x\}$).

Part B of the Generalized Licensing Criterion comprises twenty-five cooccurrence restrictions that hold between satisfied selectional requirements. It would take us too far afield to discuss all twenty-five. However, we will look in more detail at the six co-occurence restrictions that involve the phrasal dependencies encoded by θ, μ and $\sigma_{xp}$. The constraint in (8) rules out nodes specified as (i) [θ# θ#], (ii) [θ# μ#], (iii) [θ# $\sigma_{xp}$#], (iv) [μ# $\sigma_{xp}$#], (v) [μ# μ#], or (vi) [$\sigma_{xp}$# $\sigma_{xp}$#].

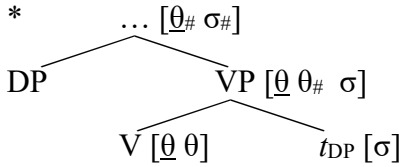
(9) a. *



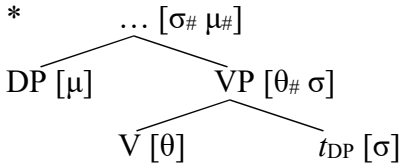

b. *




c. *

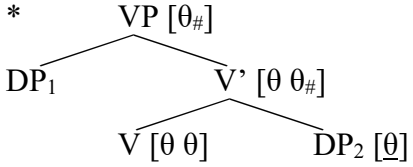



d. *




As θ-role identification falls under the Generalized Licensing Criterion, we further capture the fact that a DP argument cannot simultaneously act as depictive (even though there are DP depictives, as in *John left a happy man*):

(10) *



*2.2 The Source of the Binary Branching Constraint*

Crucially, the Generalized Licensing Criterion does not only account for the complementarity of certain syntactic functions, but also explains why asymmetric merger is at most binary-branching (compare Kayne 1984).

(11) a. * $X^m$ — $X^n$ YP ZP

b. * … — $X^n$ $Y^m$ ZP

In both representations, there are two pairs consisting of a projecting and a non-projecting category. In (11a), these pairs are <$X^n$, YP> and <$X^n$, ZP>; in (11b), they are <$X^n$, ZP> and <$Y^m$, ZP>. According to (7), each pair must be licensed through the discharge of a selectional requirement. But according to (8), no node created by asymmetric merger may be the locus of discharge of more than a single selectional requirement. Hence, (11a,b) are ruled out.

We give a range of examples below:

(12) a. * … [$\underline{\theta}_{\#}$] — DP VP [$\underline{\theta}$ $\theta_{\#}$ $\theta_{\#}$] — V [$\underline{\theta}$ $\theta$ $\theta$] DP DP

b. * … [$\underline{\theta}_{\#}$ $\mu_{\#}$] — DP AdvP [$\mu$] VP [$\underline{\theta}$] — V [$\underline{\theta}$]

c. * … [$\underline{\theta}_{\#}$ $\sigma_{XP\#}$] — DP DP VP [$\underline{\theta}$ $\theta_{\#}$ $\sigma_{XP}$] — V [$\underline{\theta}$ $\theta$] $t_{DP}$ [$\sigma_{XP}$]

d. * … [$\sigma_{XP\#}$ $\mu_{\#}$] — DP AdvP [$\mu$] VP [$\theta_{\#}$ $\sigma_{XP}$] — V [$\theta$] $t_{DP}$

(13) a. * VP [$\mu_{\#}$ $\mu_{\#}$] — AdvP [$\mu$] AdvP [$\mu$] VP

b. * … [$\sigma_{XP\#}$ $\sigma_{XP\#}$] — DP DP … [$\underline{\theta}_{\#}$ $\sigma_{XP}$ $\sigma_{XP}$] — $t_{DP}$ [$\sigma$] VP [$\underline{\theta}$ $\theta_{\#}$ $\sigma_{XP}$] — V [$\underline{\theta}$ $\theta$] $t_{DP}$ [$\sigma_{XP}$]

(14) a. * VP [$\theta_{\#}$] — V [$\theta$] DP AP [$\underline{\theta}$]

b. * VP [$\mu_{\#}$] — $AdvP_1$ [$\mu$] $AdvP_2$ [$\mu$] VP

(15) a. * … [$\varphi_{\#}$ $\underline{\theta}_{\#}$] — F [$\varphi$] DP VP [$\underline{\theta}$] — V [$\underline{\theta}$]

b. * … [$\underline{\theta}_{\#}$ $\sigma_{x\#}$] — V DP VP [$\underline{\theta}$ $\sigma_x$] — $t_V$ [$\underline{\theta}$ $\sigma_x$]

c. * … [$\varphi_{\#}$ $\varphi_{\#}$] — F [$\varphi$] F [$\varphi$] VP — V

d. * … [$\varphi_{\#}$ $\sigma_{x\#}$] — F [$\varphi$] V VP [$\sigma_x$] — $t_V$ [$\sigma_x$]

Thus, the same constraint that captures the complementarity of a range of syntactic functions also explains why asymmetric merger cannot create ternary-branching structures.

## 3. Coordination through Symmetric Merger

*3.1 Coordination and the Generalized Licensing Criterion*

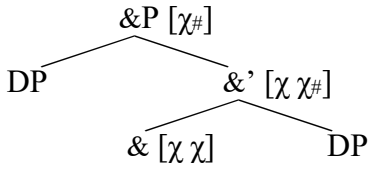
Our analysis implies that coordination cannot be reduced to subordination, as coordination routinely violates the Generalized Licensing Criterion is violated. We first consider structures in which part A is at stake.

It is not possible for a selectional requirement introduced by one of the conjuncts to be satisfied by a

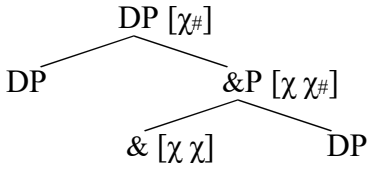
second conjunct. Hence, coordination of arguments will violate part A of the Generalized Licensing Criterion if it involves asymmetric merger. Hence, such coordination must be achieved through an alternative mode of combination: symmetric merger.

The only way around this conclusion is to assume that the coordinator in a structure like *Thelma and Louise* introduces two selectional requirements, as in (16a,b) below (for (16a) see Thiersch 1985, Munn 1987, Larson 1990, Rothstein 1991, Kayne 1994, Zoerner 1995, Johannessen 1998, Hornstein and Nunes 2002 and De Vries 2005; for (16b), see Munn 1992; 1993, Bošković and Franks 2000, Hartmann 2000, Zhang 2010 and Truswell 2019).

(16) a.



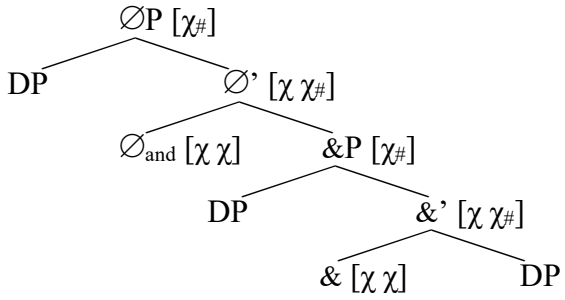

b.



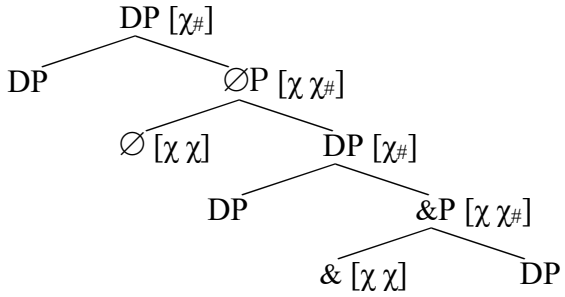

These analyses are self-defeating: given that an arbitrary number of conjuncts can be added the coordinator must contain an arbitrary number of selectional requirements, all but two of which are optional.

One could assume that a null coordinator is added for every conjunct beyond two (see Zoerner 1999 and De Vries 2005).

(17) a.




b.




How can we capture the distribution of overt and covert coordinators. First, if there is a single overt coordinator, it must attach to the final conjunct. Thus, [*Hal* [$\varnothing_{and}$ [*Thelma* [*and Louise*]]]] is grammatical, but *[*Hal* [*and* [*Thelma* [$\varnothing_{and}$ *Louise*]]]] is not. Second, there is no mixing of disjunctive and conjunctive coordinators (*Hal, Thelma and Louise* cannot mean *Hal or Thelma and Louise*, and *Hal, Thelma or Louise* cannot mean *Hal and Thelma or Louise*). Zoerner suggest that covert coordinators are in fact landing sites for LF raising of the overt coordinator. This captures the no-mixing restriction. However, it assumes that a coordinator's selectional requirements are reactivated after each step of coordinator raising. This is equivalent to saying that a coordinator contains an arbitrary number of optional selectional requirements (in addition to two obligatory ones).

Other grammatical coordinate structures potentially violate part B of the Generalized Licensing Criterion (in (8) above):

(18) Susan [gave$_V$ or lent$_V$] her two best friends all of her mother's books.

The only way to avoid this conclusion is to assume phrasal coordination plus ellipsis:

(19) Susan [[$_{VP}$ gave ~~her two best friends all of her mother's books~~] or [$_{VP}$ lent her two best friends all of her mother's books]].

But (18) and (19) do not mean the same thing. Borsley (2005:471) makes a similar point (see also Abbott 1976, Jackendoff 1977 and Zhang 2010). In (20a) there are sixteen tunes involved, while there are thirty-two tunes

involved in its putative source in (20b).

(20) a. Hobbs whistled and hummed a total of sixteen tunes.
b. Hobbs whistled ~~a total of sixteen tunes~~ and hummed a total of sixteen tunes.

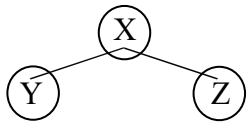
In addition, the rules required to derive (18) from (19) are not well motivated. English does not have a general rule of backward ellipsis (see (21a)), and (multiple) right-node raising seems impossible for examples like (21b) (compare Bresnan 1974:615).

(21) a. *Susan [[$_{VP}$ gave ~~her two best friends~~ all of her father's records] or [$_{VP}$ lent her two best friends all of her mother's books]].
b. She [gave$_{V}$ or lent$_{V}$] it to him.

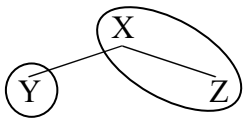
In conclusion, a subordination analysis of coordination leads to violations of part A and part B of the Generalized Licensing Criterion in fully acceptable sentences. This implies that coordinations cannot be built using the process of asymmetric merger.

*3.2 Coordination as Mutual Adjunction*

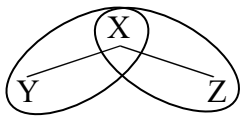
We analyze coordination as mutual adjunction (Neeleman and Van de Koot 2006, Philip 2012). The top node of a coordinate structure is a segment shared by two categories.

(22) a. 

*complementation, specification*

b. 

*adjunction*

c. 

*coordination*

The proposal does not immediately make clear what role the coordinator has. We turn to this in section 5. For now, we simply stipulate that a coordinator must be attached to the final conjunct and can optionally be attached to any medial conjuncts.

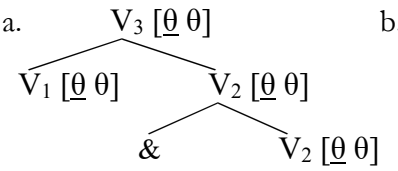
The Generalized Licensing Criterion applies to structures generated through asymmetric merger. In (22c), there is no subordination, and hence there is no demand for a selectional requirement to be discharged, nor for any discharge to be limited to a single selectional requirement. This straightforwardly permits coordination of arguments (without discharge) and coordination of transitive verbs (with multiple discharge).

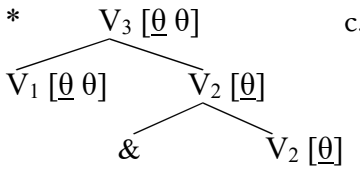
The exact empirical consequences of our proposal depend on what nodes count as segments of the same category. We assume the following:

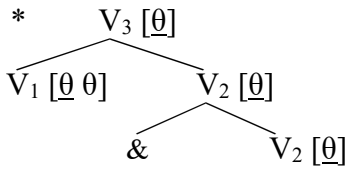
(23) Two structurally adjacent nodes can be interpreted as segments of the same category iff (i) they do not have contradictory categorial features, and (ii) they are identical in arity.

The effects of arity are illustrated in (24).

(24) a. I saw him [$_{V3}$ [$_{V1}$ buy] and [$_{V2}$ read]] a book.
b. *I saw him [$_{V3}$ [$_{V1}$ buy] and [$_{V2}$ sleep]] a book.

(25) a. 

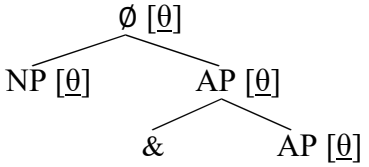

b. * 

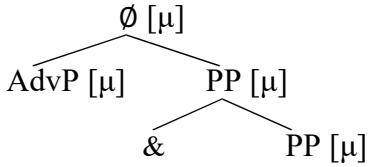

c. * 


The requirement of non-contradictory categorial features allows for the coordination of unlike categories, as in the examples in (26).

(26) a. Danny became [[$_{NP}$ a political radical] and [$_{AP}$ very antisocial]].
b. We walked [[$_{AdvP}$ slowly] and [$_{PP}$ with great care]].

Two feature sets A and B are non-contradictory if A is a subset of B. Coordination of unlike categories can then be ruled in if we permit category-less nodes:

(27) a. 

b. 


Suppose that any category merged in a selected position must meet the selecting head's requirements. When the head merges with a coordinate structure, it combines with as many categories as there are conjuncts. It follows that all of these categories must have a feature specification compatible with the head (see Bruening and Al Khalaf 2020).

(28) a. Danny became [[AP very antisocial] and [NP a political radical]].
b. *Danny became [[PP under suspicion] and [NP a political radical]].
c. *Danny became [[NP a political radical] and [PP under suspicion]].
d. *Danny became [[PP under suspicion] and [AP very antisocial]].
e. *Danny became [[AP very antisocial] and [PP under suspicion]].

A similar pattern was identified by Pollard and Sag (1987):

(29) a. Hobbs turned out to like Rhodes and to hate Barnes.
b. *Hobbs turned out to like Rhodes and hating Barnes.
c. *Hobbs turned out liking Rhodes and to hate Barnes.

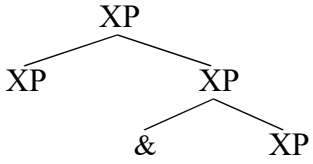
(30) a. Hobbs ended up liking Rhodes and hating Barnes.
b. *Hobbs ended up liking Rhodes and to hate Barnes.
c. *Hobbs ended up to like Rhodes and hating Barnes.

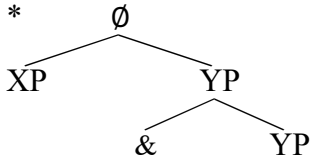
This pattern does not follow in any obvious way from the hypothesis that coordinate structure are asymmetric.

There are further restrictions on the coordination of unlike categories. If two non-maximal categories are coordinated, they must have the same category. This is because after coordination further projection has to take place.

(31) a. I never saw him [PP near it].
b. I never saw him [VP read it].
c. *I never saw him [VP [ø [V read] or [P near] it].

Suppose that merger can only create a new node by copying information from the categories that are input to the operation. Then, in the absence of category being copied, there must be some other syntactic property that characterizes the derived node.

(32) a. 

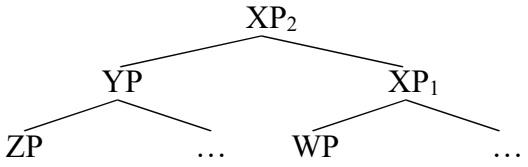
b. * 

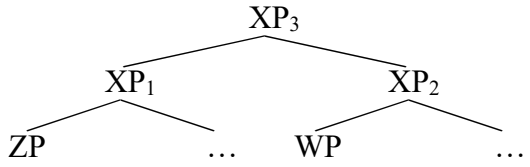

This allows us to capture a generalization argued for at length in Bruening and Al Khalaf (2020), namely that coordination of unlike categories is possible only if the two categories are predicates or modifiers.

*3.3 Coordination and C-Command*

If coordinate structures are headed by a coordinator, the left conjunct c-commands the right conjunct. Mutual adjunction implies that neither conjunct c-commands the other:

(33) A category α c-commands a category β iff (i) no segment of α dominates β and no segment of β dominates α, and (ii) the first node that dominates α also dominates β.

(34) a. 

b. 


How, then, to account for examples like *every man and his dog*? We adopt Progovac's (1997 and subsequent work) proposal that this requires quantifier raising of *every man*. In general, a quantifier may raise out of a left conjunct as long as it binds a variable in the right conjunct (see Rodman 1976, Ruys 1992 and Fox 1995, 2000):

(35) a. A soldier [[found every traitor] and [left unseen]]. (*∀>∃)
b. A soldier [[found [every traitor]$_1$] and [shot him$_1$]]. (∀>∃)

(36) a. *Which student [[likes which professor] and [hates the dean]]? (non-echo reading)
b. Which student [[likes which professor]$_1$ and [wants him$_1$ to be on his committee]]?

Notice that the element in the right conjunct must be a variable:

(37) a. A (different) student [[likes [every professor]] but [hates some TAs]].
(*'[Every professor]$_1$ is such that a different student likes him$_1$ but hates some TAs.')
b. A (different) student [[likes [every professor]$_1$] but [hates some of his$_1$ TAs.]]
('For [every professor]$_1$ there is a student that likes him$_1$ but hates some of his$_1$ TAs.')
c. A (different) student [[likes [every professor]$_1$] but [wants him$_1$ to fire some TAs]].
('For [every prof.]$_1$ there is a student that likes him$_1$ but wants him$_1$ to fire some TAs.')

The data are as predicted by the mutual adjunction analysis:

(38) a. Every man and a woman walked in. (*∀>∃)
b. [Every man]$_1$ and his$_1$ wife walked in.
c. [Every man]$_1$ and a woman he$_1$ used to date walked in. (∀>∃)

(39) a. *Which priest united which refugee and three compatriots? (non-echo reading)
b. Which priest united [which refugee]$_1$ and his$_1$ family?

Progovac's proposal for *every man and his dog* receives further support from the example in (40):

(40) I remember [every corrupt politician]$_1$ and the false promises [the bastard]$_1$ made.

An epithet bound by a quantifier is subject to Principle C (unlike a bound pronoun; Hornstein and Weinberg 1990:134). Hence, the example in (41) is ungrammatical:

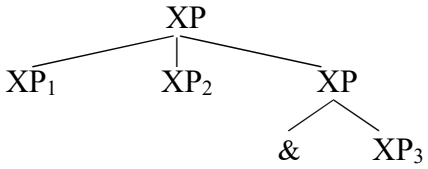
(41) *[Every corrupt politician]$_1$ certainly likes the false promises that [the bastard]$_1$ makes.

It seems, then, that the universal does not c-command the epithet in (40), but binds it after quantifier raising.

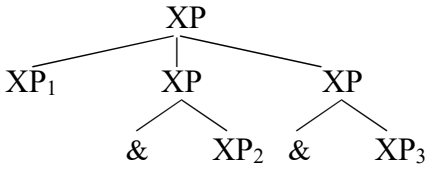
## 4. *N*-ary branching coordinate structures

### *4.1 Flat and articulated coordinate structures*

We have argued that subordination must meet the Generalized Licensing Criterion, and that this implies that subordination must be binary branching. We have also argued that coordinate structures do not involve subordination. Hence, coordinate structures do not have to be binary branching:

(42) a. 

XP$_1$ | XP$_2$ | and XP$_3$

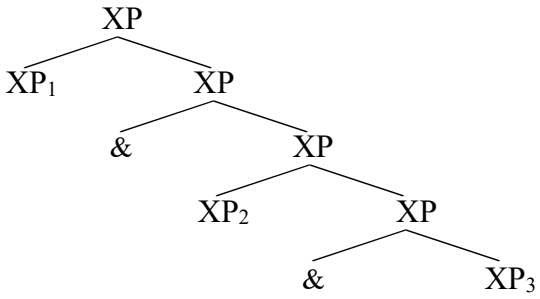
b. 

XP$_1$ | and XP$_2$ | and XP$_3$

(43) a. Hal and Thelma and Louise
b. Hal 'n' Thelma 'n' Louise
c. ??Hal and Thelma 'n' Louise
d. ??Hal 'n' Thelma and Louise

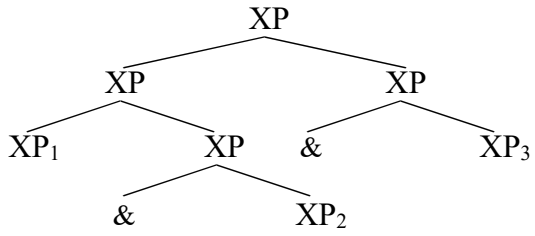
Of course, a coordinate structure may contain a conjunct that is a coordinate structure in its own right:

(44) a.




$XP_1$ ‖ and $XP_2$ | and $XP_3$
Hal and Thelma and Louise
*Hal 'n' Thelma 'n' Louise
Hal and Thelma 'n' Louise
*Hal 'n' Thelma and Louise

b.




$XP_1$ | and $XP_2$ ‖ and $XP_3$
Hal and Thelma and Louise
*Hal 'n' Thelma 'n' Louise
*Hal and Thelma 'n' Louise
Hal 'n' Thelma and Louise

*4.2 Arguments from Interpretation*

If *Hal, Thelma and Louise* has a flat structure, it must denote a single three-termed coordination. It follows that it cannot mean the same as *Hal or Thelma and Louise*. Similarly, *Hal, Thelma or Louise* cannot be interpreted as *Hal and Thelma or Louise.*

Even when the no-mixing restriction is adhered to, the coordinate structures in (42) and (44) have different truth conditions (see Borsley 1994:§7, 2005:§3; Wagner 2005:§2.2.1, 2010:§2 and Winter 2006:§3).

(45) [Tom and Dick] lifted the piano. (Borsley 1994:238)
a. 'Tom lifted the piano and Dick lifted the piano.' (distributive)
b. 'Tom and Dick together lifted the piano.' (collective)

(46) [Tom and Dick and Harry] lifted the piano. (Borsley 1994:238)
a. 'Tom lifted the piano, Dick lifted the piano, and Harry lifted the piano.' (distributive)
b. 'Tom, Dick and Harry together lifted the piano.' (collective)
c. 'Tom lifted the piano, and Dick and Harry together lifted the piano.' (mixed dist.-col.)
d. 'Tom and Dick together lifted the piano, and Harry lifted the piano.' (mixed col.-dist.)

(47) [Tom, Dick and Harry] lifted the piano. (Borsley 1994:239)
a. 'Tom lifted the piano, Dick lifted the piano, and Harry lifted the piano.' (distributive)
b. 'Tom, Dick and Harry together lifted the piano.' (collective)
c. *'Tom lifted the piano, and Dick and Harry together lifted the piano.' (mixed dist.-col)
d. *'Tom and Dick together lifted the piano, and Harry lifted the piano.' (mixed col.-dist.)

In (47), the mixed readings are unavailable, because the structure is ternary-branching.

Winter (2006:§3.4) observes a similar effect with adverbials of alternation:

(48) John alternately feels [guilt and anger and hate] toward his family. (Winter 2006:9)
a. guilt/[anger and hate] (two-state alternation)
b. [guilt and anger]/hate (two-state alternation)
c. % guilt/anger/hate (three-state alternation)

(49) % John alternately feels [guilt, anger and hate] toward his family. (Winter 2006:9)
a. *guilt/[anger and hate] (two-state alternation)
b. *[guilt and anger]/hate (two-state alternation)
c. % guilt/anger/hate (three-state alternation)

Borsley (2005:469-470) reports a related pattern for examples containing *respectively*:

(50) The two girls were seen by [Hobbs and Rhodes], respectively. (Borsley 2005:469)
'Hobbs saw one girl, and Rhodes saw the other.'

(51) The two girls were seen by [Hobbs and Rhodes and Barnes], respectively. (Borsley 2005:470)
a. 'Hobbs saw one girl, and Rhodes and Barnes saw the other.'
b. 'Hobbs and Rhodes saw one girl, and Barnes saw the other.'

(52) #The two girls were seen by [Hobbs, Rhodes and Barnes], respectively. (Borsley 2005:470)
a. *'Hobbs saw one girl, and Rhodes and Barnes saw the other.'
b. *'Hobbs and Rhodes saw one girl, and Barnes saw the other.'

A final data set involves the distribution of *both* (Borsley 1994:237-238, 2005:467-468):

(53) both Tom and Dick and Harry (Borsley 1994:237)
a. [both [Tom [and Dick and Harry]]]
b. [both [[Tom and Dick] and Harry]]
c. [[both [Tom and Dick]] and Harry]

(54) a. *both Tom, Dick and Harry (Borsley 1994:237)
b. *Tom, both Dick and Harry

*4.3 An Argument from Gapping*

Syntactic evidence from gapping, taken from McCawley (1988:269-270), also suggests that in three-element conjunctions with a single coordinator neither the final, nor the initial two conjuncts entertain a distinct conjunctive relationship:

(55) a. Alice drank a martini, and Jane ø a beer. (Borsley 2005:469)
b. Tom ate a hamburger, and Alice ø a Polish sausage.

(56) Tom ate a hamburger, and [Alice drank a martini, and Jane ø a beer]. (Borsley 2005:469)

(57) [Tom ate a hamburger, and Alice ø a Polish sausage], and Jane drank a beer.

(58) a. *Tom ate a hamburger, Alice drank a martini, and Jane ø a beer. (McCawley 1988:269)
b. ??Tom ate a hamburger, Alice ø a Polish sausage, and Jane drank a beer.

(59) Tom ordered a daiquiri, Alice ø a manhattan, and Jane ø a screwdriver. (McCawley 1988:269)

*4.4 An Argument from Modification*

If we were dealing with a binary-branching structure, either the first two conjuncts (in a left-branching structure), or the last two conjuncts (in a right-branching structure), form a constituent to the exclusion of the remaining conjunct. On the other hand, on the *n*-ary branching analysis in (42) no two conjuncts form a constituent to the exclusion of the other. These predictions can be tested by looking at the scope of modifiers.

In the case of a simple binary coordinate structure, the presence of a modifier immediately preceding the coordinate structure results in ambiguity. In flat coordinations, such a wide scope reading is out:

(60) Mary wants some [yellow pansies and tulips].
a. [yellow pansies] [and tulips]
b. [yellow [pansies and tulips]]

(61) Mary wants some [crocuses and yellow pansies and tulips].
a. crocuses and [yellow pansies] and tulips
b. crocuses and [yellow [pansies and tulips]]]

(62) Mary wants some [yellow crocuses and pansies and tulips].
a. [yellow crocuses] and pansies and tulips
b. [yellow [crocuses and pansies]] and tulips
c. [yellow [crocuses and pansies and tulips]]

(63) Mary wants some [crocuses, yellow pansies and tulips].
  a. crocuses, [yellow pansies] and tulips
  b. *crocuses, [yellow [pansies and tulips]]

(64) Mary wants some [yellow crocuses, pansies and tulips].
  a. [yellow crocuses] [pansies] [and tulips]
  b. *[yellow [crocuses, pansies]] [and tulips]
  c. [yellow [crocuses, pansies and tulips]]

The same pattern is found with adjuncts that follows the constituent they modify:

(65) The park was full of [dog-walkers and tourists and children on scooters].
  a. dog-walkers and tourists and [children on scooters]
  b. dog-walkers and [[tourists and children] on scooters]
  c. [[dog-walkers and tourists and children] on scooters]

(66) The park was full of [dog-walkers and tourists on scooters and children].
  a. dog-walkers and [tourists on scooters] and children
  b. [[dog-walkers and tourists] on scooters] and children

(67) The park was full of [dog-walkers, tourists and children on scooters].
  a. dog-walkers, tourists and [children on scooters]
  b. *dog-walkers, [[tourists and children] on scooters]
  c. [[dog-walkers, tourists and children] on scooters]

(68) The park was full of [dog-walkers, tourists on scooters and children].
  a. dog-walkers, [tourists on scooters] and children
  b. *[[dog-walkers, tourists] on scooters] and children

## 5. The Status and Distribution of Coordinators

Mutual adjunction does not in itself provide us with an account of the status of coordinators and their distribution. We now develop an explicit analysis of coordinators in flat multi-termed coordinate structures.

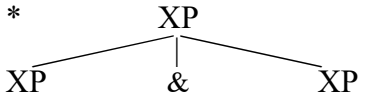
Mutual adjunction does not in fact require the presence of a coordinator. Indeed, asyndetic coordination is very common cross-linguistically, and perhaps available universally (Payne 1985:25; Haspelmath 2007:§2.1).

(69) a. He had brought [gifts, flowers, chocolate, champagne], and yet he felt unwelcome.
  b. I found no more than [two, three] mistakes in your article.

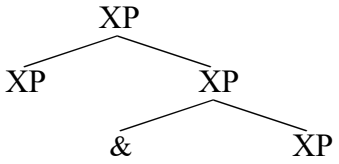
Thus, in English coordinate structures there may be zero, one or multiple coordinators. If there is a single coordinator, it is attached to the final conjunct; if there are multiple coordinators in a multitermed structure, these are attached to all non-initial conjuncts. Why?

Before we start, a clarification. is in order. Coordinators are attached to the conjunct that follows them, as in (70b) (see Ross 1967:162-165; Zwart 2005, 2009; and Philip 2012). A completely flat structure (as in Dik 1968) is ruled out the root XP and & in (70a) cannot form a multisegmented category.

(70) a. *




b.




The subtree in (70b) is asymmetric and must hence involve satisfaction of a selectional requirement. We therefore propose that the coordinator is a fully transparent functional head that selects the XP it attaches to. This puts coordinators in a large class of well-studied elements known as *linkers* (see Dik 1983, Zwart 2009 and Philip 2012). Linkers are functional heads that mark an independently existing relationship They are particularly common in the noun phrase:

(71) a. wo **de** shu
*I LNK book*
'my book'
b. hao **de** shu
*good LNK book*
'good books'
c. wo mai **de** shu
*I buy LNK book*
'the book that I bought'
d. guanyu Chomsky **de** shu
*about Chomsky LNK book*
'book about Chomsky
Mandarin

Linkers in asymmetric structures are attached to the subordinated category and linearized between that category and the head of the larger structure:

(72) a. [[XP LNK] N]
b. [N [LNK XP]]
c. *[[LNK XP] N]
d. *[N [XP LNK]]

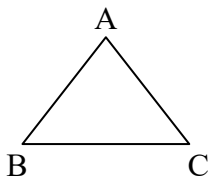
Thus, a linker connects two categories by being attached to one (XP in (72)) and pointing to the other (N in (72)) (see Dik 1983, 1997 and Philip 2012, 2013). By 'pointing to N', we mean 'appear linearly between XP and N', not 'be adjacent to N':

(73) ke'ai **de** heise **de** mao
*cute LNK black LNK cat*
'a cute black cat'
Mandarin

Like subordinating linkers, coordinators have the property of marking a relationship by linear intervention (see Dik 1997:406; Johannessen 1998:109; Zwart 2005, 2009).

In asymmetric structures, any relationship marked by a linker is bivalent. Coordinate structures are different. *A, B and C* expresses a three-way relationship, which can be decomposed into three two-way relationships that hold between A and B, A and C, and B and C, respectively:

(74)




How would a linker mark such a constellation of relationships? Given that coordinators in English precede the category they attach to, they point leftward. This means that in structures with a single coordinator attachment to the final conjunct C marks two relationships (represented by A&C and B&C in the table in (75)). However, the further leftward we shift the coordinator, the fewer two-way relations are marked:

(75)

| | A B &-C | *A &-B C | *&-A B C | A &-B &-C |
|---|---|---|---|---|
| A&B | *implied* | **marked** | unmarked | **marked** |
| A&C | **marked** | unmarked | unmarked | **marked** |
| B&C | **marked** | unmarked | unmarked | **marked** |

"Mutually adjoined to" and "co-members of set S" are transitive relationships. Therefore, marking A&C and B&C implicitly marks A&B.

With this system of marking in place, we can capture the distribution of coordinators in English through three constraints that interact in optimality-theoretic fashion (see Prince and Smolensky 2004):

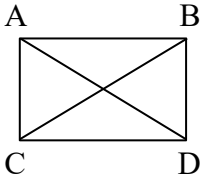
(76) a. No coordinators! (NoCo)
b. Mark coordinate relationships! (MkCo)
c. Explicitly mark coordinate relationships! (ExMk)

MkCo universally dominates ExMk (the opposite ranking would obliterate the empirical effects of MkCo). In English NoCo is not ranked with respect to the other two constraints:

(77) a. NoCo ≫ MkCo ≫ ExMk
b. MkCo ≫ NoCo ≫ ExMk
c. MkCo ≫ ExMk ≫ NoCo

We will consider the effects of these rankings for a coordinate structure with four members:

(78)




On the ranking in (77a), it is more important to avoid coordinators than it is to mark any coordinate relationships. Consequently, the coordinate structure will be realized asyndetically, as *A, B, C, D* (see (69a))..

On the ranking in (77b), coordinators will be attached up to the point that all coordinate relationships are marked (explicitly or implicitly):

(79)

| | A B C &-D | *A B &-C D | *A &-B C D | *&-A B C D |
|---|---|---|---|---|
| A&B | *implied* | *implied* | **marked** | unmarked |
| A&C | *implied* | **marked** | unmarked | unmarked |
| A&D | **marked** | unmarked | unmarked | unmarked |
| B&C | *implied* | **marked** | unmarked | unmarked |
| B&D | **marked** | unmarked | unmarked | unmarked |
| C&D | **marked** | unmarked | unmarked | unmarked |

MkCo will also be satisfied by various structures with multiple coordinators. However, while NoCo is violated once by *A, B, C and D*, it is violated twice by these alternative structures. As a consequence, the latter are ruled out on the ranking under consideration.

(80)

| | *A B &-C &-D | *A &-B C &-D | *&-A B C &-D |
|---|---|---|---|
| A&B | *implied* | **marked** | *implied* |
| A&C | **marked** | *implied* | *implied* |
| A&D | **marked** | **marked** | **marked** |
| B&C | **marked** | *implied* | *implied* |
| B&D | **marked** | **marked** | **marked** |
| C&D | **marked** | **marked** | **marked** |

| | *A &-B &-C D | *&-A B &-C D | *&-A &-B C D |
|---|---|---|---|
| A&B | **marked** | *implied* | **marked** |
| A&C | **marked** | **marked** | unmarked |
| A&D | unmarked | unmarked | unmarked |
| B&C | **marked** | **marked** | unmarked |
| B&D | unmarked | unmarked | unmarked |
| C&D | unmarked | unmarked | unmarked |

On the ranking in (77c), coordinators will be attached up to the point that all coordinate relationships are marked explicitly. This cannot be achieved with one or two coordinators. However, ExMk can be satisfied if a coordinator is attached to all non-initial conjuncts. No other distribution of three coordinators has this effect, as the other columns show.

(81)

| | A &-B &-C &-D | *&-A B & C & D | *&-A &-B C &-D | *&-A &-B &-C D |
|---|---|---|---|---|
| A&B | **marked** | *implied* | **marked** | **marked** |
| A&C | **marked** | **marked** | *implied* | **marked** |
| A&D | **marked** | **marked** | **marked** | unmarked |
| B&C | **marked** | **marked** | *implied* | **marked** |
| B&D | **marked** | **marked** | **marked** | unmarked |
| C&D | **marked** | **marked** | **marked** | unmarked |

Even when NoCo is ranked lowest, it still imposes constraints. In particular, it blocks attachment of *four* coordinators. *&-A &-B &-C &-D satisfies ExMk, but it does so at the cost of an extra violation of NoCo.

In sum, three patterns are permitted: asyndetic coordination, attachment of the coordinator to the final conjunct, and attachment of coordinators to all non-initial conjuncts. Other logically possible patterns are ruled ungrammatical.

## 6. Conclusion

- Most syntactic structures are binary branching (see Kayne 1984).
- This follows from the Generalized Licensing Criterion, which requires (i) that subordination is licensed through the discharge of a selectional requirement and (ii) that no node created by subordination may be the locus of satisfaction of two or more selectional requirements.
- The Generalized Licensing Criterion predicts an exception to the binary branching constraint: it allows symmetric structures to be *n*-ary branching.
- We have argued that this exception indeed exists, in the form for coordinate structures.