2.0 Introduction

As can be seen from our earlier discussion, there are two sets of problems about coordination. We list them here:

(i) How to generate coordinate structures? (Or, what is their D-structure?)

(ii) What prevents extraction from them? (i.e. how do we account for CSC?)

Recent work in the EST framework has made significant advances towards explanatory adequacy. Certain concepts have emerged, which have an overriding character in the sense that they appear throughout the components of UG. C-command and government are two such concepts. Again, there are certain very general principles involving these concepts which have wide-ranging effects. The Empty Category Principle (ECP) belonging to the theory of government is a principle of this sort. Our solution to the problem stated in (ii) will be in terms of ECP. As regards the problem stated in (i), we will maintain that the general theory of X-bar syntax which accounts for the generation of various structures will take care of it.

2.1 The Lexical Category of Coordination

Ross's claim that the coordinating word forms a constituent with the immediately following node (cf: 1.2.1.(18)),
and is not a sister of all the conjuncts, has syntactic and phonological support. But Ross derived this structure by generating and by a PS rule in the initial position of the coordinate construction and then copying it on to the left or the right, as the case may be - of each of the conjuncts. (He observed that in English-type languages the coordinator precedes the conjunct whereas in Japanese-type languages it follows the conjunct.) Let us examine how we can capture the insight expressed by Ross without recourse to PS rules and the mechanism of 'Conjunction Copying'. As Chomsky (1981, 1986b) has argued, PS rules can be eliminated through recourse to certain general properties of X-bar syntax.

Let us first consider what information the lexicon must contain. In the first place, the lexicon presents for each lexical item its phonological form and whatever semantic properties are associated with it. Among these will be the 'selectional properties' of heads of constructions: nouns, verbs, adjectives and adpositions (prepositions or postposition depending on how the head-complement parameter is set in the language). The entry of a particular word will specify what complements it takes. For instance, the lexical entry of the word eat will contain the information that it takes an NP complement with the semantic role of recipient of action (patient) and that its subject has the semantic role of agent. The assumption made in Chomsky (1986b) regarding the nature of the lexicon is that the lexical entries specify "semantic selection" (s-selection) and transitivity.
Suppose that the relation between the conjunction and the conjunct is exactly like a head-complement relation. This of course is not a new idea; it is implicit in Pesetsky’s (1982) claim that the conjunction θ-marks the conjuncts; it is also suggested in Chomsky (1986a). If, as has been claimed in recent work (Chomsky (1986b), Pesetsky (1982), Grimshaw (1990)), the complement of a head must be s-selected by it, then it follows that the coordinator must have a complement s-selected by it. Let us assume that the complement of the coordinator is X, where X is any category (lexical, phrasal, clausal). This may appear to be a special property that we are claiming for coordinators, but given the meaning of coordinators, their freedom as regards the category of the complement they select should not be surprising. As in any other head-complement construction, in coordinate constructions, the coordinator which is the head of the construction, governs its complement.

The claim that coordinators s-select and govern their complements has a wide range of consequences, since this particular property of coordinators interacts with various modules of the grammar. We will examine how it interacts with the sub-systems of the grammar in the following subsections.
2.1.1 \textbf{S-selection by Coordinators and $\Theta$-theory}

Consider first the interaction between $s$-selection by coordinators and theta theory. Chomsky (1986b) argues that $s$-selection eliminates the earlier notion of $c$-selection which is more or less akin to subcategorization. As a result, syntactic representation at D-structure is reduced to projections of the semantic properties of lexical items. $s$-selection, $c$-selection, and subcategorization are not identical notions. Yet there is one thing common to them, namely that they all imply (or stipulate) the $\Theta$-marking of the complement. Intuitively, it is absolutely clear that \textit{and/or} is "transitive", i.e. it needs a complement, cf. and Bill / * and ... .

This means, it $s$-selects. The question is: What is the $\Theta$-role it assigns to its complement? It cannot be a role like Agent or Patient, since we can coordinate even morphemes! (cf. "It is in, and not un- sipid"). Now we have two choices:

(i) We can say, it is a different kind of $\Theta$-role from Agent/Patient.

(ii) We can argue that the $\Theta$-role is the very "general" $\Theta$-role, Theme.

The second choice appears to have more plausibility in the light of examples like:
(1) John said that Bill is clever

where the embedded clause is the Theme of the verb say.
Recall that the idea that conjunction θ-marks its complement
was first stipulated in Pesetsky (1982).  

An immediate question arises: How (or why) a violation
of the θ-criterion does not take place in sentences like (2):

(2) I hit John and Bill

Do John and Bill get a θ-role from hit (say, Patient) and
also a θ-role from and? There are two possible solutions:

(i) We can say that hit θ-marks the whole NP John and Bill
and that this θ-role does not percolate down to the conjuncts.
John/Bill. The latter are θ-marked only by and. After all,
in a sentence like

(3) John and Bill finished a whole chicken

the responsibility of "finishing a whole chicken" is on
John and Bill. The sentence does not mean that "John finished
a whole chicken" or "Bill finished a whole chicken".

(ii) Alternatively, we could claim that and/or is a peculiar
animal which selects (θ-marks) a complement, but is not
specified in the lexicon for any θ-role. Therefore it
just "passes on" the θ-role it gets from the higher node
(the node dominating the whole conjunct structure) to its
complements. Notice that if we say this, then we don't
have to worry about the earlier question, namely, what is
the θ-role assigned by and/or?

2.1.2 Coordination and X-bar Theory

The central idea of X-bar theory is that phrases are projections of lexical categories. Each lexical category $X$ ($X = N, V, A, P$) heads a category $X'$ (X-bar) consisting of $X$ and its complements. There is a further projection, namely $X''$ (=XP), consisting of $X'$ and a specifier of $X'$. Thus the maximal projection of $X$ is $XP$ which is a phrasal category. The linear position of the head relative to its complements is determined by setting parameters concerning direction of government and their-marking.

The head-complement parameter for English-type languages will be fixed as in (4'), whereas in a head-final language like Malayalam it will be fixed as in (5):

(4)  
   a. $X' = X X''$  
   b. $X'' = X'^* X'$

(5)  
   a. $X' = X''* X$  
   b. $X'' = X'^* X''$

$X''*$ in (4a) and (5a) is referred to as the complement of $X$ (or $X'$); $X''*$ in (4b) and (5b) is referred to as the specifier of $X$ (or $X'$, or $X''$).
The basic format of the X-bar schema proposed in Chomsky (1970) leads to a number of restrictions on possible phrase structure configurations at D-structure. These are:

(6)  
   a. Every phrase is endocentric.
   b. The head always appears adjacent to one boundary of $X'$. 
   c. Specifiers appear at the $X''$ level. Subcategorized complements appear within $X'$. 
   d. The head term is one bar-level lower than the immediately dominating phrasal node.
   e. Only maximal projections may appear as non-head terms within a phrase.

   (cf. Stowell, 1981)

No matter how we formulate the PS rule for generating a coordinate structure, it will result in violating the conventions of X-bar theory. Consider a structure like (7):

(7)  

\[
\begin{array}{c}
\text{XP}_1 \\
\text{XP}_2 \quad \text{and} \quad \text{XP}_3 \\
\end{array}
\]

Both XP$_2$ and XP$_3$ are to be treated as heads of the structure since coordinate constructions are essentially multiple-headed constructions.
When we say that the coordinator selects and governs its complement, we get structures like (8a) in English-type languages and structures like (8b) in Malayalam-type languages, depending on the linear order of the head and its complements in the particular language.

(8) a. 

```
               XP
              /\  
             CONJ  XP
```

b. 

```
               XP
            /     \ 
           XP     CCNJ
```

Let us spell out the notion of a "multiple-headed" structure. As we said earlier, it does not fit into the X-bar schema, at least on the face of it. In the structure

(9)

```
               XP_0
             /     \  
            XP_1   XP_2
            \       \  
              \   \  
                \ XP_5
```

```
            /     \  
           XP_3   XP_4
            \       \  
              \   \  
                \ XP_6
```

```
            /     \  
           XP_7   XP_8
```

just the lower part (i.e. \([X_{P1} \text{ and } X_{P5}]\)) partly fits in, because \text{and} is the governor and \(X_{P5}\) is the complement; it partly does not fit in because the category of \(X_{P1}\), is determined by \(X_{P5}\) and not by \text{and}. And the expansion of \(XP\) into \(X_{P1}, X_{P2} \ldots X_{Pn}\) (any number of \(XP\)'s) definitely does not fit into the X-bar schema.

In the light of the above discussion, let us say the following:

2.1.2.1 The Head of a Coordinate Structure

\text{and} is a governor, but apparently it is not the head of the construction; the head is the complement. I.e. the category of the dominating phrase is determined by the complement and not by \text{and}. Otherwise, the dominating phrase will always be a CONJ-phrase, whether it is \text{John and Bill} (which we want to be an NP) or \text{sang and danced} (which we want to be a VP). So, in a coordinate construction, it is the complement which promotes its categorial features to the higher node.

2.1.2.2 Doing away with PS rules

We wanted to do away with PS rules and let us see how this can be done. Let us say that the expansion

\((10)\) \(X \rightarrow X^n\) (where \(X\) is any category)

is a completely general rule which will generate things like:
Such a possibility must be envisaged anyway. cf.

This is possible wherever it is interpretable. In the above, all the three NP's have the same index. So the dominating NP is interpreted on that index. In a coordinate structure:

\[ \text{NP}_i, j, k \]

\[ \text{NP}_\text{Richard}_i, \text{the third}_i, \text{the Kind of England}_i \]

\[ \text{and John}_i, \text{and Bill}_j, \text{and Peter}_k \]
the and is an instruction that the indices should form a set, so this too is interpretable. But a string of V's, or P's, is not interpretable unless they are coordinated. Thus in sang and danced, the meaning is the composition of the meanings of the two verbs, but the phrase sang danced is uninterpretable.

2.1.2.3 Coordinate Structures as Multiple-headed Structures

Let us assume (with Chomsky 1988) that in X-bar syntax the bar-levels do not matter. Whichever node is the highest projection of a lexical head is its maximal projection. Then we will get structures like:

(14)
Here, N₅ is a maximal projection of both criticism and review. And yet, no principle of X-bar syntax has been violated! It is in this sense that coordinate structures are multiple-headed.

2.1.2.4 **Deletion of Coordinators**

Let us deal with the obligatory deletion of coordinators in coordinate structures in English on the one hand and their obligatory presence in a language like Malayalam on the other. We have already pointed out that the coordinators are obligatorily present with each of the conjuncts in languages like Malayalam but not in English (cf. 15-16):

(15)  
   a. John, Peter and Mary  
   b. John Peter or Mary

(16)  
   a. joon-um piitter-um meeri-yum  
   b. joon-oo piitter-oo meeri-yoo

We can see that the facts are more complex:

(1) The final coordinator is obligatorily present in English cf. (17):

(17)  
   a. *John, Peter Mary  
   b. *John and Peter Mary
(ii) The initial coordinator is obligatorily absent in English. cf. (18):

(18) a. *and John and Peter and Mary
    b. *or John or Peter or Mary

(iii) The intermediate coordinators are optionally present, but all of them should be together present or together absent cf. (19):

(19) a. John and Bill and Peter and Joe
    b. John, Bill, Peter and Joe
    c. *John, Bill and Peter and Joe

Ross (1967) observes that the initial coordinator in English is deleted obligatorily if it is not "replaced by a suppletive element both in the case of conjunction and either in the case of disjunction. However, both and either can occur as initial coordinators in a coordinate construction only if the construction involves two conjuncts. If the number of conjuncts is more than two, the initial coordinators are deleted.

(20) a. *Both John and Bill and Peter
    b. *Either John or Bill or Peter
(21) a. Both John and Bill
    b. Either John or Bill

We would like to disagree with the treatment of both and either as coordinators that can replace the initial conjunction. In the following examples both does not seem to have replaced and.

(22) Both birds flew
(23) Both of them flew
(24) They both had hats on
(25) They had both been convicts
(26) Both died

Similar examples can be constructed with either.

It seems reasonable to assume that both and either are quantifier phrases since they occupy the same position as other quantifier phrases, cf. (27):

(27) a. all boys
    b. many boys
    c. some boys
    d. a few boys
    e. both boys

Both "floats" like all.
(28) a. They all have been eating icecream
b. They have all been eating icecream
c. They have been all eating icecream

(29) a. They both have been eating icecream
b. They have both been eating icecream
c. They have been both eating icecream

As in English coordinators in French and Dutch precede the conjuncts; but the initial coordinators are not obligatorily deleted, cf (30-31):

(30) a. Et Jean et Pierre sont fatigues
    and John and Peter are tired
b. Ou Jean ou Pierre doit le faire
    Or John or Peter must do it

(31) a. en Jan en Bob en Bill
    and John and Bob and Bill
b. Of Jan of Bob of Bill
    or John or Bob or Bill

Now based on the given data there are three questions to be addressed:
i. Why are all but the last coordinator optionally deletable in English, but not in Malayalam?

ii. Why is the initial coordinator obligatorily deleted in English but not in French or Dutch?

iii. Why are the intermediate coordinators all absent together or all present together?

The answer to the first part of Question (i) comes from the structure that we propose for coordinate constructions in English. Assuming binary branching even in coordinate structures the structure of John, Bill, Harry and Peter will be either (32) or (33):

(32)
If we assume that (33) is the correct structure, there is an advantage. The last and is also the highest. We can argue that it weakly c-commands all the lower and's, which can therefore be empty and be bound by the higher and. This would thus provide an explanation for their "deletion." 3

Let us consider the second part of question (i) which concerns the coordinators in Malayalam. Notice that in Malayalam the conjunction element -um and the disjunction element -oo are clitics. Perhaps it is the case that clitic coordinators cannot be deleted. An interesting observation to be made here is that there seems to be a distinction between post-positional and prepositional coordinators in the sense that post-positional coordinators are likely to be clitics.
Let us pass on to question (ii). It seems plausible to assume that in English coordinators were used in the initial position in the early stages of the evolution of the language; their deletion may have taken place as the result of a slow historical process. For instance, in Shakespeare we find constructions where the initial coordinator is not deleted. See the following passage reproduced from Shakespeare:

(34) Lepidus: What? Shall I find you here?
Octavius: Or here or at the Capitol.

(Julius Caesar, Act IV, Scene i)

Again, look at the following pieces reproduced from Chaucer's prose:

(35) a. / And whan thou hast forgoen thy freend, do diligence to gete another freend; and this is moore wysdom than for to wepe for thy freend which that thou hast lorn, for therinne is no boote./ And therefore if ye governe yow by sapience, put away sorwe out of your herte.

b. And whan this folk togidre assembled weren, this Malibeus in sorweful wise shewed hen his cas,/ and by the manere of his speche it seemed wel that in herte he baar a cruell ire, redy to doon vengeaunce upon his foes, and so denynly desired that the werre sholde bigynne.

(Tale of Melibee)
If a native speaker is asked to rephrase the above passages in modern English he would prefer (in most cases) constructions without *and* in the initial position.

Based on examples like these we propose that deletion of the initial coordinator in English is a minor rule which is, quite plausibly, language-specific. It is not restricted to coordinators only, for English allows a null complementizer for a tensed S'. Here also, we get a contrast between English and French cf. (36)-(37):

(36) It is likely (that) John is fond of her.
(37) a. Il est vraisemblable que Jean l'aime bien
    b. *Il est vraisemblable Jean l'aime bien
       (cf. Kayne R.S. (1984))

Coming to question (iii) we stipulate that when deletion of identical elements under c-command takes place, deletion applies uniformly to all of them. Some parallelism constraint, the precise nature of which is still unclear, seems to be operative here.

2.4.3 Interaction with Case Theory

Let us address ourselves to the question: Does the coordinator assign Case to its complement (at least in the case of conjoined NP's)? Put in a slightly different way,
what exactly is the mode of Case-marking in a coordinate construction?

Consider the interaction between theta theory and Case theory. Chomsky (1986b) argues that the Case filter can be sharpened and to a certain extent motivated by relating it to considerations of theta theory. Following Aoun (1982) he assumes that an element is visible for θ-marking only if it is in a position which is assigned Case or is linked to such a position. Assuming this position, is there any evidence to show that the coordinator assigns an abstract Case to its complements?

Let us assume that coordinators are exactly like prepositions (or postpositions), perhaps with the syntactic features (-N, -V). Now, consider the following structure:

(38) John [ VP hit [ NP [ and [ NP Bill] ] [ and [ NP Mary] ] ] ]

In (38) the NP's Bill and Mary receives Case from the Case assigner hit. Suppose that the coordinator and also assigns some idiosyncratic Case. Won't this result in some kind of a Case-conflict? Perhaps we can explain away this problem by saying that coordinators are weak governors and are incapable of assigning Case to their conjuncts. Neither can they override Case assigned by some other Case-assigners.
But how do the two NP's get Case from the same Case-assigner? Perhaps it is the case that Case percolates down to all coordinate NP's since these NP's share the thematic role assigned by the verb. In a recent paper Woolford (1987) explores the suggestion contained in Chomsky (1986a) that a "conjunction is a (possibly somewhat defective) governor of the conjuncts" and shows that Case is assigned to the top node of the coordinate structure which then percolates down to the conjunction which is the head of the structure. The conjunction (as a governor) could then reassign this Case to its conjuncts. Perhaps we can say that a similar thing happens in the case of theta roles as suggested in section 2.1.1.1.

Woolford (1987) notes that for some varieties of English, the conjunction may be able to assign a "default Case". Speakers who would never accept (39) can produce sentences like (40) in casual speech.

(39) *Me is going fishing.
(40) Me and the guys are going fishing.

Likewise, speakers who produce hypercorrect sentences such as (41) in formal speech reject nominative Case on a non-coordinate object pronominal.
Woolford argues that if INFL assigns Case directly to coordinate subject NP's and the verb directly Case-marks coordinate objects, differences in judgements between (39) and (40) or (41) and (42) should be impossible.

If Woolford's observations are correct, then we have some evidence to show that the coordinator mediates the Case assigned to its complement (at least in marked cases).

2.2 Extraction from Coordinate Structures and ECP Effects

Let us consider the assumption that coordinators select their arguments and govern them. The list comprising potential governors like N, V, A, P now includes CONJ also. Coordinators are more like prepositions than any other category in this list. According to standard assumptions, prepositions are not proper governors. Let us then assume that coordinators, like prepositions, are not proper governors. This has an immediate consequence. If a conjunct is extracted from a coordinate structure, the trace left behind will not be properly governed. Such extractions will then be ruled out by the Empty Category Principle (ECP).

We will illustrate how this system works in the following sub-sections.
2.2.1  Extraction of a Conjunct and ECP

(43) Empty Category Principle (ECP)

A nonpronominal empty category must be properly governed. For present purposes, let us define proper government as in (44) following Chomsky (1981), Lasnik and Saito (1984). The notion of government is defined in (45).

(44) \( \alpha \) properly governs \( \beta \) iff \( \alpha \) governs \( \beta \) and

a. \( \alpha \) is a lexical category \( X^0 \) (lexical government)
   OR
b. \( \alpha \) is coindexed with \( \beta \) (antecedent government)

(45) \( \alpha \) governs \( \beta \) if every maxical projection dominating also dominates \( \beta \) and conversely.

(cf. Aoun & Sportiche 1983)

Now, consider the following sentences:

(46) John hit Bill and Mary
(47) *who did John hit Bill and e?
(48) *who did John hit e and Mary?

The ungrammatical sentences (47) and (48) are derived from (46) by move alpha. In both (47) and (48) the complement of the conjunction is extracted. Since coordinators are not
proper governors, the empty Categories in (47) and (48) will not be properly governed. Thus the structures are ruled out as ECP violations. Quite generally, extraction of the conjunct will always yield ungrammaticality due to the ECP. Consider the abstract structures (50) and (51) which are derived from (49).

\[(49) \ [XP_1 [XP_2 \text{CONJ} \; XP_4] \text{[CONJ} \; XP_5]]\]
\[(50) *\[XP_1 [XP_2 \text{CONJ} \; XP_4] \; \text{[XP}_3 \text{CONJ} \; e]\]\]
\[(51) *\[XP_1 [XP_2 \text{CONJ} \; e] \; \text{[XP}_3 \text{CONJ} \; XP]\]

The ECP predicts that structures like (50) and (51) will not be possible due to lack of proper government of the empty category in the structure.

Notice that the ECP account given above eliminates the first clause of the CSC of Ross (1967). The relevant clause is reproduced here.

\[(52) \ "In a coordinate structure, no conjunct may be moved."\]

Let us now move on to the second clause of the CSC and see how it can be eliminated.

2.2.2 \textit{Extraction from within the Conjunct}

The second clause of the CSC deals with the extraction of elements contained in a conjunct. See (53):
(53) "... nor may any element contained in a conjunct be moved out of that conjunct."

The second part of the CSC thus covers the ungrammatical examples in (54) and (55) which are derived from (56) and (57) respectively.

(54) a. *the lute which Henry [plays e and sings madrigals] is warped.

b. *the madrigals which [Henry plays the lute and sings e] is warped.

(55) a. *the nurse who [e polished her trombone and the plumber computed my tax]

b. *which trombone did [the nurse polish e and the plumber computed my tax]

c. *the plumber who [the nurse polished her trombone and e computed my tax] was a hefty fellow.

d. *whose tax did [the nurse polish her trombone and the plumber compute e]

(56) Henry plays the lute and sings madrigals.

(57) The nurse polished her trombone and the plumber computed my tax.
In (54) and (55) an element contained in a conjunct is extracted out of the coordinate structure. In (54) what is extracted is the object of a verb. In (55a) and (55c) the extraction is from the subject position of the conjoined sentences. In (55b) and (55d) on the other hand, the extracted element is again the object. Let us examine how our analysis in terms of the ECP can prevent these extractions.

Consider the case of object extraction in (54a). The trace left behind after the extraction of the lute will be properly governed by the lexical governor plays. Similarly, in (54b), the Empty category created by the extraction of the NP madrigals is properly governed by sings. In (55b) polish properly governs the trace of her trombone and in (55c) compute properly governs the trace of my tax. None of these examples violate the ECP.

What about the subject extraction in (55)? Assuming that INFL is not a lexical governor, lexical government as required by (44a) will not be obtained. However, antecedent government will be possible as per the definition of antecedent government given in Lasnik and Saito (1984).

\[(58) \quad \propto \text{antecedent governs } \beta \text{ if} \]
\[\begin{array}{l}
\text{a. } \propto \text{ and } \beta \text{ are coindexed} \\
\text{b. } \propto \text{ c-commands } \beta \\
\end{array}\]
c. there is no \( y \) (\( y \) an NP or S) such that
\( \alpha \) c-commands \( y \) and \( y \) dominates \( \beta \),
unless \( \beta \) is the head of \( y \).

C-command is defined as in (59) (cf. Reinhart, 1979).

(59) \( \alpha \) c-commands \( \beta \) if neither of \( \alpha, \beta \) dominates
the other and the first branching node
dominating \( \alpha \) dominates \( \beta \).

Now look at the structure of (55c) given in (60):

(60)
The subject trace is coindexed with who in the COMP of the relative clause. Who c-commands e₁ and there is no NP or S' which is c-commanded by who and which dominates e₁. Thus antecedent government is obtained. This is true of (55c) as well. In fact, none of the examples in (54) and (55) are ECP violations. However, these examples will be ruled out by the Condition on Extraction Domain (CED):

(61) **Condition on Extraction Domain (cf. Huang (1982))**

A phrase A may be extracted out of a domain B only if B is properly governed.

Consider, now (54) in terms of the CED. Look at the structure of the conjoined VP in (54), given in (62):

(62)

```
        VP₁
       /   \
      VP₂   VP₃
     /   \     \ 
    VP₄    VP₅
   /     /     /  \
V e V   V NPNP
plays e sings madrigals
```
The empty category in (62) is properly governed by the verb *plays*. But it is in a domain which is not properly governed since coordinators are not proper governors. Thus all of the ungrammatical examples in (54) and (55) can be accounted for in terms of the CED.

Recall that we had eliminated the first clause of the CSC which disallows the extraction of a conjunct by invoking the ECP. Through recourse to the CED we are now able to eliminate the second clause of the CSC as well which prohibits the extraction of an element contained in a conjunct. However, notice that extraction of a conjunct which violates the ECP, will violate the CED also. See the coordinate structure (63):

(63)

```
NP_1
  / \  /
NP_2 NP_4 NP_3
  \   /  \
and  and  NP_5
```

Assuming that the node NP_2/NP_3 is not properly governed, nothing can be extracted from within NP_2/NP_3 by virtue of the CED. This means that all cases of extraction from coordinate structures can ultimately be reduced to CED violations.
Before concluding this section we want to make it clear that the term "conjunction" has been used in our discussion in a general sense to include both conjunction and disjunction. Whatever we have said about the conjunction element and applies equally to the disjunction element or.

2.3 An apparent problem

We claimed that the relationship between a coordinator and the category it s-selects (or subcategorizes) is that of government; the coordinator governs the category. This seems to predict very nicely the linear order of coordinator and complement in languages: in English-type languages where canonical government is rightward, the coordinator takes its complement to its right, and in Malayalam-type languages where government is leftward, the coordinator takes its complement to its left. (Ross (1967) noticed this linear order with respect to English and Japanese.)

We have a problem (however) in languages like Hindi and Oriya. Consider the following data.

Hindi

(64) a. raam aur syaam
     (Ram and Syam)

b. \[NP [NP aur [raam]][NP aur [syam]]\]
(65) a. raam yaa syaam
   (Ram or Syam)

   b. [NP [NP yaa [raam]] [NP yaa [syaam]]]

(66) a. [[himaalay] NP se ]pp
   Himalay from ('from the Himalay')

   b. [[teebul] par]
   table on (on the table')

(67) a. [[phal] NP khaayaa ]vp
   fruit eat-past ('ate the fruit')

   b. [[meela ] NP deekhaa ]vp
   festival see-past ('saw the festival')

Oriya

(68) a. raam ebaun syaam
   (Ram and Syam)

   b. [NP [NP ebaun ] raam ]] [NP ebaun [syaam ]]]

(69) a. raamo kimba syaam
   (Ram or Syam)

   b. [NP [NP kimba [raamo ]] [NP kimba [syaam]]]
In (64)-(65) and (68)-(69), a is derived from b. The coordinators in Hindi and Oriya are in no way different from their English equivalents: they are free morphemes like English and/or; more importantly they precede the conjunct. Assuming that coordinators are governors, the direction of government by these coordinators will be from the left to the right. However, lexical governors like V and P in Hindi and Oriya seem to govern from the right to the left as seen in the examples (66-67) and (70-71). This suggests that canonical government in these languages is from the right to the left. How can we account for the change in the direction of government with respect to coordinators? Notice in this connexion that there are also some other elements (i.e. heads of phrases) in Hindi and Oriya which govern rightward. Thus Hindi has at least one adposition, bina ('without') which takes its complement either to the left or to the right: bina paisa (without money) or paisa bina. More importantly, the complementizer ki

(70) \[ \text{himalaye}_\text{NP} \ -ru \ ]_{\text{PP}} \]
Himalaya from ('from the Himalaya)

(71) \[ \text{[phaloo]}_{\text{NP}} \ 	ext{khaayili}_{\text{VP}} \]
fruit eat-past ('I ate the fruit')
in Hindi takes its complement to the right, cf.

(72) main jaantaa huu [₃ ki [joon eek
I know-pres. that John a
accha ladkaa hai ]]
good boy is

'I know that John is a good boy'

The underlying structure of (72) will be something like (73); the embedded clause will be obligatorily extraposed by a subsequent rule.
As shown in (73) COMP which is the head of S' occurs in the initial position and the complement S occurs to its right. The position of INFL is not clear.

The structure is similar with respect to the Oriya complementizer je. cf.

(74) mu jaaneeh'i je joon gote hala pila atte
I know that John a good boy is
'I know that John is a good boy'

(75)
The Hindi and Oriya facts discussed here tell us something about the operation of the head parameter. It is not the case that government in a language is in a uniform direction for all categories. Based on Chinese data Huang (1982) argues that the head-final vs. head-initial parameter need not have its value fixed in a given language for all categorial types and bar levels. A particular bar level might need one value of the parameter, whereas all other bar levels might make use of the other value. Similarly, a particular type of category might use one value of the parameter whereas the other types of categories might use the opposite value. Thus in Hindi and Oriya, COMP and CONJ govern to the right.

...
Notes

1. It may (on the other hand) be worthwhile to investigate whether the s-selection of coordinators can be restricted to NP's and clauses (which are a natural class). Some recent work (cf. Larson (1988)) provides good arguments to show that the subject of a sentence is raised from the specifier position of VP (or AP). If this is correct, the coordination of VP's and AP's can be treated as coordination of clauses (specifically of "small clauses"). If a PP is simply a Case-marked NP the coordination of PP's also falls into line. We shall (of course) have a host of problems, e.g. with coordination of "bare" P's ("in and under the desk") and prenominal adjectives ("a rich and handsome man"); but these may be amenable to a "right-node raising" analysis. We wish to leave open this question, however.

2. However, Pesetsky does not say what the θ-role is.

3. Chomsky (1981) in LGB maintains that 'c-command must be understood in both a stronger and a weaker sense, the stronger sense being the one relevant to government of trace and the weaker sense being the one relevant to trace-binding'. He shows that assuming the definition of c-command as in (i), in (ii), certain c-commands the trace subject of S. Similarly, in (iii) V c-commands NP*:

(i) $\alpha$ c-commands $\beta$ if and only if

(1) $\alpha$ does not contain $\beta$

(2) suppose that $y_1 \ldots y_n$ is the maximal sequence such that

(a) $y = \alpha$

(b) $y_i = \alpha j$

(c) \( y_i \) immediately dominates \( y_{i+1} \)

Then if \( \delta \) dominates \( \alpha \), then either

(I) \( \delta \) dominates \( \beta \), or

(II) \( \delta = y_i \) and \( y_i \) dominates \( \beta \)

(ii)

```plaintext
  AP
 /     \\  
A'    S
     /\   /\
    quite A  t
    /\   /\  
   certain to VP
```

(iii)

```plaintext
  VP
 /   \
 VP  NP*
     /\  
    V   NP
```

It is the weaker sense of c-command that is made use of here. We get a similar situation in (33). We assume that the null and's are anaphoric with respect to the c-commanding and.