A step-by-step introduction to Government and Binding theory of syntax

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Designed for use as a textbook, this paper provides a data-motivated, step-by-step introduction to the main tenets of Government and Binding theory of syntax as developed by Noam Chomsky. An overview of the theory is followed by sections on subcategorization, X-bar theory, movement, semantic roles, case theory, and binding theory. A number of the more recent additions proposed by other linguists, such as the DP hypothesis and the split structure for Infl, are covered in the final section. The data used is primarily English, but also includes Abaza, Chichewa, Eskimo, French, Hixkaryana, Mohawk, Tiwa, Tzotzil, Urubú, and Zapotec.

1. Introduction

This text is designed to provide a data-motivated, stepwise introduction to the main tenets of the Government and Binding (GB) theory of Syntax, which was developed mainly by Chomsky (1981, 1982, 1986). The content of the articles is excerpted from the Syntax II course I taught at the Summer Institute of Linguistics at the University of North Dakota (SIL-UND), which was in turn based upon graduate courses I took from Dr. Sandra Chung at the University of California at Santa Cruz. After presenting a condensed version of this material to the staff at UND, I was encouraged to write up the material in a series of articles for *Notes on Linguistics* to make the material available to a larger audience. These articles (Black, May 96 - Nov. 97) are combined and slightly revised here, primarily for use as a textbook. I hope that new students and other readers will find this method of presentation as interesting and helpful as the past students and staff at SIL-UND have. The basic understanding of the theory gained should enable the reader to have much improved comprehension when reading theoretical articles and to see how formal linguistic analysis could be helpful to their own program.

The main topics covered are:

1. Overview of Government and Binding Theory (section 2)
2. Subcategorization and X-bar theory for lexical phrases (sections 3 and 4)
3. Extending X-bar theory to sentences and clauses (section 5)

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4. X-bar theory applied to languages with other word orders (section 6)
5. Constraints on movement (section 7)
6. Semantic roles (section 8)
7. Case theory (section 9)
8. Binding theory (section 10)
9. Recent updates: VSO/OSV word orders (section 11.1), additional functional projections (section 11.2), and the morphology/syntax interface (section 11.3)

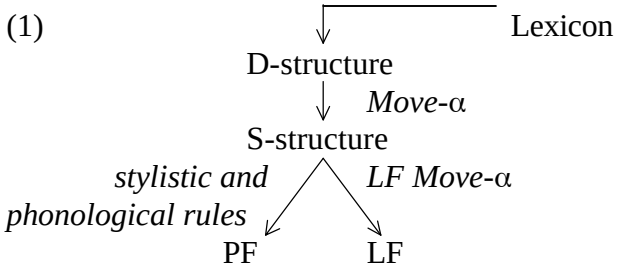
The majority of the data used throughout will be in English to allow the reader to learn the theory without the hindrance of working with an unfamiliar language at the same time. By section 6, however, the reader should be able to begin applying the theory to the language he or she is working with, which is the goal.

2. Overview of Government and Binding theory

GB assumes that a large portion of the grammar of any particular language is common to all languages, and is therefore part of Universal Grammar. The GB view is that Universal Grammar can be broken down into two main components: levels of representation and a system of constraints.

GB assumes a derivational model consisting of four levels of representation, as diagrammed in (1). The lexicon lists the idiosyncratic properties of lexical items which constitute the atomic units of the syntax. These properties include what arguments the item subcategorizes for, etc. Lexical items are combined together at D-structure (underlying structure). D-structure is mapped into S-structure, which is the syntactic representation that most closely reflects the surface order of the sentence. S-structure is not directly interpreted itself, but is factored into Phonological Form (PF) and Logical Form (LF). PF is the interface with the Phonology where shapes, sounds, and groupings of items are directly represented. LF is the interface with the Semantics. Predication relationships and the scope of quantifiers and operators of various kinds are explicitly represented in the phrase structure at LF.

(1)



These levels are related to one another by rules (noted in italics in (1)). A single movement rule, Move-α, maps between D-structure and S-structure and a similar rule maps S-structure into LF. Move-α is stated as a simple rule basically allowing anything to move anywhere, since the system of constraints (which will be introduced throughout this text) is responsible for

correctly restricting this movement. Stylistic and other phonological rules are assumed to take place at PF. These articles will be limited to the D-structure and S-structure levels of representation.

3. Constituent structure and subcategorization

A word, such as a noun, verb, adjective or preposition is a lexical category. In structural terms, they are called heads. Phrases are meaningful groupings of words built up from the lexical category of the same type that they contain. Examples of phrases are: NP, VP, AP (=AdjectiveP), and PP. But the particular head is choosy about what can combine with it to form a phrase.

VP examples:[1]

(2) died / *died the corpse / *died to Sue about politics

(3) relied on Max / *relied / *relied from Max / *relied to Max

(4) dismembered the corpse / *dismembered

(5) talked (to Sue) (about politics) / *talked that the economy is poor

(6) read (the book) (to John) / read that the economy is poor

(7) supplied the Iraqis (with arms) / *supplied

(8) told Sylvia (that it is raining)

(9) revealed (to John) that problems exist / revealed the answer (to John)

A **complement** is a phrase that a lexical category takes or selects. Which complements are taken by a particular verb is an arbitrary property of that verb: in (2) *died* cannot take any complements; in (3) *relied* must have a PP complement with *on* as the preposition; in (4) *dismembered* must take an NP complement; in (5) *talked* can take an optional PP complement with *to* as the preposition and/or an optional PP complement where the preposition is *about*, etc.

We can represent these complement selection requirements in subcategorization frames, as shown in (10), where the square brackets delimit the phrase and the environment bar indicates the position of the lexical head. Required complements are simply listed, whereas optional complements are enclosed in parentheses. Finally, in cases where a complement with a particular head is subcategorized for, the head is listed as a feature on the complement (as for *rely* and *talk*).

(10)

die,	V,	[_]
rely,	V,	[_ $PP_{[on]}$]
dismember,	V,	[_ NP]
talk,	V,	[_ ($PP_{[to]}$) ($PP_{[about]}$)]

[1] A * before a word, phrase or sentence indicates ungrammaticality. Our grammar must not only generate all grammatical sentences in the language, but also correctly rule out all ungrammatical sentences. The latter is the more difficult task (the simple rule S=Word* generates all grammatical sentences in any language), so knowledge of what is ungrammatical is crucial.

Adjectives, nouns, and prepositions also subcategorize for their complements.

AP examples:

(11) red / *red that Sylvia would win
(12) afraid (of snakes) / *afraid to this issue
(13) orthogonal (to this issue)
(14) ambivalent ((to Joe) about her feelings)
(15) certain (that Sylvia would win)
(16) insistent (to Joe) (that we leave)

NP examples:

(17) group (of scientists)
(18) individual
(19) book (about photography / *to Fred)
(20) generosity (to Fred)
(21) dislike of Fred
(22) ambivalence ((to John) about my feelings)
(23) rumor (that all is well)
(24) message (to the Contras) (about the guns)

PP examples:

(25) about [the talk]
(26) before [we leave]
(27) from [over the hill]
(28) [looked] up

We can generalize that the lexical categories (V, N, A, P):

a. Subcategorize for their complements.
b. Precede their complements in the phrase.[2]
c. Co-occur with other constituents.

Heads and complements are not the only parts of phrases. For example, NPs can be preceded by words (or sometimes phrases) like: *the*, *no*, *some*, *every*, *John's*, *my mother's*. APs can be preceded by degree words such as: *very*, *extremely*, *rather*, *quite*. These items differ from complements because they precede the lexical category and they are not subcategorized for. They are called **specifiers**.

[2]This ordering of lexical categories before their complements is obviously not a universal. Section 6 will deal with how to account for languages with different word orders.

4. X-bar Theory

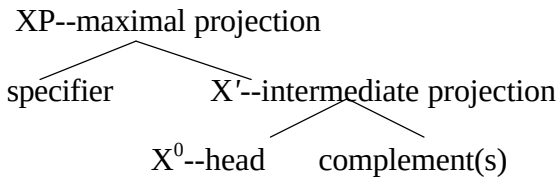
GB seeks to capture the similarities between different categories of lexical phrases by assigning the same structure to them (as shown in (30)). Rather than having different phrase structure rules for VPs, NPs, etc., just the two basic rules in (29) cover all the lexical categories.

(29) Phrase Structure Rules:

(for any lexical category X, X^0=Head)
XP $\rightarrow$ Specifier X′
X′ $\rightarrow$ X^0 Complements (=YP*)

In the trees generated by these rules, the top node (corresponding to left side of the rule) is known as the mother, with the two daughters introduced by the right side of the phrase structure rule. The daughter nodes at the same level are known as sisters. In (30) one of the daughters, X′, is also a mother with daughters of her own, just as in normal family relationships.

(30) Basic X-bar Structure



Claims involved in this schemata:

1. All phrases are projected from lexical categories in the same way (i.e. the PSRs in (29).
   a. For conjunction: $X^n \rightarrow X^n$ Conj X^n.
   b. For adjunction: $X^n \rightarrow Y^m X^n$.[3]

2. A head (=X^0) subcategorizes for all and only its sisters.
   a. The subcategorized complements are always phrases.
   b. Heads and their maximal projections share features, allowing heads to subcategorize for the heads of their sisters (i.e. *rely*).

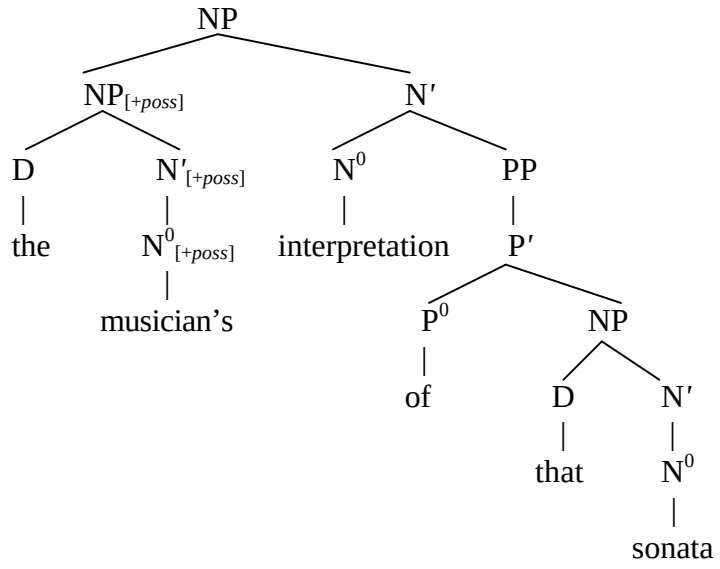
3. In general, specifiers are optional. Evidently, specifiers may be words or phrases.

The following trees illustrate how X-bar theory works. We apply the X-bar rules to specific categories. First find the head, which determines the type of phrase, then look for specifiers, complements, adjuncts, and conjunctions. In (31), *interpretation* is the head, *the*

[3] *n* may be any bar level (0,1,2=X^0, X′ or XP), *m* may only be 0,2 since only heads or maximal projections may move or adjoin. Also, the right side of the adjunction rule is unordered; adjectives adjoin on the left, but other NP adjuncts such as relative clauses adjoin on the right and VP adjuncts such as adverbs may adjoin on either side.

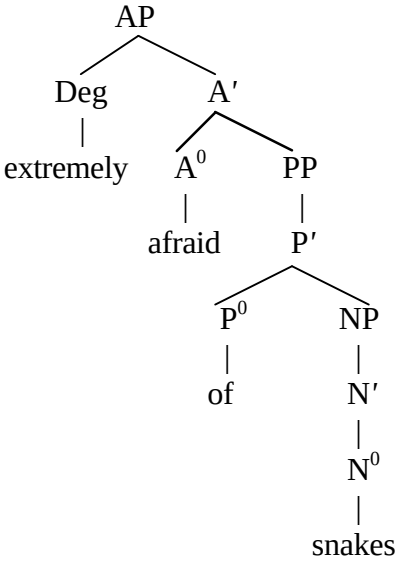
musician's is the specifier, and *of that sonata* is the complement in the NP. The specifier and complement are each phrases themselves which are also diagrammed via the X-bar phrase structure rules.[4]

(31)



In (32), *afraid* is the head, *extremely* is the specifier, and *of snakes* is the complement in the AP.

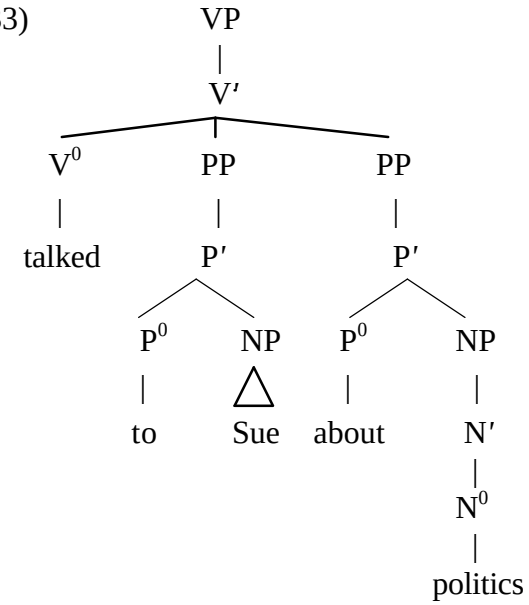
(32)



[4] In the trees throughout, a category X by itself (i.e. not X′ or XP) is equivalent to X^0.

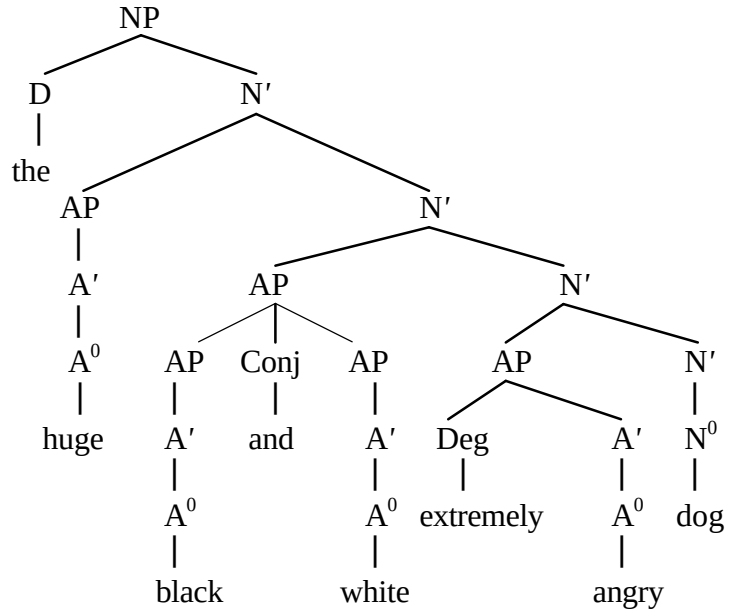
(33) shows a VP headed by *talked* with two PP complements.[5]

(33)



Tree (34) illustrates how conjunction and adjunction fit into the X-bar schemata. The conjunction rule is shown for *black* and *white*;[6] *huge*, *black and white*; and *extremely angry* are all adjuncts which are adjoined to N′, showing how the adjunction rule is recursive; *the* is in the specifier position and *dog* is the head of the whole NP.

(34)



[5] Proper names and pronouns are shown as NPs since in English they do not have specifiers or complements. In general, a triangle under a phrasal node means that further structure is not shown because it is irrelevant to the point being made.

[6] In this case, the conjunction could have been shown at either the A′ or A0 level instead.

At this point, even though we can draw trees for some complex phrases, we still cannot do even a simple complete sentence such as *John hit the ball*. The rule S $\rightarrow$ NP VP does not fit the X-bar schemata. We also cannot draw a tree diagram for a clausal complement to a verb, such as the *that*-clause in *Bill read that the economy is poor*. In order to make sentences and clauses fit X-bar theory, we need to determine the head, specifier, and complement for each. This will be the next topic addressed.

5. Extending X-bar theory to sentences and clauses

5.1 Clausal complements within X-bar theory

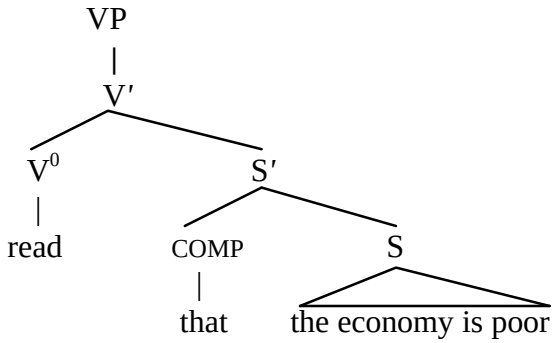
In the last section we saw that verbs choose or subcategorize for which complements can follow them. Consider the verb *read*. One can *read (the book) (to John*) or *read that the economy is poor*. In the first instance, we can say that *read* subcategorizes for an optional NP complement and an optional PP complement headed by the preposition *to*. The lexical entry would be:[7]

read, V, [_ (NP) ($PP_{[to]}$)]

But what can we do about the complement *that the economy is poor*? What kind of phrase is it and how does it fit into X-bar Theory?

Transformational grammar assumes that clauses are built up from sentences using the rule: S′ $\rightarrow$ COMP S. (35) shows the traditional tree for the VP, ignoring for the moment the internal structure of S.

(35)



Under Transformational grammar, the head of the clause is the sentence and the complementizer is a specifier. The sentence cannot be the head of any phrase in X-bar theory, since it is not a lexical item or word; it is most likely a complement. Further, the X-bar schemata allows more positions within the phrase than the S′ rule does, so we need evidence to determine whether the complementizer is a specifier or a head.

[7] Refer back to section 3 for explanation of the subcategorization frames within the lexical entry.

Examine the following data:[8]

(36) a. Everyone insisted that the store would close on Thursdays.
b. *Everyone insisted for the store to close on Thursdays.
c. *Everyone insisted whether the store would close on Thursdays.

(37) a. They arranged for their children to be happy.
b. *They arranged that their children would be happy.
c. *They arranged whether their children would be happy.

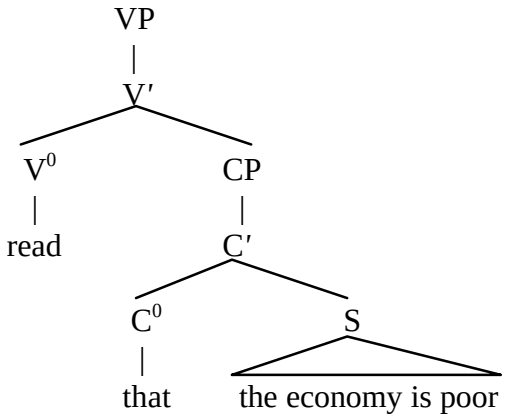
(38) a. Sue wondered whether the smoke would clear before daylight.
b. *Sue wondered that the smoke would clear before daylight.
c. *Sue wondered for the smoke to clear before daylight.

What accounts for the distribution above? Each of these verbs not only takes a clausal complement but it chooses which complementizer the clause must have. This is reminiscent of a verb like *rely* which subcategorizes for a PP complement which must have *on* as the preposition. Therefore, the main verb's subcategorization is what allows the grammatical examples and rules out the ungrammatical ones. By claims 2 and 2(b) in (30) we know that: (a) only heads can subcategorize, (b) any sisters of the head must be subcategorized for (ruling out the starred examples), and (c) if something is subcategorized for, it must be either a complement or the head of a complement.

Since the specific complementizer is subcategorized for by the verb, the complementizer must be the head of the complement clause. (It cannot be the specifier because specifiers are never subcategorized for.) Further, if the complementizer is the head of the clausal complement, then according to X-bar theory the clausal complement is a complementizer phrase or CP.

The revised structure for (35) is shown in (39).

(39)



[8] Throughout, a * before an example indicates ungrammaticality. As previously noted, it is crucial that the theory rule out ungrammatical examples as well as correctly generate the grammatical data.

In (38), note that the sense of *wonder* used here is that of questioning. The other sense, expressing amazement, would subcategorize for a *that*-clause like *insist*, as in:

(I) Sue wondered that the smoke had cleared before daylight.

C^0 is a non-lexical or functional head. We need to expand the range of categories to which the basic PSRs apply. This can be accomplished by deleting the phrase 'from lexical categories' in claim 1 in (30) so that it reads simply, 'All phrases are projected in the same way' and by removing the word 'lexical' within the parenthetical note in (29).

We can now write the following lexical entries for the main verbs in (36)-(38):[9]

insist, V, [_ $CP_{[that]}$]
arrange, V, [_ $CP_{[for]}$]
wonder, V, [_ $CP_{[whether]}$]

At this point, complement clauses almost fit within X-bar theory. One problem remains: if C^0 is a head, its complement must be a phrase by claim 2(a) in (30). Yet the complement of C^0 seems to be a sentence (S). Is S a phrase in X-bar terms?

5.2 Reanalyzing sentences within X-bar theory

The traditional phrase structure rule for a sentence is: S → NP VP. In order to reanalyze this rule in X-bar terms, its head, complement, and specifier must be determined. Neither of the constituents on the right side of this rule can be the head of a phrase because they are phrases themselves, not lexical items or words. To find out what the head of a sentence is, we need to look again for evidence of subcategorization.

Consider this data:

(40) a. Everyone insisted that the store would close on Thursdays.
b. Everyone insisted that the store was closed last Thursday.
c. *Everyone insisted that the store to close on Thursdays.

(41) a. They arranged for their children to be happy.
b. *They arranged for their children were happy.
c. *They arranged for their children would be happy.

(42) a. Sue wondered whether the smoke would clear before daylight.
b. Sue wondered whether the smoke cleared before daylight.
c. *Sue wondered whether the smoke to clear before daylight.

When the complementizer is either *that* or *whether*, the sentence that follows is a regular finite sentence, and *to* cannot be present as shown in (40c) and (42c). In contrast, when the complementizer is *for* (41), *to* must be present and a finite or tensed verb is not allowed in the following sentence. We can say that the complementizers *that* and *whether* subcategorize for a finite complement, whereas *for* requires a nonfinite complement. But the head of that complement still needs to be determined.

We saw that *to* must be present when the complementizer is *for*. We can conclude that *to* is the marker for nonfinite clauses in English. Thus, *for* subcategorizes for a nonfinite

[9] These subcategorization frames are not meant to say that these particular types of CPs are the only types of complements that these verbs can select. These are simply the ones relevant to the current discussion.

complement that must have *to*, so *to* must be the head. Further evidence that *to* is a head can be seen in (43)-(44). Since *to* subcategorizes for the bare form of the verb following it, *to* must be a head.

(43) a. They arranged for their children to be happy.
b. *They arranged for their children to were happy.
c. *They arranged for their children to are happy.

(44) a. We would hate for him to leave.
b. *We would hate for him to left.
c. *We would hate for him to leaves.

We still need a category for *to* and for its counterpart in finite sentences. GB posits that the tense and agreement features fill the same head position in finite sentences that *to* fills in nonfinite sentences. The category is therefore called Inflection, or Infl or I for short. This means a sentence is an Inflection Phrase (IP).

The lexical entries for the three complementizers and nonfinite *to* can be given as:[10]

that, C, [_ $IP_{[+fin]}$]

for, C, [_ $IP_{[-fin]}$]

whether, C, [_ $IP_{[+fin]}$]

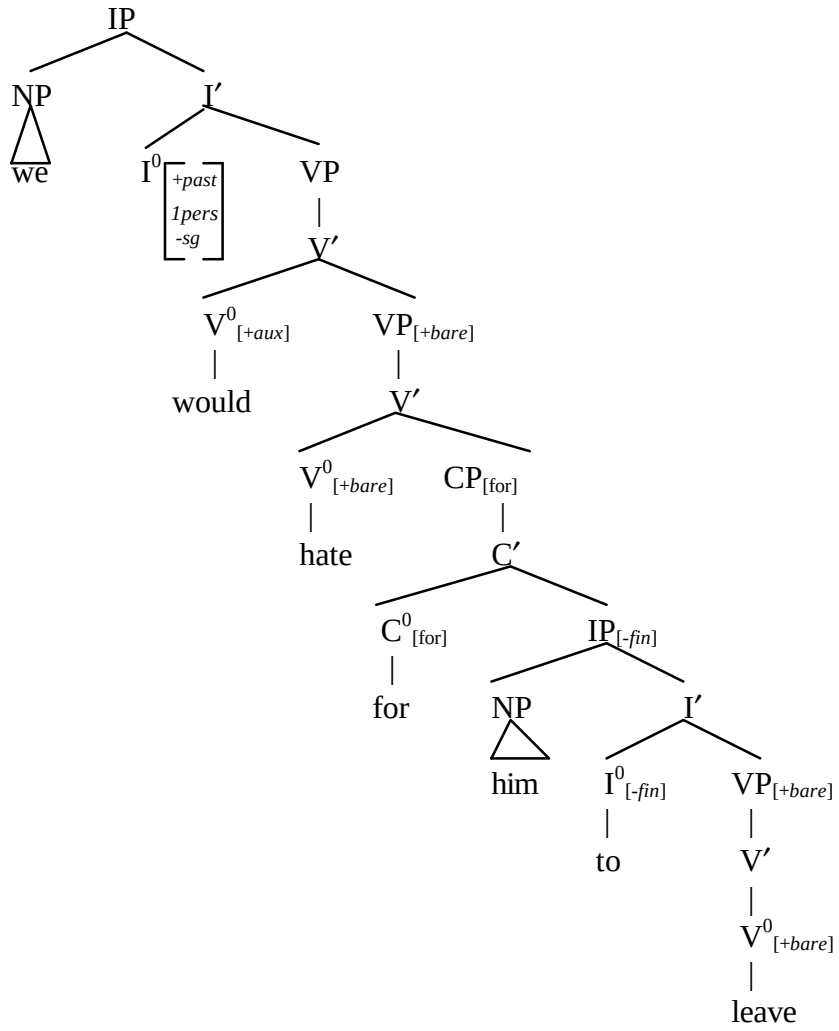
to, $I_{[-fin]}$, [_ $VP_{[+bare]}$]

$I_{[+fin]}$ is never filled by a lexical word at D-structure in English, so it does not have a lexical entry. It always takes a VP as its complement just as nonfinite *to* does. The subject NP is assumed to fill the specifier position in the IP. We can now draw trees for any of the sentences discussed so far.

The tree for (44a) is exemplified in (45), where I assume that pronouns are NPs and auxiliaries are verbs which take a VP whose head has a certain form as their complement.

[10] The feature [+bare] means the infinitive or uninflected form.

(45)



English sentences and clauses, as well as lexical phrases, now conform to X-bar theory in that they can be generated from the two basic phrase structure rules in (29), possibly coupled with the conjunction and adjunction rules in claims 1(a-b) of (30). Our next step is to see how this theory of phrase structure can account for languages with other word orders.

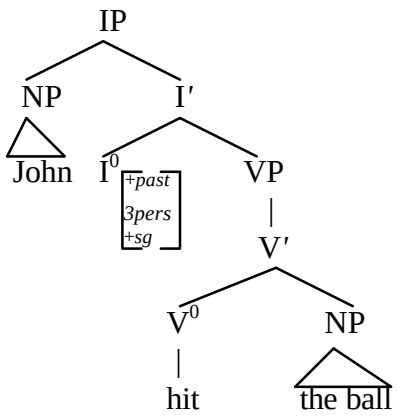
6. X-bar theory applied to languages with other word orders

We have seen that X-bar Theory can account for the phrase structure of lexical phrases, sentences, and clauses in English, based upon the subcategorization of a head for its complement(s), using only the two basic rules repeated in (46) plus the rules for conjunction and adjunction.

(46) $XP \rightarrow$ Specifier X'
$X' \rightarrow X^0$ Complements

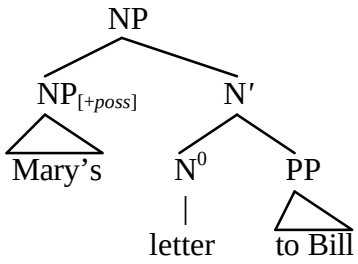
We can refer to English and other SVO languages as **head-initial** and **specifier-initial**, since the specifier comes before X′ and the head comes before its complements. This generalization holds in all phrases in English. For example, in sentences the subject is initial in the specifier position and the VP complement follows the head containing nonfinite *to* or the inflection features. Within the VP, the head V precedes the NP object complement. The tree for a simple sentence is given in (47).

(47)



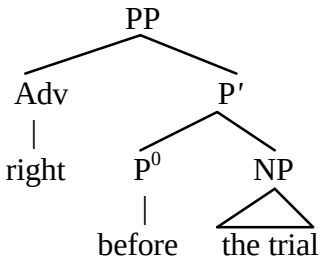
In nominal phrases, either the possessor or the determiner is in the specifier position and they again come before the head, whereas complements follow the head noun.

(48)



Also, in prepositional phrases, words like *right* or *just* may precede the head in the specifier position and the preposition precedes its NP complement.

(49)



But not all languages have these orders. Can the X-bar rules work for them, too? We will look at each major word order in turn.

6.1 SOV Languages

Consider the following data from Abaza, a Northwest Caucasian language (O'Herin 1993). (50) gives an example of a sentence with a transitive verb, (51) shows a possessed noun phrase, and example (52) is a PP.[11]

(50) *H-pa* *xs^{j}ı* *yıǐın.*
our-son milk drank
'Our son drank the milk.'

(51) *Ahmet* *y-tdzı*
Ahmet 3SM-house
'Ahmet's house'

(52) *awiy* *a-mštaxi*
that 3SI-after
'after that'

What is consistent about the phrases in this SOV language? In the sentence, noun phrase, and 'prepositional' phrase, the head is always final but the specifier is initial. We can capture these generalizations of **head-final** and **specifier-initial** by simply changing the order of the head and complements in the X′ rule.[12] Therefore, for regular SOV languages like Abaza,[13] the basic phrase structure rules are:

(53) XP → Specifier X′
X′ → Complements X^0

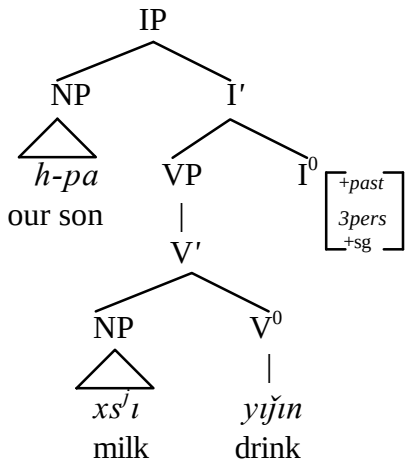
The trees generated by the rules in (53) for each of the Abaza examples will be given to show how the SOV version of the trees look. Sentence (50) is shown in (54), where the subject is in the initial specifier position (as in SVO languages) but the object is also before the verb in the complement position. (Note that we always read the word order from left to right beginning at the top left and going down and back up the tree.)

[11]Abbreviations: 3SM = third person singular masculine pronoun; 3SI = third person singular inanimate pronoun.

[12]This parameterization allowing us to change the order of the elements on the right side of the phrase structure rule parallels the distinction between Immediate Dominance and Linear Precedence in Generalized Phrase Structure Grammar (Gazdar, Klein, Pullum and Sag 1985).

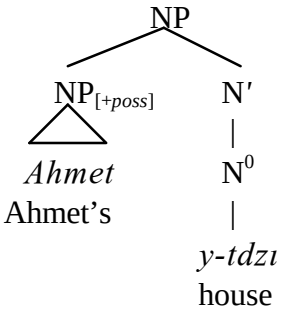
[13]I use 'regular' here to mean a language in which **all** phrases in the language follow the same basic phrase structure rules. In some languages, nominals have a slightly different order than the rest of the phrases do. We will see an example of this in the OVS language, Hixkaryana. Other splits in ordering, or languages where some or all phrases lack a strict ordering, are also possible.

(54)



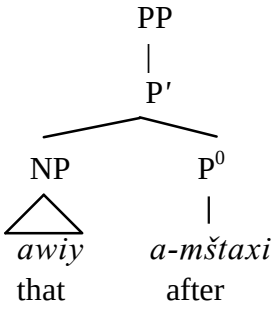
The possessor fills the specifier position in the noun phrase, which is initial:

(55)



The head of the PP comes after the complement, so it is a postposition:

(56)



6.2 VOS Languages

Tzotzil, a Mayan language spoken in Mexico, provides data for a VOS language (Aissen 1987). (57) shows a sentence with a transitive verb, (58) shows a possessed noun phrase, and (59) gives a prepositional phrase.[14]

(57) *7i-s-pet lok'el 7antz ti t'ul-e.*
CP-A3-carry away woman the rabbit-CL
'The rabbit carried away the woman.'

(58) *s-tot li Xun-e*
A3-father the Xun-CL
'Xun's father'

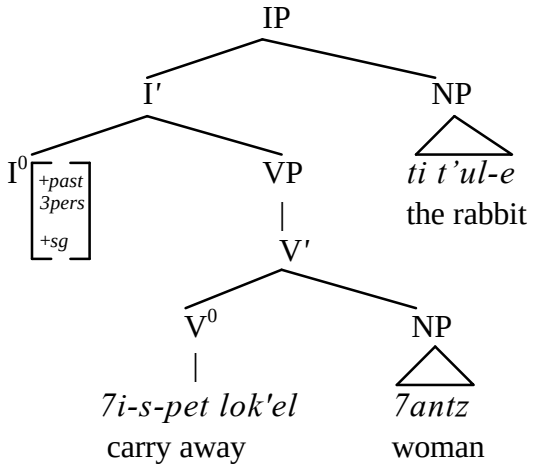
(59) *ta bala*
with bullets
'with bullets'

All the phrases here are **head-initial** (like English) but **specifier-final**. The X-bar phrase structure rules for VOS languages are:

(60) XP → X′ Specifier
X′ → X^0 Complements

The tree for sentence (57) is given in (61), where the verb is first as the head of the VP, followed by the object in the complement position, with the subject last in the (final) specifier of IP position. VOS languages are just like SVO languages except for the ordering of the specifier.

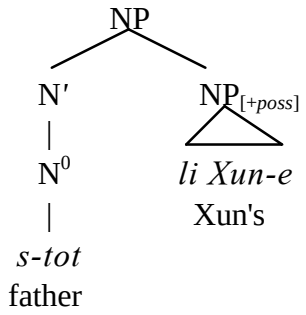
(61)



[14]The segment *7* is a glottal stop, whereas *C'* is a glottalized consonant. Abbreviations: CP=completive aspect; CL=clitic; A3 = third person absolutive.

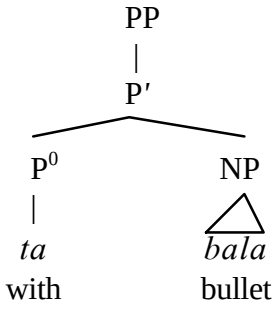
In the possessed noun phrase, the possessor fills the specifier position, so it is final, as shown in (62):[15]

(62)



Finally, the PP is head-initial as expected:

(63)



6.3 OVS Languages

(64)-(66) give examples of a simple transitive sentence, a possessed noun phrase, and a PP from one of the rare OVS languages, Hixkaryana, a Southern Guiana Carib language spoken in Northern Brazil (Derbyshire 1985).

(64) *Kuraha yonyhoryeno ɓiryekomo.*
bow he-made-it boy
'The boy made a bow.'

(65) *Masarɨ hokru*
Masarɨ child-of
'Masarɨ's child'

(66) *mokro yakoro*
that-one with
'with that fellow'

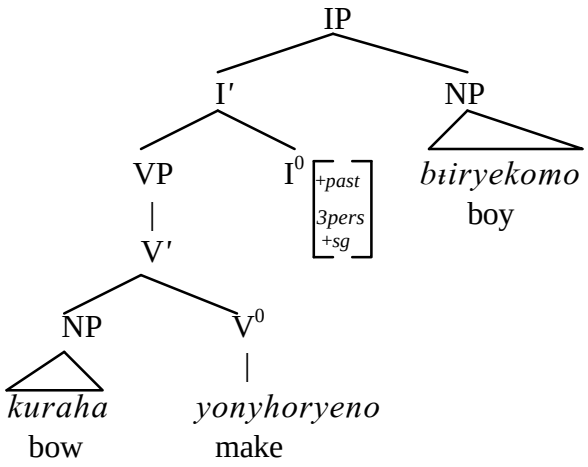
[15]Note that within the possessor NP a determiner is present. In English, we have said that the determiner is also a specifier of the NP which alternates with the possessor. In Tzotzil and many other languages, possessors and determiners may co-occur and have different positions with respect to the noun. Since the determiner comes before the noun in Tzotzil, a head-initial and specifier-final language, it seems more likely that the determiner is a head. We will see how this works in section 11.2.1 where the DP Hypothesis will be presented as one of the more recent additions to the theory.

What is consistent about the three phrases here? The heads V, N, and P are all final. Looking at the position of the subject in (64) we see that the specifier is also final. The X-bar rules that generate **head-final** and **specifier-final** trees are:

(67) $XP \rightarrow X'$ Specifier
$X' \rightarrow$ Complements X^0

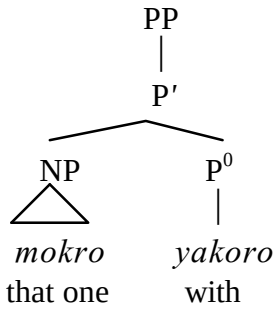
The tree for sentence (64) is shown in (68), where the object as the complement to the verb is the leftmost element, followed by the head verb and then the subject in the specifier of IP position. The only difference between OVS and SOV languages is the order of the specifier.

(68)



This simple change in ordering within the X-bar rules accounts for a good part of the typological expectations based on the word order. For example, head-initial languages, such as SVO and VOS languages, have prepositions while head-final languages have postpositions. (69) shows that Hixkaryana, as an OVS language, has postpositions as expected.

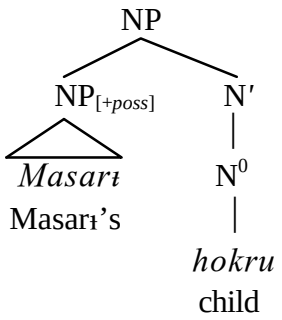
(69)



A closer look at the possessed noun phrase in (65) shows that the possessor is initial in Hixkaryana. This is contrary to expectation, since the subject (which is also a specifier

position) is final. Hixkaryana can be analyzed as a head-final language that has the specifier in final position in all phrases except nominal phrases,[16] where the specifier is initial. The tree for (65) is shown in (70).

(70)



The simple parameterization of the order of elements on the right side of the two basic phrase structure rules has taken us a long way in accounting for the various underlying word orders found in languages. SVO, SOV, VOS, and OVS languages can all be analyzed in this way, as summarized in the following chart:

SVO:	XP → Specifier X′	VOS:	XP → X′ Specifier
	X′ → X^0 Complement(s)		X′ → X^0 Complement(s)
SOV:	XP → Specifier X′	OVS:	XP → X′ Specifier
	X′ → Complement(s) X^0		X′ → Complement(s) X^0

There are still two more word orders that do not fall out directly from a change of order within the X-bar rules: VSO and OSV.

6.4 VSO and OSV Languages

There are only a few documented languages with OSV order, but a significant number of languages from various language families have dominant VSO word order. (71)-(73) give examples from Quiegolani Zapotec, an Otomanguean language spoken in Mexico (Regnier 1989, Black 1984), that has VSO word order.[17]

(71) *W-eey Benit mël.*
C-take Benito fish
'Benito took a fish.'

[16] This division might be that all [-V] phrases, which would include PPs, have their specifiers initial. More data would be required to determine this.

[17] Abbreviations: C = completive aspect; 3RD = general third person pronoun; 1EX = first person exclusive pronoun.

(72) *W-nii men disa lo noo.*
C-speak 3RD language face 1EX
'She spoke Zapotec to me.'

(73) *xnaa noo*
mother 1EX
'my mother'

Urubú, of the Tupí family in Brazil (Derbyshire and Pullum 1981 from Kakumasu 1976), provides data for an OSV language (74)-(75).

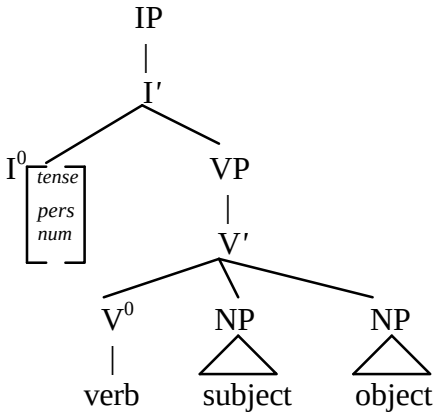
(74) *Pako xuã u'u.*
banana João he-ate
'John ate bananas.'

(75) *Koĩ sepetu-pe jurukã Nexĩ mái muji-ta.*
tomorrow spit-on ribs Nexĩ mother she-will-roast
'Nexĩ's mother will roast the ribs on the spit tomorrow.'

In all of the phrases in Quiegolani Zapotec, the head is initial: the verb is first in (71) and (72); the preposition *lo* 'face' (used for 'to') comes before the pronoun *noo* 'me' in the prepositional phrase in (72); and the noun comes before the possessor in (73). In contrast, all of the phrases in Urubú have the head in final position: the verb is last in both (74) and (75); *sepetu-pe* 'spit-on' in (75) shows that the language has postpositions; and in the possessed noun phrase, *Nexĩ mái* 'Nexĩ's mother' (75), the noun is final. We can generalize that VSO languages are **head-initial** and OSV languages are **head-final**.

The problem with these two word orders for X-bar Theory is that the subject intervenes between the verb and the object, something a specifier should not do. For many years, it was assumed that these languages were different from the others and had a flat structure rather than a configurational one. For example, (76), which follows, shows the flat VP structure (otherwise following GB) that Woolford (1991) posits for the VSO language, Jacaltec:[18]

(76)



[18] The OSV structure would be a mirror image of (76).

However, research on VSO languages indicates that they really are similar to languages with other word orders in a number of ways (such as subcategorization for complements, subject-object asymmetries, and topicalization of a constituent allowed for a verb plus its object but not a verb plus its subject), leading to the proposal that they start out with the same configurational structure as other languages (Anderson and Chung 1977, Chung 1990, McCloskey 1991, etc.). From a theoretical point of view it is desirable to claim that all languages have the same basic D-structure, where the subject is in a specifier position and the sisters of the verb are all and only its complements. Two main proposals have been made to derive VSO word order from an underlying head-initial (SVO or VOS) D-structure. We need to understand more of the theory before addressing these proposals, however, so they will be presented in section 11.1.

We have now seen how to account for the basic word order of a language using the X-bar Theory of phrase structure. In languages having SVO, SOV, VOS, or OVS word order, the trees are simply generated in the proper order at D-structure from the phrase structure rules which have been parameterized for the language. In VSO and OSV languages, we must either use a flatter structure where the subject is a sister of the verb or posit some as yet undetermined movement. Of course, not all sentences in any language have the basic word order. In the next section, we begin to look at the constraints on movement as we consider question formation.

7. Constraints on movement: Question Formation

Government and Binding theory considers word order an important part of the syntax and therefore seeks to account for how and why different word orders come about within a particular language.[19] Since it is a derivational theory, the various word order changes will be assumed to arise from movement of one or more constituents, as was done in the predecessor to GB, Transformational Grammar. However, Transformational Grammar was strongly criticized as being too powerful, therefore GB puts constraints both on the movement allowed and on the structure resulting from the movement. We will see what these constraints are as we develop the analysis of Yes/No questions and content questions, one step at a time.

7.1 Yes/No Questions

To form a Yes/No question in English, an auxiliary is moved in front of the subject, as in the change from (77a) to (77b). The distribution in (77c-g) shows that we need to be careful in how we formulate this movement rule to be sure that only the grammatical Yes/No questions are generated. For example, only one auxiliary can move (an auxiliary only, not a main verb), it has to be the first auxiliary, and that first auxiliary agrees with the subject and determines the form of the following verb.

[19] Even in languages which allow (fairly) free word order, usually due to a rich case and/or agreement system, there is an unmarked, neutral, or more frequently occurring word order. The other allowed word orders are more marked in that they involve foregrounding or backgrounding of one or more constituents and/or would only be used in specific contexts. The unmarked word order would be the D-structure in GB, with the other orders being derived by movement.

(77) a. Sally has declined the job.
b. Has Sally declined the job?
c. *Has Sally declines the job?
d. *Has Sally might decline the job?
e. *Might have Sally declined the job?
f. Might Sally have declined the job?
g. *Declined Sally the job?

Sentences like:

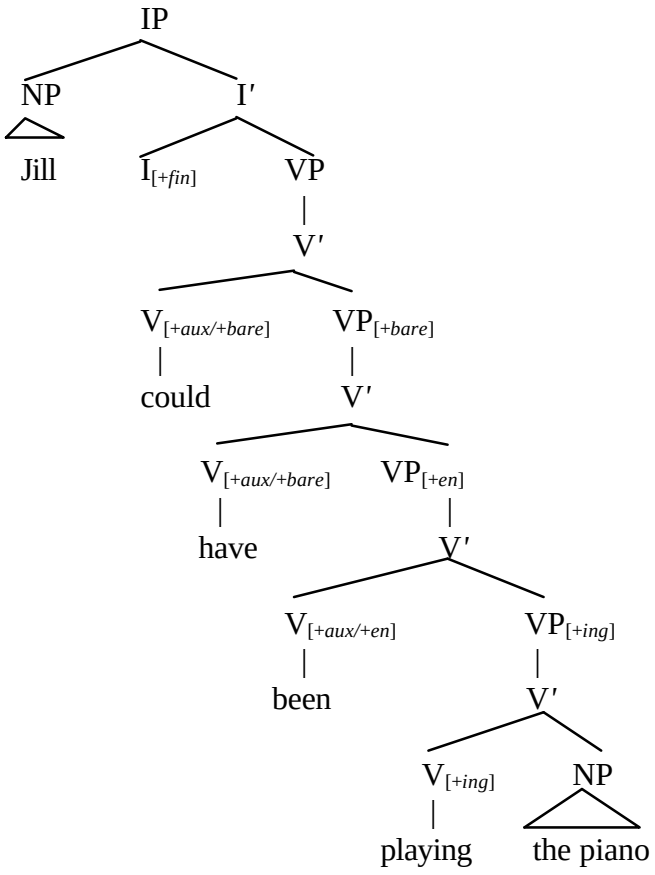
(78) Jill could have been playing the piano.

show that auxiliaries come in a certain order and that they subcategorize for the form of the verb that comes after them. This means that auxiliaries must be heads themselves, each subcategorizing for a VP of a certain type. For example, *could, might, shall*, etc. are modals which may not be followed by another modal and require the verb that comes after them to be in the bare form. The lexical entry for *could* is given in (79). Similar entries could be given for the other modals and for the non-modal auxiliaries.

(79) could $V_{[+aux\ /+modal\ ]}$ [_$VP_{[-modal\ /+bare\ ]}$]

The structure for (78) has four VPs, stacked one upon the other, as shown in (80).

(80)



In Yes/No questions, the order and form restrictions still hold. With a movement analysis, we can account for these restrictions via subcategorization at D-structure. Then the highest auxiliary can move in front of the subject to obtain the surface word order. We need to look at more data to determine which position the auxiliary moves to.

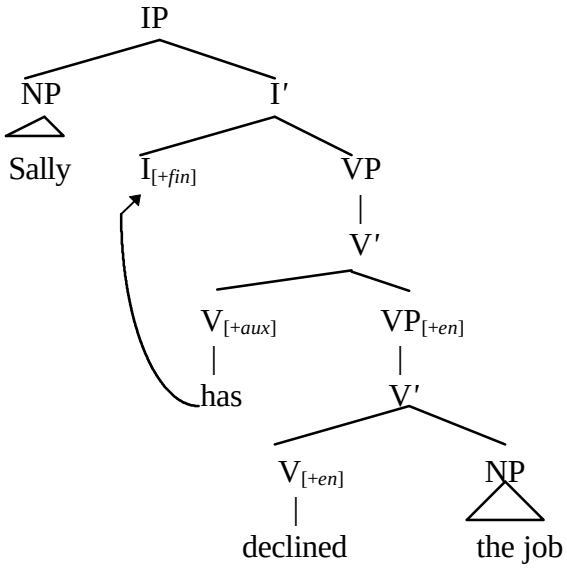
Two other phenomena show that the highest auxiliary is important also: VP deletion and the placement of negation. Consider the example in (81).

(81) Jill couldn't have been playing the piano but
Bill could (have [been (playing [it])]).

We see in the first clause of (81) that negation follows the first auxiliary. The options for the second clause show that VP deletion constructions carry the restriction that at least one auxiliary (the highest one) must remain behind. A coherent account of these facts yields that the highest auxiliary must move to I^0.

The D-structure tree for (77a and b) would be as shown in (82), with the movement of the highest auxiliary *has* up to $I_{[+fin]}$ indicated by the arrow:

(82)



This movement of $V_{[+aux]}$ to I^0 is called HEAD MOVEMENT, since a head is moving to another head position. This movement does not give us the word order of a Yes/No question, so something more is needed. We know that the auxiliary moves in front of the subject, but we do not know where it attaches. Before we can propose what that movement is, we need to see how movement is constrained in the theory.

Two basic principles are used to constrain movement. First is the Principle of No Loss of Information, which simply says that nothing can move to a position that is already phonetically filled. The second principle says that movement must be either STRUCTURE-PRESERVING or ADJUNCTION. Structure-preserving movement means that the moved constituent must fit into

the tree structure that is already there. Further, it must fit the requirements of X-bar theory so that it could have been generated there at D-structure. This means that you cannot put a head into a complement position or a phrase into a head position, and you cannot add a complement that was not subcategorized for (and therefore filled) at D-structure. In general, a head can move to an empty head position, as we saw when the highest auxiliary moved to I^0, or a maximal projection can move to an empty specifier position.

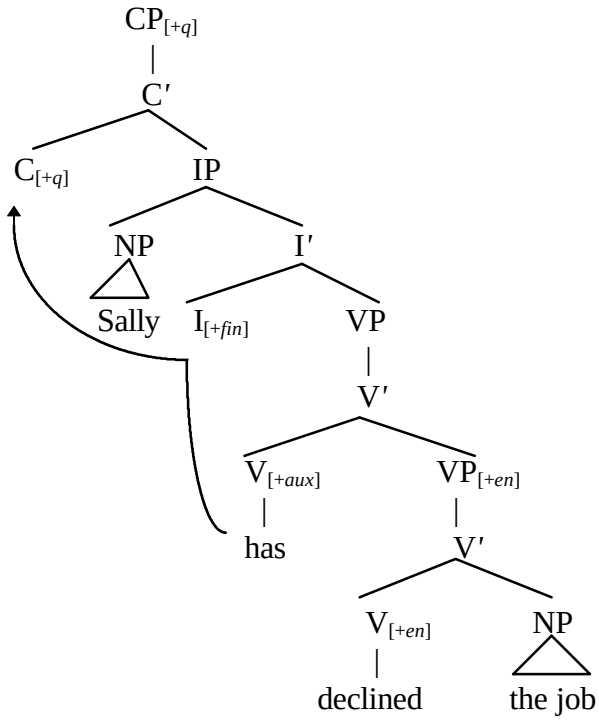
Looking back at the tree in (82), we see that there is not another empty head position for the auxiliary to move to. We do have the option of adjoining to the IP, since movement by adjunction is allowed, but the adjunction rule is recursive, which would incorrectly predict that more than one auxiliary may be fronted ((77e) is ungrammatical).

We can find a better solution by looking at embedded Yes/No questions, as in (83):

(83) I wonder whether Sally has declined the job.

We know from section 5.1 that the embedded clause following *wonder* is a CP. Semantically, both main clause Yes/No questions and embedded Yes/No questions have the same interpretation; one only requires a more direct answer than the other. Drawing on this parallel between main clauses and embedded clauses, we can posit that main clauses are also CPs, and that the CP and its head C for both main clause and embedded clause questions have the feature [+q]. This means the D-structure for (77b) is as shown in (84). Now, as the arrows indicate, after the $V_{[+aux]}$ moves to I^0 it can move on to $C_{[+q]}$ to obtain the word order of Yes/No questions.

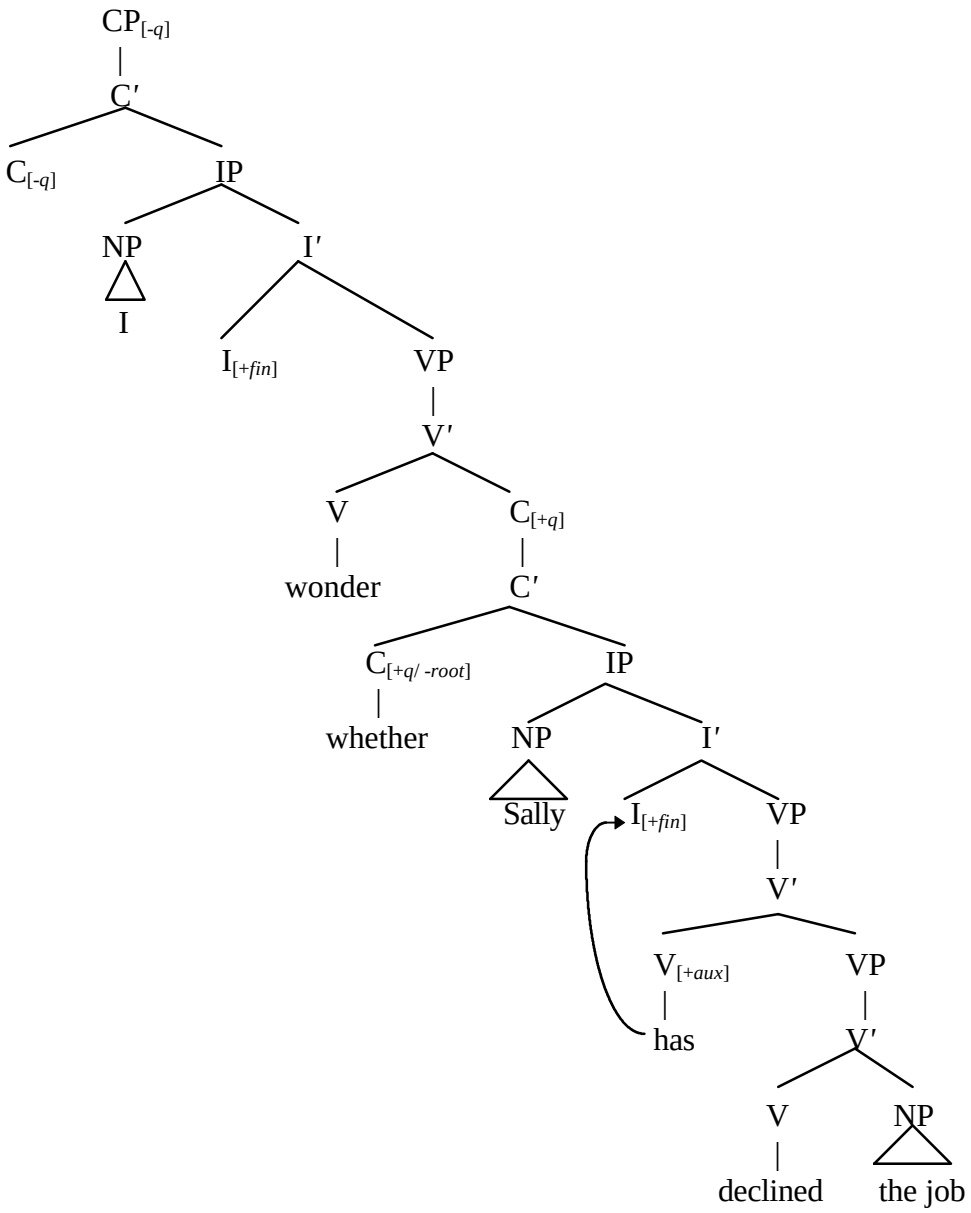
(84)



While we want to assume that the highest $V_{[+aux]}$ moves to I^0 in all cases, the movement of I^0 to $C_{[+q]}$ only occurs in questions, since declaratives and other non-questions will have a $C_{[-q]}$.[20]

Main clause and embedded Yes/No questions now have parallel structure, yet there is a significant difference in their surface word order. How do we account for the fact that no Subject/Aux inversion occurs in embedded Yes/No questions? The tree in (85) shows that the $C_{[+q]}$ position is filled in an embedded clause with *whether*. The Principle of No Loss of Information blocks the movement of *has* to the $C_{[+q]}$ position, without any additional stipulations.

(85)



[20] In practice, the $CP_{[-q]}$ projection is usually omitted, so main clause declaratives simply have IP as the topmost node.

The examples in (86)-(88) from Black English (Jim McCloskey, p.c.) show that Subject/Aux inversion is not a root-clause-only phenomenon universally.

(86) Ask your father DOES HE want his dinner?

(87) Do you remember DID THEY live in Rosemont?

(88) I never found out WOULD HE really have come with me.

The only change we need to make to account for this data is to note that Black English has a Ø $C_{[+q/\ -root]}$ instead of *whether*. Therefore, I^0 moves to $C_{[+q]}$ in embedded clauses just as in root clauses in Black English, since no information is lost.

7.2 Content Questions

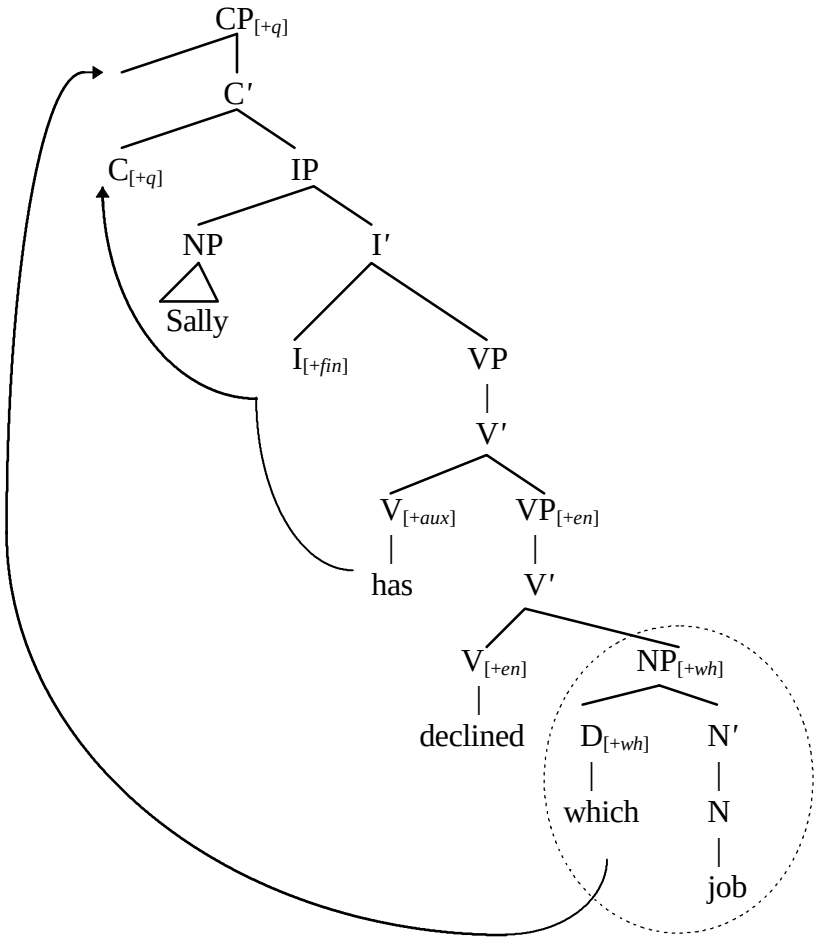
Content questions have the same Subject/Aux inversion as Yes/No questions, so the same head movement of the highest auxiliary to I^0 and on to $C_{[+q]}$ applies. This movement takes place automatically because both types of questions have a $C_{[+q]}$. The difference between Yes/No questions and content questions is that an additional movement takes place in content questions: a [+*wh*] phrase moves to the front. For example:

(89) Which job has Sally declined?

Since there is an open specifier position in the $CP_{[+q]}$, the *wh*-phrase *which job* can move to that position, as shown in the tree in (90). This movement is called $\bar{A}$-movement (where the bar in this case is set complement notation), which is movement to a non-argument position.[21]

[21] An argument is a subject or complement position. Therefore, a non-argument position is a non-subject specifier position or an adjoined position.

(90)



The movements required for questions can be stated simply:

(91) a. The highest $V_{[+aux]}$ must move to I^0.
b. I^0 must move to $C_{[+q]}$.
c. An $XP_{[+wh]}$ must move to the specifier of a $C_{[+q]}$.

No conditions are needed on the rules, because the general principles rule out the ungrammatical examples.[22] For example, English allows multiple *wh*-phrases in a single question, such as in (92), yet only one of these phrases is fronted. Since there is only a single specifier position for $CP_{[+q]}$, once one *wh*-phrase is fronted, the Principle of No Loss of Information blocks further movement.

(92) a. Who(m) did John give what to?
b. *Who(m) what did John give to?
c. What did John give to whom?
d. *What to whom did John give?

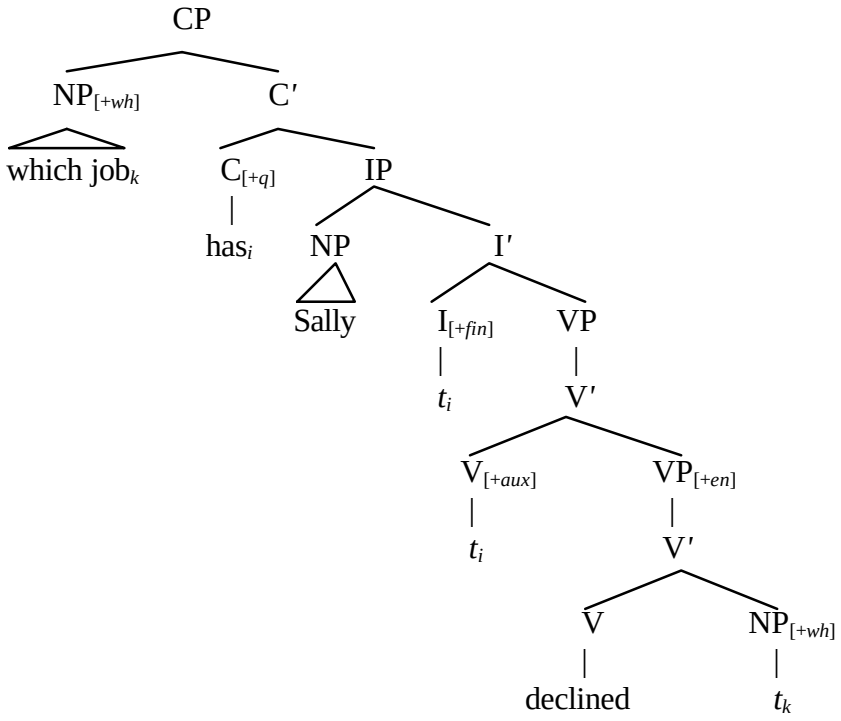
[22] Other principles are needed to handle all the cases.

Of course, not all languages have movement of *wh*-phrases in questions while others allow multiple fronting, so parameterization is needed to account for the variation seen (Black 1994:Appendix). The motivation for Ā-movement seems to be the scope of the semantic operator. Other instances of Ā-movement involve focus, negation, and quantifier constructions, all of which are semantic operators. Some languages, such as Zapotec and Tzotzil require scope to be readable from the S-structure tree, whereas other languages allow further covert movement to take place to establish scope for semantic interpretation.

7.3 Traces of Movement

Instead of drawing arrows on the D-structure tree to indicate movement, as we have done so far, a separate S-structure tree is drawn with a coindexed trace (indicated by the subscripted *t*) left in place to show where the moved constituent came from. The S-structure tree for (89) corresponding to tree (90) is given in (93).

(93)



The traces also serve to insure that movement cannot move an item into a previously filled position.

We have seen examples of both head movement and Ā-movement here. The other type of movement is A-movement: movement to an argument position. This type turns out to be all movement to subject position, such as passive, unaccusative, and raising constructions. Nothing is allowed to move to a complement position, since complement positions are determined by subcategorization and filled at D-structure. The full analysis of these A-movement constructions requires more theoretical 'machinery' involving semantic roles and Case theory. These will be presented in the following two sections.

8. A-movement and Semantic roles

In the last section, we began looking at the constraints on movement. We saw there instances of head movement, such as movement of the auxiliary verb in front of the subject in a question, and Ā-movement, where a phrase moves to a non-argument position as in the fronting of a *wh*-phrase in content questions. This section looks at the third type of movement, A-movement or movement to the subject position, which is an argument position. Cases of A-movement to be considered here include passive, unaccusative, and raising constructions. Passives are the most well-known constructions involving movement to the subject position. The old Transformational Grammar analysis begins with a transitive deep structure, then creates a passive surface structure by moving the subject to the *by*-phrase (or omitting it completely); moving the object to the subject position; adding the passive *be*; and changing the verb form appropriately. This movement analysis of passives captured the generalizations that:

(94) a. Most transitive verbs have passive alternates.
b. No intransitive verbs have passive alternates.
c. The 'subject' of a passive verb corresponds to the object of its transitive alternate.

Government and Binding Theory does not account for passives in exactly the same way as Transformational Grammar did, since movement of the object to a previously occupied subject position would violate the Principle of No Loss of Information. Besides accounting for the generalizations in (94), GB also seeks to explain the synonymy between the active and passive sentences, as seen in (95).

(95) a. The kids invited Sue to the party.
b. Sue was invited to the party by the kids.

This is done by expanding the lexical entries to include semantic roles.

8.1 Semantic Roles in the Lexicon: Passive Constructions

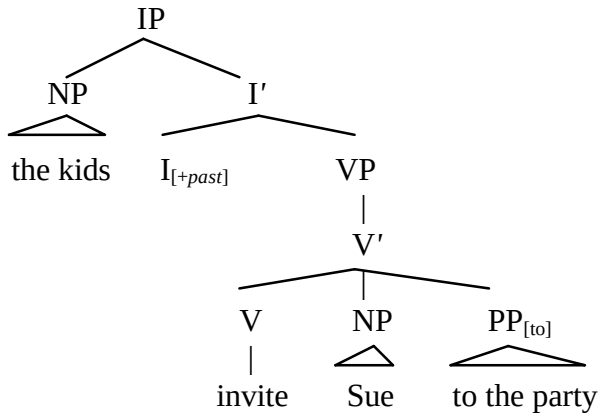
In both (95a and b) *the kids* gave the invitation, *Sue* was the one invited, and *the party* is what Sue was invited to. General semantic roles, such as AGENT, THEME, RECIPIENT, GOAL, LOCATIVE, etc., can be linked to arguments within the lexical entries to capture this synonymy. For example, the lexical entry for *invite* would be:[23]

invite, V,	[__ NP	(PP$_{[to]}$)]
	|	|
invite′	<AGT, THEME, GOAL>	

[23]The line containing the semantic roles is introduced by the logical semantic predicate which is indicated by the syntactic verb form followed by a prime. The lexical entry thus specifies both syntactic and semantic subcategorization information.

where each syntactic complement (called internal arguments) must be linked one-to-one with a semantic role, and one additional role (underlined) may be linked to the subject (called the external argument). Lexical entries apply at D-structure, so not all verbs assign a semantic role to the subject position.[24] As seen in sections 3 and 4, the internal arguments are sisters to the head, as shown in the tree for the declarative sentence (95a).

(96)



Further assumptions about lexical entries in GB include the desire that the related forms of a word share a single subcategorization frame and that there should not be any cross linking of syntactic arguments and semantic roles. For example—directly relevant to the analysis of Passive—the THEME should not be assigned to the object in one case and to the subject in a related entry. This assumption is formalized under the Uniformity of Theta Assignment Hypothesis (Baker 1988:46), which makes the broader claim that the THEME role is always assigned to the direct object when it is present, since that is its position in normal transitive verbs; the RECIPIENT role is assigned to the indirect object, etc.

Though the semantic roles are assigned at D-structure through the lexical entries, another assumption forbids any movement from changing the linking between syntactic arguments and semantic roles. Therefore, movement of something out of a position is allowed, as we have seen with *wh*-question formation, but nothing else can move into that position. The semantic role stays with the original position rather than moving with the phrase; the semantic role is not part of the tree but part of the lexical subcategorization that goes with the D-structure position. Movement into a position linked to a semantic role is not allowed, since it would cause the moved element to take on that semantic role, and thus alter the original linking. The coindexed trace left after movement provides the link between the moved element and the position it occupied at D-structure. Therefore, both semantic roles and subcategorization requirements are still recoverable at S-structure.

[24]For example, auxiliaries do not. So in *John may have hit a home run*, there is only one external argument = *John*. Which verb assigns a semantic role to *John*? It is the AGENT of the verb *hit*; *a home run* is the THEME of *hit*. Auxiliaries do not assign external arguments: there is nothing anyone did or experienced to *may*. Instead they simply select a VP complement that is a type of EVENT or STATE.

The assumptions about the form of the lexical entries are made to capture generalizations about language. Given these assumptions, the GB account of passive must be partly done in the lexicon and partly by movement. A lexical rule,[25] such as that given in (97), is used to capture generalizations (94a-b) that passive verbs are related to transitive verbs. No intransitive verbs will have a passive counterpart generated by this lexical rule. In order to account for alignment of the semantic roles between entries as much as possible and to follow the Uniformity of Theta Assignment Hypothesis, the object NP remains in position at D-structure.

(97) V, [_ NP X] → $V+en_{[+pass]}$, [_ NP X ($PP_{[by]}$)]

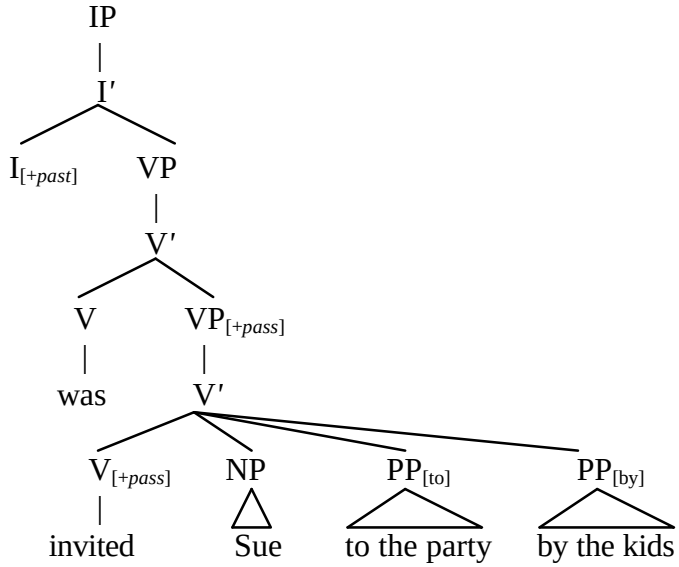
The full lexical entry for the passive form *invited*, including semantic roles, is:

invited	$V_{[+pass]}$	[_ NP ($PP_{[to]}$) ($PP_{[by]}$)]
		| | |
invited′		<THEME, GOAL, AGENT>

Note that no external argument is assigned by the passive verb.

The D-structure for the passive sentence (95b) is as shown in (98), where the passive auxiliary verb is inserted from the lexicon as the only head which subcategorizes for a $VP_{[+pass]}$:

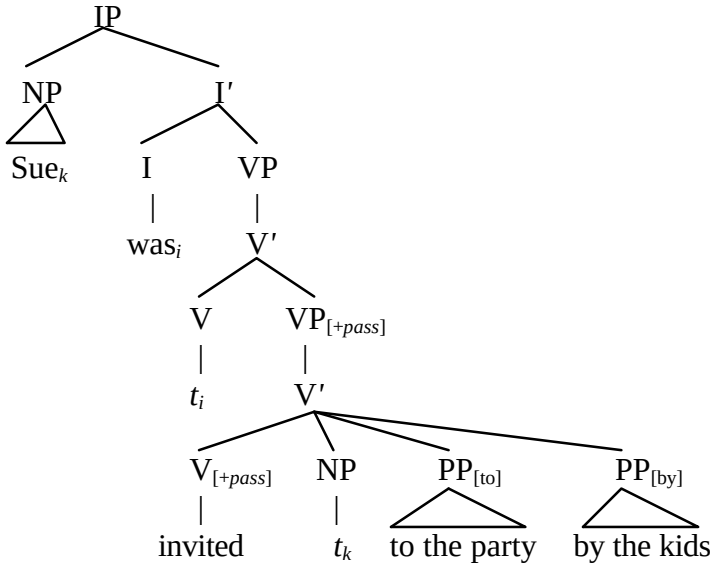
(98) D-structure for passive



[25]A lexical rule takes a lexical entry that matches its left side and generates an additional lexical entry in the form of the right side. The original lexical entry is unchanged and still part of the lexicon. A few exceptional passives will have to be separately added to the lexicon, such as verbs which take clausal complements that can have a passive alternate.

Movement of the object to subject position is still needed. This movement can take place since there is no semantic role linked to the subject position at D-structure and the position was not lexically filled so the Principle of No Loss of Information is not violated. A coindexed trace is left behind to maintain the linking of the object to its semantic role. So the S-structure tree looks like (99):

(99) S-structure for passive



8.2 Unaccusative Constructions

The assumptions made about semantic roles in the lexical entries also require us to distinguish between types of intransitive verbs, following the Unaccusative Hypothesis (Perlmutter 1978). The key distinction is whether the NP (which ends up) in subject position performed the action or was acted upon. Consider the examples in (100):

(100) a. Bill sleeps well.
b. Bill died.
c. The glass broke.
d. Bill broke the glass.

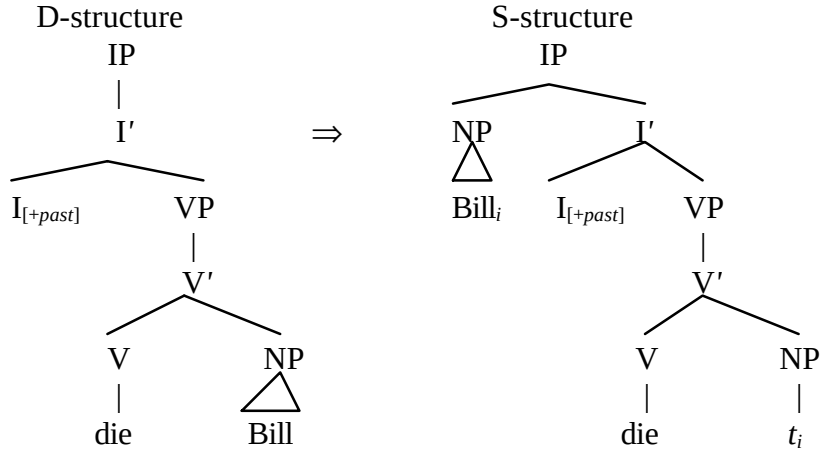
In (100a), *sleep* is assumed to be a regular intransitive verb with an AGENT subject. In contrast, Bill did not do anything to make himself die, so in (100b) the subject is assumed to have the THEME role. Similarly, in both (100c) and (100d) *the glass* is what the breaking happened to so it fills the THEME role in both the unaccusative construction in (100c) and the transitive construction in (100d).

The assumptions about semantic roles require that while verbs like *sleep* have an AGENT in subject position at D-structure, verbs like *die* have an empty subject position at D-structure with a THEME object, as shown in the lexical entries below.

Further, a verb like *break* has an optional AGENT. Movement of the THEME to subject position for the unaccusative verb *die* is exactly parallel to the simple example in (101).

sleep, V [_]	die, V [_ NP]	break, V [_ NP]
	|	|
sleep′ <AGT>	die′ <THEME>	break′ <(AGT), THEME>

(101)



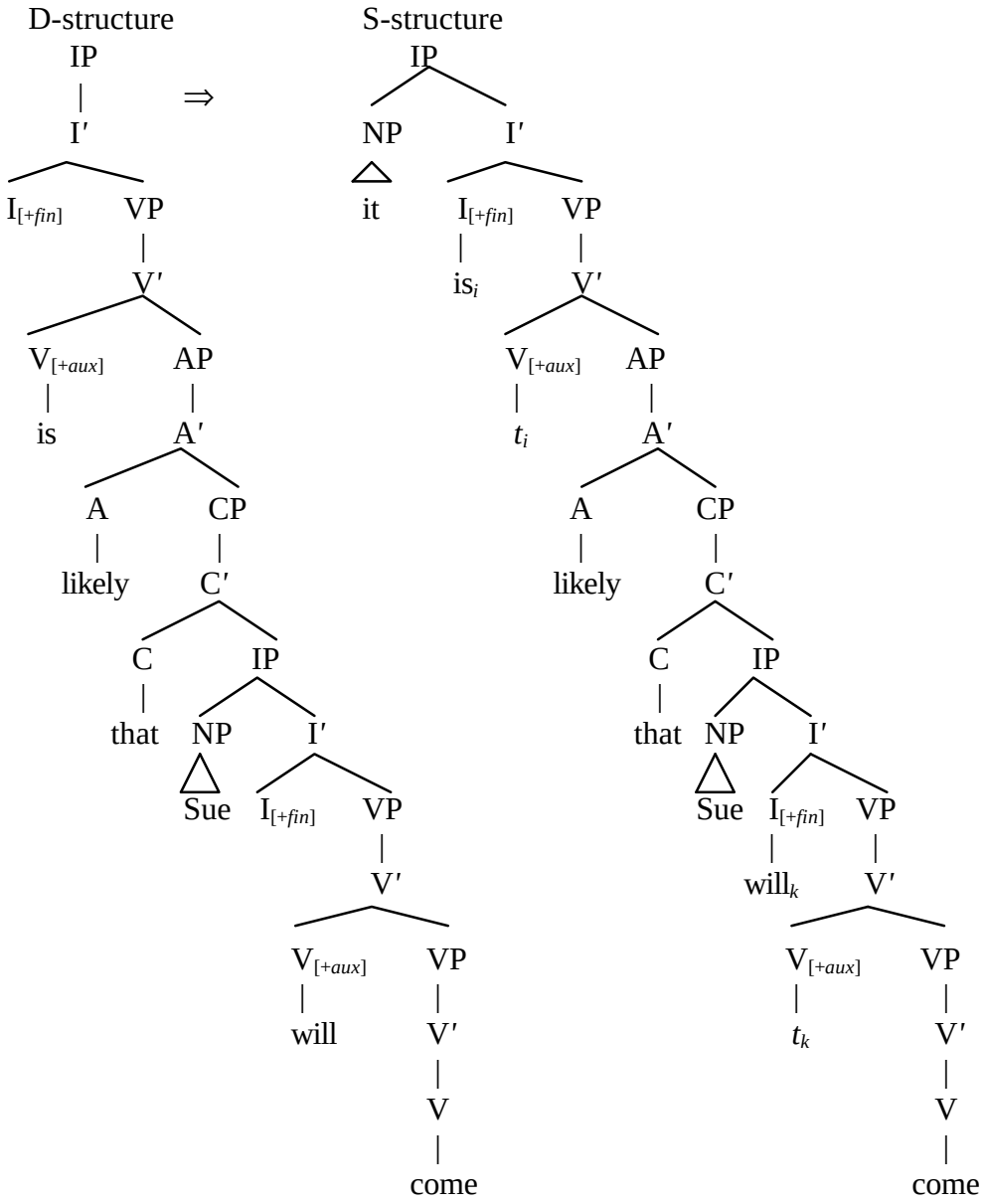
8.3 Raising Constructions

The third type of A-movement (movement to an argument position) involves raising predicates such as *seem* and *likely*. These predicates take either a finite or a nonfinite clause complement and do not assign a semantic role to their own subject position. The lack of a semantic role assigned to the subject position can be seen by the presence of the dummy *it* when there is a finite clause complement (102a). In the case of a nonfinite clause complement, the subject of the lower clause must raise to the main clause subject position (102b-c).

(102) a. It is likely that Sue will come.
b. Sue is likely to come.
c. *It is likely Sue to come.

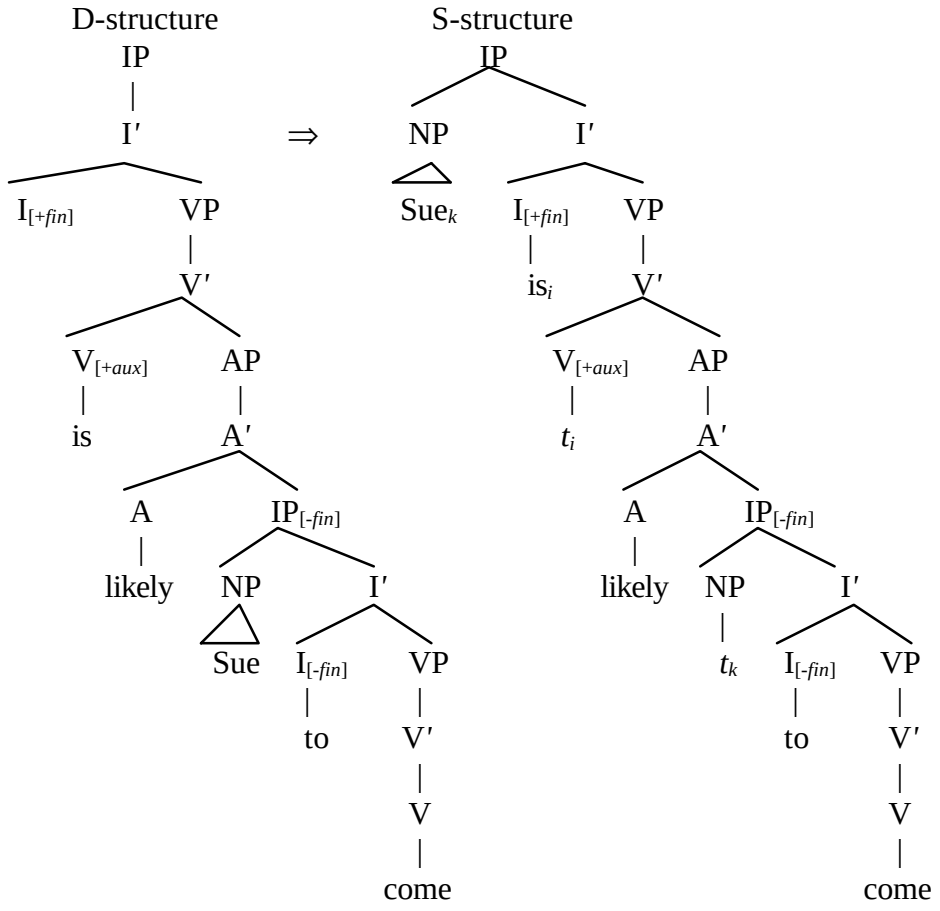
The trees for (102a) are given in (103). The dummy *it* is inserted in the main clause subject position to obtain the S-structure, fulfilling the English-specific requirement that (at least) main clauses have phonetically filled subjects. Movement of the auxiliaries to I^0 in both clauses is also shown.

(103)



Contrast the trees in (103) for sentence (102a) with the trees shown in (104) for sentence (102b), where the subject of the nonfinite clause must raise to the main clause subject position.

(104)



Clearly, more than just a requirement that the main clause subject position be phonetically filled is at work here. Case Theory provides the motivation for A-movement of the particular NP which raises in passives, unaccusatives, and raising constructions.

9. Case Theory

The English pronoun system gives us a glimpse of the positions that are assigned case and which morphological case they receive. Consider the data in (105)-(111).

(105) **She/*her** went to the store.

(106) John invited **her/*she** to the party.

(107) John bought it for **her/*she**.

(108) John would have liked for **her/*she** to come.

(109) John was glad that **she/*her** came.

(110) John wondered whether **she/*her** would come.

(111) **She/*her** brought **them/*they** **their/*they/*them** suitcases.

We can generalize from this data that:

a. *she*, *they*, *I*, etc. are used in subject position of main and embedded clauses, except for embedded clauses headed by $C_{[for]}$.

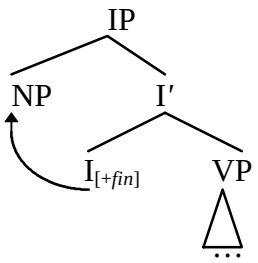
b. *her*, *them*, *me*, etc. are used in object position and as the object of a preposition and in subject position after $C_{[for]}$.

c. *their*, *his*, *my*, etc. are used in possessor position.

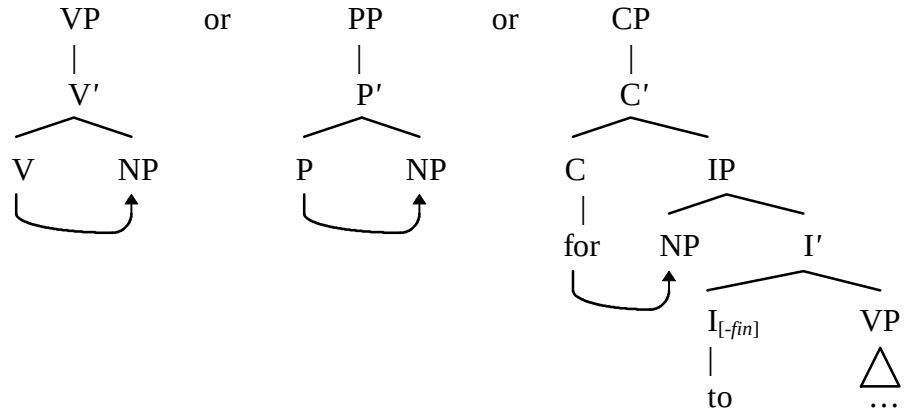
As usual, GB rephrases the generalizations in terms of phrase structure. Also, even though only pronouns show overt morphological case in English, it is assumed that all NPs have Case (called abstract case) that matches the morphological case that shows up on pronouns. Appeal is made to other languages with much richer case systems than English to back up this claim.

In phrase structure terms:

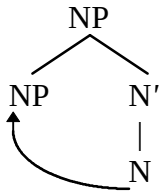
a. Nominative Case is assigned to the NP specifier of $I_{[+fin]}$.



b. Accusative case is assigned to the NP sister of V or P. The $C_{[for]}$ which is homophonous with the preposition *for* acts like P for Case assignment. Note that the subject of a nonfinite clause could not receive Case from $I_{[-fin]}$ since only $I_{[+fin]}$ assigns Nominative Case.



c. Genitive Case is assigned to the specifier of N.



What is the same about these positions that receive Case and the positions that assign Case? Chomsky observed that every maximal projection (=XP) that dominates the NP that receives Case also dominates the head that assigns it (if we do not count the IP that intervenes between the $C_{[for]}$ and the NP).

Our first definition of **government** [26] comes from this observation.

α GOVERNS β iff

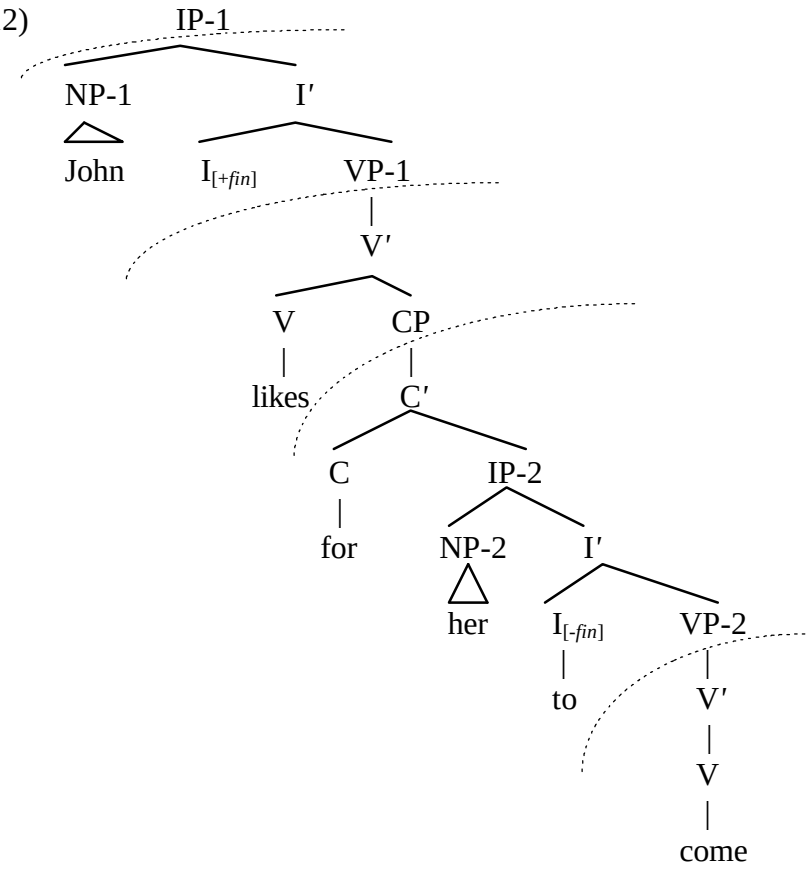
a. α is a head [±N,±V] or $I_{[+fin]}$ or $C_{[for]}$, and
b. every XP that dominates α also dominates β, and
c. every XP (other than IP) that dominates β also dominates α.

In this definition, α and β stand for particular categories. Clause (a) requires that α be one of the heads N, V, A, P, $I_{[+fin]}$ or $C_{[for]}$. Almost always, β is an NP, since NPs need Case, which is assigned under the government relation. Clause (b) determines how high up the tree a head may govern: if every maximal projection above the head must also dominate the NP in question, then the NP must be below the maximal projection of the head (e.g. VP for V, IP for $I_{[+fin]}$). Clause (c) provides the lower limit of government by not allowing the head to govern down into another maximal projection other than IP. Together, clauses (b) and (c) establish locality constraints on the government relation for each head.

These locality constraints are illustrated in the tree in (20) by the dashed lines. (Indexes have been added to some of the categories to aid discussion.)

[26]This definition will be changed slightly in section 10 on Binding Theory. At that point, the reader should be able to understand the full name of the theory.

(112)



There are four heads that can govern in this tree: $I_{[+fin]}$, V *likes*, C *for*, and V *come* (recall that $I_{[-fin]}$ *to* cannot govern by clause (a) of the definition). $I_{[+fin]}$, governs up to its maximal projection IP-1, so it governs its specifier NP-1 *John*, and $I_{[+fin]}$ also governs its complement VP-1 (but not anything inside VP-1). V *likes* governs up to its maximal projection VP-1 and its complement CP, but it does not govern anything within the CP. C *for* governs up to its CP maximal projection and down all the way through IP-2 (which is invisible for government) to and including the next maximal projection VP-2, crucially governing the NP-2 *her*. Finally, V *come* governs everything else within its own maximal projection, which in this case is nothing.

Since we will be using government for Case assignment to NPs, we can think of the definition in simpler terms as:

> A head (N, V, A, P, $I_{[+fin]}$, $C_{[for]}$), GOVERNS its NP specifier and its NP complement and the NP specifier of an $IP_{[-fin]}$ complement.

Note that government is stronger than subcategorization because a head governs its specifier (and the specifier of its complement for IP complements) as well as its complements.

The Case assignment rules in terms of government are simply:

a. $I_{[+fin]}$ assigns nominative case to the NP specifier that it governs.
b. N assigns genitive case to the NP specifier that it governs.
c. V, P, $C_{[for]}$ assign accusative case to the NP that they govern.

GB requires that all NPs must have Case at S-structure by the Case Filter in (113).

(113) Case Filter: *NP if it does not have Case at S-structure.

With one further assumption, we will have the motivation for A-movement in passive, unaccusative, and raising constructions. Burzio's Generalization (Burzio 1986) states that predicates which do not assign a semantic role to their external argument cannot assign Case to their complement(s). This provides the answer to why the passive object must move. Passive verbs do not assign a semantic role to their external argument position, so they have lost the ability to assign Case to their complement. Therefore, the NP object cannot remain in place at S-structure and must move to a position where it can get Case: the specifier of $I_{[+fin]}$ where nominative case is assigned. The same reasoning accounts for the unaccusative and raising constructions: the NP which cannot receive Case in its D-structure position is the one which must move; and it may only move to a position which does assign Case, the specifier of $I_{[+fin]}$.

Note that A-movement is motivated by the need for Case, so the moved NP will be in a Case-assigning position at S-structure but its trace will not. Ā-movement is just the opposite: the moved NP is not in a Case-assigning position at S-structure but its trace is. We must therefore allow the Ā-moved phrase to pass the Case Filter via its coindexed trace. In general, either the moved NP or its trace must be assigned Case at S-structure, but not both. Another way of stating this is to say that the moved element and its coindexed trace form a **chain**, and only one Case is assigned to a chain.[27]

We have now completed the basic restrictions on the three types of movement allowed in GB. We also learned what government is in phrase structure terms. The next section deals with the second part of the name of the theory: binding constructions.

10. Binding Theory

In this section, we finally learn what Binding Theory is and why it is so important that it is part of the name of the overall Government and Binding framework. In its narrowest conception, binding involves reflexive constructions, such as (114). Equi constructions, such as (115), also fall under Binding Theory, however, as do the various types of movement constructions considered in the last three sections, exemplified in (116)-(118). Further, we will see that *pro*-drop constructions (which English does not allow), shown for Spanish in (119), are also accounted for by Binding Theory.

(114) Sue likes herself.

(115) Bill tried to win the race.

(116) What did Jill give to you?

---

[27]The only construction which seems to allow two Case assignments to a chain is *tough* movement, where the object NP of an embedded nonfinite clause may move to the main clause subject position:

i a. The bricks$_i$ are hard for Lisa to cut t_i.

b. The bricks$_i$ are hard to cut t_i

The bricks would receive nominative Case in its S-structure subject position, but its trace would also receive accusative Case from *cut*. This construction remains a problem for the theory.

(117) The homerun was hit by Joey.

(118) Kim is likely to win the prize.

(119) *Hablo español .* 'I speak Spanish'

It is most likely unclear at this point what the examples in (114)-(119) have in common. Let's start with reflexive constructions and build the Binding Theory step by step in section 10.1, and then seek to unite all the constructions above in section 10.2. We will also work through the analysis of the equi constructions (115) in section 10.3.

10.1 Binding and Command Relations in Reflexive Constructions

We saw in section 9 that Case Theory determines whether a nominative pronoun, such as *she* or *he*, is used instead of an accusative pronoun, *her* or *him*, or a genitive pronoun like *his*. It is Binding Theory's job to determine when a reflexive anaphor, for example, *herself*, is used instead of one of the pronouns, *she* or *her*.

Consider the following data, where 'her/*herself' means *her* is grammatical but *herself* is not (similarly for 'she/*herself' and other combinations).

(120) She/*herself shuddered.

(121) Sally enjoyed herself at the party.

(122) Sally left a note for herself.

(123) Sally thought that Max disliked her/*herself.

(124) Sally talked to John about himself.

(125) Sally talked to John about herself.

(126) Sally believed that she/*herself would succeed.

(127) Sally herself/*she/*her couldn't read what she/*herself had written.

(128) That Sally might succeed amazed her/*herself.

(129) That we had seen Sally in the street amazed her/*herself.

(130) That Sally enjoyed herself/*her surprised her/*herself.

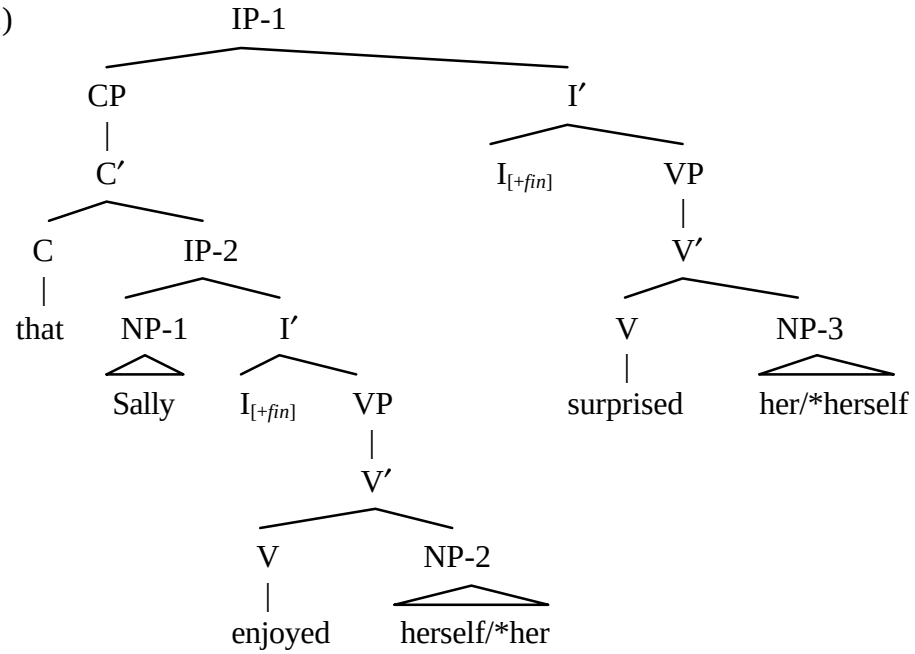
What basic generalizations can be gleaned from this data?

a. Reflexive pronouns must corefer with some NP before them in the sentence.

b. There is a locality condition for this coreference relationship. Examples (126)-(130) suggest that the antecedent, which is the NP that the reflexive corefers with, must be within the same minimal clause (=CP) as the reflexive.

The S-structure tree for (130) is given in (131) to make the same/different clause distinction clearer. The NP following *enjoyed* (marked as NP-2) can be the reflexive *herself* because it is coreferent with the NP-1 *Sally* in the same CP. NP-3 following *surprised* may also refer back to NP-1 *Sally*, but the reflexive *herself* is ungrammatical in that position because the locality condition is not met.

(131)



We need more definitions before we can formulate the binding conditions more precisely. Just like the government relation, the following command and binding relations are based on the phrase structure.

The first definition is that of C(onstituent)-COMMAND (Reinhart 1976), which formally expresses the notion of 'higher in the tree than'.

α C-COMMANDS β iff

a. α does not dominate β, and
b. the first branching node that dominates α also dominates β.

In this definition again (and in others to follow) α and β stand for particular categories. For example, in tree (131) we can let α be NP-1 *Sally* and see if it C-commands NP-2 *herself* (=β). Clause (a) of the definition requires that NP-1 does not dominate NP-2. This is true because NP-1 is not directly above NP-2 in the same branch of the tree. Clause (b) requires that the first branching node that dominates NP-1, which is IP-2, also dominates NP-2. IP-2 does dominate NP-2, so NP-1 C-commands NP-2. (Note that NP-1 also C-commands everything else under IP-2 on the right branch.)

Now let's check whether NP-1 *Sally* C-commands NP-3 *her* according to the definition. This time we set α = NP-1 and β = NP-3. Clause (a) is met because NP-1 does not dominate NP-3. Clause (b) fails, however, because the first branching node that dominates NP-1 is still IP-2 and NP-3 is not under (dominated by) IP-2.

A simple way to think of C-command is to start with your α category, go up the tree one level to where it branches, then α C-commands everything down in the other branch. So, if the category you are concerned about (β) is in that other branch, α C-commands β.

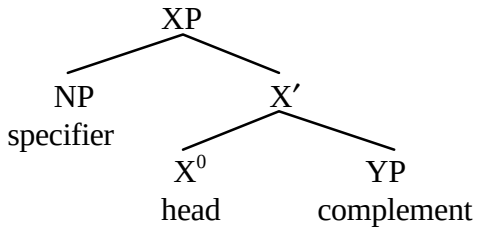
As you might have guessed, C-command is one of the conditions on binding. Before we go on with the specifics of binding, though, we are ready to understand a similar command relation, called M(aximal)-COMMAND, that is used for government.[28]

α M-COMMANDS β iff

a. α does not dominate β, and
b. the first maximal projection that dominates α also dominates β.

We can see how C-command and M-command differ using the simple X-bar tree in (132). If we choose the NP specifier to be α, we know from above that it C-commands everything in the right branch below the maximal projection XP. M-command will give exactly the same results for this choice of α; in simple terms, M-command says to go up the tree from α until you reach a maximal projection, then α M-commands everything in the other branches below that maximal projection. The reason C-command and M-command give the same results in this case is that the first branching node above the specifier is also the first maximal projection above it.

(132)



The difference between these two types of command relations shows up when α is a head X^0. Now the first branching node above X^0 is X′, so the head only C-commands its complements, as in the subcategorization relationship. M-command, however, reaches up to the maximal projection and then goes down the other branches, so both the complements and the specifier are included.

This second relation is exactly what is needed for government. In fact, M-command provides the same upper limit as clause (b) of the definition of government given in section 9, so the revised definition is:

α GOVERNS β iff

a. α is a head [±N,±V] or $I_{[+fin]}$ or $C_{[for]}$, and
b. α M-commands β, and
c. every XP (other than IP) that dominates β also dominates α.

[28]Review section 9 if necessary for explanation of the notion of government and see the revised definition below. Also, there is actually a whole family of command relations. See Barker and Pullum (1990) for formal discussion.

Returning now to the binding conditions, the official definition of binding simply adds coindexing to the C-command relation. Coindexing is marked in the tree via subscripts and indicates that the two NPs refer to the same entity.

α BINDS β iff

a. α C-commands β, and
b. α and β are coindexed.

We can further distinguish between A-binding and Ā-binding just as we did with movement. A-binding is binding by an antecedent in argument (=subject or complement) position, and Ā-binding is when the antecedent is in a non-argument position.

α A-BINDS β iff

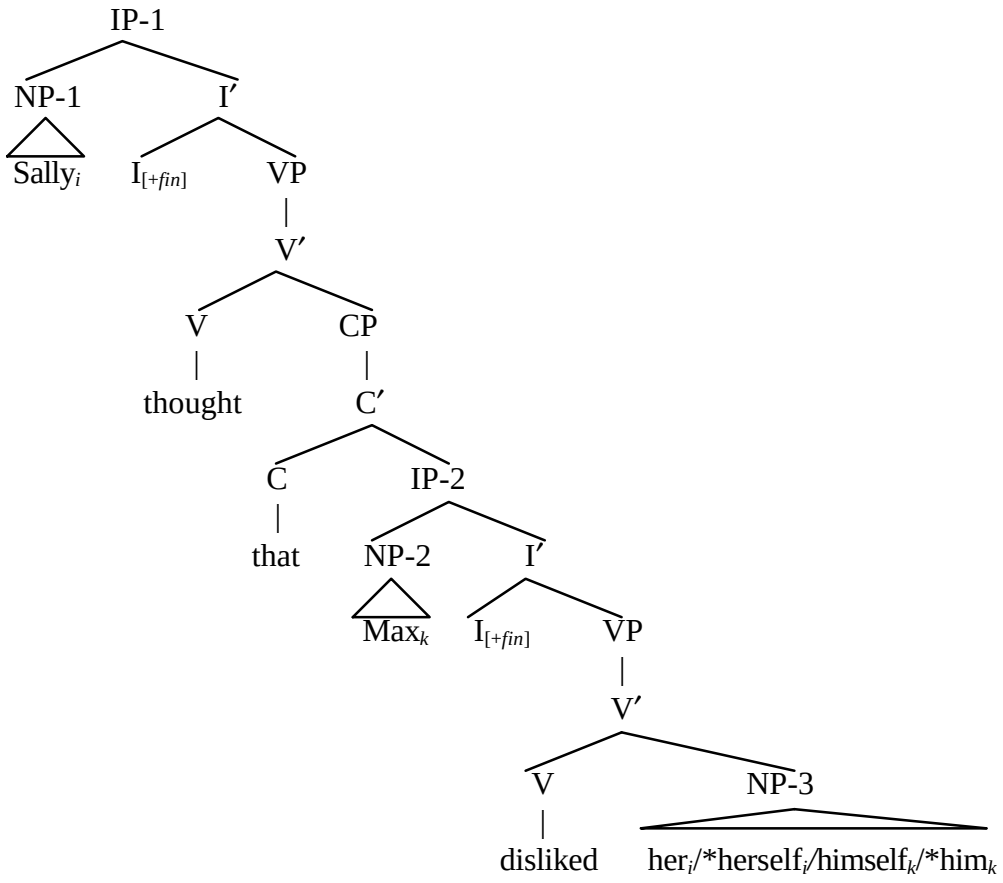
a. α is in an argument position, and
b. α binds β.

A simpler way to think of A-binding that works most of the time is:

An NP is A-BOUND if it is coindexed with a higher NP in either a subject or object position.

We can illustrate A-binding using the tree in (133). NP-1 *Sally* and NP-2 *Max* are both in argument position and they both C-command the object of *disliked*, NP-3, and are coindexed with it. Therefore, NP-3 is A-bound.

(133)



But A-binding alone does not explain all the options for filling NP-3. Why must we use *her* and not *herself* to refer back to *Sally*, while just the opposite is true with respect to *Max*? We still need conditions to rule out the ungrammatical cases.

The Principles of Binding Theory determine whether a pronoun or an reflexive anaphor is correct in a particular position.

Principles of Binding Theory

A. Anaphors (e.g. reflexives and reciprocals) must be A-bound in their governing category.

B. Pronouns must not be A-bound in their governing category.

C. Full NPs (also called denoting expressions or R(eferential)-expressions) must not be A-bound.

Principle A says that an anaphor can only be used when the position that A-binds it is local enough: In tree (133), NP-2 *Max* is close enough to NP-3 so that the anaphor *himself* is correct; NP-1 *Sally* is too far away to use *herself* in NP-3.

Principle B says that a pronoun can only be used if it is not A-bound at all, or if its A-binder is far enough away. This is why *him* cannot be used in NP-3 to refer back to NP-2 *Max* but *her* may refer back to NP-1 *Sally* in (133).

Finally, Principle C says that nonpronominals may not be A-bound at all. This is to rule out repetition of full nominals.

(134) *John$_i$ hit John$_i$.

(135) *Sally$_i$ thought that Max$_k$ disliked Sally$_i$/Max$_k$.

Defining this local domain that requires an anaphor and cannot have a coreferent pronoun has been problematic. We saw above that a basic generalization is that the antecedent and the anaphor must be in the same clause. This works for most cases, but there are a few exceptions (e.g., *Sally is eager for herself to succeed*) where the anaphor and antecedent are not in the same clause. The local domain is therefore defined in terms of government and subjects,[29] since most anaphors have antecedents that are subjects.

The GOVERNING CATEGORY is a local domain which denotes the minimal category which contains both a subject and the governor of the element in question. This minimal category is usually a finite IP or an NP containing a possessor (which qualifies as the subject).

In tree (133) above, the governing category for NP-3 is IP-2, since it contains both a subject (=NP-2 *Max*) and the governor for NP-3 (=V *disliked*).

[29] Actually, the formal definition requires that there be a SUBJECT, which includes an NP subject, and NP possessor for binding within an NP, or agreement features in I$_{[+fin]}$.

Working with the binding principles can get confusing since the definitions are nested one within another, but, in about 99 percent of the cases, these simplified principles will work:

Simplified Principles of Binding Theory

A. Reflexives and traces of A-movement must be coindexed with the closest subject above them in the tree.

B. Pronouns cannot be coindexed with the closest subject above them in the tree.

C. Full NPs and traces of Ā-movement must not be coindexed with any subject or object above them in the tree.

10.2 Extending Binding Theory Beyond Reflexives

As seen in the last section, the Principles of Binding Theory recognize that the class of nominal phrases is partitioned into three different types: anaphors, pronouns, and full NPs. These partitions are characterized by the two features [±anaphoric] and [±nominal], where reflexives and reciprocals are [+ana,-pro], pronouns are [-ana,+pro], and full nominal phrases are neither pronominal nor anaphoric so they are [-ana,-pro].

The chart in (136) shows these featural distinctions and which Principle of Binding Theory applies to each. Empty categories are also included, since both Extended Standard Theory (which came out of Transformational Grammar) and GB claim that the chain coindexing established by movement is equivalent to the coindexing in binding relationships between overt nominals. Four types of empty categories are recognized, corresponding to the four possible feature specifications, as explained further below.

(136) Featural Distinctions for Overt NPs and Empty Categories

Features	Binding Principle	Overt Nominals	Empty Categories
[-*pro*/+*ana*]	A	*e.g. himself*	trace of A-movement
[+*pro*/-*ana*]	B	*e.g. him*	*pro*
[-*pro*/-*ana*]	C	*e.g. John*	trace of Ā-movement
[+*pro*/+*ana*]	A and B		*PRO*

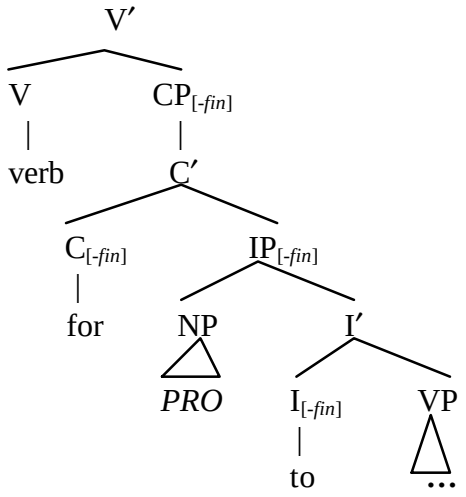
We talked about the trace of A-movement in passive, unaccusative, and raising constructions in section 8. By saying that the trace of A-movement is anaphoric and thus subject to Principle A, we restrict the movement to only local domains. We also saw the trace of Ā-movement in the formation of content questions in section 7.2. This trace is subject to Principle C, which requires that it cannot be bound by an element in an argument position. But Ā-movement is movement to a nonargument position by definition, so this requirement is clearly met.

The two new empty categories are not traces, but empty elements in the lexicon. The first of these, *pro*, is the empty pronoun allowed in *pro*-drop languages, usually because of agreement morphology on the verb to specify the person and number of the subject, e.g. *pro No hablo español.* (See (119).) This empty pronoun shows up in all the same places that an overt pronoun does and is therefore subject to Principle B.

Finally, *PRO* is the empty subject in non-finite clauses, sometimes called controlled *PRO*. Since it is both anaphoric and pronominal, *PRO* is subject to both Principles A and B of Binding Theory. From this is derived the fact that *PRO* must be ungoverned: the only way it could be A-bound inside its governing category and not be A-bound in its governing category is if it doesn't have a governing category because it doesn't have a governor. Further, if *PRO* doesn't have a governor, it cannot receive Case, since Case is assigned by the governor. Overt NPs of all types are required to have Case at S-structure by the Case Filter (see section 9). This explains why there cannot be an overt counterpart to *PRO* with the [+*pro*/+*ana*] feature specifications.

The requirement that *PRO* must not be governed at S-structure means that it can **only** be in the configuration shown in (137). This position is ungoverned because the V cannot govern past the CP maximal projection, and neither the null C nor the $I_{[-fin]}$ *to* may govern. Note also that since this position is ungoverned and therefore cannot receive Case either, only *PRO* can fill it.

(137)



Other NPs and traces filling the specifier of $IP_{[-fin]}$ cannot have a CP headed by a null $C_{[-fin]}$ above them as in (137); either the complementizer *for* must be present, or the main verb simply subcategorizes directly for an $IP_{[-fin]}$.

Both *pro* and *PRO* have intended reference, even though they are null. Since they are referential, they bear a semantic role, unlike the dummy *it* seen in constructions like *It is likely that Sue will come*. (This construction was analyzed in section 8.3.) We'll see examples of how and where *PRO* is used in the next section.

10.3 Equi Constructions

How can we analyze (138)-(140)?

(138) I would like to leave by noon.

(139) I hate to swim in that pond.

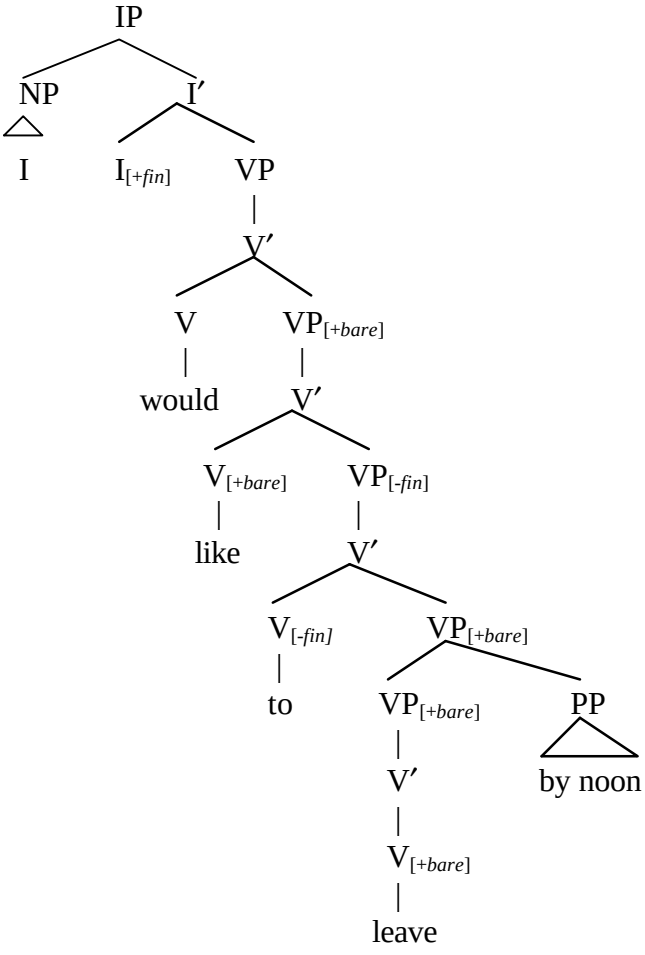
(140) I would like to have finished the homework by midnight.

Non-derivational theories such as Head-Driven Phrase Structure Grammar (HPSG) (Pollard and Sag 1994) assume that, in examples like (138), *like* simply subcategorizes for a $VP_{[-fin]}$, which in English must be marked by *to*. Consider what happens if we try such an analysis within the assumptions of GB. Possible subcategorization frames for the two main verbs in (138) are shown, followed by the tree structure in (141).[30]

like V [__ $VP_{[-fin/\ to]}$] leave V [__]

like′ <EXP, EVENT> leave′ <AGT>

(141)



[30] EXP stands for the Experiencer semantic role.

There are two problems for this analysis within the GB framework. First, we have said earlier that *to* is $I_{[-fin]}$. Allowing *to* to be either $I_{[-fin]}$ or $V_{[-fin]}$ is possible, but less constrained. The second and greater problem is that there is no place for the semantic role for the external argument of *leave* to be assigned.

Considering more data will aid us in finding a better proposal:

(142) I would hate to be chosen by the committee.

(143) I would like to be appreciated by someone.

We need to take into account the meaning of these sentences, our assumptions about the linking of semantic roles to syntactic positions (see section 8.1), and the fact that (142)-(143) are synonymous with (144)-(145).

(144) I would hate for the committee to choose me.

(145) I would like for someone to appreciate me.

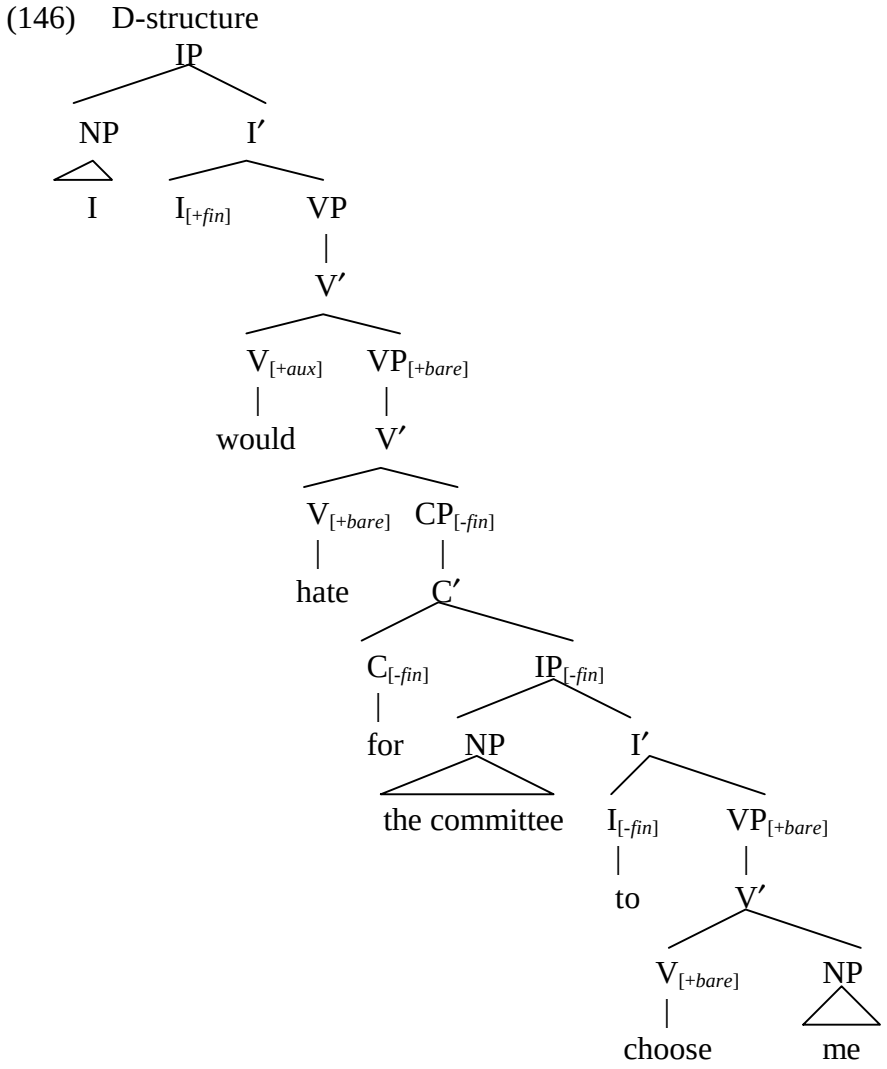
Based upon examples (144)-(145), we can propose that the subcategorization frame for *like* is instead:

like V [__ $CP_{[-fin]}$]
|
like′ <EXP, PROP>

This allows the presence of a full embedded clause so that passive can take place within the lower clause, as in (142)-(143), and subjects may be expressed, as in (144)-(145).

The D-structure for (144) is straightforward, as shown in (146).

(146) D-structure



But this subcategorization is still not the full story for (142)-(143), nor does it answer the question of how we generate (138)? Compare:

(147) *I would like for me/myself to leave by noon.

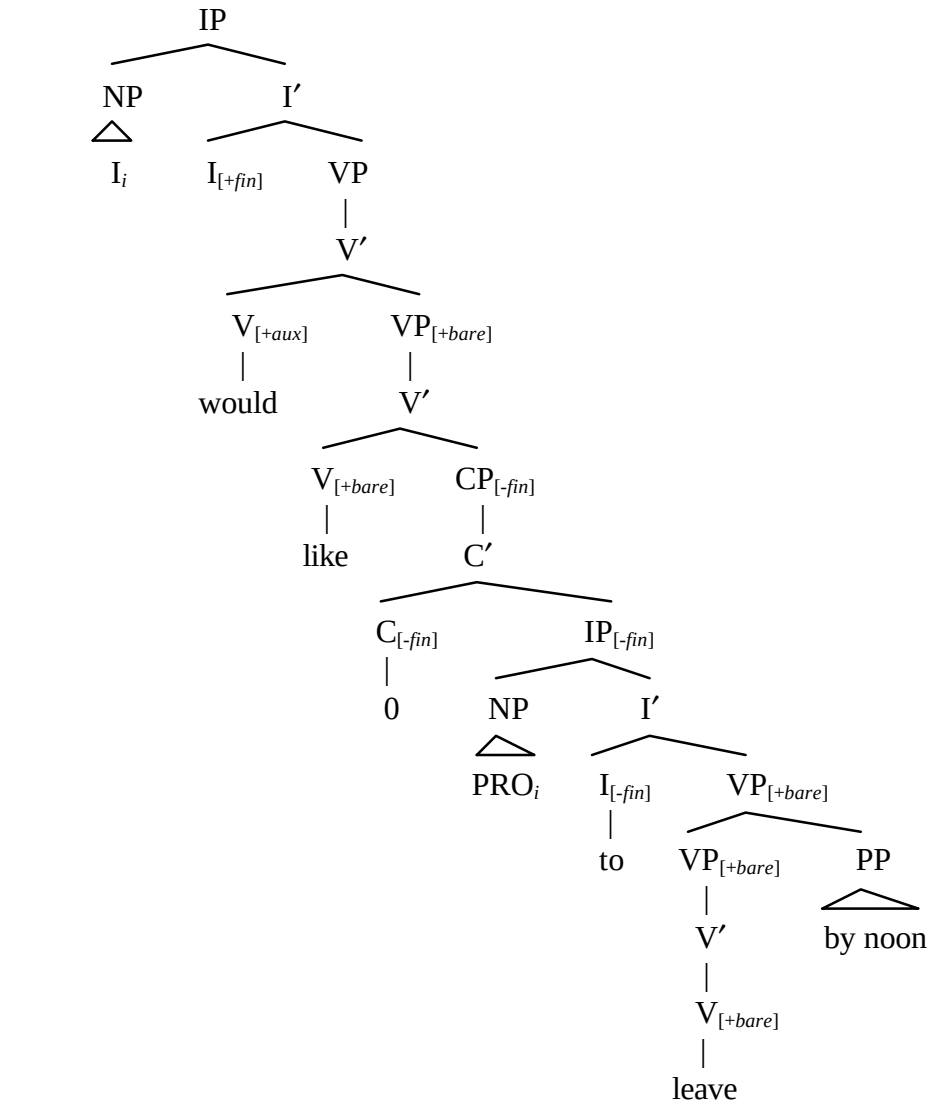
The standard Transformational Grammar account of (138) is called Equi Deletion, where (in GB terms) the D-structure for (138) has a full $CP_{[-fin]}$ as the complement to *like*, as in (147), and then the complementizer *for* and the subject NP delete when the NP is coindexed with the subject of the main clause.

GB chooses another way, because it does not like deletions. This option is to assume the positions were never filled since we have the possibility of using an empty category for the coindexed subject NP: *PRO*. The $C_{[-fin]}$ is always null when *PRO* is the subject, but it is

always *for* when there is an overt subject (e.g., **I would hate the committee to choose me*).[31] The null $C_{[-fin]}$ is not a governor, so the specifier of $IP_{[-fin]}$ would not be governed, nor would it receive Case. This exactly meets the requirements for *PRO* (as seen in section 10.2) but is disallowed for overt NPs.

The D-structure for (138) is shown in (148). The S-structure would be identical, except that the auxiliary *would* in the main clause would have moved to the $I_{[+fin]}$ position (as discussed in section 7).

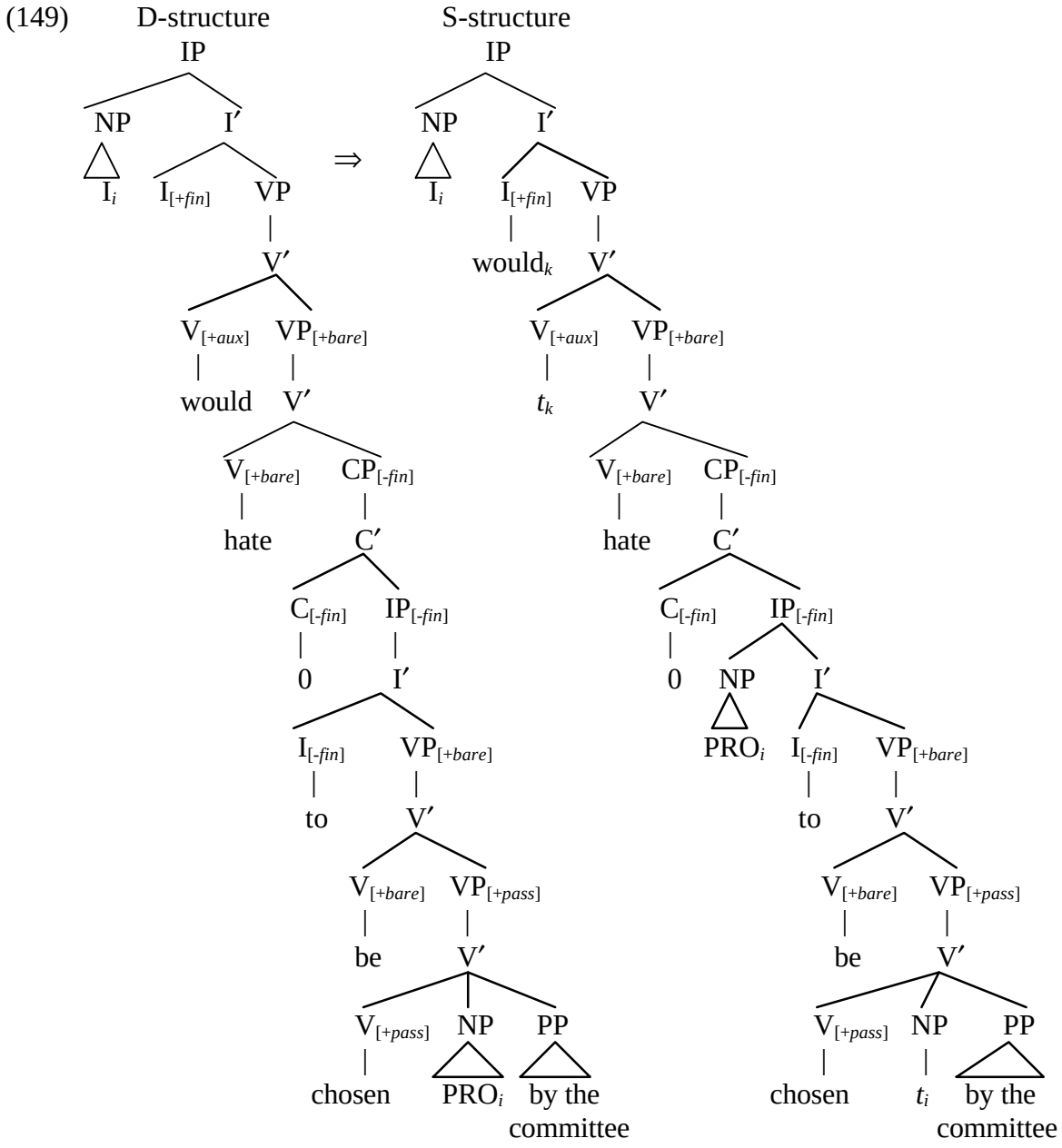
(148) D-structure



[31] Some speakers prefer *I would like someone to appreciate me* over the version with the complementizer *for* present, as in (145). In this case, *like* would have to subcategorize for an $IP_{[-fin]}$ as in the tree (156) for *expect*, as well as the $CP_{[-fin/0]}$ shown in (148).

To review how Passive movement interacts with these equi constructions, the derivation for (142) is shown in (149).

(149)



Compare the D-structure in (149) with that given for the synonymous sentence (144) in (146). *PRO* is filling the same semantic role in (142) as the overt pronoun *me* is in (144), so they both begin as the object of *choose*. But, even though the passive verb *chosen* cannot assign Case to *PRO*, it can still govern it, forcing *PRO* to move to meet the Binding Principles by S-structure.

GB claims that the various types of predicates which take embedded clause complements can be accounted for with the correct subcategorization frame. In the case of nonfinite clause complements, either *PRO* or A-movement (raising) will be involved when there is no overt NP in the embedded subject position in the surface string. The key distinction between the A-movement constructions (known earlier as Subject-to-Subject Raising and analyzed in section 8.3) and the constructions involving *PRO* (also known as Subject-Subject Equi) is whether or not the main predicate assigns a semantic role to its subject position.[32] Idiom chunks and the possibility of the dummies *it* and *there* provide 'tests' to help determine this. Consider:

(150) a. John is likely to win the race.
b. The roof is likely to cave in.
c. It is likely that John will win the race.
d. There is likely to be no solution to her dilemma.

(151) a. John tried to win the race.
b. ?The roof tried to cave in.
c. *It tried that John will win the race.
d. *There tried to be no solution to her dilemma.

The predicate *is likely* is a raising predicate that does not assign a semantic role to its subject position; either of the dummy NPs can fill the position (150c-d), or an idiom chunk can raise to it and still maintain the idiomatic reading (150b), or a regular NP can raise to the subject position (150a). In contrast, *try* does assign a semantic role to its subject position and it also requires that the subject of its embedded nonfinite clause complement be coreferent with its own subject. Thus, *try* subcategorizes only for a $CP_{[-fin]}$ that is headed by the null $C_{[-fin]}$ (as in tree (148)), so the coindexed *PRO* will always be the subject of the embedded clause.[33]

Two other main types of predicates should be mentioned. These were known in Transformational Grammar as Object-Subject Equi and Subject-to-Object Raising. Here it is important to distinguish whether or not the main predicate assigns a semantic role to the NP following it. The dummy *there* and idiom chunk tests can be applied again, as well as checking whether passive in the embedded clause yields a synonymous result.

(152) a. Sue persuaded Bill to fix the sink.

---

[32]These distinctions seem to apply cross-linguistically in that predicates meaning *seem* or *likely* will not assign a semantic role to their subject position in any language. Whether they raise the lower clause subject to the main clause depends on the syntax of the particular language, however. Similarly, predicates with the same meaning as *try* will assign a semantic role to their subject position and require that the subject of the embedded clause be coreferent with the main clause subject. Depending upon the binding conditions of the language, however, the coreferent subject may or may not be *PRO*. For example, the VSO language, Quiegolani Zapotec, simply allows the main clause subject to be missing in 'raising' constructions and overtly repeats the coreferent subject in 'equi' constructions (Black 1994:Ch. 4-5).

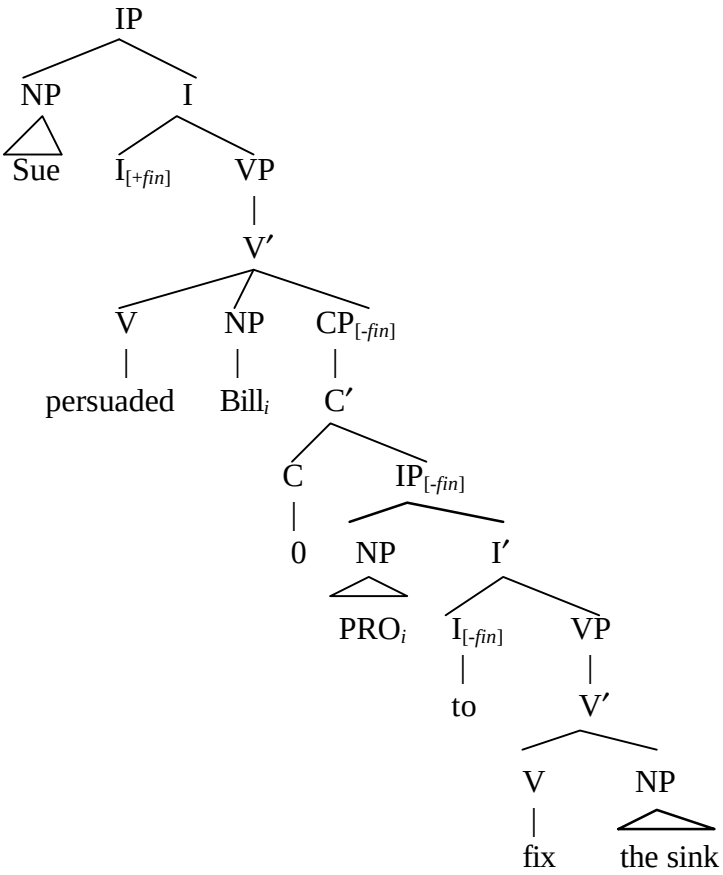
[33]Note that in both raising and equi constructions, apparent long-distance binding of reflexives is allowed:
(i) Bill seems to like himself.
(ii) Bill tries to humble himself.
This is because either the coindexed trace or the coindexed *PRO* acts as the antecedent for the reflexive within the lower IP, which is the governing category.

b. ?Sue persuaded the sink to be fixed by Bill.
c. *Sue persuaded there to be no solution to her dilemma.
d. ?Sue persuaded the roof to cave in.

(153) a. Sue expected Bill to fix the sink.
b. Sue expected the sink to be fixed by Bill.
c. Sue expected there to be no solution to her dilemma.
d. Sue expected the roof to cave in.

It should be clear from (152) that *persuade* does assign a semantic role to the NP following it, so it subcategorizes for both an NP and a $CP_{[-fin]}$ headed by the null $C_{[-fin]}$, which will have a *PRO* subject that is coindexed with the object of the main clause. The tree for (152a) is given in (154).

(154)

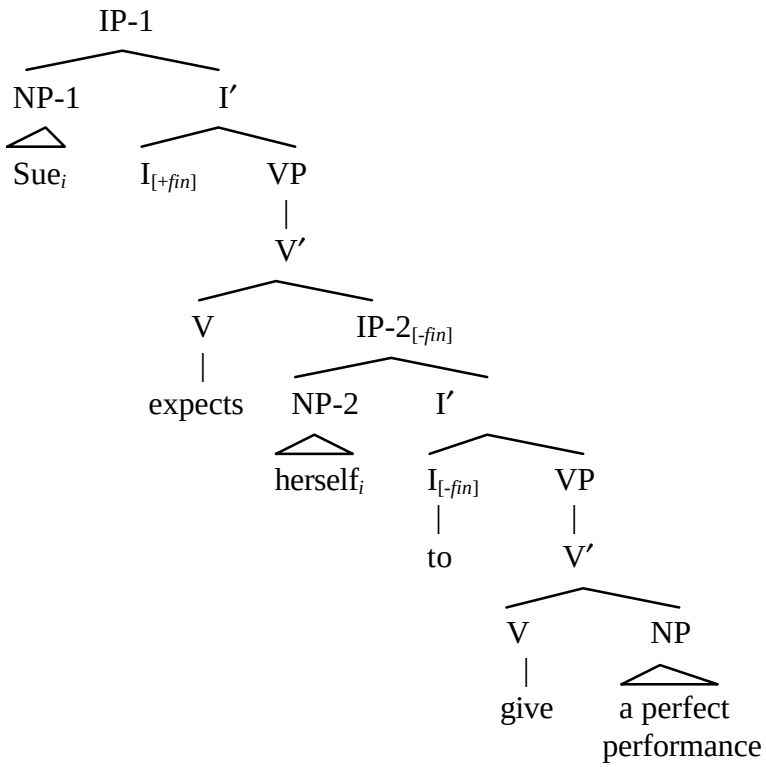


In contrast, the examples in (153) show that *expect* does not assign a semantic role to the NP following it, which would lead us to believe that *expect* simply subcategorizes for an $IP_{[-fin]}$ complement. Data such as (155) led to the Transformational Grammar proposal that the subject of the lower clause subsequently moves to the object position in the main clause.

(155) Sue expects herself to give a perfect performance.

Movement to a complement position is not allowed in GB, since the complement position can only exist if it is subcategorized for, and therefore filled, at D-structure. Instead, Principle A of the Binding Theory and the Case Filter can be met without movement, as shown in the D-structure tree for (155) given in (156).

(156)



In this tree structure, the NP-2 *herself* is governed by the verb *expects* (since IP-2 is excluded from blocking government by clause (c) of the definition). Further, *expects* is not a passive form and it does assign a semantic role to its external argument (subject), so it can assign accusative case to NP-2 (e.g., *Sue expects me to give a perfect performance*), allowing it to pass the Case Filter. Finally, NP-2 can act as if it is part of the main IP-1 for the Principles of Binding Theory: since its governor is above IP-2, the governing category in which the coindexed antecedent for NP-2 must be found is IP-1, legalizing the reflexive in NP-2.

This concludes our introduction to most of GB theory as developed through 1986.[34] The next section deals with more recent developments in the theory, many of which were necessary due to consideration of other languages, especially non-Indo-European languages.

[34]In *Barriers* (Chomsky 1986), Chomsky reformulates the definition of government in terms of barriers. Discussion of barriers, subjacency, bounding theory, and the Empty Category Principle has been omitted from this introductory series. The reader is referred to the original sources or to textbooks (such as Haegeman 1994) for more information.

11. More recent additions to the theory

After the theory seemed fairly adequate for English, attention shifted to how it would account for other languages. Many other linguists joined in the task of analyzing phenomena not seen in English to determine the coverage of the theory and to propose needed modifications or extensions.

This section covers some of the additions to the basic GB theory that were proposed in the late 1980s and early 1990s. First, we return to the issue of how VSO or OSV word order can be obtained from a configurational phrase structure. Section 11.2 then introduces the additional functional projections (besides IP and CP) which have been proposed. Finally, section 11.3 discusses several ways of dealing with the interaction between morphology and syntax.

11.1 Phrase structure for languages with VSO/OSV word order

In section 6 we saw that the phrase structure of all the basic word orders except VSO or OSV can be generated by simply changing the order of the elements on the right side of the two basic X-bar phrase structure rules:

XP $\rightarrow$ Specifier X'
X' $\rightarrow$ X^0 Complements (=YP*)

We are now able to understand the proposals for VSO or OSV word order which allow these languages to have an underlying configurational structure (rather than a flat structure) like the others. The example data is repeated here for reference.

One of the many languages exhibiting VSO word order, Quiegolani Zapotec, an Otomanguean language spoken in Mexico (Regnier 1989, Black 1994), is exemplified in (157)-(159).[35]

(157) *W-eey Benit mël.*
C-take Benito fish
'Benito took a fish.'

(158) *W-nii men disa lo noo.*
c-speak 3RD language face 1EX
'She spoke Zapotec to me.'

(159) *xnaa noo*
mother 1EX
'my mother'

[35] Abbreviations: C=completive aspect; 3RD=general third person pronoun; 1EX=first person exclusive pronoun.

Urubú, of the Tupí family in Brazil (Derbyshire and Pullum 1981 from Kakumasu 1976), provides data from one of the very rare OSV languages, shown in (160)-(161).

(160) *Pako xuã u'u.*
banana John he-ate
'John ate bananas.'

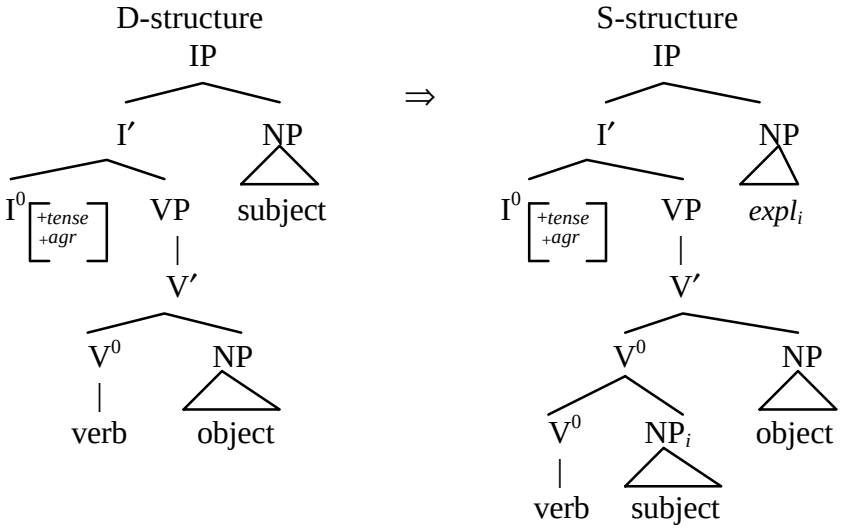
(161) *Koĩ sepetu-pe jurukã Nexĩ mái muji-ta.*
tomorrow spit-on ribs Nexĩ mother she-will-roast
'Nexĩ's mother will roast the ribs on the spit tomorrow.'

Two main proposals have been made to account for VSO surface order[36] from an underlying configurational structure where the verb and its complements form a constituent distinct from the subject, which is in a specifier position. Each proposal works well for particular VSO languages but makes incorrect predictions for others.[37]

11.1.1 Subject Adjunction

The Subject Adjunction proposal was developed for Chamorro in Chung (1990) and was originally proposed by Choe (1986) for Berber. An underlying SOV structure is assumed. The surface order is obtained by movement of the subject down to adjoin to the right of the verb, leaving behind a coindexed null expletive (i.e. a null form of the dummy *it)*.[38] The D- and S-structures under this proposal are shown in (162).[39]

(162)



[36]OSV order can be obtained by taking the mirror image of either proposal.

[37] For full argumentation, refer to the works cited with each proposal and/or Black (1994:Sections 6.2, 9.3, 11.1).

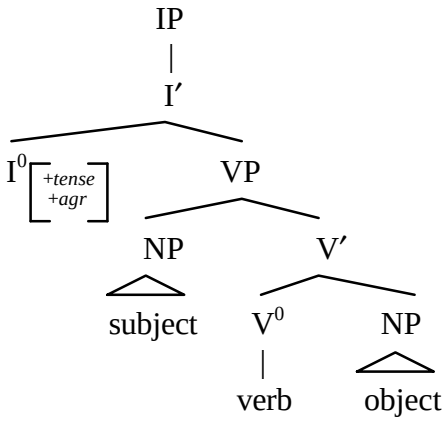
[38] The use of this questionable null element rather than a trace is necessary because downward movement is ruled out by the Empty Category Principle (ECP), which basically requires that, in addition to being governed by a proper head governor (including lexical heads and those functional heads allowed by the specific language), a trace must be governed by the moved element that it is coindexed with. Since clause (b) of the definition of government (in section 10.1) requires that the governor M-command the category in question, movement downward into another maximal projection is ruled out.

Chung argues convincingly that the Subject Adjunction proposal is correct for Chamorro, based upon the unique coordination facts and surface word orders allowed. The Chamorro data cannot be accounted for by the more widely assumed Verb Movement proposal.

11.1.2 Verb Movement

This proposal assumes that the surface VSO order is obtained by moving the verb upward from an underlying SVO structure. However, in the current IP structure for sentences where the subject is in the specifier of IP, there is no place for the verb to move. This problem is eliminated if we assume the Internal Subject Hypothesis (Kitagawa 1986, Kuroda 1988, Diesing 1990, Koopman and Sportiche 1991, etc.), which proposes that the subject begins in the specifier of VP in all languages. The D-structure for both SVO and VSO languages under this hypothesis is shown in (163).

(163)

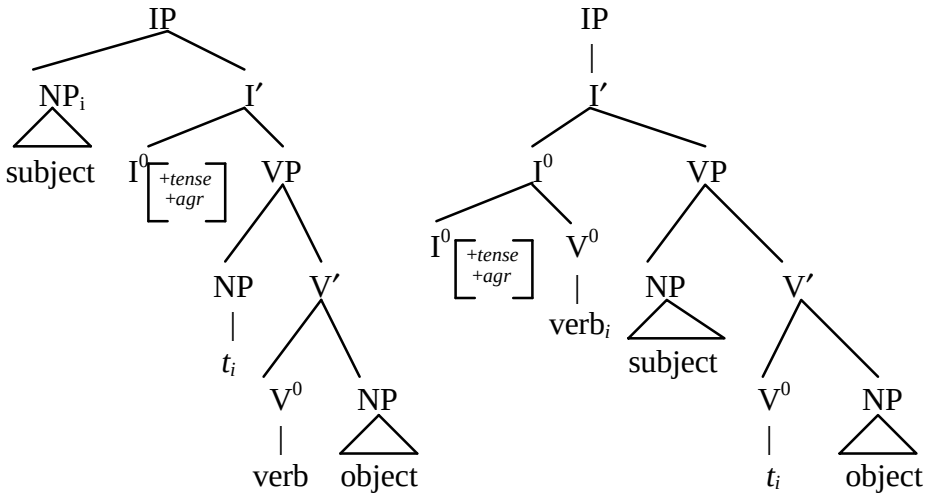


From this D-structure, the subject is assumed to move to the specifier of IP in order to receive Case (as discussed in section 9) in an SVO language, whereas VSO word order is obtained by moving the verb up to the I^0 head position (McCloskey 1991, Koopman and Sportiche 1991, etc.)[40] as shown in the trees in (164).

[39] The feature [+*agr*] used in various trees throughout section 11 includes such features as [*person*], [*number*], and [*gender*].

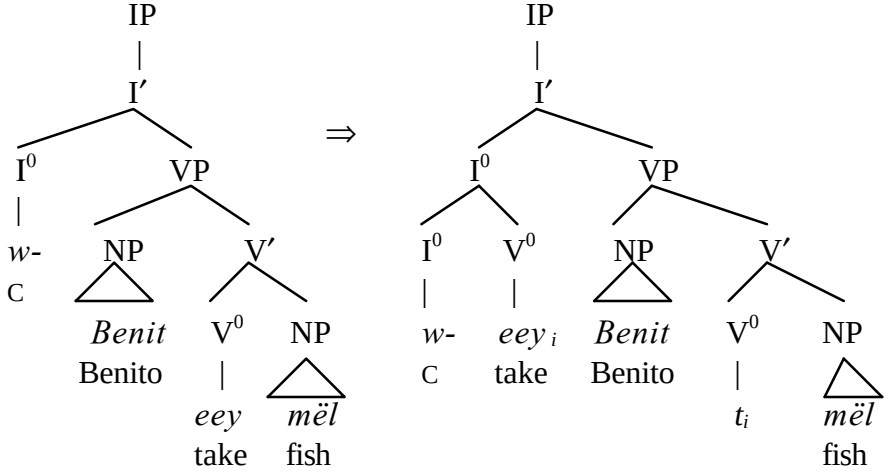
[40] The subject must be assigned Case by either the trace of the moved verb or by the Verb-Infl complex in VSO languages.

(164) SVO S-structure versus VSO S-structure



Black (1994) argues for the Verb Movement proposal as the correct one for obtaining VSO order in Quiegolani Zapotec, based upon evidence for movement of the verb in negation constructions, the distribution of coordination in the language, and the structure of the complements of motion auxiliaries. (165) gives the trees for sentence (157), where I^0 is filled by the aspect marker since there is no tense or agreement marking in the language. We will see in section 11.3.1 that the dependent status of the aspect markers can be seen as part of the motivation for the verb movement.

(165) D-structure ⇒ S-structure



I won't attempt to draw trees for the Urubú data, since it would be necessary to know more about the language to determine whether Subject Adjunction (with an underlying SOV structure) or Verb Movement (with an underlying OVS structure) is best for it.

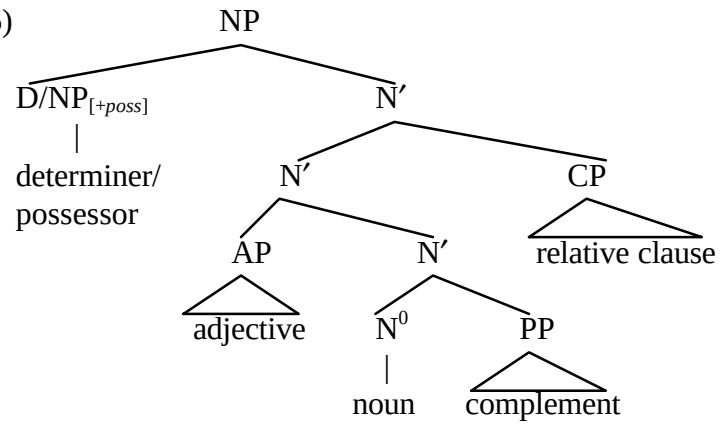
11.2 More Functional Projections

Back in section 5 the functional projections IP and CP were introduced so that sentences and clauses would fit into X-bar theory. A functional projection is a maximal projection headed by a functional (rather than a lexical) head: in the case of IP, the head is either nonfinite *to* or the inflectional features, whereas the complementizer is the head of CP. More functional heads, and therefore projections, were proposed later. We look first at Determiner Phrases (DPs) headed by the determiner, which filled out the structure of nominal phrases. Then section 11.2.2 shows how IP may be broken down further into more functional projections.

11.2.1 The DP Hypothesis

In section 4 we applied X-bar structure to NPs, where the noun is the head, the determiner or possessor is the specifier, complements are in the expected position, and adjectives and relative clauses are adjoined to N′, as shown in (166).

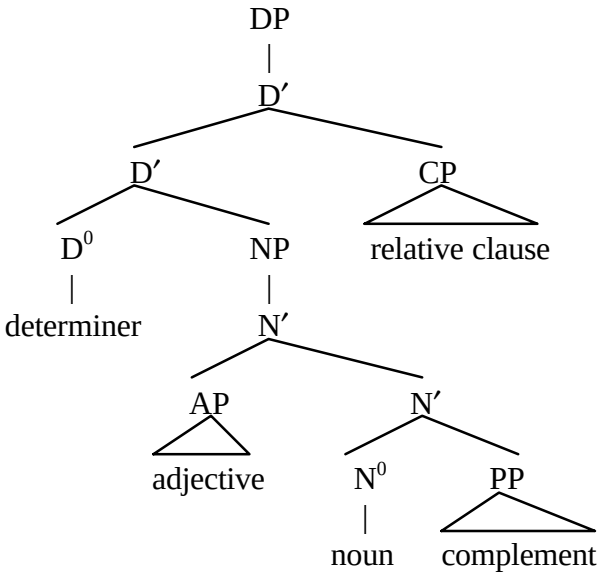
(166)



Abney (1987) and Stowell (1989) propose a different structure based primarily upon the similarities in distribution and meaning between sentences and noun phrases (e.g. *Nero's destruction of the city* and *Nero destroyed the city*) and the fact that determiners and possessors co-occur in many other languages. Their proposal, known as the DP Hypothesis, says that D is the head of a nominal phrase and it takes an NP as its complement. This is seen as parallel to the IP structure of sentences, since the functional head of both DP and IP takes a lexical phrase as its complement.

An unpossessed English nominal phrase would have the DP structure shown in (167), where the determiner fills the head D position, the noun is still the head of NP with its complement as expected, and adjectives and relative clauses are adjoined to one of the intermediate level projections (or to NP). Note that neither DP nor NP has a specifier in this case.[41]

(167)

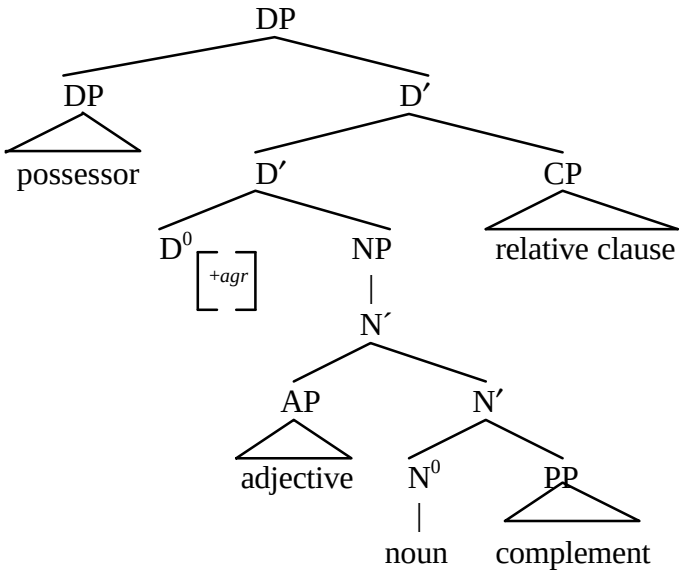


Possessed nominal phrases present more of a problem. The possessor is itself a nominal phrase, so it cannot fill a head position. Therefore, the possessor is seen as filling either the specifier of DP or the specifier of NP, depending upon whether or not the Internal Subject Hypothesis is used for sentences (i.e. the position of the subject of the sentence and the possessor in the nominal phrase should be parallel and Case should be assigned in a parallel way also, if possible). The big question is what fills the head of DP position, since English does not allow an overt determiner in a possessed nominal phrase. Again relying on the similarities between sentences and nominal phrases, as well as the morphological case marking on the possessor in many Ergative-Absolutive languages, it was proposed that agreement features fill D^0 when an overt determiner is not present.[42] The DP structure for English possessed nominal phrases (not assuming the Internal Subject Hypothesis) is shown in (168).

[41]The specifier of DP could be filled by certain quantifiers, as in *all the little children of Rwanda who were orphaned*, though in some analyses such quantifiers would have to be adjoined.

[42] Abney (1987) argues that this is similar to I^0 being filled with agreement features only when the nonfinite *to* is not present.

(168)



For English, this change from NP to DP may seem to be mostly theoretical. But in other languages there is more need of the DP Hypothesis to account for all the positions allowed. Since field linguists need to analyze the nominal structure of the language they are studying, the application of the DP Hypothesis to a non-Indo-European language should be the most interesting part.

As an example of how the DP Hypothesis can be used, let's look at data from Quiegolani Zapotec. This language does not have any determiners; instead quantifiers are used. The noun being quantified may also be modified by a demonstrative. In this case the quantifier is first, followed by the noun or pronoun, with the demonstrative last.[43]

(169) *y-ra maa gin*
P-all 3A this
'all those animals'

Possessors may be embedded, as shown by the bracketing in (170a). The possessor phrase follows the noun, though adjectives may intervene between the noun and the possessor, as shown in (170b). The prefix *x-* 'POS' is required on an alienably possessed noun when it has a possessor.

(170) a. *x-yuu* [*x-mig* [*men*]]
POS-house POS-friend 3RD
'their friend's house'

[43]Abbreviations: C=completive aspect; H=habitual aspect; P=potential aspect; 1EX=first person exclusive pronoun; 3A=third person animal pronoun; 3RD=third person general pronoun; POS=possessive marker used on alienably possessed nouns.

b. *x-pëëk* *ngas* *noo*
POS-dog black 1EX
'my black dog'

A quantifier may co-occur with a possessor.

(171) *y-ra* *x-kayet* *Biki*
P-all POS-cracker Virginia
'all Virginia's crackers'

Finally, a nominal phrase may also be modified by a relative clause (shown in brackets).

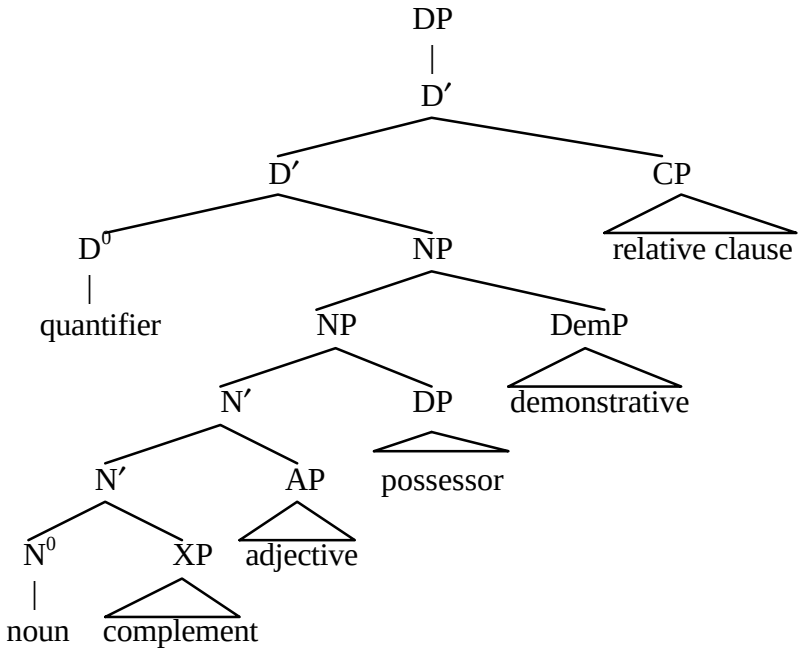
(172) a. *ndal* *ngyed* *gol* [*w-u* *mëëz*]
lots chicken old C-eat fox
'lots of old chickens that the fox ate'

b. *te* *x-mig* *noo* [*ne* *r-laan* *te* *men*
one POS-friend 1EX that H-want one 3RD
'a friend of mine that wants a person
[*ne* *r-nii* *disa*]]
that H-speak language
that speaks the language'

To account for all these elements and their required orders, I first proposed that the quantifier acts as the head of the DP. Recall that Quiegolani Zapotec is a VSO language, so the fact that both the quantifier and the noun are initial in their phrases is expected. Note, however, that the possessor not only follows the noun but also any modifying adjectives (170b). This means that the nominal structure cannot be fully parallel to the Verb Movement proposal used for the sentence, with the possessor in the specifier-initial position in NP and N moving up to D. Instead, the possessor is analyzed as the specifier of NP in a head-initial but specifier-final configuration, with no movement. The *x-* prefix on an alienably possessed noun when a possessor is present is seen as a type of agreement between the specifier and the head within NP.[44] The full DP structure for nominal phrases in Quiegolani Zapotec, with all the adjoined elements included, is given in (173).

[44]Specifier-Head agreement is the preeminent feature-sharing relationship within GB, used for things like subject-verb agreement via the features in I^0 being shared with the subject in the specifier of IP and also for agreement in the [+*wh*] or [+*q*] feature between the fronted *wh*-phrase and the $C^0_{[+q]}$ position in questions.

(173)



11.2.2 Splitting Infl into Separate Functional Heads

Pollock (1989) argues that IP must be split into several separate functional projections to account for the differences between French and English, illustrated in the following data (all taken from Pollock 1989).

Look first at the contrasts between English and French with respect to the allowed positions of negation and VP adverbials in finite clauses:

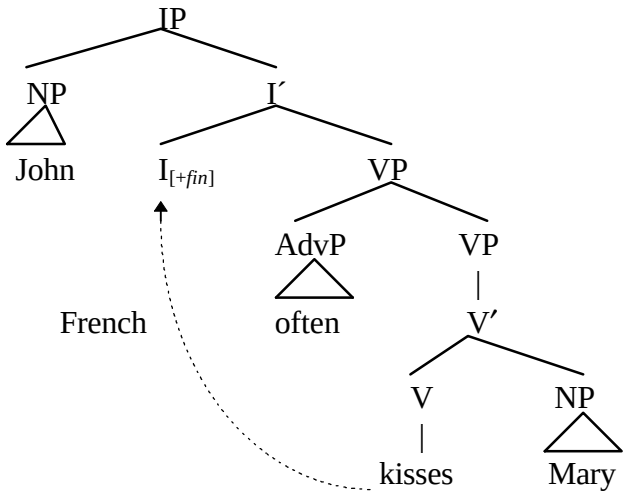
(174) a. *John likes not Mary.
b. *Jean (n') aime pas Marie*.

(175) a. *John kisses often Mary.
b. *Jean embrasse souvent Marie*.
c. John often kisses Mary.
d. **Jean souvent embrasse Marie*.

If we assume that negation is part of Infl and the position of VP adverbials like *often, seldom, hardly* is left-adjoined to VP, and also that both French and English have exactly the same underlying structure, then the differences in the distribution of the data in (174)-(175) can be attributed to verb movement in French.

The D-structure tree for the English sentence (175c) is given in (176), with the arrow indicating how verb movement will account for the corresponding French example (175b).

(176)



The data in (177)-(178) verify that this V-to-I movement occurs only for auxiliaries in English, as discussed earlier in section 7.

(177) a. He is not happy.
b. *He seems not happy.

(178) a. He was not arrested.
b. *He got not arrested.

The French verb movement account explains the difference between English and French in finite clauses. Look now at the nonfinite clauses in (179)-(180).

(179) a. Not to seem happy is a prerequisite for writing novels.
b. *Ne pas sembler heureux est une condition pour écrire de romans.*
c. *To seem not happy …
d. **Ne sembler pas heureux …*

(180) a. Not to own a car in the suburbs makes life difficult.
b. *Ne pas posséder de voiture en banlieue rend la vie difficile.*
c. *To not own a car …
d. **Ne posséder pas de voiture …*

In nonfinite clauses we suddenly have identical distributions for French and English, with French following the English pattern of no movement of the verb to end up in front of the negation. We could get this by simply saying that verb movement only occurs in finite clauses in French.

But then what do we do with (181b and d)? The data in (181) show that the verb may optionally move in front of the adverbial; yet the verb could not move in front of negation in the nonfinite clauses in (179)-(180).

(181) a. *A peine parler l'italien aprés cinq ans d'étude …*
hardly to.speak Italian after five years of.study

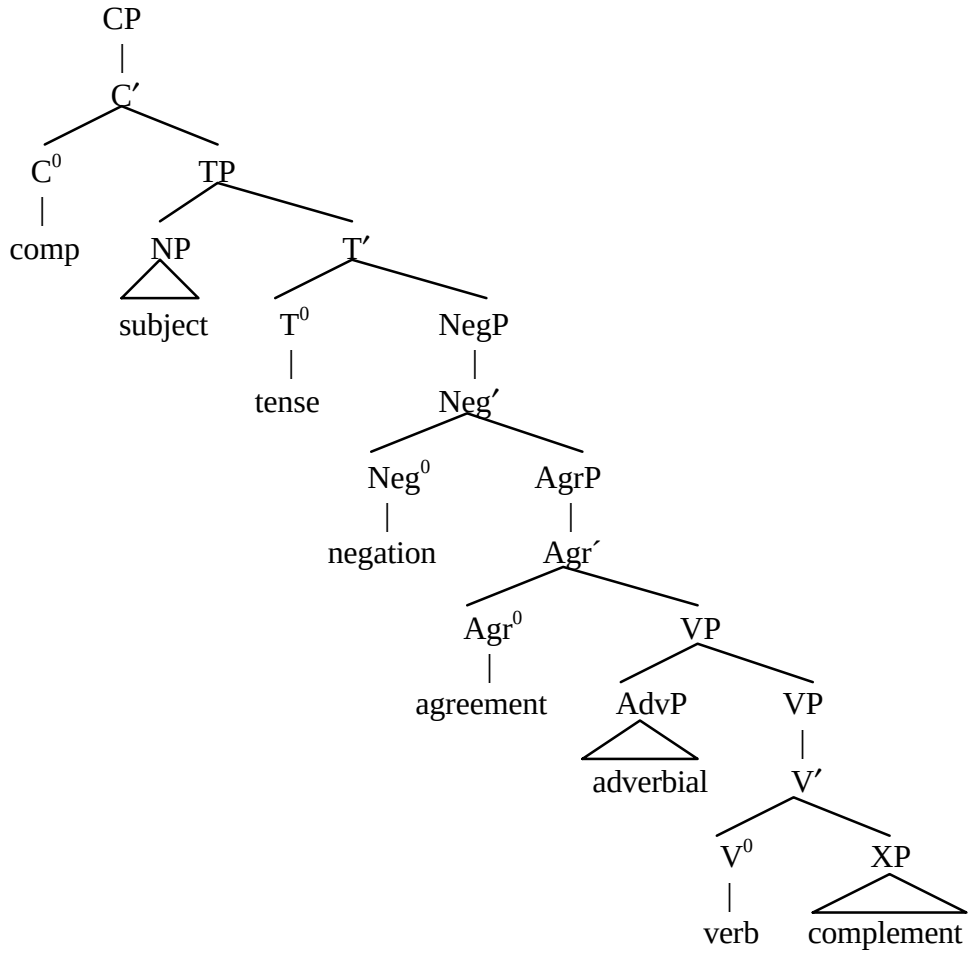
b. *Parler a peine l'italien aprés cinq ans d'étude …*

c. *Souvent paraître triste pendant son voyage de noce …*
often to.look sad during one's trip of lovers

d. *Paraître souvent triste pendant son voyage de noce …*

We need both an intermediate position between the adverbial and the negation that the French verb can move to in nonfinite clauses and a position above negation that the French verb must move to finite clauses. Pollock argues that this is evidence for IP to be broken down into further functional projections. He claims that the difference between finite and nonfinite clauses is either the presence of a Tense Phrase (=TP) in finite clauses only, or that movement cannot occur to TP in nonfinite clauses. Negation follows this TP and others have presented evidence that it is a full projection itself (=NegP). Then comes an Agreement Phrase (=AgrP) and finally the VP. CP is still above TP for the clause. At S-structure, the subject occupies the specifier of the highest projection below CP in SVO languages. This more articulated clause structure is shown in (182).

(182) Split Infl structure (SVO)



Lots of work is still being done to modify this structure. For some languages, both a Subject Agreement phrase (=SAgrP) and an Object Agreement phrase (=OAgrP) have been proposed. Also AspectP, sometimes two NegPs or a NegP and a negative adverbial that adjoins to VP,[45] and projections for Ergative and Absolutive Case are argued to be needed for particular languages.

This might make one wonder if we can account for morphology via head movement also.

11.3 The Morphology/Syntax Interface

In the GB account of English presented here, we have two rules involving head movement:

a. The highest $V_{[+aux]}$ must move to I^0, and
b. I^0 must move to a $C_{[+q]}$.

In section 7, we saw that the movement to $C_{[+q]}$ in an embedded question was blocked by the Principle of No Loss of Information, since the $C_{[+q]}$ position is filled by *whether*. This difference between main and embedded clauses is found in many languages, showing that the principle is valid.

But we need to look a little closer. So far, for English, we have seen that movement of the highest auxiliary to I^0 is required when only features such as [*person*], [*number*] and [*tense*] fill the position, but the same movement is blocked if nonfinite *to* occupies I^0. Features allow head movement but words do not. The next section explores the question of what happens to head movement when a bound morpheme, especially an inflectional morpheme, fills the position which is targeted for movement. Section 11.3.2 then presents a syntactic account of various types of incorporation.

11.3.1 Head Movement and Inflectional Morphology

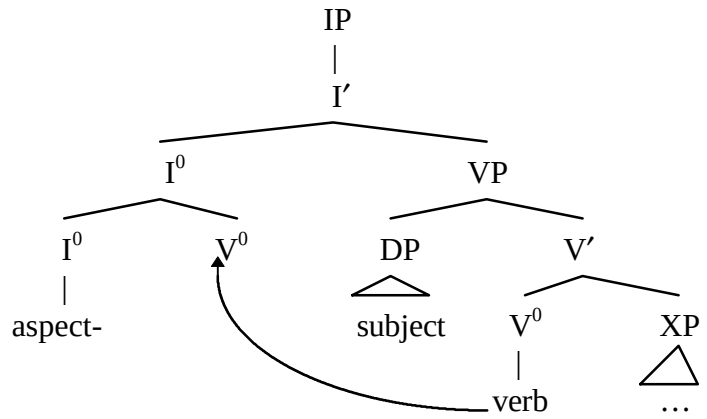
In many languages, inflectional morphemes may be isolated from the verb and these morphemes are attached in an order which can be accounted for in the tree structure. This idea that morphological and syntactic derivations must directly reflect each other is known as the Mirror Principle (Baker 1985). In these languages, the Split Infl structure will have a projection above VP and below CP for each inflectional morpheme, with the morphemes closest to the verb having the lowest projections in the tree and proceeding upward in order. The morphemes are in the head position of the projections at D-structure, and head movement of the verb through each projection puts the head together with its morphemes step-by-step up the tree.

This is precisely the situation where the question arises of how the Principle of No Loss of Information applies to morphemes. For example, in Quiegolani Zapotec, we need head

[45]For example, Zanuttini (1996) claims that the English negative element *n't* is a functional head Neg^0 and the verb raises and adjoins to this negative marker to support it morphologically (see the next section). In contrast, the negative element *not* is simply an adverbial element which can be adjoined to (or possibly occur in the specifier position of) any maximal projection.

movement to occur to account for the surface position of the verb, since it is a VSO language. Yet the I^0 position is filled by the aspect marker that shows up on the verb. Rizzi and Roberts (1989) claim that the motivation for the head movement in these cases is that the higher head node (filled by a bound morpheme) contains a slot for the lower head to fill based upon the morphological subcategorization requirements. In other words, at D-structure I^0 is really a complex head containing the aspect marker and a position for the verb to move to, since the aspect marker cannot stand alone. The morphological requirements must be met by S-structure, forcing the head movement to take place, as shown by the arrow.

(183) D-structure for Quiegolani Zapotec



Under this view, at least the inflectional morphology is done in the syntax. In languages where the particular morpheme is not easily separated off or where the order of elements required by the morphology and that required by the syntax do not match (i.e. the Mirror Principle cannot be followed), a checking approach is advocated (Chomsky 1993).[46] The verb can be fully inflected in V^0, and as it moves up, the features on it and the features required by the relevant inflectional heads are checked to be sure they match.

11.3.2 Incorporation

Baker (1988) explores many cases where the grammatical function of a particular word changes. He uniformly analyzes these as syntactic incorporation. Noun Incorporation, Preposition Incorporation, Antipassives, and Causative constructions will be considered here.

A phenomenon where the head noun from the object position is part of the verb exists in some languages, called Noun Incorporation. This is illustrated in (184)-(186) (taken from Baker 1988:77, 81-82).[47] In each example, the non-incorporated version is given first in (a).

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[46]This checking approach is used for all languages in the new Minimalist Program (Chomsky 1993, 1995). Some features must be checked by S-structure (or its equivalent point in the derivation), determining how high the verb moves. The remaining features are checked by further movement in LF (Logical Form) prior to semantic interpretation.

[47]Abbreviations: 1SS/AO=first person singular subject or noun class A object; 3FS/3N=third person feminine subject or third person neuter; PRE=nominal inflection prefix; SUF=nominal inflection suffix; A:A=noun class A agreement; ASP=general aspect marker; FUT=future tense.

Normal incorporation of the object is shown in (184b) and (186b), while (185b) and (186c) show that subjects cannot be incorporated.

(184) a. ***Seuan**-ide ti-mũ-ban.* SOUTHERN TIWA
man-SUF 1SS/AO-see-PAST
'I saw the/a man.'

b. *Ti-**seuan**-mũ-ban.*
1SS/AO-man-see-PAST
'I saw the/a man.'

(185) a. ***Hliawra**-de 0-k'ar-hi yede.* SOUTHERN TIWA
lady-SUF A:A-eat-FUT that
'The lady will eat that.'

b. **0-**Hliawra**-k'ar-hi yede.*
A:A-lady-eat-FUT that
(The lady will eat that.)
OK as 'She will eat that lady'

(186) a. *Yao-wir-a?a ye-nuhwe?-s ne ka-**nuhs**-a?.* MOHAWK
PRE-baby-SUF 3FS/3N-like-ASP the PRE-house-SUF
'The baby likes the house.'

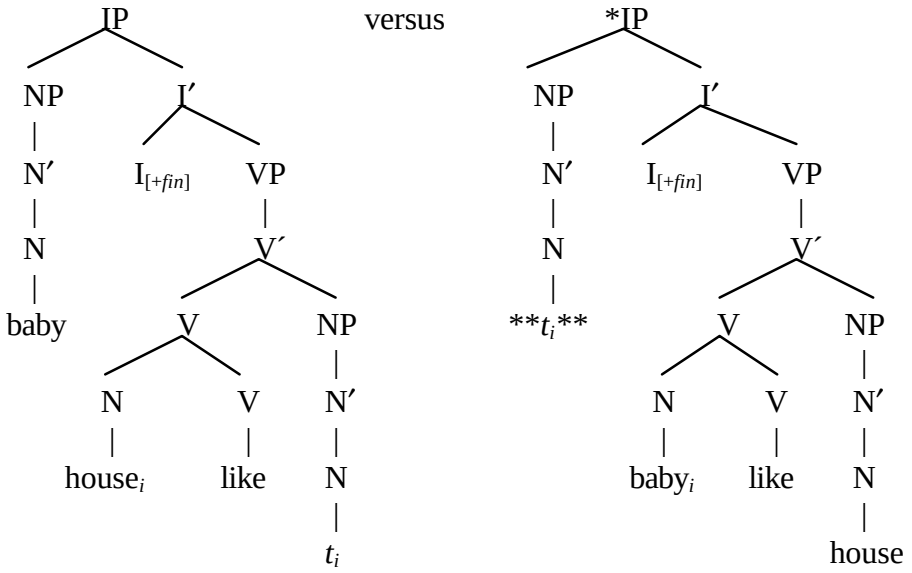
b. *Yao-wir-a?a ye-**nuhs**-nuhwe?-s.*
PRE-baby-SUF 3FS/3N-house-like-ASP
'The baby house-likes.'

c. **Ye-**wir**-nuhwe?-s ne ka-nuhs-a?.*
3FS/3N-baby-like-ASP the PRE-house-SUF
(Baby-likes the house.)

The fact that only objects may incorporate and not subjects is explained by a syntactic derivation where the object moves to adjoin to the verb.[48] It is a strong generalization with all types of movement that objects may move quite freely, while subjects and adjuncts are much more restricted. This is accounted for in GB by the Empty Category Principle, though there has been great debate about the proper formulation needed to account for all the data crosslinguistically. For our purposes here, the relevant restriction is that a trace must be governed by a lexical head. Since the governor of the subject is the functional category $I_{[+fin]}$, a trace would not be legal in subject position, whereas the trace of the object would be governed be the lexical category V. The S-structure trees for the legal and grammatical (186b) versus the ungrammatical (186c) are shown in (187).

[48] Note that this is an optional movement, not required by morphological subcategorization, so it is simply movement by adjunction at S-structure without the provision of a D-structure slot argued for above by Rizzi and Roberts (1989).

(187)



Languages which allow other noun phrase constituents to be stranded when the head noun incorporates into the verb provide strong evidence for the head movement account. Consider the examples in (188)-(189) (taken from Baker 1988:94). In each case, the unincorporated construction is first. In (188b) the quantifier meaning 'two' is stranded and in (189b) the adjective meaning 'beautiful' is left behind when the noun incorporates. (See Baker 1988:93-97 for examples of stranding of other noun phrase constituents.)

(188) a. [*Wisi* ***seuan***-*in*] *bi-m-ban.* SOUTHERN TIWA
two man-PL 1SS-see-PAST
'I saw two men.'

b. *Wisi bi-**seuan**-mũ-ban.*
two 1SS:B-man-see-PAST
'I saw two men.'

(189) a. [***Sapannga***-*mik kusanartu-mik*] *pi-si-voq.* GREENLANDIC ESKIMO
bead-INSTR beautiful-INSTR 0-get-INDIC/3SS
'He bought a beautiful bead.'

b. *Kusanartu-mik **sapangar**-si-voq.*
beautiful-INSTR bead-get-INDIC/3SS
'He bought a beautiful bead.'

It is important to note that not all languages allow incorporation. One key factor to consider is productivity: can you incorporate any object noun into any verb (with few exceptions)? Or does this only occur in fixed forms (e.g. *babysit* in English, or in Quiegolani Zapotec, *put-foot* = 'step'? Fixed forms should be treated simply as lexical compounds.

A crucial fact about a verb with an incorporated object is that the transitive verb cannot take another object; it has seemingly become intransitive or had its valence lowered. The head movement account provides an explanation for this fact, since its regular subcategorization as a transitive verb is met at D-structure before head movement.[49]

The opposite type of effect occurs with Preposition Incorporation, allowed in some languages. For example, in many Zapotec languages the comitative preposition meaning 'with' can or must incorporate into an intransitive motion verb. This new predicate is now transitive. (190a) gives the unincorporated version of a Yatzachi Zapotec sentence, followed by the incorporated version in (190b).[50]

(190) a. *Ch-i'-a* ***len****-bo'.* YATZACHI ZAPOTEC
H-sit-1S with-3F
'I am sitting with him/her.'

b. *Ch-i'-****len****-a'-bo'.*
H-sit-with-1S-3F
'I am sitting with him/her.'

In Isthmus Zapotec, the comitative preposition ***ne*** must incorporate into the verb, but the process is not limited to intransitive motion verbs, as (191b-c) illustrate.[51]

(191) a. *Ri-za-****ne****-be naa.* ISTHMUS ZAPOTEC
C-come-with-3H 1SG
'S/he walks with me.'

b. *Ri-guite-****ne****-be naa tala'dxi'.*
H-play-with-3H 1SG ball
'S/he plays ball with me.'

c. *R-uni-****ne****-be naa dxiiña'.*
H-do-with-3P 1SG work
'S/he does work with me.'

The incorporation analysis would use head movement of the preposition to account for this phenomenon. If the process is very limited, it can also be achieved in the lexicon, possibly by a lexical rule. Note that in English 'went with' is an intransitive verb followed by a preposition, but it has the same meaning as 'accompany', which is a transitive verb.

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[49]Incorporation may occur with the subjects of intransitive verbs in some languages, but Baker claims that this is only possible when the verbs are unaccusative and thus the THEME subject began in the object position and could incorporate directly from there rather than raising to the subject position via A-movement. (The analysis of unaccusatives was covered in section 8.2.)

[50] Abbreviations: H=habitual aspect; 1S=first person singular; 3F=third person familiar. Data source: Inez Butler (p.c.)

[51] Abbreviations: H=habitual aspect; C=completive aspect; 1SG=first person singular object; 3H=third person human. Data source: Pickett, Black and Cerqueda (1998).

Antipassive constructions, where either the object is not realized at all or it is realized as an oblique argument (like the *by*-phrase in English passives), can also be analyzed as a type of incorporation. A morpheme always occurs on the verb to mark the antipassive construction, as illustrated in (192)-(193) (taken from Baker 1988:129, 131).[52] In (192a) a regular transitive sentence from Greenlandic Eskimo is given. The antipassive construction where the object is demoted to an oblique argument (marked with instrumental case) is shown in (192b), while (192c) gives the impersonal antipassive construction where the object is not realized at all. Tzotzil only allows the unrealized object form of antipassives, shown in (193).

(192) a. *Angut-ip arnaq unatar-paa.* GREENLANDIC ESKIMO
man-ERG woman(ABS) beat-INDIC:3SS/3SO
'The man beat the woman.'

b. *Angut arna-**mik** unata-**a**-voq.*
man(ABS) woman-INSTR beat-APASS-INDIC:3SS
'The man beat a woman.'

c. *Angut unata-**a**-voq.*
man(ABS) beat-APASS-INDIC:3SS
'The man beat someone.'

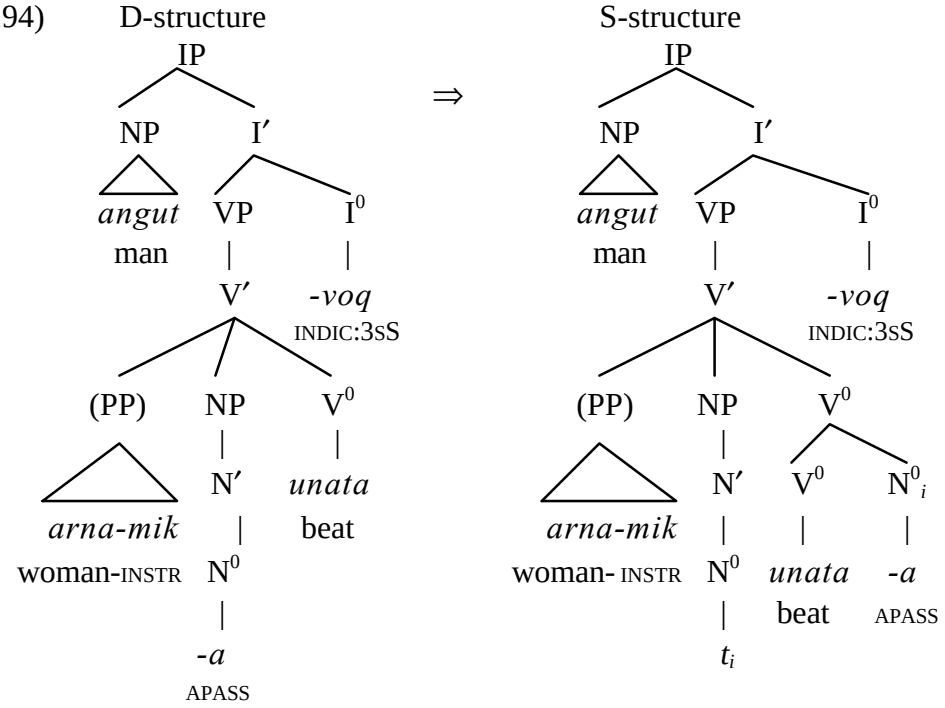
(193) a. *Muk'bu š-i-mil-**van**.* TZOTZIL
never ASP-1SA-kill-APASS
'I never killed anyone.'

b. *š-k'ot sibatas-**van**-uk-0.*
ASP-come frighten-APASS-uk-3SA
'He came to frighten someone.'

Baker's account of Antipassives is that the antipassive morpheme begins in the object position and then is forced to incorporate into the verb due to its morphologically dependent status. The derivation for (192b or c) is given in (194). Note the SOV clause structure and that V-to-I movement could also occur to account for the verbal morphology.

[52]Abbreviations: ABS=absolutive case; ERG=ergative case; INSTR=instrumental case; APASS=antipassive; INDIC:3SS/3SO=indicative mood with third singular subject and third singular object agreement; INDIC:3SS=indicative mood with third singular subject agreement; ASP=aspect marker; 1SA=first singular absolutive agreement; 3SA=third singular absolutive agreement.

(194)



Causative constructions can also be analyzed as Incorporation, this time Verb Incorporation. Some English examples of syntactic causative constructions with two independent verbs are given in (195). Chichewa also has syntactic causatives, as shown in (196), but additionally allows parallel morphological causatives, illustrated in (197) (taken from Baker 1988:147-149).[53]

(195) a. Bill made his sister leave before the movie started.
b. The goat made me break my mother's favorite vase.

(196) a. *Mtsikana ana-chit-its-a kuti mtsuko u-gw-e.* CHICHEWA
girl AGR-do-make-ASP that waterpot AGR-fall-ASP
'The girl made the waterpot fall.'

b. *Aphunzitsi athu ana-chit-its-a kuti mbuzi zi-dy-e udzu.*
teachers our AGR-do-make-ASP that goats AGR-eat-ASP grass
'Our teachers made the goats eat the grass.'

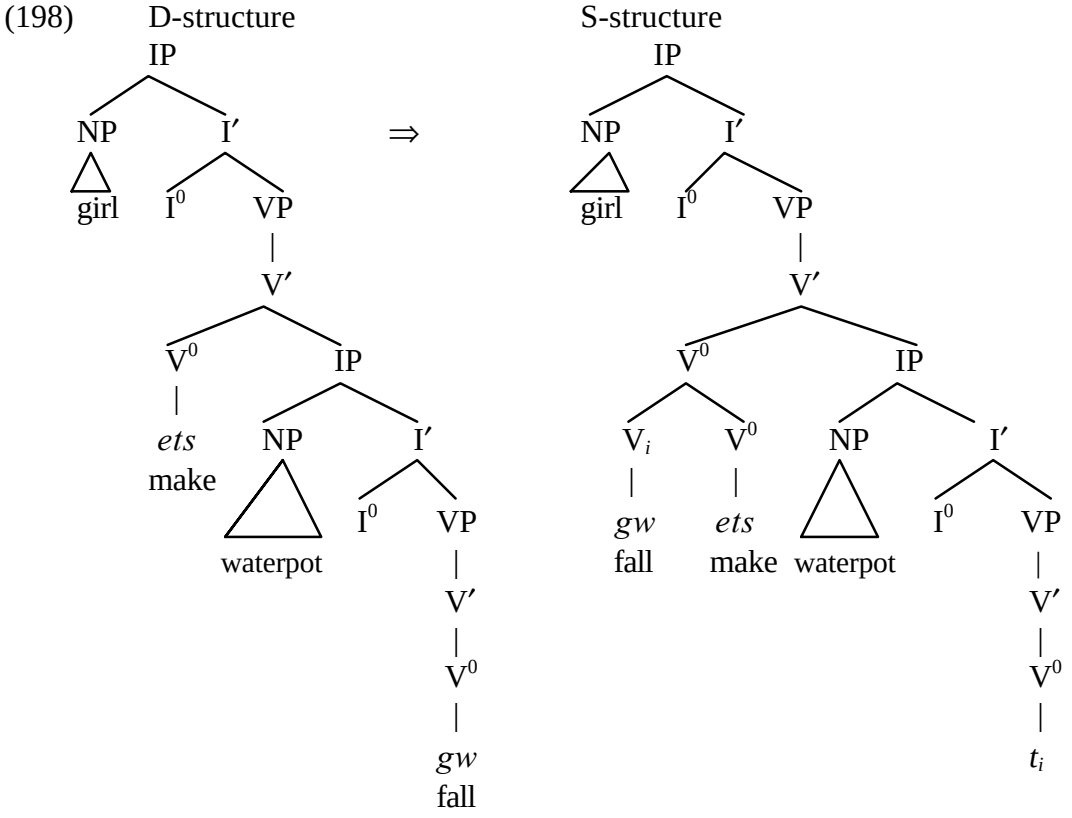
(197) a. *Mtsikana anau-gw-ets-a mtsuko.* CHICHEWA
girl AGR-fall-made-ASP waterpot
'The girl made the waterpot fall.'

[53] Abbreviations: AGR=agreement marker; ASP=aspect marker.

b. *Catherine ana-kolol-ets-a mwana wake chimanga.*
Catherine AGR-harvest-made-ASP child her corn
'Catherine made her child harvest corn.'

The incorporation analysis of morphological causatives says that they begin with a biclausal structure, just like syntactic causatives, and then have the lower verb incorporate into the higher verb. The tree structures for (197a) are given in (198), where some details are omitted to make clearer how the structure is parallel to that of English syntactic causatives.

(198)



This concludes our introduction to Government and Binding Theory and some of its more recent modifications. It is not meant to be all-inclusive, but I hope that the readers now have enough understanding to apply the theory to the language they are studying and to read further on their own.[54]

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[54]Some of the key recent developments not covered here include:
(i) Relativized Minimality (Rizzi 1990), which accounts for the differences in grammaticality obtained when (a) a complement versus (b) a subject or (c) an adjunct is extracted from an island.

a. ?Which problem$_i$ do you wonder how$_i$ John could solve t_i t_k?
b. *Which student$_i$ do you wonder how$_k$ t_i could solve the problem t_k?
c. *How$_k$ do you wonder which problem$_i$ John could solve t_i t_k?

(ii) The *Wh*-Criterion (May 1985 and Rizzi 1996), which allows for licensing and correct interpretation of *wh*-elements. This was parameterized as to the level at which movement takes place to account for the variation seen in how questions are formed cross-linguistically.

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(iii) The new Minimalist Program (Chomsky 1993, 1995), which pares the syntax down to a core set of principles and eliminates some of the levels of the derivation. The functional projections are maintained, but all movement (both overt movement to reach surface word order and covert movement for semantic interpretation) is motivated by the need to check off features.

These developments may seem of little interest to the field linguist, yet I needed to appeal to parts of all three to analyze Quiegolani Zapotec. See Black (1994:Chapter 10 and Appendix) for details.

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