Many (most?) languages of the world have something like a basic word order, an order in which words come in in “neutral” sentences.

- English: SVO
  - Akira ate an apple.
- Japanese: SOV
  - John wa ringo o tabeta.
  - John top apple acc eat
  - ’John ate an apple.’

These two word orders work nicely with X-bar theory as it stands; the difference can be stated in terms of a simple parameter which differentiates languages as to whether they are head-initial or head-final.

Notice that in English, both V and T are head-initial, and in Japanese, both V and T are head-final. In fact, languages tend to be consistent in their headedness:

- Japanese has postpositions; C comes after TP in embedded clauses…
- English has prepositions; C comes before TP in embedded clauses…

There are also languages in which the basic word order is VOS, although they are few in number.

- Malagasy: VOS
  - Nahita ny mpianatra ny veviavavay.
  - saw the student the woman
  - ’The woman saw the student.’

See how we might generate an X-bar structure of this?
X-bar parameters

- So by changing the parameters of head-complement order and specifier-X’ order we can generate the following basic word orders:
  - SVO (spec-initial, head-initial) (English)
  - SOV (spec-initial, head-final) (Japanese)
  - VOS (spec-final, head-initial) (Malagasy)
  - OVS (spec-final, head-final) (Hixkaryana)

- And that’s all…

The problem of VSO languages

- There are quite a number of languages, however, for which the basic word order is VSO. Irish, Welsh, and Arabic are among them.
- Try as we might, there is no way to set the X-bar parameters to get VSO order—we have a specifier (the subject) between the verb and its complement.

French

- French presents a similar problem; consider the English sentence
  - I often eat apples.

- The adverb *often* is an adjunct, attached at V’, as seen here.

French

- In French the sentence is
  - Je mange souvent des pommes.
  - *I often eat apples.*

- The adverb *souvent* appears between the verb and its complement; there is no place to put it in this tree.

- Moreover, it *should* be basically in the same place as in English, given the structural similarity and the sameness of meaning.

X-bar theory: A sham?

- So is X-bar theory not up to the task of being a universal principle of phrase structure, despite its initial promise in English (and Japanese and Malagasy and Hixkaryana)? Should we scrap it and start over?

- Answer: No… There is a way we can salvage all the good stuff we’ve gotten from X-bar theory so far…

Movement

- Consider English yes-no questions…

- To form a question from a statement like:
  - Bill should eat his peas.

- We prepose the modal *should* to the front of the sentence, before the subject.
  - Should Bill eat his peas?

- Where is *should* in this sentence?
Movement

– Should Bill eat his peas?
• There is one position in our sentence structures so far that is to the left of the subject, the one where the complementizer that goes (C):
  – I said that Bill should eat his peas.
• This is where we expect should to be. It is, after all, a modal, of category T. It is not a complementizer.
• Also notice that if we embed this question, should stays after the subject, and if is in C:
  – I wonder if Bill should eat his peas.

Movement

• All of this suggests that the way to look at this is that we start with the sentence…
  – Bill should eat his peas
• …as usual, and if we’re forming a yes-no question, we follow this up by moving should to the position of C. If we can’t move it (in an embedded question, there’s already something in C: if), it stays put.

Movement

• Given that things do seem to move around in the sentence (that is, they start where we’d expect them to but we hear them somewhere else), this gives us a way we might “save X-bar theory” from Irish and French.
• Let’s go back and look at French with this in mind…

French

– Jean mange souvent des pommes.
– Jean eats often of the apples
– ‘Jean often eat apples.’
• If we suppose that the French sentence starts out just like the English sentence, we have the underlying DS (deep structure) representation shown here.
• What needs to happen to get the correct surface word order?

Why does this happen?

• Why would a language need to move its verb up to tense?
  • In French, verbs are marked for tense and agreement—past tense verbs look different from present tense verbs, which look different from future tense verbs. If the tense information is in T ([PRES]), and the verb reflects this, somehow the verb needs to get together with T.
• French does this by moving the verb to T.
• English does this by moving T (-ed) to the verb.
**Pondering about T**

- In the DS of every matrix sentence (French or English or anything) there is a TP.
- In the example *Jean mange souvent des pommes*, the tense marked on the verb is present tense. So, we suppose that T was present, which we can mark as being `[PRES]`, i.e. having the feature for “present” on tense. The present tense morpheme in French is Ø, so writing the feature is clearer.

**Features**

- In general, as far as syntax is concerned, we can think of the things at the terminal nodes in our tree as being “bundles of features” or “collections of properties.”
- The T node has (by definition) the feature “is of category T” for one. Terminal nodes have categorial features, like `[T]`.
- The T node also has features indicating what kind of tense it is ( `[PRES]`, `[FUT]`, `[PAST]`, `[FIN]` ).
- The V node has features indicating its theta-grid, and so forth.

**Projections**

- When we say the category of the head of an X-bar phrase determines the category of the phrase as a whole (i.e. an N heads an NP, a D heads a DP, and so forth), we sometimes refer to this as projection of the category feature (property).
- A DP is a DP because the `[D]` feature of its head projects up to the phrase level (and through the intermediate bar-levels as well).
- For this reason, XPs are sometimes referred to as ”projections (of their head)”.

**Features**

- One consequence of modeling category this way is that an XP node doesn’t have a category feature intrinsically, it essentially inherits it from its head.
- For this reason, an XP (a phrase, a projection) must always have a head.
- For similar reasons, we also assume that an XP can’t have two heads—only one head projects its features to the XP.

**What happens when V moves to T?**

- If we think that V moves to T in order to get the verb together with the tense feature, then certainly V cannot replace T. T must still be there, with its tense feature.
- Moreover, if T were replaced by V, the TP wouldn’t be a TP any longer, would it?

**Projections**

- The T and V must fuse in some way, retaining the features of T, since the tense feature of T is why the verb needed to move up there.
- In fact the features of T must still be primary, since a phrase cannot have two heads and it remains a TP (not a VP).
What happens when \( V \) moves to \( T \)?

- To show that \( V \) attaches to \( T \), but that \( T \) remains primary, this is drawn in the tree structure like this.
- We say that \( V \) head-adjoins (attaches, head-to-head) to \( T \).

What happens when \( V \) moves to \( T \)?

- This structure that is formed in this way is a complex head. It’s a head (\( T \)) with another head (\( V \)) attached to it.
- Importantly, it’s still a \( T \) head, it still heads the TP. It just has a \( V \) attached to it.
- The tree structure shown is the normal convention for drawing this, so we will follow this convention. This will require a bit of concentration. This is one head, there is one \( T \)—with a \( V \) attached.

What happens when \( V \) moves to \( T \)?

- Last year I experimented with introducing a convention of drawing the connection between the “two \( T \)’s” in the diagram differently to help reinforce the idea that it’s not a normal mother-daughter relationship.
- I will try to continue this tradition this year, using a double-line (to evoke the idea of an extra-strong connection), although outside this class you will almost always see it drawn as a regular line.

What happens when \( V \) moves to \( T \)?

- We should also consider what happens to the VP from which the \( V \) moved.
- This too is still a VP, it must still have a head.
- We note the original location of the \( V \) by writing \( t \) (standing for “trace” left behind by the original \( V \)), and we co-index the \( V \) and \( t \) to indicate their relationship.

What happens when \( V \) moves to \( T \)?

- Since the VP is still a VP, it still gets a \([V]\) category feature projected up from its head.
- So the trace is still a verb.
- In fact, there’s no reason to suppose that any of the features of the original \( V \) have been removed given that \([V]\) is still there.
- We write it as \( t \), but its content has not really changed.

What happens when \( V \) moves to \( T \)?

- What has changed is that the original verb is now related to a higher position in the tree, and for many purposes, the top copy in the tree is considered to be primary.
- What we have created by moving the verb is a chain of positions in the tree that the verb has occupied.
What happens when V moves to T?
• When we think of moved elements in SS and LF structures, we will often need to consider the chain of positions; this is usually written like:
  \((V_i, t_i)\)
• referring to the two positions held by \(V_i\) and \(t_i\) in the structure here.

Why does V move to T?
• “The verb and tense have to get together” is what I said before, but we can focus this question a little bit more.
• Think about the English past tense morpheme, generated in (originating in, at DS) T, which we’ve written as -ed.
• We wrote it this way because it isn’t a whole word, it is the regular past tense suffix that appears attached to verbs.

Why does V move to T?
• Similarly in French, regular tense morphology is realized as a suffix on the verb.
• One productive way of thinking about why the verb and tense need to get together is that tense is a verbal suffix.
• By definition, a verbal suffix can’t stand on its own, it needs a verb to attach to.
• That is, the “need” for the verb and tense to get together isn’t something that the verb needs, it’s something that tense needs. A verbal suffix needs a verb to attach to.
• If tense is “stranded” with no verb, the result is morphologically ill-formed = ungrammatical.

Why does V move to T?
• In English, the tense affix (e.g., -ed) moves down to the verb rather than the verb moving up to T.
• However, the negative marker not blocks this movement—for reasons that are controversial, but we can state the fact as a stipulation (not otherwise derived from our system) like so:
• Affix lowering is blocked by the presence of not in English.

Why does V move to T?
• What happens in negative sentences in English, then, is that the tense affix is “stranded” up in T; it can’t lower to the verb because not is “in the way”.
• Bill -ed not buy cheese. (DS)
• As a “last resort”, English has a rule which salvages this situation by inserting the meaningless verb do to “support the tense affix”— do is only there to provide something for -ed to affix to.
• Bill did not buy cheese. (SS)

Why does V move to T?
• We can state the rule like this:
• Do-insertion
  When there is no other way to support inflectional affixes in T, insert the dummy verb do into T.
• Bill did not buy cheese.
• In this sentence, the verb has not moved up to T nor has T moved down to V. And we see no tense suffix on the verb as a result.
Why does V move to T?

• English has two special verbs which do move to T, the auxiliary verbs *have* and *be* in English.
  – Bill is sloppily eating apples.
  – Bill is not eating apples.
  – *Bill sloppily is eating apples.
  – *Bill not is eating apples.
  – *Bill did not be eating apples.
  – Bill has not eaten the apples.
  – *Bill not has eaten the apples.

Why does V move to T?

• Notice that if there is something in T already, like a modal, then the verb doesn’t move up to T.
• John might not be eating apples.
• And moreover, the verb has no tense inflection.
• This all suggests that the view that it is the affix in T which causes V to move to T. The verb is happy not to move, but will move when it can in order to help T out.
• There are requirements on T, not on V.

A word on auxiliaries

• English has two auxiliary (“helping”) verbs *have* and *be*, which are not the main verbs of a sentence but generally serve to indicate differences in verbal aspect (progressive, past perfect, …).

• These auxiliary verbs are verbs, but they have special properties. Among these properties: they move to T, and they have no theta-roles to assign.

A word on auxiliaries

• The DS of a sentence with an auxiliary verb would be something like this, where the auxiliary verb heads a VP, and takes the main verb’s VP as its complement.

• Notice that we are treating the past participle *eaten* as just a special kind of verb. This is good enough for present purposes.

A word on auxiliaries

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English yes-no questions

• Now, let’s go back and think about English yes-no questions, which we took originally to be motivation that movement occurs.
  – Bill will buy cheese.
  – Will Bill buy cheese?
• What’s happening here? Well, we saw earlier that it is reasonable to think that the modal will, which starts out in T, moves to C in questions.
  – Will, Bill t, buy cheese?
English yes-no questions

• Why does this movement happen?

• By analogy with the motivation for V-to-T movement, we will take C to hold a special (this time silent, or perhaps prosodic) affix that must be joined up with T. This affix is the “question” morpheme, of category C, which we can write as $\emptyset_{Q}$. 

\[
\begin{array}{c}
\text{CP} \\
\text{TP} \\
\text{DP} \\
\text{VP} \\
\text{Bill} \\
\text{will + $\emptyset_{Q}$} \\
\text{T} \\
\text{\textbf{T}_{+C}} \\
\text{\textbf{C}} \\
\text{SS}
\end{array}
\]

\[\text{buy cheese}\]

• Incidentally, \textit{lots} of languages have an overt question morpheme, which adds plausibility to our assumption that English has a question morpheme in C that is just null.

  – Akira ga hon o kaimasita ka? (Japanese)
  – Akira top book acc bought Q
  – ’Did Akira buy the book?’

\[
\begin{array}{c}
\text{T}_{+C} \\
\text{\textbf{C}} \\
\text{SS}
\end{array}
\]

\[\emptyset + Q\]

T to C

• In English, anything that would be in T moves to C. So, modals and auxiliaries all “invert” around the subject:

  – Will Bill buy cheese?
  – Is Bill buying cheese?
  – Has Bill bought cheese?

• But main verbs never raise to T in English. Consider then:

  – Did Bill buy cheese?

• Why is there a \textit{do} there? Before, we only saw \textit{do} in sentences with \textit{not}, inserted because the tense affix couldn’t “reach” the verb, blocked by \textit{not}.

• What seems to be the case is that if T moves to C (that is, the past tense suffix -ed in this case), it also gets too far away from the verb (now Bill is between the suffix and the verb), and \textit{Do}-insertion is required.

\[
\begin{array}{c}
\text{T} \\
\text{\textbf{T}_{+C}} \\
\text{\textbf{C}} \\
\text{SS}
\end{array}
\]

Negation

• We’ve used negation as a test, like (in fact usually better than) adverbs to see if the verb appears to the left (suggesting it has raised, in a head-initial language) or to the right (suggesting it has not raised).

• Negation acts a little bit different from adverbs in a few ways. One way negation acts different is that negation blocks affix lowering in English but adverbs don’t (in the tree, both come between T and V at DS):

  – Bill did not buy cheese.
  – Bill never buys cheese.
  – Bill quickly bought cheese.
NegP

- A common view of negation is that it has its own projection, a NegP, headed by a negative morpheme. For example, something like this.
- Interestingly, negation sometimes comes “in two parts”, with two morphemes implicated in negation. NegP has in principle two positions available for negative morphemes, its specifier and its head.
- Standard French *ne…pas* is an example of this which we’ll look at now.

French negation

- In standard French, the negation of a sentence generally involves a morpheme *ne* placed before the tensed verb and a morpheme *pas* placed after it, as in:
  - Jean mange pas des pommes.
  - Jean NE eats NOT of the apples
  - ‘Jean doesn’t eat apples.’
- However, English gives us reason to believe (assuming NegP is in the same place in the tree in both languages) that NegP comes between TP and VP:
  - Bill will not eat apples.
**French negation**

- This final movement ends up with the verb close enough to the tense suffix to satisfy the requirement that tense have a verbal host, while at the same time “taking ne along” to get us the right word order.
  - Jean ne mange pas…

**Head Movement Constraint**

- This is an example which motivated the hypothesis that head movement is constrained by the Head Movement Constraint (or HMC) which says that when a head moves to another head, it cannot “skip” over a head inbetween. So, the reason the verb stops at Neg is because Neg is between where V began and T.
- Head Movement Constraint
  - A head cannot move over another head.

**English negation**

- A common view of English negation is actually an extension of this: Many people consider not to be in the specifier of NegP, with a null head.
- However, sometimes English negation does appear to be the head of NegP, when it’s “contracted” as -n’t.
  - Isn’t Bill hungry?
- Notice that when the verb moved to T and then to C, it seems to have carried negation along.
- Not doesn’t act this way, though—and often sounds a bit archaic:
  - Has Bill not bought cheese yet?
  - Hasn’t Bill bought cheese yet?
- There are lots of interesting questions about negation in English and other languages—we can’t pursue them here any further, but this is a good first approximation to how negation works.

**Colloquial French?**

- It turns out that the negation morpheme ne that we suppose is the head of the NegP projection is actually generally optional (or even preferentially omitted in colloquial French)—yet pas doesn’t act any differently (i.e. it doesn’t get “picked up” by the verb on the way up to T instead of ne).
- What this suggests is that colloquial French has a null morpheme which is the head of NegP—that pas is still in SpecNegP, but the head is Ø instead of ne.

**French negation**

- So, we see that assuming that ne is the head of NegP in French (with pas in the specifier), and assuming that the verb “stops off” to attach to Neg before moving (now as a part of the complex Neg head) up to T, we get the right word order.
- Note that, since *Jean mange pas ne des pommes* is ungrammatical, we also know that the verb has to stop off at Neg on the way up.
Back to VSO

• Now, let’s return to the question of VSO order in languages like Irish (remember that?). Recall that we started off with the observation that there isn’t any way to “generate VSO order” at DS using X-bar rules because V and O are sisters at DS.
• However, now that we have verb movement at our disposal, we could certainly derive VSO like this:
  • DS: Subject Verb Object
  • SS: Verb, Subject  \( i \) Object

Irish

• In support of verb movement, consider:
  – Phóg Máire an lucharachán
  – kissed Mary the leprechaun
  – ‘Mary kissed the leprechaun.’
  – Tá Máire ag-pógáil an lucharachán.
  – Is Mary ing-kiss the leprechaun
  – ‘Mary is kissing the leprechaun.’

• We find that if an auxiliary occupies the verb slot at the beginning of the sentence, the main verb appears between the subject and verb—it remains, unmoved.
• This suggests that deriving VSO from SVO is on the right track.

VSO order in Irish

• Where is the verb moving to, though?
• The verb ends up to the left of the subject, which in English we took to be movement to C:
  – Will Bill buy cheese?
• A natural thing to suppose is that the verb moves to T and then to C in Irish to get VSO order.

VSO order in Irish

• Except, consider these:
  – An bhfaca tú an madra?
  – Q See you the dog
  – ‘Did you see the dog?’
  – Duirt mé gur phóg Máire an lucharachán.
  – Said I that kissed Mary the leprechaun
  – ‘I said that Mary kissed the leprechaun.’

• If the verb moves to C, where are \( an \) and \( gur \)?

VSO order in Irish

• In English (and German and other languages) if there is something in C, the verb doesn’t move there (it doesn’t need to):
  – Is Bill hungry?
  – Should Bill be hungry?
  – I wonder if Bill is hungry.
• But in Irish, we see an overt complementizer followed by VSO.

A VP-internal subject?

• One possibility that this suggests is that the verb is only moving to T, but the subject is actually lower than T—and we have a place in our tree which hasn’t been used yet, the specifier of VP.
• But what about English? We expect that DS looks pretty much the same across languages, so why does the subject seem to start in different places in Irish and English?
A VP-internal subject?

- Actually, though, there’s some reason to think that in English the subject originates in SpecVP too, contrary to what we’ve been assuming—and moves to SpecTP.
- One argument for this concerns the “floating quantifier” all.
  - All the students will leave.
  - The students will all leave.
  - *The students will leave all.
- Where can all be found?

The Italian DP

- Remember earlier (not so long ago, really), we supposed that proper names could be of category D, but yet we observed that in some languages, it is possible (even obligatory) to say the Bill (rather than Bill, as we say in English).
- Let’s take a look at Italian, which has this property.

The Italian DP

- In Italian, in many cases, there is simply an option (stylistically governed) as to whether you say The Gianni or just Gianni:
  - Gianni mi ha telefonato.
  - ‘Gianni called me up.’
  - Il Gianni mi ha telefonato.
  - ‘Gianni called me up.’

A VP-internal subject?

- First of all, all the students looks like the basic form—this is what the second sentence means, but the all has somehow “floated off”.
- However, if the subject moves from SpecVP to SpecTP and if the students can move, leaving all behind, then all got left behind in SpecVP.
The Italian DP

• But this makes perfect sense, if what is happening in the cases where there is no determiner is that the N is moving up to D (just like V moves up to T in the main clause), and when there is a determiner, the N stays put.
  – L’ antica Roma
  – the ancient Rome

  – Roma antica  *Antica Roma
  – Rome ancient  ancient Rome

And English?

• So, in Italian, there seems to be pretty good evidence that the N raises to D.
• In English, adjectives can sometimes be found with proper names, and they precede it:
  – Good old John
  – Ancient Rome
• However, in English, we can never have a determiner with a proper name (*The Mary).
• For now, all we can conclude is that English lacks a (null affixal) determiner that causes raising, but Italian has it. Later, we might be able to revise this in light of further discussion.

Wrapup

• So, what we’ve seen is basically that there is an operation of head movement which can take the head of an XP and attach it (head-adjoin) it to a higher head.
• This kind of movement cannot skip over intervening heads in the structure (HMC).
• We’ve seen V-to-T movement, T-to-C movement, and N-to-D movement as examples of this.

For next time:

• Read:
  – Chapter 8
• Homework:
  – Chapter 8: problems 1(abde), 2, 4
  – One problem (“VP deletion”) not from the textbook.