Our grammar (minus the linearization algorithm).

1. A grammatical sentence must have a well-formed derivation. A derivation is a series of phrase-markers such that:
   a. The first is generated by the $X$ Skeleton and Lexical Insertion, and satisfies the $\Theta$ Criterion and the Projection Principle, (D-structure)
   b. Each subsequent phrase marker is derived from the previous by an application of a rule (e.g., Argument Movement),
   c. The final phrase marker satisfies the EPP and is fed to the linearization algorithm. (S-structure)

2. a. $XP \rightarrow \{(\alpha P), \overline{X}\}$
   b. $X \rightarrow \{\overline{X}, \beta P\}$
   c. $\overline{X} \rightarrow \{X^0, (yP)\}$
   where “[(α, β)]” means α and β are sisters.

3. **Lexical Insertion**
   Insert into every $X^0$ in a phrase marker a morpheme of category X.

4. **The Theta Criterion**
   a. For every $\theta$-role there is exactly one XP to which that $\theta$-role is assigned.
   b. Every argument phrase is assigned exactly one $\theta$-role.

5. **The Projection Principle**
   If $X^0$ assigns (non-external) $\theta$ roles, then one of its projections must contain all the phrases it assigns those $\theta$ roles to and nothing else.

6. **Extension of the Projection Principle (EPP)**
   The Specifier of IP must have a phrase in it.

7. The external (underlined) $\theta$-role is assigned by $\alpha$ to the Specifier of $\alpha P$.

8. **Case Positions**
   a. Finite $I^0$ assigns Nominative Case to its Specifier position.
   b. Genitive Case is assigned to Specifier of DP.
   c. Accusative Case is assigned to the position adjacent to, c-commanded by, and close to a verb or preposition.
   d. $\alpha$ is close to $\beta$ iff no more than one phrase dominates $\alpha$ but not $\beta$.

9. $\alpha$ c-commands $\beta$ iff:
   a. Every phrase that dominates $\alpha$ also dominates $\beta$, and
   b. $\alpha$ does not dominate $\beta$.
   NB: “dominates” is not reflexive.

10. **Case Filter**
    Every argument DP must be in a Case marked position at some point in a derivation.

11. **Heavy NP Shift**
    Right adjoin XP to the smallest IP dominating it, when XP is “heavy.”
    Finite CPs are always heavy.
    Other XPs are heavy when they are “long.”

12. **Argument Movement**
    Move an XP into Specifier position, $\Sigma$, if every finite clause that dominates XP dominates $\Sigma$ too.

13. **Lexical Rule:**
    a. Passive
       i. Apply to a verb that assigns Accusative Case, and delete that Case, and
       ii. Suppress that verb’s external $\theta$-role.

We need to understand how parses like (14) can have the effect they do on the morphological form of the verb.
The position of *not* relative to the verbs and modals is instructive.

(15)  
   a. Andre must not have eaten.  
   b. Andre must not be eating.  
   c. Andre will too/so have eaten.  
   d. Andre will too/so be eating.

(16)  
   a. Andre has not been eating.  
   b. Andre is not eating.  
   c. * Andre not has been eating.  
   d. * Andre not is eating.  
   e. Andre has too/so been eating.  
   f. Andre is too/so eating.  
   g. * Andre too/so has been eating.  
   h. * Andre too/so is eating.

But:

(17)  
   a. * Andre not must have eaten.  
   b. * Andre not must be eating.  
   c. * Andre must have not eaten.  
   d. * Andre must be not eating.  
   e. * Andre too/so will have eaten.  
   f. * Andre too/so will be eating.  
   g. * Andre will have too/so eaten.  
   h. * Andre will be too/so eating.

The verbs, when inflected, are not in the VP. One way of seeing this is by way of VP Ellipsis, which I will formulate as a Transformational Rule.

(18)  Satoshi can eat natto but because Jones can't.
     Jones: I can't!

(19)  VP Ellipsis  
       Make a VP silent when it matches another VP in the discourse

A convention is to put a “△” in the position where ellipsis has applied:

(21)  Satoshi can eat natto but because Jones can’t △.

One reason for formulating VP Ellipsis as a transformational rule is that it appears to interact with other transformational rules. For instance, Heavy NP Shift can be ordered before VP Ellipsis, yielding (22).

(22)  Satoshi will eat natto, but he won’t △ casu marzu.
Don't think this is just evidence that VP ellipsis can elide a single verb, because there are some phrases that cannot undergo Heavy NP Shift and these phrases cannot be left behind by VP ellipsis.

(23) * Smith considered yesterday him handsome.

\textit{compare:}

Smith considered him handsome yesterday.

(24) * Smith might consider him handsome but he won't \textit{△} him charming.

With VP ellipsis, then, we can see that the items that appear to the left of \textit{not} do not stand inside the VP.

(25) \begin{itemize}
  \item a. Sam is eating pickles because Mike is \textit{△}.
  \item b. Sam should be eating pickles because Mike should \textit{△}.
  \item c. * Sam is eating pickles because Mike \textit{△}.
  \item d. I claimed that Mary is eating pickles, and [VP eating pickles] she is.
  \item e. I claimed that Mary has to be eating pickles and [VP be eating pickles] she has to.
  \item f. * I claimed that Mary is eating pickles, and [is eating pickles], she.
\end{itemize}

(26) \begin{itemize}
  \item a. Have you eaten pickles?
  \item b. Should you eat pickles?
\end{itemize}

We'd like to make Verb Movement obligatory in those contexts where \textit{I\textsuperscript{0}} holds inflection, and prevent it from happening when \textit{I\textsuperscript{0}} holds a modal. This looks like the effects of our constraint on Lexical Insertion that matches lexical items just to \textit{X\textsuperscript{0}} positions, but that happens at D-structure and not later. So we need to either change where lexical insertion takes place, or think of something else. For the moment, let's separate this out as a constraint that is meant to hold of an S-structure:

(29) \textit{X\textsuperscript{0} Constraint}

An \textit{X\textsuperscript{0}} position must be dominated by an \textit{X\textsuperscript{3}} that is matched to exactly one word.

Verb Movement, then, is responsible for building the inflected verb from its two parts: \textit{V\textsuperscript{0}} and \textit{I\textsuperscript{0}}.

\textit{I\textsuperscript{0}} can move too.

(30) \begin{itemize}
  \item a. Have you eaten pickles?
  \item b. Should you eat pickles?
\end{itemize}

(31) \begin{itemize}
  \item a. Which pickles have you eaten?
  \item b. What should you eat?
\end{itemize}

Where does \textit{I\textsuperscript{0}} move to? The common answer to this question, from den Besten (1983) and Koster (1975) is that it is \textit{C\textsuperscript{0}}.
(32)  
   a. Have you eaten?
   b. * I remember (that) have you eaten.
   c. Which pickles have you eaten?
   d. * I remember that which pickles have you eaten.

   Under this view, the rule involved in these questions, then, might be formulated as in (33).

(33)  
   **I-to-C Movement**
   Adjoin I\(^0\) to C\(^0\).

   We need to make sure that I-to-C movement happens only in questions. And we've also seen that there is a way of thinking about the distribution of complementizers that suggests there is a silent morpheme in the C\(^0\) position of questions: Q. We could use the same technique of bringing verbs into the I\(^0\) position when they are finite there. For finite I\(^0\), we suggested that there is a bound morpheme that occupies I\(^0\) position, and this morpheme is required to combine with a verb. That forces a verb to move into I\(^0\) position when it occupies finite morphology. We might similarly define Q as being a suffix on I\(^0\) (because that is what moves to C\(^0\) position in examples like *Should we continue?). The X\(^0\) constraint will then force movement of I\(^0\) to a C\(^0\) that contains Q.

   We got to the Verb Movement rule by way of two tests. One suggests that the finite verb is to the left of Neg\(^0\), and the other suggests it is not part of the VP it heads.

(34)  
   a. Andre has not been eating.
   b. Andre is not eating.
   c. * Andre not has been eating.
   d. * Andre not is eating.
   e. Andre has too/so been eating.
   f. Andre is too/so eating.
   g. * Andre too/so has been eating.
   h. * Andre too/so is eating.

(35)  
   a. Sam is eating pickles because Mike is \(\triangle\).
   b. Sam should be eating pickles because Mike should \(\triangle\).
   c. * Sam is eating pickles because Mike \(\triangle\).

   Both criteria tell us that something different happens with some verbs, however.

(36)  
   *Andre likes not/too/so apples.

(37)  
   * Andre ate apples because Jill bakes \(\triangle\).

   And to the extent that the rule which brings verbs into initial position targets just I\(^0\), we also learn that most verbs do not occupy I\(^0\) as they are not targets for this rule.

(38)  
   a. * Eat you pickles?
   b. * Which pickles eat you?
   c. Do you eat pickles?
   d. Which pickles do you eat?

   Indeed the majority of verbs are like *eat, bake* and *like*. Only the auxiliary verbs *have, be* and perhaps *do* undergo verb movement. How, then, are we to deal with the most common case?

   Bobaljik (1994, 1995) suggests weakening Lexical Insertion so that it can match a lexical item to two positions, just so long as they are adjacent. This would explain (39), on the assumption that *not* must intervene between I\(^0\) and VP.

(39)  
   a. * Andre not likes apples.
   b. * Jill not ran down the street.
   c. * Winnie so read that encyclopedia.
   d. * Bart too ran into the street.

   Problem:

(40)  
   a. Jill will completely /finite finish the apple.
   b. * Jill completely will /finite finish the apple.
   c. Jill completely finished the apple.

   We'll pursue instead the idea in Chomsky (1995), who suggests that I\(^0\) assigns inflection to a following verb in much the same way that we have seen Accusative Case assigned. He calls this assignment relationship: AGREE.
We'll have to modify the locality condition on Accusative Case assignment if AGREE is the same thing. We've already seen, however, that our locality condition on Accusative Case assignment (the "klose" relation) is broken.

Let's travel.

(42)  
\begin{enumerate}
  \item … daß Hans das Buch kauft.
  \hspace{1cm}…that John the book buys
  \item … daß Hans das Buch gekauft hat.
  \hspace{1cm}…that John the book bought has
  \item … daß Hans das Buch gekauft haben muß.
  \hspace{1cm}…that John the book bought have must
\end{enumerate}

VPs are head final, and let's assume (for now) that IPs are too. CPs are head initial — so this is a counterexample to Greenberg's headedness generalization.

We find a different word-order in root, or independent, clauses.

(43)  
\begin{enumerate}
  \item Hans hat das Buch gekauft.
  \hspace{1cm}John has the book bought
  \item Hans muß das Buch gekauft haben
  \hspace{1cm}John must the book bought have
\end{enumerate}

The general pattern is this:

(44) The finite verb immediately follows a sentence-initial XP.

This is known as a "Verb Second" word order pattern, or "V₂," for short.

The Koster/den Besten solution to the V₂ word order uses the two rules we've just seen responsible for positioning auxiliary verbs in English, plus another rule that English doesn't have: Topicalization.

We must understand Topicalization to be obligatory. So, we must understand every sentence to be equipped with at least one "topic."

Here are some illustrative derivations.

(45) Topicalization

Move an XP into Specifier of a CP if XP is the Topic.

(46) The finite verb immediately follows a sentence-initial XP.

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Confirmation, perhaps, that Verb Second word order is achieved by movement to C⁰ is that the X⁰ Constraint blocks movement of the verb to second position with C⁰ is occupied by a complementizer.

(49) a. Er sagt, daß die Kinder diesen Film gesehen haben.
   He says that the kids this film have
   ‘He says that the kids have seen the film.’

   b. Er sagt, diesen Film haben die Kinder gesehen.
   he says this film have the kids
   ‘He says that, this film, have the kids seen.’

Topicalization is also not found in contexts where I to C hasn’t applied, so we need to build that into our Topicalization rule.
(50) **Topicalization**

Move an XP into Specifier of CP if XP is the Topic and the head of the CP is occupied by \( I^0 \).

We see some interesting things about some of our generalizations across grammars in German. We see for instance, that Specifiers come first, just as our sketch of a linearization algorithm requires. However, unlike what our linearization algorithm requires, we see that there is not uniformity across category types with respect to the headedness parameter. CPs are head initial and VPs are head final. We’ll have to find a way of letting some more room in our linearization algorithm, it seems. We also see that German has some of the same rules that English does. That is, we see that derivations have at least some of the same properties that English derivations have. There is Verb Movement and I-to-C. And if we looked a little further, we’d also see that German has A movement and Wh Movement. One difference is that German has Topicalization, and though English does have a similar rule, it looks quite different.

Another place where German and English differ is with respect to the scope of Verb Movement. Unlike English, Verb Movement seems to apply to every verb. There is no other way in which verbs get inflected in German.

(51)  

\begin{align*}
\text{a.} & \quad \text{Gertrude buhlt Hans immer.} \\
& \quad \text{Gertie wooes Hans always} \\
& \quad \text{‘Gertie always wooes Hans.’} \\
\text{b.} & \quad \text{Immer buhlt Gertrude Hans.} \\
& \quad \text{always wooes Gertie Hans} \\
& \quad \text{‘Gertie always wooes Hans.’} \\
\end{align*}

Let’s take a look at our rule set for making derivations.

(52)  

\begin{align*}
\text{a.} & \quad \text{VP Ellipsis} \\
\text{b.} & \quad \text{Heavy NP Shift} \\
\text{c.} & \quad \text{Argument Movement} \\
\text{d.} & \quad \text{Wh Movement} \\
\text{e.} & \quad \text{Verb Movement} \\
\text{f.} & \quad \text{I-to-C} \\
\text{g.} & \quad \text{Agree} \\
\end{align*}

Let’s set VP Ellipsis and Agree aside for the moment. All the other rules are “movement” rules – they cause some term to have a new position. One observation we can make about all the movement rules is that the terms they move go into “higher” positions in a phrase marker. There is some evidence that this is a requirement for Wh Movement.

(53)  

\begin{align*}
\text{a.} & \quad \text{* I told who Sally left.} \\
\text{compare:} & \quad \text{I told Sally who left.} \\
\end{align*}

This requirement for Wh Movement uses a very specific kind of definition of “higher.”

(54)  

\begin{align*}
\text{a.} & \quad \text{Who Sally left bothered.} \\
\text{compare:} & \quad \text{Who boothered Sally.} \\
\end{align*}

(55)  

\begin{align*}
\text{Who left bothered Sally.} \\
\end{align*}

So:

(56)  

\text{Wh Movement}  \\
\text{Move a wh-phrase into a c-commanding Specifier of CP.}

(57)  

\begin{align*}
\alpha & \quad \text{c-commands} \beta \iff: \\
\text{a.} & \quad \text{every phrase that contains} \alpha \text{contains} \beta, \text{and} \\
\text{b.} & \quad \text{\( \alpha \) doesn’t contain} \beta. \\
\end{align*}

Examples like (58) might show us that the same requirement holds of A-Movement.

(58)  

\begin{align*}
\text{a.} & \quad \text{* It seems to Jerry’s dog to be happy.} \\
\text{compare:} & \quad \text{Jerry seems to the dog to be happy.} \\
\end{align*}

So:

(59)  

\begin{align*}
\text{Jerry seems to the dog to be happy.} \\
\end{align*}

(60)  

\text{A Movement}  \\
\text{Move an argument XP into a c-commanding Specifier position.}

Heavy NP Shift also seems to be subject to it:

(61)  

\begin{align*}
\text{a.} & \quad \text{* That squirrels suffer every child in Kindergarten bothers.} \\
\text{compare:} & \quad \text{That squirrels suffers every child in Kindergarten bothers.} \\
\end{align*}

This is already built into our definition of Heavy NP Shift, as it turns out:

(62)  

\text{Heavy NP Shift}  \\
\text{Right adjoin a “heavy” XP to the smallest IP dominating it.}
The way the constraint is framed is a bit different. It refers to a dominating phrase, rather than a c-commanding position. But these are very nearly saying the same thing:

(63) Move $\alpha$ to a Specifier that c-commands it $\approx$ Move $\alpha$ the Specifier position of a phrase that dominates it.

(64) Adjoin $\alpha$ to a phrase dominating it $\approx$ Adjoin $\alpha$ into a position that c-commands it.

It’s very difficult to demonstrate that Verb Movement or I-to-C must be similarly constrained, and this has sometimes been exploited. In his work on verbal inflection, Chomsky explored ideas that would have let verbs and $l^0$ move to lower positions. But at least for our present observations, this seems to be true:

(65) Verb Movement
    Adjoin $V^0$ to an $I^0$ that c-commands it.

(66) I-to-C Movement
    Adjoin $I^0$ to a $C^0$ that c-commands it.

If all movement operations are constrained in this way, we should factor this out of the rules, as it doesn’t seem to be something particular to any of the rules. Here’s a way of doing that.

(67) Upwards
    If $\alpha$ moves to position $\beta$, then the projection of $\beta$’s sister must dominate $\alpha$.

References


