

11 Syntax

MARK C. BAKER

1 The Domain of Syntax

At its most basic level, syntax can be defined as the branch of linguistics that studies how the words of a language can be combined to make larger units, such as phrases, clauses, and sentences.

As such, syntax is deeply concerned with the relationship between the finite and the infinite. Most languages have a finite number of basic words, but those words can be put together to make an infinite number of sentences. Thus, one can buy a more or less complete dictionary of English, but it is unthinkable to buy a similar reference book that would list all the sentences of English. This is because there are rules and patterns that can be used in a dynamic way to create and understand new English sentences. Syntax is the study of these rules and patterns. For example, readers of this chapter will be aware of having encountered the English words *this*, *loves*, *elephant*, and *eggplant*, and they will find them listed in their dictionaries. However, they will not be aware of having encountered the English sentence in (1) before, and they will be unable to “look it up”:

(1) This elephant loves eggplant.

Nevertheless, they will have no hesitations about recognizing it as English, or about being able to understand it and use it appropriately. Moreover, they will feel very differently about (2), even though it is made up of the same familiar elements:

(2) *Loves elephant eggplant this.

In this arrangement, the words are not well-formed, but rather are *ungrammatical* (indicated by * symbol).

Syntax is primarily concerned with whether a sentence is “properly put together” rather than whether it is meaningful, or silly, or bizarre. Thus, it is

concerned with the difference between (1) and (2), more than in the difference between (1) and the examples in (3) (Chomsky 1957: ch. 2).

- (3) a. Those hippopotamuses hate asparagus.
b. #This eggplant loves elephants.

These sentences are all instances of the same basic pattern from a syntactic point of view, even though they mean different things ((3b) in particular being nonsensical, and unacceptable for that reason). What the new sentences formed by the patterns of syntax actually mean is the primary concern of semantics. However, aspects of how words are put together can influence how the sentence is interpreted; hence these issues can come into the domain of syntax as well. Indeed, there is a complex interaction between the disciplines of syntax and semantics, and it is controversial whether the topics can truly be distinguished.

The other branches of linguistics that are closely related to syntax are morphology and discourse analysis: morphology because it builds the words that are the starting point of syntax, and discourse analysis because it involves the construction of sentences into even larger entities, such as texts. Again, it is somewhat controversial to what extent syntax is a distinct topic from these others. It is conceivable that sentences are built in accordance with the same patterns and procedures as words or texts are. In that case, syntax would not be a separate topic from morphology or discourse analysis. Be that as it may, there is no doubt that some kind of syntax exists, and that it involves taking the finite building blocks made available by a given language and putting them together into an infinite number of representations, which in turn can express an infinite number of thoughts.

2 The Chomskyan Perspective

The study of syntax has flowered since 1950, having been given new impetus by the work of Noam Chomsky. One small but essential part of Chomsky's contribution has been to bring certain insights and perspectives from the study of formal languages in mathematics and computer science to bear on the fundamental problems of syntax. For example, the simple mathematical concept of a recursive function sheds crucial new light on how a finite number of words could be pieced together to make an infinite number of sentences (Chomsky 1975: chs 7, 8). In essence, a recursive function is one that is defined in terms of itself – a “circular” definition that succeeds in saying something substantive. For example, suppose that English contains the following rules:

- (4) a. A sentence (S) consists of a Noun Phrase (NP) followed by a Verb Phrase (VP).
(S \rightarrow NP + VP)

- b. A VP consists of a verb (V), possibly followed by an NP and / or a clause (CP).
(VP → V, or V + NP, or V + CP, or V + NP + CP)
- c. A CP consists of a S, possibly preceded by a complementizer (C)
(CP → S or C + S)

English also includes the following words, which are members of the indicated lexical categories:

- (5) Noun phrases: John, Mary, Bill
Verbs: believes, likes
Complementizer: that

This is a very small vocabulary, and a relatively short list of rules / patterns. However, the set of rules is *recursive* in the sense that a sentence contains a VP, and one of the things a VP can contain is a clause (CP), which always contains a new S. This S in turn contains its own VP, which can contain yet another S. And so on. Thus, with only these rules one can already make an infinite number of grammatical English sentences, depending on how many times one puts a new S inside the verb phrase:

- (6) Mary likes Bill.
John thinks that Mary likes Bill.
Bill thinks that John thinks that Mary likes Bill.
Mary thinks that Bill thinks that John thinks that Mary likes Bill.
John thinks that Mary thinks that Bill thinks that John thinks that Mary likes Bill.

Note that each of these sentences expresses a distinct idea – one that is potentially useful in the complex world of high school courtship. Clearly there is much more to English than this, but it shows how the basic idea of recursion can elegantly address the apparent paradox of how people who have a finite amount of knowledge of English stored in their minds can produce and understand an infinite number of English sentences.

Another foundational contribution from Chomsky and the cognitive science revolution of the 1950s and 1960s has more to do with the spirit of linguistic inquiry than its technical machinery. This is the ethos that when one is trying to discover the syntactic rules and patterns of a particular language, those rules should be stated explicitly and precisely, with (ideally) nothing being taken for granted or left to the imagination (Chomsky 1957: Preface). To see why this has proved important, consider the difference between telling a friend to do something and programming a computer to do something. Interacting with your friends is generally easier, because you automatically expect the friend to bring a great deal of common sense to bear on the request, filling in the details and interpreting the command in the light of circumstances. In

contrast, computers have no inherent common sense; they do all and only what they are told in the most literal fashion. But while this can make working with computers exasperating, it can also make it educational, because trying to program a computer to do a task forces one to take stock of exactly what goes into that task, with no question-begging or step-skipping. This experience turns out to be highly relevant to the study of language. The syntax of English often seems deceptively simple, particularly in a monolingual situation. Since we all speak English (or another natural language), it is very easy to unconsciously fill in details without realizing it. If, however, one takes up the challenge of finding the patterns and principles of syntax to the point where one could (in principle) program a computer to judge sentences, manipulate them, and interpret them the way we do, one is forced to seriously investigate many issues that are otherwise easily overlooked. Sometimes this may seem obsessive to the outside observer: syntacticians sometimes seem to be telling needlessly complex stories when it is obvious that we say (1) and not (2) because “(1) sounds better” or “(1) makes more sense.” But in fact linguists are at least as interested in exactly what goes into this “linguistic common sense” as they are about the salient and arbitrary rules of grammar that get most of people’s attention (like “don’t end a sentence with a preposition”). In fact, many important discoveries have been made by taking this perspective, some of which will be mentioned below.

The broadly Chomskyan approach to syntax is often called *formal* or *generative*: “formal” because it uses mathematical style formalisms and definitions in presenting its analysis, such as the recursive rules above; “generative” because it seeks to explicate how fluent speakers can generate new well-formed expressions of a language. Many current syntacticians still accept these labels for their work, while others have reacted against them and what they see as some deficiencies and excesses of this approach. However, it seems fair to say that even those that react most loudly against the Chomskyan approach have been positively influenced by its most basic ethos and by some of what has been learned from that perspective. For purposes of this chapter I will attempt to background these areas of disagreement, and foreground areas of relative agreement, simply noting in passing some areas where interpretations differ significantly.

3 Basic Lessons of Syntactic Research

What then are some of the substantive discoveries that have been made by adopting this perspective to syntax? Beyond the details of a vast number of particular discoveries, one can identify at least three broad themes: (1) that syntax is a vast topic; (2) that constraints are central to syntax; and (3) that there is a large component of syntax that is common to all human languages. I will discuss each of these themes in turn, using them as a context for presenting some more specific material by way of illustration.

3.1 The vastness of syntax

The first important lesson that comes from several decades of research on syntax is that there is much more to syntax than anyone ever imagined. Natural languages turn out to be enormously complicated, once one takes up the “take nothing for granted” attitude of the computer programmer. Prior to reflection, it is natural to think of an activity like playing chess as the epitome of a complex activity requiring great intelligence; in contrast, forming grammatical English sentences seems like a very ordinary, routine behavior. After all, playing chess requires conscious mental exertion and some people can do it much better than others, whereas English sentences are formed automatically, almost unconsciously by practically everyone. Indeed, the first blush of success over phrase structure rules could make one think that that is pretty much all there is to it. However, the actual experience of computer programming has shown vividly that the real complexity of the tasks is the reverse. Steady progress has been made in programming computers to play chess, to the point that they now beat even the best human players. In contrast, there is still no computer system that can match the ability to judge, generate, and interpret English sentences of an average ten-year-old child, in spite of the fact that enormous resources have been devoted to the problem. Indeed, the longest grammars of the best-studied languages are not close to complete descriptions, and new discoveries about languages like English and French are still made on a regular basis.

3.1.1 Phrase Structure

To see where some of the complexities come from, let us return to the notion of phrase structure. Rules like $S \rightarrow NP + VP$ and $VP \rightarrow V$ or $V + NP$ express in a succinct way several facts (Chomsky 1965: ch. 2). First, they express the fact that all normal sentences must have at least a subject NP and a verb (except for imperatives, and certain elliptical expressions). If the subject is omitted, the sentence strikes native speakers of English as deviant.

- (7) a. Mary likes the dress.
b. *Likes the dress.

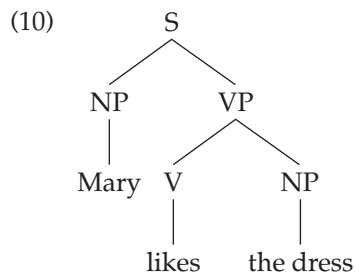
Second, these rules express the fact that the subject appears before the verb, and the object appears immediately after it. Thus, *The dress likes Mary* is a silly sentence with a completely different meaning from (7a); this is because it cannot be understood as having the object come before the verb and the subject after, but only as *the dress* being the subject and *Mary* being the object. The other logically possible rearrangements of the words are simply ungrammatical:

- (8) a. *Mary the dress likes.
b. *Likes Mary the dress.
c. *Likes the dress Mary.
d. (*)The dress Mary likes. (This is OK in context as a topicalization)

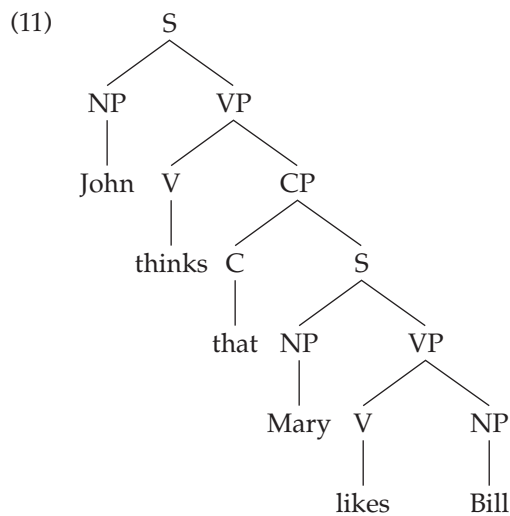
Third, the phrase structure rules as given also express the more subtle fact that the object and the verb together form a tighter unit in English, with the subject attached more loosely. Thus, in some special contexts one can put the verb and the object together at the front of the sentence, leaving the subject behind (see (9a)). In contrast, one can never put the subject and the verb at the front, leaving the object behind ((9b)).

- (9) I told you that John would like that dress, and indeed . . .
 a. . . Like that dress, John does.
 b. * . . John like, does that dress.

This unit that contains both the verb and the object but not the subject – the phrase that appears before the comma in (9a) – is called the Verb Phrase. Putting these pieces together, we can diagram the structure of a simple English sentence as follows:



Similarly, the second sentence in (6) would have the phrase structure diagram in (11); note the recursion, where one S is embedded inside another.



While these rules can be elaborated, refined, and added to, this gives some sense of how they are intended to work.

Already some complications arise. The phrase structure rules as given account for the ungrammaticality of (7a) compared to (7b), where the subject has been omitted. Now it is also ungrammatical to leave out the object of (7a):

(12) *John likes.

Indeed, (12) feels just as bad as (7b). However, unlike (7b), (12) can be generated by the phrase structure rules we have given. The difference is intentional. The reason is that (12) becomes grammatical when another verb is substituted for *likes*; for example, one can say *John smiles*. However, sentences like (7b) are impossible whatever verb is chosen (**Arrived the dress*, **Tore the dress*, etc.). Thus, it is a property of the particular English verb *like* that it needs to appear with an object, whereas it is a property of the English language as a whole that sentences need to have subjects. This difference between the status of subjects and objects is sometimes called the (*extended*) *projection principle* (Chomsky 1981). In contrast, the fact that objects must be present if and only if the particular verb of a clause specifically calls for one is sometimes called the *theta criterion* (Chomsky 1981).

3.1.2 Transformational and interpretive rules

Rich as they are, there seems to be more still to syntax than phrase structure rules. There are also certain systematic relationships between sentences that need to be captured, for which Chomsky originally proposed the formal device of the *transformational rule* (Chomsky 1957: ch. 7). These rules change one phrase structure into another. For example, consider the following English sentences:

- (13) a. Mary will like the dress.
 b. *Mary will like what?
 c. What will Mary like?
 d. *What will Mary like the dress?
 e. *The dress will Mary like.

Like other languages, English has a special set of words that can take the place of a missing piece of information in order to form a question; these are often called *wh*-words after the letters that most of them begin with (*who*, *what*, *where*, *which* . . .). However, (13b) shows that it is not enough in English to simply put one of these words in place of the desired piece of information. Rather, the *wh*-word must appear at the beginning of the sentence, as in (13c). Moreover, (13c) is a striking exception to the generalization made above that the verb *like* must be immediately followed by an object. On the contrary, in this environment *like* must *not* have an object after it, as shown by (13d). One

natural way to describe this network of facts is to say that the initial structure of (13c) is like that of (13a), with *what* substituted for *the dress*. However, the structure is “transformed” by a rule that can be stated something like this:

(14) Move *wh*-words to before the first word of an S that contains them.

This rule applies to interrogative NPs, but not to other kinds of NPs; hence (13e) is not possible, even though it is perfectly parallel to (13c).

Transformational relationships like these turn out to be relatively common. Indeed, (13) illustrates another one. Notice that the placement of the future auxiliary element *will* is different in declarative sentences like (13a) and interrogative ones like (13b). In declarative sentences, it always comes after the subject and before the main verb, whereas in interrogative sentences it comes between the *wh*-phrase and the subject. This change in word order is required (see (15a)) and one cannot have a second auxiliary of the same type in the usual position between the subject and the verb (15b).

- (15) a. *What Mary will like?
 b. *What will Mary will / may like?

Again, a movement transformation is a simple way to account for this fact:

(16) Shift the auxiliary verb to the front of the subject NP in sentences that are interpreted as questions.

There may also be processes that apply to phrase structures that do not fall under the general category of movement. Suppose that we expand our miniature English dictionary to include NPs that are pronouns, such as *he*, *she*, and *it*. Then the phrase structure rules generate examples like (17):

(17) John thinks that he likes Mary.

This sentence is ambiguous. Depending on context and expectations, it can easily be interpreted as meaning that John thinks that John himself likes Mary, or that John thinks that some other male we are discussing (say Bill) likes Mary. This is an essential feature of how competent English speakers understand and use sentences with pronouns. Now suppose that each distinct person referred to is associated with a unique number, written as a subscript to the Noun Phrase(s) that refer to it. Then the ambiguity in (17) can be captured by adding a rule like the following (Chomsky 1973; this rule is given for illustrative purposes; it is not now widely accepted, although the effect is genuine (Lasnik 1989: ch. 4)):

(18) Copy the referential index of an NP onto a pronoun as its referential index.

This is called an interpretive rule, rather than a transformational rule. It is optional: one meaning of (17) comes from applying the rule, and the other meaning comes from choosing not to apply it.

- (19) a. John₃ thinks that he₃ likes Mary₄, or (by (18))
 b. John₃ thinks that he₂ likes Mary₄.

Just as the transformational rules apply only to a specific set of items (*wh*-words, auxiliary verbs), so (18) applies only to pronouns. Thus, if the man named John also happens to be a sentimental fool, one can in principle use either the NP *John* or *the sentimental fool* to refer to him. However, if one replaces the pronoun *he* in (17) with the NP *the sentimental fool*, the sentence can only have a meaning like (19b), where three distinct people are being discussed. This is because *the sentimental fool* is not a pronoun, and therefore rule (18) does not apply.

The existence of transformational rules like (14) and (16) and interpretive rules like (18) is more controversial than the existence of phrase structure. These elements of a linguistic analysis can be eliminated; one simply has to make up new phrase structure rules that will generate the desired sentences directly (Gazdar et al. 1985). Some syntacticians prefer this alternative approach, often for reasons of computational simplicity or formal elegance. However, there is no doubt that there needs to be *some* kind of general mechanism for expressing the relationships among the different parts of a syntactic structure – such as the relationship between the sentence initial question word in (13c) and the fact that the sentence has no NP in the object position of the verb phrase.

3.2 The centrality of constraints

This is far from exhausting the domain of syntax, however. Indeed, it merely sets the stage for what is perhaps the most interesting and significant discovery of all: the existence of *constraints*. When the various rules of syntax are stated in their simplest and most general form, they typically “over-generate,” producing a number of ungrammatical sentences along with the grammatical ones. Therefore, syntacticians have proposed a system of constraints that prevent these rules from running wild.

As an example, let us return to the rule that moves *wh*-words to the front of sentences. This is a very general phenomenon, but it turns out to be far from exceptionless. Consider, for example, the following more complex examples:

- (20) a. John will think that Mary likes the dress
 b. John will think Mary likes the dress.
 c. What will John think Mary likes – ?
 d. What will John think that Mary likes – ?

- e. Who will John think – likes the dress?
- f. *Who will John think that – likes the dress?

(20a) and (20b) are both simple sentences, formed by the phrase structure rules in (4). They differ only in whether the complementizer *that* is present or not: in (20a) the CP inside the VP containing *think* is expanded as C + S (where *that* is C); in (20b) the CP is expanded simply as S. Examples (20c) and (20d) are the result of generating *what* as the object of the embedded sentence and moving it to the front; both are grammatical, as expected. Examples (20e) and (20f) are the result of substituting *who* for the subject NP of the embedded sentence and moving it to the front. This time, we find something unanticipated: (20f) is ungrammatical for most speakers, even though our rules can construct this sentence just as easily as the others. There seems to be a special, additional constraint at work here, which can be phrased as follows (Chomsky and Lasnik 1977):

(21) *Complementizer constraint*

A sentence is ungrammatical if a complementizer comes immediately before a verb (in languages where subject phrases are generally obligatory).

Since only (20f) has the forbidden sequence of words ... *that* – *likes* ... it alone is ruled out by (21), as desired.

There are other constraints on *wh*-movement as well. We have seen that either a subject or an object can be replaced by a *wh*-word, which then moves to the front of the clause. However, a difference between subjects and objects arises when one tries to question only a part of the noun phrase. When a question word replaces part of an object noun phrase and moves to the front, the result is often perfectly acceptable, as in (22).

- (22) a. You saw [a picture of *John*].
- b. Who did you see [a picture of –]?

However, when a question word replaces a similar part of a subject noun phrase, the result is unacceptable:

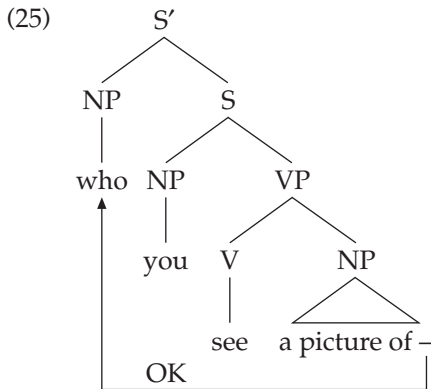
- (23) a. [A picture of *John*] disturbed you.
- b. *Who did [a picture of –] disturb you?

There is no obvious reason why (23b) should not be as useful or meaningful a sentence as (22b); it just sounds awkward. To account for this, linguists have stated the following condition (Huang 1982):

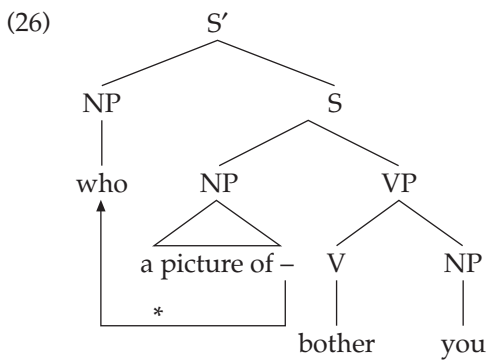
(24) *The condition on extraction domains* (CED):

A phrase X can move out of a phrase Y only if Y is immediately contained in a Verb Phrase.

Since the object is inside the VP, as shown by the phrase structure diagram in (25), the movement in (22b) is possible:



However, the subject NP is not inside the Verb Phrase; therefore question words cannot move out of the subject:



Thus, the condition on extraction domains correctly differentiates between sentences like (22) and (23).

There are also interesting constraints on the pronoun interpretation rule in (18). Suppose that the object of a sentence is a pronoun. That pronoun can easily be understood as referring to something contained in the subject noun phrase, as expected:

(27) *John's*₂ mother₃ loves *him*₂.

The situation is not symmetrical however. If we put a pronoun in the subject position, it cannot normally be understood as referring to something contained in the object. Thus, *he* cannot be John (or the mother) in sentences like (28), but must be some third person.

(28) * He_2 loves $John's_2$ mother $_3$

One might think that this is simply a matter of linear order – that a pronoun can never refer to a noun phrase that comes after it. However, this is not true. For example, in a sentence like (29), the pronoun *his* comes before *John*; nevertheless, *his* can be understood as referring to John, at least for most English speakers. (This interpretation is easier to get if one says the sentence with the main stress on the verb *loves*, rather than on *John*.)

(29) (?) His_2 mother $_3$ loves $John_2$.

Thus, we need to add a condition to (18), which by itself implies that pronouns can always refer to any other NP in the same sentence (Lasnik 1989, Reinhart 1983). First, it helps to define the term *c-command*:

(30) *C-command*:

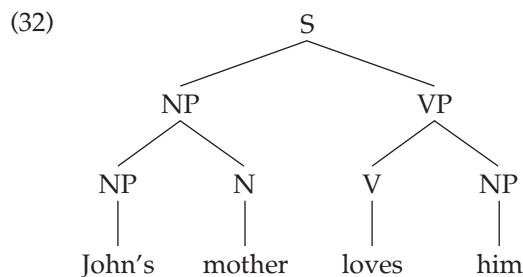
An element X *c-commands* another element Y if the first phrase which properly contains X also properly contains Y.

Given this, we can state the condition on pronouns as follows:

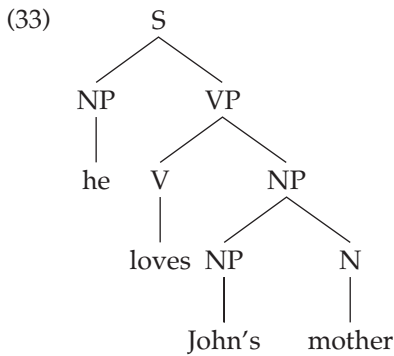
(31) *Disjoint reference condition (DRC)*:

A pronoun X may not refer to the same thing as (have the same index as) a nonpronominal NP Y if X *c-commands* Y.

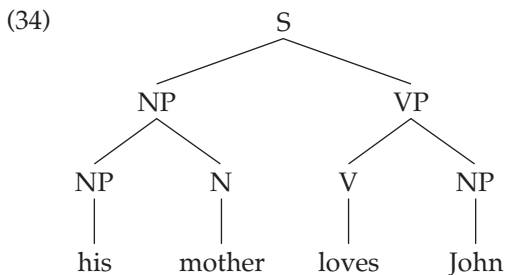
This explains the pattern of facts as follows. Consider (32), which is the structure of (27).



First we must check if the pronoun *him* *c-commands* the NP *John*. The first category that properly contains *him* is the VP, and *John* is outside this VP. Thus, the pronoun does not *c-command* *John* in this structure. Therefore, the DRC does not apply, and (18) can; thus, the pronoun may refer to the same thing as “John.” However, (28) comes out differently:



Here the first category that contains the pronoun *he* is *S*, the whole sentence, and *S* obviously contains the NP *John* as well. Therefore, the pronoun does c-command the noun phrase in this structure, so the pronoun cannot refer to the same thing as that noun phrase, by the DRC. Finally, (34) is the structure of (29):



Here the pronoun *his* is not the whole subject, but only a part of the subject. Thus, the first phrase which properly contains *his* is the subject NP. This subject NP does not include the object *John*. Therefore, the pronoun does not c-command the NP in this example. Therefore, coreference is possible again. Thus, we see that a condition defined over the basic phrase structure of the sentence accounts for the usage of pronouns in English; indeed, it does so better than a simplistic rule that says that a pronoun must come after the Noun Phrase that it refers to.

Much of the beauty of these constraints comes from the fact that in many cases they regulate the operation of more than one transformational relationship (Ross 1967, Chomsky 1973, Chomsky 1977). For example, in addition to the transformations outlined above, English has a rule of relative clause formation that makes noun phrases out of sentence-like structures. A simple example is:

(35) Mary likes the dress → The dress that Mary likes –

This is not the same process as question formation, but it is somewhat similar in that a noun phrase (here *the dress*) comes to appear at the beginning of the

clause, and there is a gap inside the clause where a noun phrase normally has to be. Thus, this too can be thought of as a movement process. Now given the way the constraints are set up, we automatically expect relative clause formation to have the same limitations as question formation. This is correct. Like question movement, relative clause formation cannot create a configuration where the complementizer *that* comes immediately before the verb. The examples in (36) are exactly parallel to those in (20).

- (36) a. The dress that John thinks Mary likes –
 b. The dress that John thinks that Mary likes –
 c. The woman that John thinks – likes the dress
 d. *The woman that John thinks that – likes the dress

Similarly, relative clause formation obeys the CED, such that part of the object can be moved, but not part of the subject. (37) is parallel to (22b) and (23b).

- (37) a. The man that you saw a picture of
 b. *The man that a picture of disturbed you

This is an important finding, because it shows that the constraints should not be built into the individual transformations themselves; rather they are more general, and have a semi-separate existence. A priori, one could write the Complementizer Filter and the CED into the basic formulation of the question movement transformation. The result would be a rule that is rather complex and inelegant. Furthermore, the same complexities would have to be written into the relative clause transformation – and into a number of other transformations as well. Clearly, it is better to factor these out as separate conditions. This has led to the view that the constraints are really more fundamental than the transformations themselves, a shift from seeing language as fundamentally a list of construction rules to seeing it as a system of constraints that must be satisfied (Chomsky 1981).

Ongoing research has proceeded in the direction of uncovering constraints that are more and more general. A good illustration is the so-called “shortest move” constraint. Auxiliary inversion seems to be quite a different kind of process from both question movement and relative clause formation: it moves a very different kind of linguistic element (a verb, rather than a noun phrase) to a somewhat different position under partially different circumstances. As a result, constraints like the complementizer constraint and the CED do not seem relevant to this particular transformation. Nevertheless, there are similarities. Suppose that one tries to generate a sentence with two distinct *wh*-words, each substituting for a different piece of desired information, as in (38a). The *wh*-movement rule must apply exactly once to such a structure (in English), moving one of the *wh*-words to the beginning of the clause and leaving the other in place, as shown by the grammatical example in (38b). Strikingly, one does not have a choice as to which of the *wh*-words to move, as shown by (38c).

- (38) a. John gave what to who.
 b. What did John give to who?
 c. *Who did John give what to?

Something very similar is found with *auxiliary inversion*. (39a) shows a structure that contains two distinct auxiliary verbs. Auxiliary inversion can apply once and only once to this structure to create the grammatical Yes / No question in (39b). Again, one does not have a choice of which auxiliary to move, as shown by the ungrammaticality of (39c).

- (39) a. John will have eaten the sandwich by noon.
 b. Will John have eaten the sandwich by noon?
 c. *Have John will eaten the sandwich by noon?

There is a simple generalization here: in both cases it is the element that starts off closest to the front of the clause that must move. This has led linguists to propose the “shortest move” condition, which favors shorter movements to longer movements when there is a choice (Chomsky 1995). All the various kinds of movements arguably obey this very general condition. This condition can be looked at as a kind of *economy condition*, in the sense that it favors the smallest possible adjustment to the structure. One strain of current research explores the idea that all conditions can be reduced to a very small number of these “super-conditions,” all of which have an economy flavor (Chomsky 1995).

3.3 *The similarity of all human language*

A third major lesson that emerges from contemporary syntactic research is that all natural languages are strikingly similar. This is certainly not one’s first impression. There are some six thousand languages currently spoken in the world, many of which had relatively little contact with each other until recently. When speakers of an Indo-European language first start to learn a Native American language, or an Australian Aboriginal language, or an East Asian language they are usually more struck by difference than by similarity. However, the differences seem to be largely on the surface. We have already seen how once one starts to take nothing for granted one begins to discover many unsuspected intricacies of English grammar. It is not surprising that when one begins to study other languages from the same perspective, one finds unsuspected intricacies in those languages too. What is surprising is that the intricacies turn out to be largely the same, even across languages that are geographically separated and historically unrelated. Moreover, this seems to be more true the further one goes into the linguistic analysis. Thus, the phrase structures of languages are not necessarily the same; for example, verbs and prepositions come before their object noun phrases in English, but they come after their objects in Japanese, Hindi, and many other languages. Similarly, the

transformational processes of a language may or may not be the same. For example, English has a rule that moves question words to the front of the clause, but languages like Chinese, Japanese, and Hindi do not. But at the level of syntactic constraints it is striking that constraints originally discovered for languages like English and French often show up in other languages – or at least it is possible to rephrase the constraint slightly so that it applies to all of the languages. Thus, the syntax of natural languages is not only vaster than we thought, but it is also more similar than we thought.

To get a flavor of how this kind of reasoning goes, consider the Edo language, spoken in Nigeria. This language had no contact with European languages until recent times, and has had no impact on the development of syntactic theory before now. Thus, it provides an interesting test case for the generality of that theory. In fact, it can be shown that Edo is strikingly like English in most of the syntactic features presented above. (The data in this section is from O. T. Stewart, personal communication.)

First of all, the same basic phrase structure rules that work in English work also in Edo. For example, the subject comes before the verb, and the object comes immediately after it:

- (40) Òzó guòghó àkhé.
Ozo broke pot.
“Ozo broke the pot.”

As in English, the subject noun phrase is obligatory in all clauses, but whether an object is needed or not depends on which verb is chosen:

- (41) a. Òzó só.
Ozo shouted
“Ozo shouted.”
b. *Guòghó àkhé.
broke pot
 (“Pot” must be the subject, not the object: Àkhé guòghó “the pot broke.”)

While Edo does not have any process that fronts the VP that is directly comparable to the English one in (9a), it is possible to show that the object and verb form a relatively tight unit to the exclusion of the subject, as in English. Thus, the basic phrase structure patterns $S \rightarrow NP + VP$ and $VP \rightarrow V$ or $V + NP$ (or $V + CP$) are equally valid for both languages.

There are also similarities between the two languages at the level of transformations. Edo, like English, has a rule that obligatorily moves question words to the front of the clause:

- (42) a. *Òzó ghá guòghó dèmwìn?
Ozo will break what

- b. Dèmwin nè òzó ghá ghó'ghó?
 what that Ozo will break
 "What will Ozo break?"

Edo also has the optional process of assigning a pronoun the same reference as a noun that appears elsewhere in the sentence. Thus, (43) is ambiguous in Edo, just as (17) is in English.

- (43) Òzó hòó nè ò kpàá.
 Ozo wants that he leave. (he = Ozo, or he = the other guy under discussion)

However, Edo does not have the Auxiliary Inversion transformation. Thus, in (42b) the future tense auxiliary *ghá* does not shift to before the subject in Edo questions the way it does in English (**dèmwin ghá òzó guòghó*). Instead a special functional word *nè* is inserted in this position. This kind of patterning gives syntacticians the impression that, while languages are certainly not identical, they seem to choose their syntactic structures from a limited set of options that are universally available.

Finally, consider the level of constraints. Recall that English puts limitations on when a *wh*-word can move to the front of the clause, such as the CED. The same constraint holds in Edo. (44a) shows a sentence in which a clause is in the object position with respect to the main verb *ta* "say." (44b) shows that one can generate a question word as the object of this embedded clause and then move it to the front of the sentence as a whole in the usual way.

- (44) a. Úyì tá wé!é òzó dé ímótò.
 Uyi said that Ozo bought car.
 "Uyi said that Ozo bought a car."
 b. Dèmwin nè Úyì tá wé!é òzó dé – ?
 what that Uyi said that Ozo bought.
 "What did Uyi say that Ozo bought?"

In contrast, in (45a) there is a clause that functions as the subject of the main verb *yee* "please." All things being equal, it should be possible to replace the object of this clause with a question word and then move that question word to the front, forming the question in (45b). But this is impossible.

- (45) a. Wèé òzó dé ímótò yèé Úyì.
 that Ozo bought car please Uyi.
 "That Ozo bought a car pleased Uyi."
 b. *Dèmwin nè wèé Òzó dé – yèé Úyì?
 what that that Ozo bought please Uyi.
 "What did that Ozo bought please Uyi?"
 (i.e. "What did it please Uyi that Ozo bought?")

Note that exactly the same judgments hold true of the English translations. This confirms that the same constraint on question movement holds in both languages.

The DRC also applies in Edo, constraining how pronouns are interpreted. Consider the following range of examples:

- (46) a. *Wé'è né'né ékítà lèlé Ìsòkèn yèé órè.*
That the dog followed Isoken pleased her (OK her = Isoken)
b. *Wé'è né'né ékítà lèlé éré yèé Ìsòkèn.*
That the dog followed her pleased Isoken. (OK her = Isoken)
- (47) a. *Ìsòkèn hòó nè né'né ékítà lèlé éré.*
Isoken wants that the dog follow her. (OK her = Isoken)
b. *Ò hòó né né'né ékítà lèlé Ìsòkèn.*
She wants that the dog follow Isoken. (Only OK if she ≠ Isoken)

The examples in (46) have an embedded clause that functions as the subject of the main verb *yèé* “please”, and the speaker desires to express that the object of the embedded verb (the person who is followed) is the same person as the object of the main verb (the person who is pleased). This can be done by either putting a pronoun in the embedded clause and a name in the main clause, or vice versa. The examples in (47) are similar, except that this time the embedded clause is the object of the main verb *hòó* “want.” Now if the speaker desires to express that the subject of wanting is the same person as the intended object of following, the options are restricted: the name must be used as the subject of the sentence as a whole, and a pronoun must be used as the object of the embedded clause, as in (47a). It is grammatical to use a pronoun as the subject and a name as the embedded object, as in (47b), but then the pronoun can only be interpreted as some third person, not *Ìsòkèn*. This is exactly what the DRC predicts. In (47b) the smallest phrase containing the pronoun is the sentence as a whole, which also contains *Ìsòkèn*. Therefore, the pronoun c-commands the name, and coreference is prohibited. However, the pronoun does not c-command the name in any of the other sentences in (46) or (47) (it is contained in the embedded VP in (46b) and (47a), and in the main VP in (46a); these phrases do not contain *Ìsòkèn*). Therefore, coreference is allowed. Again, the same judgments are valid for the English translations, confirming that the same constraint holds in both languages.

Sometimes even when languages look quite different, they are actually responding to a similar constraint in a different way. An interesting example comes from the complementizer constraint, stated in (21). The configuration of complementizer *wèé* followed by verb is also avoided in Edo:

- (48) a. *Dèmwìn nè Úyì tá wèé òzò dé –*
what that Uyi said that Ozo bought.
“What did Uyi say that Ozo bought?”

- b. *Dòmwan nè Úyì tá wèé – dé ímótò.
 who that Uyi said that buy car.
 "Who did Uyi say that bought a car?"

However, English avoids the problematic configuration by omitting the complementizer; in contrast Edo avoids it by filling in the space left behind by the question word with a pronoun, as shown in (49) (see (Koopman 1982) for discussion of this pattern in Vata):

- (49) a. *Dòmwan nè Úyì tá dé ímótò.
 who that Uyi said buy car.
 "Who did Uyi say bought a car?"
 b. Dòmwan nè Úyì tá wèé ó dé ímótò.
 who that Uyi said that he buy car.
 "Who did Uyi say bought a car?"

Moreover, this difference in the two languages is not an arbitrary one. Edo is different from English in that it normally requires embedded clauses to have a complementizer; in symbols, $CP \rightarrow C + S$ is the only option in Edo. Therefore, (49a) is ungrammatical in this language. On the other hand, there are other situations in which pronouns show up where question words once were in Edo. This then is a simple example of how even in areas where languages look somewhat different, important similarities can be discerned, particularly in the domain of constraints.

Over all, when one compares the syntax of different languages, they seem to be making different choices from a similar range of options: they have the same kinds of phrase structures, with possible differences in the order of the words; they have the same kinds of transformations; they have the same general constraints, although with different specific ways of satisfying them. This leads to the idea that much of human language is somewhat like a kit that you buy at a store: the basic pieces are prefabricated, although there is some variation in how you assemble them (and much freedom in how you decorate the final product).

Up to this point, there is reasonably broad agreement across a wide range of syntacticians, although significant differences in emphasis. Disagreement becomes more vigorous on the question of how to interpret this interplay of universal patterns and language-particular facts. Roughly three approaches are current. The first is the *principles and parameters* approach of Chomsky himself and his nearer followers. This takes the view that the principles of language are essentially universal, and they take the form of a certain number of stipulated abstract constraints. The set of these principles is often referred to as *Universal Grammar*. Language variation comes from fixing certain *parameters* – especially those that involve the idiosyncratic properties of the words of a language (Chomsky 1981). This has been called a "constitutional view." The second approach is more "architectural" (Bach 1988). It emphasizes the modes of composition of the words of languages (phrase structure rules or the

equivalent) and tries to state those principles of combination in just such a way that constraints like the CED emerge as theorems of the system. This is roughly the view of more mathematically oriented theories like categorial grammar and generalized phrase structure grammar. Third, there are a variety of functionalist approaches. These see the universal constraints on language as functional in nature: they are design features that facilitate language's basic purpose of communication, a goal which is taken to be essentially the same across the species (see, for example, Croft 1995). On these views, language-specific idiosyncrasies are generally taken to have historical explanations, in which some communicative strategy that was originally a dynamic option gets entrenched as a habit, and thus becomes a "rule" of a particular language.

The CED facts surveyed above can provide an illustrative comparison of these perspectives. I stated the CED as an extrinsic constraint, in the style of the formal, "constitutional" approach: all movements are possible, *unless* they violate this "law." A functionalist approach, on the other hand, would investigate the communicative purpose of asking a question and the communicative purpose of expressing something as a direct object (rather than a subject or a modifier), looking for (in)compatibilities at that level. At first, it seems like it should be easy to determine which approach is correct by simple cross-linguistic comparison. The formal approach predicts that CED-type restrictions should appear when and only when there is a movement relation; the exact communicative purpose of the movement is not directly relevant. For example, (37) showed that the CED restricts the formation of relative clauses as well as questions, even though the communicative effects of the two are quite different. Conversely, I mentioned in passing that some languages form questions simply by replacing the unknown material with a suitable interrogative word, with no movement. On the formal view, it should be possible to ask a wider range of questions in these languages than in English, because the CED does not restrict this kind of question formation. For a number of languages, this seems correct. Thus, (50) is a grammatical question in Chinese, where the *wh*-phrase *shei* replaces an NP inside a clause that functions as the subject of the sentence as a whole (Huang 1982):

- (50) [Lisi da-le shei] shi ni hen bugaoxing? (Huang 1982: 496)
 Lisi hit-ASP who make you very unhappy.
 "Who did it make you very unhappy that Lisi hit?"

Strikingly, relative clause formation does involve movement of an NP in Chinese – although to the end of the clause, rather than to the beginning of the clause. Thus, the formal approach expects CED-style restrictions, and that is what one finds:

- (51) ??Lisi da-le – shi wo hen bugaoxing de neige ren
 Lisi hit-ASP – make I very unhappy DE that man
 "The man that it made me very unhappy that Lisi hit"

However, there is also evidence that points the other way. For example, Foley and Van Valin (1984: 22–4) mention that question words are not moved in the Native American language Lakhota; yet the kinds of sentences that violate the CED in English are also ungrammatical in Lakhota:

- (52) #WiChaSa wā taku ophethū ki he wālaka he.
 man a what buy the that you-see Q
 “What did you see the man who bought?”

They point out that the badness of (52) makes more sense from the functionalist perspective, assuming that there is some kind of basic incompatibility between the goal of asking a question and the goal of expressing an object modifier. This functional style of explanation can rule out sentences like (52) in the same way in Lakhota and English, irrespective of differences in how each particular language chooses to express questions. Much work remains to be done to sort out whether the formalist expectations or the functionalist expectations fit the facts better, or whether some kind of synthesis is called for. This is an area in which further research and debate can be expected.

4 Universal Grammar and Parameterization: A Concrete Example

So far, I have presented syntacticians’ claims about Universal Grammar only by comparing English and Edo. While this is a fair test in as much as the languages developed quite independently of each other, it is clear that they are relatively similar typologically. In the rest of this chapter, I will illustrate the claims of syntax by way of a more radical comparison, between English and the Mohawk language. The analysis in this section, based on Baker (1991, 1996), is less a part of the standard canon than the material presented so far, and some features of it are controversial. However, its leading idea has wide acceptance, and it provides a good illustration of some characteristic features of contemporary syntactic research.

If one offered a prize for the language that looks the least like English, Mohawk would be a strong candidate. At first glance, one finds differences wherever one looks, starting with the most simple sentences. We saw that in English and Edo a transitive verb must appear with two NPs, a subject and an object. In Mohawk this is not so: either the subject or the object – or both – can be left out, and the result is still a complete and grammatical sentence:

- (53) a. Sak ranuhwe’s atya’tawi.
 Sak likes dress
 “Sak likes the dress.”
 b. Ranuhwe’s atya’tawi.
 likes dress
 “He likes the dress.”

- c. Sak ranuhwe's.
Sak likes
"Sak likes it."
- d. Ranuhwe's.
likes
"He likes it."

In English and Edo, the subject must come before the verb and the object after; in Mohawk this is not so. Rather, the subject, the object and the verb can appear in any of the six orders that are logically possible for a three word sentence (see also (53a)):

- (54) a. Ranuhwe's Sak atya'tawi.
likes Sak dress
"Sak likes the dress."
- b. Sak atya'tawi ranuhwe's.
Sak dress likes
- c. Ranuhwe's atya'tawi ne Sak.
like dress NE Sak
- d. Atya'tawi ranuhwe's ne Sak.
dress like NE Sak
- e. Atya'tawi Sak ranuhwe's.
dress Sak like

In English, the object and the verb sometimes move together as a unit; in Mohawk this is never possible, as far as researchers have been able to determine. Thus the phrase structure rules of English do not seem applicable to Mohawk at all. Such languages are sometimes called *nonconfigurational* (Hale 1983).

Moving on to the domains of transformations and constraints, recall that in English, a question word can move out of the direct object noun phrase to the beginning of the clause, but question words cannot move out of subject noun phrases (see (22) and (45)). One similarity between Mohawk and English is that question words must move to the front of the clause in Mohawk too:

- (55) Uhka washakokv' ne Sak?
who see NE Sak
"Who did Sak see?"

However, in Mohawk when one tries to move a question word out of some larger phrase that serves as the object, the result is just as ungrammatical as if the question word moves out of a subject phrase. Thus, there is no difference here between subjects and objects the way there is in English and Edo:

- (56) a. *?Uhka wesatsituni' ne akokara?
who made-cry-you NE story
"Who did the story of make you cry?"

- b. *?Uhka senuhwe's ne akokara'?
- who you-like NE story
- "Who do you like the story of?"

In English, the DRC says that a pronoun subject cannot refer to an NP contained in the direct object, but a pronoun object can refer to an NP contained in the subject ((27) and (28)). In contrast, both kinds of coreference are possible in Mohawk.

- (57) a. (Akauha) wa'akoya'takehnha' ne Uwari akona'tsu.
- her help NE Mary pot
- "Mary's pot helped her." (OK her = Mary)
- b. (Rauha) wahanohare' ne Sak rao'share.
- he wash NE Sak knife
- "He washed Sak's knife." (OK he = Sak)

Thus, our first impression is that the syntax of Mohawk is radically different from the syntax of English, and (except for question movement) virtually none of the rules and principles seem to carry over. Rather, it seems like, in order to analyze Mohawk insightfully, one must start from scratch, building a theory that accounts for Mohawk in its own terms.

There is another possibility, however. It could be that Mohawk is actually rather like English, but we are looking at it wrong. In fact, when one looks a little further, certain similarities begin to turn up. Consider once again the DRC. Before, I only used this to explicate differences between subjects and objects, but the condition is more general. For example, most English speakers find a difference between (58a) and (58b):

- (58) a. I hired *him*₂ [because *John*₂ was a good worker].
- b. *I told *him*₂ [that *John*₂ was a good worker].

Superficially, these sentences look very similar, the main difference being the first verb. However, the pronoun *him* can be understood as referring to *John* in the first sentence, but not in the second. Why should this be? Part of the answer is that the embedded clauses in these two sentences are performing very different functions. In (58b), the clause is basically a special kind of object. As such, it can be replaced by a normal NP object:

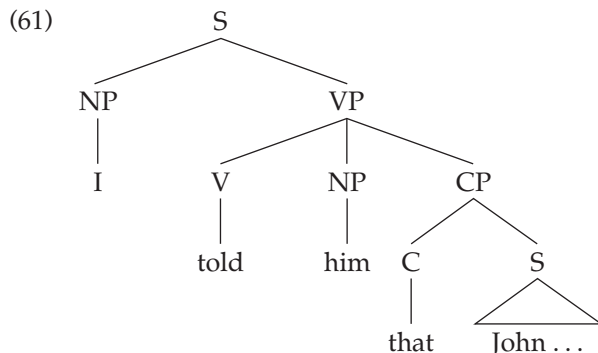
- (59) I told him [the news].

However, a similar replacement is not possible in (58a):

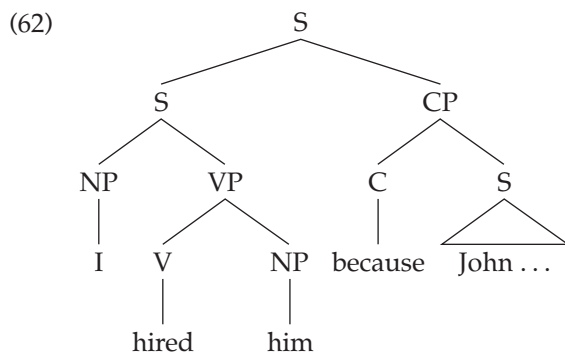
- (60) *I hired him [the reason].

The embedded clause is not an object of the verb at all in (58a); rather, it is a *modifier* that helps put the main clause into context. As a result, the embedded clause is optional in (58a); if it is omitted, the sentence is still grammatical and

complete. In contrast, (58b) sounds incomplete without the embedded clause. These differences translate into a difference in the phrase structure of the sentences. Since the clause of *tell* functions as a kind of direct object, it makes sense that this would be generated inside the VP, in the same kind of position as other direct objects:



On the other hand, since the *because* clause is a modifier of the sentence as a whole, and only loosely attached to it, its phrase structure is as in (62):



Now we can apply the DRC to these structures and we get the results we want. In (61) the object pronoun c-commands the NP *John* inside the embedded clause; therefore they cannot refer to the same thing. In (62), however, the object pronoun does not c-command the NP “John” inside the *because*-clause: the first phrase that properly contains the pronoun is VP, and this VP does not contain the modifier. Therefore, the pronoun can refer to the same thing as the NP, just as we observed.

Significantly, comparable sentences in Mohawk elicit the same pattern of judgments, as shown in (63).

- (63) a. (Rauha) wahi'nha'ne' ne tsi Sak rayo'tvhseriyō.
 him I-hired because Sak is-a-good-worker
 “I hired *him* because *Sak* is a good worker.” (OK him = Sak)

- b. (Rauha) wahihrori' tsi Sak rayo'tvhseriyo.
 him I-told that Sak is-a-good-worker
 "I told *him* that *Sak* is a good worker." (Not OK: him = Sak)

Again, the pronoun object of the first verb can refer to an NP in the embedded clause when the verb means "tell," but not when it means "hire." Perhaps then the DRC applies in Mohawk after all.

Consider next the CED. Given the structures in (61) and (62), the CED predicts that *wh*-words should be able to move out of *that*-clauses but not *because*-clauses, because only *that*-clauses are immediately contained in VP. This is true in English:

- (64) You think [that Mary kicked *John*.]
 Who do you think [that Mary kicked –]?
 (65) You cried [because Mary kicked *John*.]
 *Who did you cry [because Mary kicked –]?

(In fact, this kind of contrast was part of the original motivation for the CED in Huang (1982).) Strikingly, the same contrast is found in Mohawk. Sentences like (66a) are perfectly grammatical, while sentences like (66b) are not:

- (66) Uhka ihsehre' Uwari wahuwarasvtho'?
 Who you-think Mary kicked
 "Who do you think Mary kicked?"
 (67) *Uhka wa'tesahvrehte' ne tsi Uwari wahuwarasvtho'?
 who you-shouted because Mary kicked
 "Who did you shout because Mary kicked?"

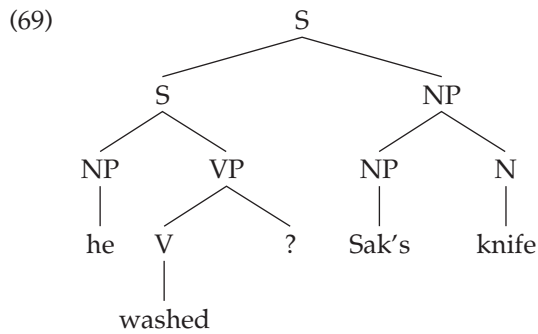
Thus, there is evidence that the CED applies in Mohawk too.

So far, we have something of a paradox. When we look at noun phrase objects and subjects, Mohawk and English seem completely different. However, when we look at embedded clauses, they seem very much the same. How can this conflicting evidence be reconciled?

In fact, there is a rather simple way of resolving the paradox. (Formal) syntactic analysis characteristically comes in two steps: first, one determines the basic structures of sentences in the language, and, second, one defines conditions over those structures. Given this, the fact that one gets different grammaticality patterns in Mohawk from English is not necessarily due to a difference in the conditions, but could be due to a difference in the basic structure that the conditions apply to. Let us then hypothesize that the conditions in Mohawk are indeed the same as those in English, based on the evidence from embedded clauses. Now, reconsider sentence (57b), repeated as (68).

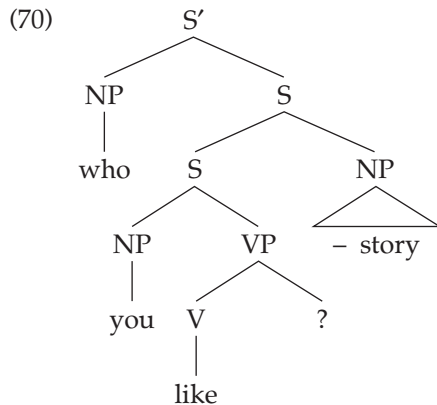
- (68) (Rauha) wahanohare' ne Sak rao'share.
 he wash NE Sak knife
 "He washed Sak's knife." (OK he = Sak)

Here the pronoun subject can be coreferent with the NP *Sak* inside the direct object, unlike in English. If the DRC really holds in Mohawk, this can only mean that the object NP is in some other position where it is not c-commanded by the pronoun subject. In other words, it must be outside of the smallest phrase that properly contains the subject. Is there such a position? The answer is yes: we saw above that *because*-clauses can be attached loosely to the sentence as a whole. This is only legitimate because the sentence is complete without the *because*-clause. However, the same is true of object NPs in Mohawk; sentences are complete without them (see (53c)). Thus, the structure of (68) is (69).



More generally, we can conjecture subject and object NPs are always loosely attached to the clause in this way in Mohawk.

This hypothesis about Mohawk sentence structure immediately solves some other problems as well. Another difference between Mohawk and English was that question words cannot move out of object NPs in Mohawk, as shown in (56b). This now makes perfect sense. The NP that we are trying to move out of is not a true object after all, but rather a loosely attached NP, in the same kind of position as *because*-clauses:



Since the loosely attached NP is not in the VP, it follows from the CED that a question word cannot move out of this NP. These sentences fall into place with no further adjustments.

The important thing to realize here is that the DRC and the CED both seem to go wrong in Mohawk – but *crucially they go wrong in the same way*. They both assume that object NPs are inside the VP. Once this assumption about basic structure is corrected, the conditions consistently give the correct results after all. Our first impression was that Mohawk was different from English in almost every imaginable way. We have now corrected that impression; in fact, Mohawk differs from English in only one way, as stated in (71) (see Jelinek 1984; the idea apparently has roots as far back as Humboldt's remarks on Nahuatl in the first half of the nineteenth century).

- (71) NPs are true subjects and objects in English, but are loosely attached to the sentence as a whole in Mohawk.

Since this affects the basic structure of the sentence, and many conditions are stated in terms of that structure, it causes ripples throughout the grammar of Mohawk. Nevertheless, most of the syntactic principles are the same.

In fact, there is reason to think that even (71) overstates the differences between Mohawk and English. Consider again the fact that the subject and object in Mohawk do not need to appear:

- (72) Ranuhwe's. (= (53d))
likes
"He likes it."

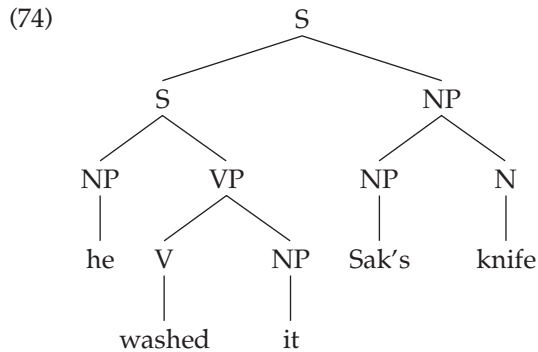
Why is such a sentence possible? The verb *nuhwe'* "like" is similar to its English translation in being a transitive verb; logically speaking, it is a two-place predicate. Thus, it should need to have two NPs, almost as a point of logical necessity. The reader may have noticed that when NPs are missing, the gaps are interpreted as pronouns – "he" and "it" in this case. Moreover, what pronoun to use is determined by agreement prefixes on the verb. Many languages such as Spanish use different verb forms for different subjects, depending on whether it is first person, or second person, or whatever:

- (73) a. (eI) habla español. "He speaks Spanish."
b. (tu) hablas español. "You speak Spanish."
c. (yo) hablo español. "I speak Spanish."

Moreover, languages that have enough of this kind of agreement typically allow one to omit the pronoun, because the information is already there on the verb; thus, it is normal to say simply *Hablo español*. Linguists often assume that there is still a pronoun present in the syntactic structure of such a sentence, but it is not pronounced. Now Mohawk is like Spanish in these respects, only more so: Mohawk verbs change form not only depending on the subject, but depending on the object as well. Thus, it is not surprising that Mohawks can

leave out both subject and object pronouns unless they want to give them special emphasis.

With this in mind, we can reconsider Mohawk structures in (69) and (70). These structures are peculiar from the English perspective because there is no direct object (or the direct object is in the wrong place, depending on your terminology). However, given Mohawk's rich agreement system, it is reasonable to say that there is an object present, but it is simply one of the invisible pronouns just discussed. Then a more complete structure for (68) would be:



This structure does not look so unfamiliar. English too can have structures in which the true object is a pronoun, and some NP is attached to the sentence to clarify what that pronoun refers to, as shown in (75).

- (75) a. That dress, he really likes it.
 b. He really likes it, that dress.
 c. That dress, he really likes it, John.

This phenomenon is called *dislocation*. It is colloquial and not particularly common in English, but it does exist. Thus, it is not really accurate to say that English and Mohawk have different structures; it is more accurate to say that Mohawk uses dislocation all the time, while English does not.

Finally, we can ask why NPs *must* be dislocated in Mohawk but not in English. Moreover, recall that embedded clauses do not need to be dislocated; rather they can appear inside the VP in Mohawk just as in English, as shown in (63)–(67). In fact, a similar contrast between NPs and clauses is found in English, although in a different part of the grammatical system. Some verbs like *believe* can have either an NP or a clause as their object:

- (76) a. People generally believe [John]_{NP}.
 b. People generally believe [that John is telling the truth]_{CP}.

However, when these verbs are put in the passive voice, the situation changes. The clause can still remain in its usual position after the verb, but the object NP cannot. Rather, it must be “dislocated” – in this case to the subject position:

- (77) a. It is generally believed [that John is telling the truth]_{CP}.
 b. *It is generally believed [John]_{NP}.
 (Compare: [John]_{NP} is generally believed –.)

Apparently putting the verb in the passive form disrupts its ability to take an NP object, but has no effect on clauses. This has led linguists to propose a principle which I state very informally as follows (a part of the case filter; Chomsky 1981):

- (78) If an affix (of a certain type) is attached to a verb, it can no longer take an NP as a direct object.

Now we know that every transitive verb in Mohawk has affixes attached to it. In particular, it has an affix that agrees with the object in person, number, and gender. Suppose this agreement affix is in the same class as the passive voice affix. Then it follows that NPs will never be in the normal object position in Mohawk; they will always be dislocated. There will be no similar effect on clauses, however. If this is correct, then all of the many differences between Mohawk and English actually boil down to this:

- (79) All Mohawk verbs have affixes that agree with their subject and object (but English verbs do not).

There is nothing mysterious or complex about (79); on the contrary, it is one of the first things one must face when learning Mohawk.

In closing, let us reconsider the basic question of whether Mohawk is like English. Crucially, the answer depends on what one means by the question. In one sense, Mohawk is obviously very different. In particular, the basic structure of most sentences in Mohawk is very different from that of comparable sentences in English. As a result, words can appear in any order, pronouns have different possibilities of interpretation, question words face different limitations, and so on. However, in another sense, the syntax of Mohawk and English is virtually identical. This comes out most clearly if one makes a list of the syntactic principles that hold in both languages and compares it to a list of the differences:

- (80) a. *Common elements ("principles")*
 The disjoint reference condition
 The condition on extraction domains
 Question words become clause-initial
 Clauses must be "logically complete" (have the right number of NPs)
 NPs can be "dislocated" to the edge of a sentence
 The case filter, etc.
 b. *Differences ("parameters")*
 Verbs agree with both subject and object in Mohawk, not English

Almost all the principles are the same, and the one difference is a rather superficial one. However, that one difference just happens to be like a pebble that is in exactly the right position to start an avalanche: it has repercussions throughout the grammar.

Thus, this extended example should help to explicate what syntacticians mean when they speak of "Universal Grammar," and when they say that "all human languages are essentially the same." This claim makes sense, but only when one shifts from looking at languages as some kind of list of sentence structures to looking at them as a set of constraints in the minds of speakers that the sentences they form must satisfy. In other words, one must look not at particular Mohawk examples like (53) to (57), but rather at the abstract characterization of Mohawk in (80) that induces those examples. Chomsky (1986) refers to this as the shift from looking at "Externalized language" to looking at "Internalized language," a part of his emphasis on the importance of a psychological interpretation of syntactic theory. Hopefully, this example also illustrates something of the intellectual interest that surrounds the task of trying to tease out what is universal in human language and what is idiosyncratic and particular, which is a central focus of current syntactic research.

12 Generative Grammar

THOMAS WASOW

1 Introduction

1.1 “Grammar”

To most people, the word “grammar” suggests a normative enterprise, dictating what constitutes correct language use. For example, many educated English speakers would identify at least five supposed grammatical “errors” in the following sentence:

- (1) Hopefully, we will be able to easily figure out who to talk to.

Yet native speakers of American English also certainly recognize that (1) would be an entirely acceptable and natural sounding sentence in ordinary discourse. Indeed, the supposedly “correct” alternative (2) would be an awkward and affected way of expressing the thought.

- (2) I hope that we shall be able easily to figure out to whom to talk.

Modern linguistics has little use for this prescriptive conception of grammar. Linguists are more interested in the knowledge of English that allows native speakers to judge (1) as fully acceptable and (2) as somewhat less natural. The prescriptions of traditional grammar are attempts to impose the speech patterns of one region, class, ethnicity, or generation on speakers belonging to other groups. They may be of interest to sociologists, historians, and political scientists, but they tell us very little about the nature of language.

Language is a natural phenomenon, constituting an essential component of every human society. Linguistics is concerned with studying languages and language in general, much as biology studies living species and life in general. From this scientific perspective, the norms of prescriptive grammar are to