

4 Syntax

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The term *syntax* (← Greek 'arrangement') is used to refer to the rules of a language for the grouping of words into larger units, i.e. sentences. The basic unit of syntax is the sentence just as the morpheme is that of morphology, for example. When dealing with the sentence the first matter to stress is that its formation is rule-governed. This fact is obvious if one considers for a moment how a child acquires a language. To begin with children are exposed to the speech of others around them (their family, playmates, etc.). They slowly learn to abstract from sentences they hear the structures which lie behind them. Equipped with this structural knowledge they can then at a later stage produce sentences not necessarily heard before. This is known as the generative aspect of syntax. Children after the age of 6 or 7 have a store of words (a lexicon) and a set of sentence patterns abstracted from what they heard in the first few years of life. By combining the two they theoretically have access to an infinite number of sentences. Each sentence has a definite structure which is in keeping with the rules for sentence formation in a given language, i.e. it is *well-formed* (the latter

is a purely descriptive term and means that a sentence would be acceptable to native speakers of a language).

Linguists assume that we all possess an *innate language faculty*, which is part of our biological makeup and which enables us to acquire the grammar of our native languages well, quickly and without any instruction. The language faculty is present in our brains, but not accessible to our consciousness. It consists of what is technically called *universal grammar* (see below for further remarks), a specification of the structures and rules which are possible in human language. During early childhood the language faculty combines with the raw data of the child's surroundings to give a mental grammar of this language (a subset of universal grammar with specific settings for certain parameters).

Language faculty (universal grammar) + exposure to language X →
Mental grammar of language X

Support for the assumption that we all have an innate language faculty comes from the fact the grammars which children construct during childhood are remarkably uniform across groups of individuals. Furthermore, the ability to acquire and use language proficiently is largely independent of intelligence.

The mental grammar which we construct during childhood forms the unconscious knowledge of our native language which we carry throughout our lives. It is this knowledge which we use when we speak. We can also tap into it on demand, for instance when judging language produced by others. This can be shown quite easily. Imagine a situation where a foreigner asks a native speaker of English (not a linguist) to correct something which the former has written in English, say an important letter. The English speaker then reads the text and judges this according to his/her *intuitions* about the English language. By 'intuitions' one means the unconscious knowledge which results from language acquisition in early childhood. It is important to stress that this knowledge is unconscious: speakers have intuitions about grammaticality but they cannot formulate the rules of syntax on demand. Hence in the hypothetical situation just described, the English speaker will probably wish to change parts of the foreigner's letter without necessarily giving linguistic reasons for wishing to do so. Most likely, the English speaker will offer alternatives or re-formulate sentences in such a way that they are spontaneously acceptable to other speakers of English.

4.1 The nature of linguistic theory

In the past fifty years or so, theories of linguistics have been closely connected with research on syntax. The only level of linguistics which shows a comparable concern with theory is phonology where many alternative models exist.

What is a theory? A linguistic theory is a system of assumptions which

attempt to explain the nature of human language and which is based on principles independent of the data of any individual language. There are a number of criteria which any theory of language should meet.

Economy The number of constructs assumed should be kept to a minimum, the assumption being that the human language faculty avoids unnecessary proliferation of structure and principles.

Simplicity The constructs themselves should be maximally simple in structure. Defining simplicity has proved a difficult task and there is no accepted algorithm for doing this.

Generality The statements made about language should apply to the maximum number of languages and the greatest number of levels within each language.

Falsifiability Any statement about language should be inherently falsifiable. If not the statement could be false and it would be impossible to demonstrate this.

In addition to the above, a linguistic theory must fulfil three important criteria of *adequacy*. In the early years of generative grammar these were outlined by Chomsky with reference to the theory which he himself had developed. The first type is *observational* adequacy which a grammar shows if it generates the data observed for a particular language correctly. The second type is *descriptive* adequacy which applies if the grammar expresses all linguistically significant generalisations concerning the language in question. The third type is *explanatory* adequacy which a grammar can be said to possess if it offers a principle basis for deciding between competing grammars all of which show descriptive adequacy. The search for these three types, above all, for the last, has guided the alternations and mutations which generative grammar has gone through over the past few decades. The major versions will be outlined briefly below (from section 4.4. *The study of syntax* onwards).

4.2 Why analyse sentence structure?

Research on syntax has been particularly intensive in the last 50 years or so. By and large one can recognise three main aims in the analysis of sentence structure contained in this recent literature.

- 1) to reveal the hierarchy in the ordering of elements
- 2) to explain how surface ambiguities come about
- 3) to demonstrate the relatedness of certain sentences

To this end linguists have developed a series of tools which render visible the structure which they assume to lie behind sentences. The mechanisms for analysing sentences vary great from one syntactic model to the next and within a given school of syntax there may well be many changes during its development.

This is particularly true of *generative grammar* which has been the subject of detailed research ever since the publication of Noam Chomsky's seminal study *Syntactic Structures* in 1957. Whatever the devices used to represent sentences in linguistic studies, the goal of the technique is to uncover internal structure, accounting for the particular orders of words found in the sentences of a language. To this end linguists normally distinguish between a level of structure which is not visible – what one can loosely call *deep structure* – and a level which corresponds to the actual form of a spoken or written sentence, what one can loosely call *surface structure*. Major syntactic relations in sentences, such as subject, object, predicate are taken to be specified at the level of deep structure while more minor matters such as the order of elements (as in active and passive sentences) are assumed to be determined in the process of generating the surface structure.

When talking about deep and surface structure it is important not to assume that these terms are used in a vertical spatial sense. By 'deep structure' is meant a level of representation where the meaning of the sentence structure is unambiguous and where basic sentence structures are to be found before they have been altered, i.e. gone through possible transformations (movement rules), deletions, etc. Whether this corresponds to some mental level or a stage in a process prior to actually speaking a sentence is not known (Chomsky himself has been very sceptical about this) and there is at present no way of finding out. The validity of deep structure is found in its ability to disambiguate sentences and to show links between types of sentences which are not evident on the surface.

4.2.1 *Acquisition of syntax*

In the first part of the 20th century there was a school of thought in psychology called *behaviourism* which maintained that children gained knowledge of their native language by imitation. This notion became controversial in linguistics with the advent of generative grammar in the 1950s. Basically it was a stand-off between imitation and generation: the first standpoint maintained that sentences are learned by children imitating the language of adults, ultimately learning sentences off by heart, while the second standpoint claimed that adults can produce sentences because of the process outlined in the following table.

Input	Language heard in child's surroundings
Step 1	Abstraction of structures from actual sentences
Step 2	Internalisation of these structures as syntactic templates (unconscious knowledge)

The untenable nature of the behaviourist argument has repeatedly been pointed out and it is worth remembering: if one learns by imitation then one should not be able to produce a sentence which one has never heard before. But this is patently untrue. The majority of sentences which we utter are unique. The point

here is not so much that the behaviourists maintained that all knowledge of syntax is acquired by imitation as that they did not apply sufficiently stringent principles to the linguistic side of their arguments and did not think through the consequences of their standpoint to its logical conclusion. But just this was done by the generativists and their conclusion was that knowledge of syntax is acquired in early childhood, stored in abstract form and accessed later any time one wants to utter a sentence.

4.2.2 *Sentence production*

Given that children acquire syntax by abstracting structures from the actual sentences they hear in their surroundings, it is fair to assume that the production of sentences as outlined in the steps below apply to all speakers using their native language.

- 1) Choose a sentence structure (an empty template)
- 2) Fill the slots in with words (lexical insertion)
- 3) Utter the actual sentence

Other steps may be involved in producing particular sentences. Take the case of active and passive sentences. It is obvious that these are related in meaning and there is a clear relationship in form as well, seeing as how the object of the active sentence becomes the subject of the passive one and the subject of the active sentence is expressed (optionally) as a prepositional object. One can safely say that active sentences in English are statistically more frequent than passive ones – these are used for topicalisation (special emphasis of the semantic object of the active sentence) or to avoid mentioning the semantic subject by omitting the prepositional phrase in the passive sentence. So there is a sense in which active sentences are more basic and passive ones are secondary. This fact has led linguists to imagine that the relationship between the two is one of *derivation*: first speakers choose a template for an active sentence and then alter this into a passive sentence. There is much disagreement here, for example, some linguists maintain that the derivation does not take place during production but is merely a shorthand for expressing the obvious formal relationship between the two types of sentence.

In older models of syntax it was assumed that these sentence types, such as active and passive, were related by so-called transformations, changes in structure which were assumed to correctly account for the observed relationships. These transformations tended to be dropped more and more out of syntactic models in the 1970s and 1980s and replaced by other, simpler devices. Later they came to be termed ‘movement rules’ and were greatly reduced in number. They are seen as notational means of indicating the relatedness of sentence types.

Whether derivation, such as that of passive from active sentences, takes

place during production or not, one can nonetheless recognise that many sentence types are related to others which are similar in meaning and form. For instance, interrogative and imperative sentences can be described in terms of a basic sentence from which an interrogative or an imperative one is derived. Whatever the precise status of such relatedness is in our mental grammar, it is fair to assume that we do not store separately declarative, interrogative and imperative sentences like the following – this would be inefficient and unnecessarily block mental resources which could be use for other purposes.

Declarative *Fiona read the new book.*
 Interrogative *Did Fiona read the new book?*
 Imperative *Fiona, read the new book!*

4.3 The structure of clauses and sentences

4.3.1 Form and function

The words in sentences can be classified in various ways and it is sensible to first distinguish between form and function. According to form, a word can belong to a certain lexical class, for example the word *umbrella* is a noun. According to function a noun may typically be a subject or an object (*The umbrella fell off the stand* versus *He bought the umbrella*). The major lexical categories involved in forming sentences are nouns and verbs, they are also many grammatical words as shown in the following.

Lexical words

Nouns, verbs, adjectives, adverbs

Grammatical words

Auxiliary verbs

may, might, must, will, can, could, should

Determiners

Definite and indefinite articles, demonstrative pronouns, possessive pronouns

Prepositions

on, over, towards, under, against, beside, at, around

Personal pronouns

I, you, he, she, it, we, they; me, his, her, its, us, them

Quantifiers

very, more, too, a lot, all

Qualifiers

maybe, never, almost, always

Conjunctions

and, or, although, but

There is not complete agreement here. Prepositions are regarded by some scholars as lexical words with descriptive content and by others as mere function words. Certainly their lexical status is different from that of nouns or verbs which have maximum descriptive content.

Overlap between certain categories is also found. For instance, some personal pronouns can function as determiners in sentences like *We teachers don't believe you linguists*. One should also remember that varieties of English may have different category assignments than the standard language. The oblique personal pronoun *them* functions as a demonstrative in many varieties, e.g. *Them linguists have no standards*, to mention one well-known example. Other varieties do not require the infinitive particle *to* in the complements of certain verbs, e.g. *Fiona allowed Fergal [to] stay. She helped him [to] get out of bed*.

A key difference between grammatical and lexical words is that the former cannot be 'stacked'. By this is meant that grammatical words occur one at a time but lexical words can have multiple instances at the same point in a sentence, for example *She is a beautiful, elegant, sophisticated, young lady. She stole, deceived, cheated, lied and slept her way into that job*. But this is not possible with grammatical words: **This, her, a new computer*. Cases like *Her one interest in life* contain *one* functioning as an adjective. This can be shown by a simple substitution test where *one* is replaced by the adjective *sole* which retains the meaning of the sentence: *Her sole interest in life*.

The lexical words can furthermore form so-called *phrases*, that is groups of words in which a lexical word is the head or dominant element. For example, the phrase *this particularly interesting film* is a noun phrase, consisting of a head noun *film*, an adjective *interesting* which is qualified by the adverb *particularly* with the demonstrative pronoun *this* preceding all the other words. The head of a phrase does not have to be the first element. In fact in English it rarely is because in this language the elements which co-occur with heads, so-called modifiers, precede these. Other languages have the reverse order. In Irish, for example, modifiers follow their heads as can be seen from the phrase *an scannán an-suimiúil seo*, lit. 'the film very interesting this'. Rather than considering position to determine the head of a phrase, it might be advisable to search for the element without which the phrase would be incomplete. In the English phrase just given one can see that *film* is the element which is indispensable for the noun phrase, deleting or substituting other elements will not change the kind of phrase, e.g. *this interesting film* or *a particularly interesting film* are still noun phrases whereas *this particularly interesting* is not.

Because phrases are larger structures which incorporate individual words they occur further up in tree diagrams as will be seen presently.

4.3.2 *Arguments and complements*

Arguments are the constituents which occur in sentences because of the requirements of verbs. A traditional binary division recognises intransitive and transitive verbs, i.e. those without an object – *Fiona smiled* – and those with an object – *Fiona has eaten the potato*. The latter group is in fact more complex and allowance must be made for ditransitive verbs – *Fiona gave Siobhan the new book* – some of which have prepositional or clausal complements – *Fiona spent her holidays in Connemara*. *Fergal regarded her as his potential successor*. Still others can take a past participle in adjectival function, e.g. *He thought the matter closed* or have a prepositional object, e.g. *Fiona cooked a meal for Fergal* or show an infinitival complement, e.g. *Fiona intends to write a novel*.

In connection with argument types one can mention the group of *small clauses* which consist of a noun and a following verbal phrase which can together be regarded as a complement, e.g. *Fiona made [Fergal sit down]*, *Fiona considers [him devious]*. Small clauses include such traditional complement types as *accusative and infinitive*, deriving from Latin, which denote the complements of certain verbs which take a direct object and an infinitival complement as well, e.g. *Fiona asked [Fergal to stop]*, *Fiona ordered [the student to be quiet]*.

In general, the term *complement* can be used to denote constituents which occur in object positions after verbs. Some verbs allow variation among their complements, for example *consider* can take a nominal object – *Fiona considered the matter* – or a small clause – *Fiona consider [the matter difficult]*.

The element which introduces a complement is a *complementiser*, abbreviated to COMP. There are different types, most of which are found before clausal complements (1 to 3 below). A complementiser can also be found introducing a complex nominal (4 below) which acts as the complement of a verb.

Fiona thinks that Fergal is lazy
Fiona wonders whether Fergal is lazy
Fiona questioned if Fergal was sincere
Fiona was concerned for Fergal's safety

The first example show the word *that* acting as a complementiser. This suggests the word belongs to a different category than *that* in its determiner function. Syntactic patterning is the justification for this. One can show that the noun qualified by the determiner *that* can be deleted but the complement introduced by the complementiser *that* cannot, consider the following sentences.

Fiona regretted that move à *Fiona regretted that*
Fiona thinks that move was wrong à **Fiona thinks that*

In many sentences one finds elements that are optional. Here linguists may speak of *adjuncts*, those elements which can be omitted without affecting the grammaticality of a sentence, e.g. adverbial phrases as in *Fiona left (in a huff)*.

4.3.3 *Thematic roles in sentences*

If one now considers the role of elements in a sentence from the semantic perspective one can offer a classification of these semantic roles. Work on such roles began in earnest in the 1960s and in the government and binding model of generative grammar (see below) these were defined explicitly. The following is a list of the most common roles.

- 1) *Theme (patient)* : the entity undergoing an action, change of state, etc., e.g. *Fiona fell asleep*.
- 2) *Agent* : the initiator of an event or action, e.g. *Fergal bought a bicycle*.
- 3) *Experiencer* : the entity which experiences a state, e.g. *Fiona was despondent*.
- 4) *Benefactive* : the entity which benefits from an action *Fergal bought flowers for Fiona*.
- 5) *Locative* : a specification of place, e.g. *Fiona's flowers are in the kitchen*.
- 6) *Goal* : the entity which is the end point (goal) of an action, e.g. *Fergal took the rubbish to the bin*.
- 7) *Source* : the entity which is the starting point (source) of an action, e.g. *Fiona came home from the office*.

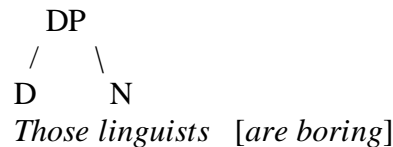
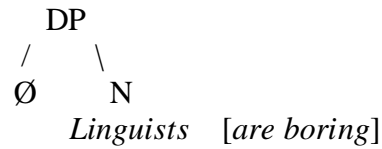
Thematic roles are often referred to use the name of the Greek letter theta, i.e. as *theta-roles* or *T-roles*.

4.3.4 *Traces*

A controversial concept in syntactic theory of the past few decades is that of a *trace*. By this is meant that in the formation of a sentence, the underlying structure may have undergone some change by moving an element from one position to another. The original position of the shifted element is assumed to contain a trace and this can affect operations on the derived sentence, notably it can block contraction. Consider the following example.

<i>We have no interest in linguistics</i>	à	<i>We've no interest in linguistics</i>
<i>Will we have a party tonight?</i>	à	<i>*Will we've a party tonight?</i>

To the right of the arrows are contracted forms of the pronoun and auxiliary. This is permissible with declarative sentences, but not with interrogatives. The



The assumption of a null determiner allows expressions like *linguists* and *those linguists* to be treated in like manner, something which is a gain in terms of symmetry and economy of description.

4.3.6 Similarities in patterning

Similarity in syntactic patterning often leads linguists to subsume different elements under a single heading. In a well-known suggestion by Chomsky, he proposed allocating both finite auxiliaries and infinitival *to* to a category *Inflection*, abbreviated to INFL or just I. The justification for this that both finite auxiliaries and infinitival *to* share positions and behaviour in sentences as can be seen from the following examples.

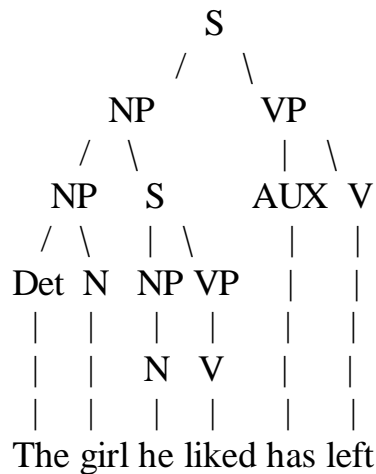
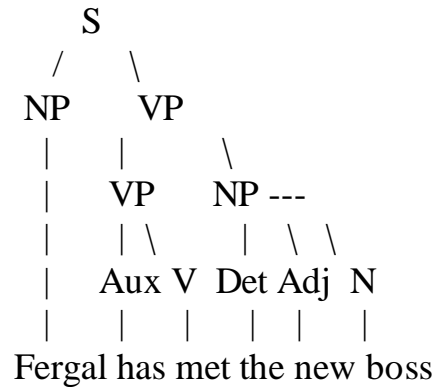
Fiona doesn't want to read the book but she knows she should
Fiona should read the book but she doesn't want to

4.4 Sentence analysis

In the various models of syntax, diagrams are offered purporting to show the underlying structure of sentences. Among linguists there is much discussion about whether such representations have any psychological reality. It is obvious that we have a mental grammar of our native language, otherwise comprehensible speech would not be possible. The tree diagrams drawn by linguists do not exist mentally, but certain abstract properties which they embody can be taken to have psychological reality. For instance, in diagrams some elements precede others and this corresponds to a temporal precedence in the speaking of a sentence. In a tree diagram of the sentence *Fiona has left the office* the noun *Fiona* would appear at the leftmost position with *left the office* to the right with the verb *has* in between. This ordering reflects the precedence relations of the elements in the sentence. Equally tree diagrams represent dominance relations. For instance, in the sentence *Fergal is [concerned about Fiona]* the phrase in square brackets consists of a past participle, *concerned*, functioning as an adjective. This dominates the prepositional phrase *about*

Fiona, in which *about* dominates the noun *Fiona*. It is the relation of elements to each other in sentences which is assumed to hold for our mental grammars, irrespective of how we represent these relations on paper.

Having dealt with these caveats, one can now look at some of the techniques which have been developed in syntactic analysis. Initially, a sentence was broken up into its constituent elements by a process of branching from a single element at the top – the sentence – down to all the individual elements of the actual sentence at the bottom, what is called a *terminal string*. In this type of analysis the function of a word becomes obvious from the label which is used above it within the diagram. Below two sample sentences are given in which the internal structure is shown by means of a tree diagram.



4.4.1 *Phrase structure grammar*

The above diagrams are intended to render visible the structure which underlies the respective sentences. The basis for the branches is what is called *phrase structure grammar*. This is a type of grammar which attempts to show the structure which lies behind a sentence by breaking it down into its component

parts. The steps necessary for this involve *re-write rules* which split a larger unit, starting with the sentence itself, into its next smallest components, continuing until one has reached the lowest level which consists of the individual words of a sentence, the terminal string.

Sentence	à	Noun Phrase + Verb Phrase
Verb Phrase	à	Verb + Noun Phrase
	à	Auxiliary and full Verb
Noun Phrase	à	Determiner + Noun

(determiner = articles, possessive pronouns, demonstrative pronouns, numerals, etc.)

From the first re-write rule one can see that this represents the simplest type of sentence, a subject and an intransitive verb as in *Beethoven died*. The second rule breaks down the verb phrase of the first and can be used to deal with a sentence like *Beethoven wrote symphonies*. The noun phrase can be further broken down, for instance, to accommodate the sentence *Beethoven wrote nine symphonies* where *nine* is a determiner. The number of re-write rules necessary is dependent on the complexity of the sentences as these simple examples show.

Readers may well ask whether there is evidence to support the representation of syntax in tree form. To answer that question consider a few examples of what are known in the trade as ‘garden path’ sentences. These are sentences where the interpretation speakers normally make at the beginning of a sentence has to be revised later.

Fat people eat is dangerous for their coronary system.
The security officers demand costs a lot of money.

The assumption native speakers of English appear to make is that in the above sentences the elements *fat* and *security* are an adjective and a part of a compound respectively. This assumption is abandoned when other words in the sentence are heard (or read) which contradict this. Linguists imagine that what speakers do is to analyse sentences structurally as they are perceived and that in the case of garden path sentences this analysis must be revised midstream so to speak. Such behaviour would appear to justify the notion that we break down sentence structurally as we process them – the mental equivalent of drawing a tree diagram, i.e. the latter can be regarded as a visual representation of the analytical steps and assumptions we go through in the perception and production of speech.

In reality garden path sentences are not a problem for native speakers because, in the above instances, a very slight, but perceptible, pause after *fat*

and *security* is made to indicate that the elements do not modify the following nouns. Nonetheless, the conclusions drawn in terms of speakers' mental representation of sentences would seem to be valid.

4.4.2 *The concept of 'generation'*

Phrase structure grammar was used by early generative grammarians. It can be employed to explain what the structure of an existing sentence is but does not account for how sentences are produced.

The new grammatical model of the late fifties, generative grammar, had as its express goal to go beyond this and deal with the question of sentence production. For this reason the adjective *generative* is normally given to views of syntax which assume that speakers form sentences by taking a skeleton structure and filling it in with words and that also assume that the number of possible sentences in a language is infinite. However, the term *generative* should not primarily be understood in the simplistic sense of 'make' a sentence in one's brain before speaking but more in the technical sense of 'describe exhaustively, account explicitly for the steps in a process'. If a deep structure is said to generate a surface structure then this means that, with the deep structure as input, the surface structure is derived by a series of specific steps, without an explicit claim to their mental reality, although deep structure, as seen by the generativists, may indeed approximate to a map of mental linguistic structures. The answer to this consideration is simply that our knowledge of the mental representation of linguistic knowledge is far too inadequate to make any substantial claims in this direction.

Because generative grammar is concerned with the manner in which sentences are generated it must not only deal with attested, actual sentences but it must also exclude sentences which are not *well-formed*, that which is are not acceptable to native speakers. In syntactic theory much discussion is given over to the relative power of grammatical models. If a model will regard as well-formed sentences which are not acceptable to native speakers then the model is not a valid representation of native speaker competence and must be revised or indeed abandoned.

There are different kinds of well-formedness. In a formal sense this is achieved by simply complying with the rules of sentence structure without taking account of lexical rules of selection so that sentences like *My car is interested in politics* are in a narrow sense well-formed, albeit nonsensical (because 'to be interested' only takes an animate subject). This instance illustrates the essential difference between syntax and semantics: the former is concerned with the form and latter with the contents of sentences.

4.4.3 *Surface ambiguity*

Among the goals of generative grammar is the resolution of structural ambiguity

(as opposed to the lexical ambiguity of words with more than one meaning). Before looking at examples students should note that formal ambiguity is a very common feature of language. It is tolerated by speakers because the context – pragmatic information – is always sufficient to disambiguate a sentence. For instance, the phrase *old cars and buses* could mean either [*old cars*] and [*buses*] or *old* [*cars and buses*]. But in a given context it should be clear to the hearer what is intended. Nonetheless, the grammarian is concerned with resolving formal ambiguity by semantic paraphrases of sentences and working out the deep structure behind them.

Ambiguities can arise for a variety of reasons. The question of adjective range touched on just now is only one example. Another would be where it is not clear from the surface structure who is actor and who is experiencer as with the following examples

The love of the parents :

- 1) *The love of the children for their parents*
- 2) *The love of the parents for their children*

Brian saw the girl from the library :

- 1) *Brian saw the girl who works in the library.*
- 2) *Brian saw the girl when he was standing at a window in the library.*

The ambiguity here is a consequence of using the preposition *of* in the first sentence and of *from the library* being either a qualifier of the object (*girl*) or an indication of location for the subject (*Brian*) in the second sentence. With other nouns the distinction between actor and experiencer is expressed by a different preposition as the following instances illustrate.

The affection for/of the parents
The interest of/in the students

The example of adjective range above can be dealt with in some more detail to show how deep and surface structure relate. A sentence like *Young men and women* has one surface structure but two deep structures depending on what is intended, i.e. it either means *Young men and young women* or *Young* [*men and women*]. This relationship can be displayed graphically in a variety of ways, all of which are all intended to indicate the same matter, i.e. the alternative underlying structures behind the two *meanings* of the sentence *Young men and women*. The sentence with the meaning *Young men and young women* obtains its surface structure by an optional deletion of the second adjective on the assumption that the range of the first one (*young*) is over both nouns which follow (*men* and *women*). This deletion is frequently carried out when the context in which a sentence is spoken is sufficient to exclude any ambiguity.

Another example of such deletion would be the case of what is called

Equi-NP deletion. By this is meant that if two phrases are joined and both have the same subject then the second subject is usually omitted as in *The man stood up and left the room*. This instance is slightly different from that of *Young men and women* as there can be no doubt that the subject of the conjoined phrase is the same as that of the first one.

The above cases represent potentially ambiguous sentences. There are other cases where the relevance of deep structure can be recognised. Some sentences appear to have an identical surface structure but which can be shown to be quite different in type. Consider the following two instances.

It is likely that Fiona will leave.
It is probable that Fiona will leave.
It happened that Fiona met Fergal.
Fiona happened to meet Fergal.

The difference between these two can be illustrated by a reformulation. In this case one applies a particular type of transformation known technically as *raising*.

Fiona is likely to leave.
 **Fiona is probable to leave.*

Another type of alteration is what is called *tough* movement. By this is meant that the object of an embedded clause is raised to the subject of a higher clause as in the following example:

It is difficult to convince the Irish. *The Irish are difficult to convince.*
It is not easy to find good people. *Good people are not easy to find.*

The structure behind sentences can sometimes be shown by reformulating (paraphrasing) them using a more explicit construction, often one beginning with *It is...* The results are still permissible sentences but with decidedly different structures.

Fiona is easy to please. *It is easy to please Fiona.*
Fiona is eager to please. *It is the case that Fiona wishes to please.*
Fiona seems to be successful. *It appears that Fiona is successful.*
Fiona tries to be successful. *Fiona attempts to be successful.*

One can now recognise that, in the sentence on the left with *easy*, Fiona is the object whereas in the sentence with *eager* she is the subject. These situations in which an underlying subject and object both appear as subject on the surface are good illustrations of the difference between deep and surface structure. It is also interesting that children have difficulty in acquiring the correct interpretation of

the underlying object type (*Fiona is easy to please*) as was shown in a well-known case study by Carol Chomsky in the late 1960s.

4.4.4 *Impossible sentences*

As a result of first language acquisition, speakers know what is permissible and what is not in their native language. But we don't produce grammatically ill-formed sentences, except in exceptional circumstances, such as when we are extremely tired. Speakers of English are unlikely to produce sentences like the following.

**He considers the answer was inadequate*
**She won't this think is unfair.*

These sentences are incorrect in different ways. In the first sentence the combinatory rules of a particular verb – *consider* – have not been adhered to. This verb takes an adjective preceded by an optional infinitival complement as in *He considers the answer [to be] inadequate*. The use of a tensed verb is not permitted here though the related verb *think* does allow this, e.g. *He thinks the answer was inadequate*.

The second sentence is not permissible because of the overlap of the phrases *She won't think* and *this is unfair*, that is two components of a sentence have been cross-wired

She will not this think is unfair
 |_N_V_Neg_| ---- |_V_|
 |_N_| ---- |_V_Adj_|

The first sentence above illustrates a type of mistake which learners of English might make. However, the second sentence is very unlikely to be produced by anyone because the kind of cross-wiring of clauses which it shows is not characteristic of human languages in general.

It is important that grammars constructed by linguists do not allow such structures to be generated. If they do, they are too powerful and clearly do not match the mental grammar of speakers.

4.5 The study of syntax

The study of syntax has had a chequered career. In the heyday of Indo-European studies in the latter half of the 19th century syntax was neglected as linguists were mainly concerned with phonology and morphology. With the advent of structuralism the situation looked better, particularly with the Prague school of linguistics in the 1920s, because syntagmatic relationships in language (those

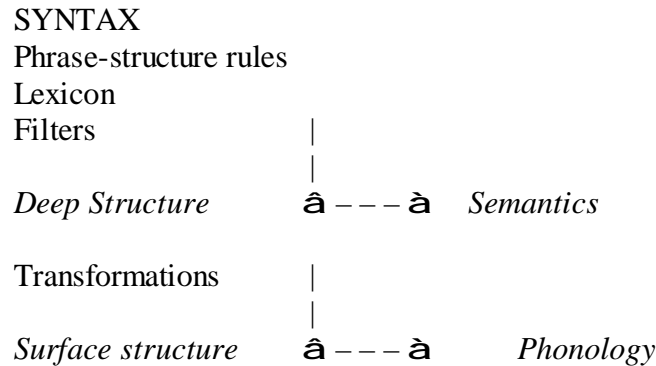
between elements in sequence) were discussed. However, American structuralism in the inter-war years did not devote its attention to syntax chiefly because Leonard Bloomfield – the main figure in linguistics at the time – was concerned with matters of phonology and morphology; there was a neglect of both syntax and semantics. It was not until the 1950s with the reaction to classical structuralism that syntax came into its own as an autonomous level of linguistics.

4.5.1 *The early model of generative grammar*

The school of transformational-generative grammar, as it was originally known, was the first to have syntax as its main concern. It began with Chomsky's *Syntactic Structures* (1957) and triggered an unprecedented rise in interest in syntax. The two basic tenets of this school of linguistics are obvious from its name. It maintains that sentences are generated on the basis of stored patterns and a lexicon (to put it very simply) and that various sentence types are related to each other by a process of transformation. For example, passive sentences are said to be derived from active ones by a transformational process. As mentioned above, this notion is controversial as it implies that some types of sentences are more primitive or fundamental than others (the derived sentences). Furthermore, it seems to assume when during sentence production a basic type is taken and a transformation is applied to it. Direct evidence for this assumption has not been forthcoming as the mechanisms of language production are not accessible to observation. Nonetheless a large amount of indirect evidence has been offered, such as slips of the tongue, the semantic equivalence of certain sentence types, and the intuitions of native speakers.

4.5.2 *The standard theory*

Generative grammar has undergone several major revisions since its initial introduction in the late 1950s. The term *standard theory* has been used to refer to the model of generative grammar as expounded in the 1965 book by Chomsky *Aspects of the Theory of Syntax* (a review of his thought on the nature of grammar, particularly syntax, since the publication of *Syntactic Structures*). The conception of sentence generation put forward in this book can be displayed graphically as follows. The surface structure corresponds to actual sentences, terminal strings in the terminology of generative grammar, and deep structure to the assumed structure which underlies the actual sentences.



Initially, grammatical information was assumed to be specified on the syntactic level of a language. However, there is convincing evidence that in many cases the syntactic information is specified in the lexicon. Take for instance those verbs which allow what is called *dative movement*. This is a shift of the indirect object to a position before the direct object with the deletion of the preposition previously before the indirect object.

We sold our house to the Murphys. + dative movement à
We sold the Murphys our house.

There are, however, a number of verbs which are ditransitive, i.e. which take two objects, but do not allow this type of movement as in the following two examples.

The Murphys transferred the money to us.
 **The Murphys transferred us the money.*

The Murphys explained the matter to us.
 **The Murphys explained us the matter.*

Such instances have led linguists to assume that the lexicon is a repository for specifications on the syntactic behaviour of verbs. Various properties of verbs, especially what are called *subcategorisation restrictions*, i.e. what objects go with what verbs, were then taken to be properly in the domain of the lexicon.

4.5.3 *EST and REST*

Extended standard theory (= *EST*) is a term for the model of generative grammar which evolved in the early 1970s and derives from the so-called standard theory as put forward in *Aspects of the Theory of Syntax*. The essential nature of the extension is the increase in the range of semantic rules, some of which are suggested by Chomsky as applying to surface structure. Features which are taken to apply on the surface level are those of stress and intonation,

aspects of quantification (the use of such elements as *all*, *some*, *each*), for example, *The boys have eaten all their dinner* vs. *All the boys have eaten their dinner*. Further aspects of semantics, dealt with on the surface level, are the focus of the sentence, presuppositions implied in the sentence, etc. It was no longer the case that deep structure determined the semantic representation of a sentence in its entirety. This led later linguists, particularly semanticists, to abandon the notion of syntactic deep structure altogether.

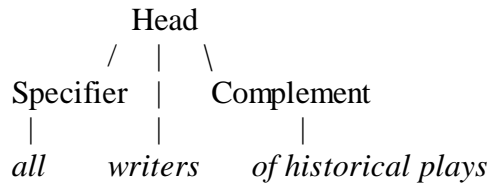
Revised extended standard theory (= *REST*) The uncertainty of just what the nature of semantic representation is, led to a further revision of the extended standard theory, known as the ‘revised extended standard theory’ in which the notion of shallow structure is introduced (yielding a three-fold distinction in structure: deep, shallow and surface). There are two semantic levels, termed logical form and full semantic representation. In REST the number of transformations is greatly reduced and the question of movement rules (‘wh’ movement, for instance, as in *Fiona is speaking* ⇔ *What is Fiona doing?*) was given increased attention with the adoption of the *trace* convention which implies that elements after they have been moved by transformation leave a ‘trace’ of their former position which is discernible in the surface structure. This notion refers to the formal means of marking the place which a constituent once held in a derivation before it was moved to another position by transformation. The position which the element originally occupied is called the trace and is said to be bound by that constituent, e.g. *It is unlikely [Fiona will come]* → *Fiona is unlikely [t] to come* (raising transformation, ‘[t]’ symbolises the trace). The term is of essential importance in government and binding theory (see below) where different types of traces are distinguished, such as noun traces or *wh* traces.

4.5.4 *X-bar theory*

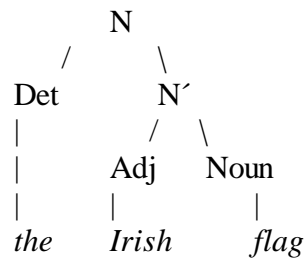
Various refinements have been suggested to the manner of representation in phrase structure (see the examples in 4.2 above) and the most important is undoubtedly what came to be known as X-bar theory. This is a system designed to deal elegantly with heads, specifiers and complements in sentences and clauses. It strives to recognise intermediary levels of phrase structure and assumes that syntactic categories are projected from lexical heads. It can encompass several levels of structure between a head, the topmost element, and a terminal string, the surface structure of a phrase. There are many versions of the theory, several of which are alternatives of each other, and nearly all theories of syntax today have taken on board the basic premises of the original system – proposed by the American linguist Ray Jackendoff in 1977 – and modified them subsequently.

Consider for a moment a typical phrase structure representation. This begins from a head, often abbreviated to XP, to stand for NP (Noun Phrase), VP (Verb

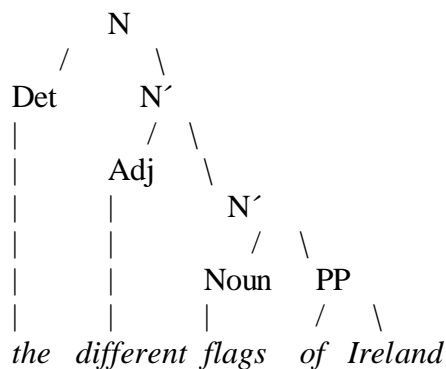
Phrase), PP (Prepositional Phrase), etc. The normal rewrite rule is $XP \rightarrow$ (specifier) X (complement) and would look like the following for a typical phrase.



The advantage of X-bar theory is that it allows a simple and economic classification of levels and so captures generalisations about structure which had not hitherto been expressed formally. Take, for instance, the phrase *The Irish flag*. The word *flag* is obviously a noun but what is *Irish flag* in this phrase? The answer is a complement of a lexical head N and this can be indicated in the phrase structure as follows.

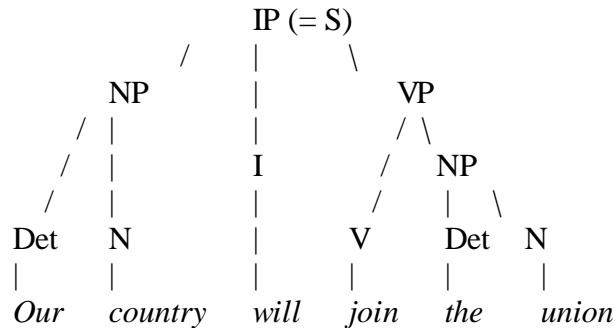


Complements of a lexical head expand into X-bar and modifiers expand an X-bar into a further X-bar. Specifiers, typically determiners before nouns or the subjects of verb phrases, stand to the left of a lexical head, i.e. a non-barred X element.



Sentences can be represented as having, as head, a category INFL, an abbreviation for 'inflection'. This stands for the tense of a sentence, sometimes written IP for 'inflected phrase'. A sentence is now seen as no different from a

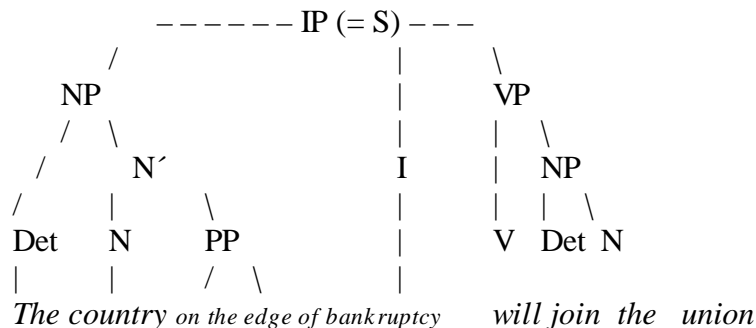
phrase (part of a sentence) except that it is obligatorily inflected because all sentences show tense. To reanalyse a sentence as a structure of the type (specifier) X (complement) with $X = I(NFL)$ one needs a tensed element at the top. Take the sentence *Our country will join the union*. This can now be represented with IP as the head and the elements to its left as specifier and those to its right as complement as follows.



Representations can be refined to accommodate more complex sentence types. Assume that the re-write rule for lexical heads is expanded into two steps as follows.

- XP → (specifier) X'
- X' → X (complement)

How does this help in the analysis of sentences? Consider the following example: *The country on the edge of bankruptcy will join the union*. It is obvious that the specifier is complex consisting of *The country on the edge of bankruptcy*. Allowing for the multi-step phrase structure rules can lead to a representation which accommodates this complex sentence as follows.



After the original formulation of X-bar theory in the late 1970s a whole series of variations arose as linguists grappled with analysing the syntax of various languages and various stages of language using this notation. The next model to dominate syntax theory is discussed in the following section.

4.5.5 *Government and binding theory*

This model of generative grammar by Chomsky derived from the various revisions of extended standard theory of the 1970s. It began with the article ‘On Binding’ in the journal *Linguistic Inquiry* in 1980 and was expanded in the comprehensive work *Lectures on government and binding* which appeared in 1981. Since then the theory has gained a great number of supporters, although those linguists who were prepared to acquaint themselves with the technicalities of the standard theory became increasingly more reluctant to spend the time and energy necessary to come to grips with the new theory. The net result of this is that government and binding is a direction in linguistics which has perhaps as many followers as the standard theory but far fewer linguists who are *au fait* with the details involved.

The term *government* refers to the principle whereby the positions from which movements in sentences can occur are restricted by the constraints which traces place on potentially movable elements. The term *binding* refers to those conditions which formally relate or bind elements of a sentence such as co-indexed noun phrases.

In government and binding theory the assumption is made that sentences have three main levels of structure: D-Structure, S-Structure and Logical Form. The S-Structure is derived from D-Structure, and Logical Form from S-Structure by a single transformation, Move Alpha (a movement rule which combines all previous movement rules and transformations such as active to passive, declarative to imperative sentence type, etc.). Various so-called sub-theories interact with the main government and binding theory to yield the correct structures for an individual language. Because of its arrangement (general theory with specific subtheories), government and binding is regarded as a fitting framework for describing the syntax of all languages, i.e. the syntactic component of universal grammar (see below). Given this approach, linguists speak of *parameters* rather than *rules* in grammar. Thus for any given language each of the universal set of parameters will have a certain value. For example, the ‘adjacency’ parameter would specify that in English adjectives precede nouns but in Irish they follow. A child learning Irish will know on hearing *mála Sheáin* ‘bag John-GENITIVE’ that Irish is a post-specifying language, with modifiers after heads and will then correctly predict that adjectives come after nouns as in *mála mór* ‘bag big’. Another example is the ‘pro-drop’ parameter which allows a language to leave out personal pronouns with certain verb forms, e.g. Italian *capisco*, Irish *tuigim* ‘I understand’.

Certain links may exist between certain parameters, for instance the parameter ‘unmarked word order’ with a value SVO (subject verb object in non-topicalised declarative sentences) would co-occur with a value Left Placement (adjective normally precede nouns) for the adjacency parameter. This is true of English, Dutch, Swedish, German, etc. In Irish, Welsh or Arabic, on

the other hand, an unmarked word order VSO (verb subject object) would link up with a Right Placement for the adjacency parameter. In this context one should consider the implicational universals of language typology (see section ??? below), particularly those developed by the American typologist Joseph Greenberg.

Terms in Government and Binding

- 1) **PRINCIPLES** Types of grammatical statements which are much broader in their scope than rules, e.g. statements about the basic structure of sentences, or about the existence of major lexical categories like nouns and verbs. In government and binding theory the assumption is made that there are no rules but principles which take a somewhat different form in each language.
- 2) **PARAMETER** A type of variation across languages. Parameters constrain the range of structural variation, in fact parameters are limited to one of two options, i.e. parameter settings are binary choices (see the examples just discussed above). Parameters can furthermore be set correctly on the basis of minimal linguistic input. Combined with the previous term, the name 'Principles and parameters' is often used to refer to this theory of grammar.
- 3) **UNIVERSAL** A property which is claimed to hold true for all attested languages and for any conceivable (human) language. There are basically two types: 1) *Formal universals* which are the necessary conditions which have to be imposed on the construction of grammars in order for them to operate and include such features as types of rules, transformations, ordering restrictions, etc. 2) *Substantive universals* which are the primitive elements in any grammar and which are required for the analysis of linguistic data. Universals can occur in various components of grammar, e.g. syntax, phonology, semantics.

4.5.6 *Universal grammar*

The more advanced generative grammar has become the more it has tried to raise its goals. With advances in analytical techniques and the range of languages examined, generativists felt that they were gradually in a position to make claims about grammar as it applies to all languages. This is the technical meaning of the term *universal grammar*. It is the body of structure which is common to all languages and specific to none. Universal grammar is furthermore concerned not just with saying *that* languages have certain structural features but with accounting for *why* this is the case.

The details of universal grammar are quite complicated as they involve a highly formal analysis of possible syntactic structures and a wealth of terminology with which the reader is not initially acquainted. The following is a selection of

some principles of universal grammar. These principles are concerned with the form of a possible human grammar, with restrictions on what is permissible and with generalisations which apply to several word classes.

Subjacency A moved element cannot be separated from its trace by more than one binding element.

Tensed S constraint No rule involves two elements respectively inside and outside a tensed S.

Bound anaphora interpretation This associates reflexive pronouns with potential intrasentential co-referents.

Disjoint co-reference No two NPs may be interpreted as intersecting in reference.

Cross-categorical generalisation Verbs and prepositions take formally similar arguments (for instance the traditional accusative case).

Any model of universal grammar, if it is to achieve the higher goal of explanatory adequacy, must have three attributes:

- 1) universally valid
- 2) psychologically real
- 3) maximally constrained

The first feature is obvious and refers to the fact that universal grammar applies to all human languages, both present-day languages and those which are extinct as well as possible future languages. The second feature is more elusive. It maintains that the postulates of the linguist's universal grammar must be in keeping with what one knows about the psychology of language. Universal grammar must be congruent with the facts of first language acquisition, it must seek confirmation from such peripheral areas as aphasia where language breakdown can be observed and must be in accord with what one knows about temporary dysfunctions such as slips of the tongue. The last attribute above refers to a necessary feature for models of universal grammar to ensure that they do not allow the generation of sentences which are obviously non-grammatical in any language. The model must ban rules which are universally impossible.

4.5.7 *Modular organisation of language*

Language organisation would seem to be modular, i.e. the different areas are initially independent and meet at certain interfaces. Chomsky, when discussing syntax, has formulated this as the autonomous syntax principle by saying that 'no syntactic rule can make reference to pragmatic, phonological or semantic information'. What this implies is that all generation operations and transformations which are involved in getting from the deep structure of a

sentence to the surface do not involve any other rules than syntactic ones. This notion has been the cause of much controversy in linguistics in the past few decades but is something which ties up elegantly with other parts of the human organism such as organs which are self-contained functional units with interfaces through which they communicate.

In discussing universal grammar, Chomsky has stressed repeatedly that the data which children are presented with in first language acquisition is not just degenerate (poor performance on the part of those around them) but also underdetermined. What this means is that children receives no help from their surroundings for many of the structural principles which they later acquire. If no help is forthcoming externally then the knowledge must be there to start with. All the items of linguistic knowledge which are not supplied from an external source must be located in universal grammar, i.e. that amount of (unconscious) knowledge about the structure of language in general with which we are born.

Again a comparison with another faculty may serve to help, this time from the field of vision. No one teaches a child how to recognise geometrical patterns, no one tells a child how to recognise someone from the side, how to extrapolate the limited information in a side view into a hypothetical front view. These are tasks the knowledge of which the child is born with. Equally one can postulate that the knowledge one requires for many general syntactic structures, which are found in all languages, is innate and not later acquired.

4.5.8 *The minimalist program*

During the 1990s a further model of syntactic analysis, which addressed many questions of X-bar theory, was proposed. This is the *minimalist program* developed by Chomsky. It largely does away with X-bar notation because it is assumed to contain redundant elements in tree representations. An express goal of this program in syntax is to remove superfluous steps in derivations and much research in recent years has been devoted to testing this model on data from various languages to determine if it has inherent advantages over previous proposals.

This research program demands that grammars constructed for human languages be minimal, i.e. they should involve the smallest number of constructs to account adequately for the intuitions of native speakers about their language. The more minimal the apparatus to describe a language is, the more it is likely to be maximally learnable by children in the first few years of life.

Summary

- *Syntax* concerns the possible arrangements of words in a language. The basic unit is the *sentence* which minimally consists of a main clause (containing at least a subject and verb).
- Linguists distinguish between *deep structure* – the level on which the

unambiguous semantic structure of a sentence is represented – and *surface structure* – the actual form of a sentence.

- Sentence structure is normally displayed by means of a *tree diagram* (the so-called ‘phrase structure’) and by a system of *re-write rules* one can move from an initial unit (the entire sentence) to the individual elements (a so-called ‘terminal string’).
- The term *generation* is used in linguistics to *describe exhaustively* the structure of sentences. Whether it also refers to the manner in which speakers actually *produce* sentences, from the moment of conceiving an idea to saying a sentence, is disputed.
- *Generative grammar* can be divided into three main periods. An early one dating from Chomsky (1957), a central one which was initiated by Chomsky (1965) and a more recent one which reached its maturity in the 1980s with the development of the *government and binding* model. The *minimalist program* is a radical departure from previous models of analysis which is not supported by all syntacticians.
- *Universal grammar* represents an attempt to specify what structural elements are present in *all* languages, i.e. what is the common core, and to derive means for describing these adequately.
- Language would appear to be organised modularly. Thus syntax is basically independent of phonology for instance, though there is an *interface* between these two levels of language.

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