

The History of the Phrase as a Notion in Linguistics

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0 Introduction

In this series of lectures we are going to investigate the history of the phrase as a linguistic concept. These days the phrase is seen as one of the basic truths of syntactic analysis (Hornstein et al. 2005) and so is central to understanding this. It is important therefore to get an understanding of where the notion came from and how it has developed over the years. The importance of the phrase, as seen from the present perspective, might suggest that it has ancient roots, at least in its basic conception. We will see however, that the notion is actually relatively new (less than 100 years old) and also that its lineage is not as impeccable as we might think.

1 What was there before there were phrases?

1.1. Early Indian Grammarians: Panini

The Indian grammatical tradition is the oldest one known, dating back several hundred years before the first Greek writers. In the main, this tradition was motivated solely for the purpose of maintaining Sanskrit, the language of religious texts and incantations, which inevitably had undergone changes over time. Therefore, the works of this tradition mainly concentrated on the correct translation of the sacred language into those it had developed into. Because the language of rituals was important to get right, most emphasis was placed on pronunciation. It is understandable therefore that the main thrust of Indian linguistics at the time was on phonology. Like most ancient works on language, the emphasis also tended to be on the word and therefore morphology also figures high in its concerns.

Panini is perhaps the best known of the Indian linguists, not because he was the first, he wrote his grammar sometime between 500 and 300 BCE, but because his grammar was one of the most detailed and comprehensive. Surprisingly enough, when European scholars discovered it, in the 1800s, its theoretical underpinnings were found to be far in advance of its contemporaries in Greece. Indeed it contained notions which were only just beginning to be formed in western linguistics and even ones which only developed much later in its history, such as the *phoneme*, the formalisation of grammatical rules and the notion of rule ordering. Modern linguistics owes quite a debt to Panini's grammar.

It is therefore right that we start our search for the beginnings of the notion *phrase* in Panini's grammatical system. Unfortunately, due to the main emphasis being on the pronunciation and morphological structure of Sanskrit, the grammar had very little to say about syntax. This is a theme we will find reoccurring in most ancient linguistic studies, probably due to the fact that the languages under investigation, Sanskrit, Greek and Latin, were highly inflected languages and therefore allowed a large amount of word order freedom. In this situation, it is understandable that the focus of attention will be on words and their forms and pronunciations than on the rules of their combination into sentences.

The Panini grammar is a highly formalised grammar consisting of about 4000 rules, some of which are meta-rules, defining the form of the grammatical rules themselves. Kiparsky (1993) reports that amongst these rules, we can find ones which have the form:

(1) $A \rightarrow AA \mid C_D$

This rule says that a component A is produced as two components AA in the context of a preceding C and a following D. Clearly this is very much like a phrase structure rule:

(2) $X \rightarrow YZ$

However, before jumping to conclusions, two things should be noted. The formulation of the rule in (1) is Kiparsky's, and was done like this to highlight the similarity of some of Panini's rules to modern ones. Secondly, these rules did not concern syntax, but phonology and morphology: the rule in (1) for example, is a rule for producing reduplication, a morphological process in which one or more morpheme is produced twice, one after the other. In this context, it is not even clear that such a rule states anything of a structural nature, even in terms of morphological organisation: it simply says that when a certain morpheme is in a certain context, it is reduplicated.

In conclusion then it would appear that there is very little evidence that ancient Indian linguists had a conception of a phrase, especially as they were not particularly concerned with syntax.

1.2. Classical Grammarians: Greeks and Romans

The Greeks were the first Europeans to turn to the study of language. Most of their work, however, we have knowledge of through secondary sources and the earliest surviving Greek text on language we have, Thrax's grammar *Téchne*, dates from about 100 BCE.

Although Greek linguistics is to some extent a direct ancestor of current linguistic science, providing us with many terms and concepts that we use today, it was in fact rather limited in certain respects. First, the Greeks were only interested in Greek and so never set the study of language in a more wider sphere. As with Sanskrit, Greek was a highly inflectional language with a great degree of word order freedom, and, in line with Indian grammarians, this meant that they didn't venture much beyond the word: phonetics and morphology taking up most of their interest. Thrax's grammar, for example, did not even mention syntax. Their lack of interest in, or perhaps awareness of, syntax does not bode well for our search for the foundations of the notion *phrase*.

The Greeks did come up with the distinction between subject and predicate, which one might think of as a basic division of a sentence into two parts – rudimentary phrases, perhaps. But this distinction was first made in logic, and logic was not the study of language, *per se*, but the study of the use of language, i.e. the validity of argument. Plato is credited with the first identification of two major parts of a sentence, a nominal one (*ónoma*) and a verbal one (*rhema*) and Aristotle added a third part, which is these days taken to be 'conjunct'. However, there is no indication that these notions were to be associated with anything other than words and were given morphological definitions.

It is true that the Greeks were aware of a relationship which is normally termed subordination, a term which these days is associated with hierarchical structure. But given that they saw words as being subordinate to other words, it doesn't seem that they had the same view of subordination as we do in current syntax. Instead it seems to be closer to the modern notion of dependency than constituency: a word is subordinate to another if it is related to it semantically in some inferior way.

At the level of the sentence, the Greeks were more interested in its functional properties than its formal ones. Thus the identification of sentences into questions, statements, commands, etc. was about as far as they got.

The Romans had a deep respect for the intellect of the Greeks, and continued to support and encourage Greek study during the time of the Roman Empire. Probably because of this respect, the majority of their investigation into their own language pretty much entailed attempting to fit Latin into the categories that the Greeks had proposed. Latin is similar to Greek (and Sanskrit) in being highly inflecting, though it isn't identical. But the tendency of the Romans to take Greek as the basis of the analysis of Latin meant that they didn't really develop linguistic thought much further than the Greeks had got. In fact, that Priscian's 18 volume Latin grammar, the most influential for scholars of the Middle Ages, was entirely based on Thrax, meant that Greek analysis had almost as much influence as Latin did in an era when people in Europe had turned away from the study of Greek culture and philosophy because of their barbaric pagan way of life.

Priscian's grammar, however, did contain two volumes on syntax. These concerned nothing of much interest to us, mostly being based on some rather dubious philosophy concerning the way the natural order of the world imposes order on the words of a sentence. For example, it was claimed that the natural order of subject-predicate in Latin follows from the fact that the existence of physical objects naturally precedes the actions of those objects.

In his *Short History of Linguistics*, Robins (1967) first mentions the notion of a subordinate clause in connection with the Priscian grammar. Again, however, we cannot take this to be the rudiments of the notion of grammatical hierarchical structure (i.e. one clause being contained within another) as it is not at all clear whether Priscian's notion of subordination is not similar to the Greek one, i.e. more like dependency. The fact that this notion continued into the Middle Ages, as we shall see, indicates that it was.

Although the study of classical languages marks the birth of linguistics in Europe, it seems that, just like the tradition in India, syntax was not very well developed. There is no evidence that the notion of hierarchical arrangements of elements in a sentence, even in its rudiments, had been conceived of during this time.

1.3. Grammar in the Middle Ages

The Middle Ages, as its name suggests, consists of the time between the ancient era and the modern one. It is hard to say when the ancient era ended and the modern one began, so it is difficult to put exact dates to the Middle Ages. Certainly, the fall of the Roman Empire marks one possible starting point.

From a linguistics point of view, we can divide this period in two: an initial fairly uninteresting period in which most linguistic work concerned the writing of pedagogical grammars for the teaching of Latin (most of which stuck steadfastly to Priscian grammar) and a more interesting second part, dominated by the 'speculative grammarians', who set to challenging the accepted status quo of Priscian ideology and insisted on building more on theoretical grounds.

Throughout this time there was a general backlash against classical works, which were viewed as dangerously pagan in nature. Also the Christian based philosophy of 'scholasticism' held sway, in which all knowledge was attempted to be brought under one set of (Christian) principles. Nevertheless, Latin had become a lingua franca within Europe and it was therefore the main interest of scholars at the time, if only for the purpose of education. Much of this work simply relied on Priscian grammar of Latin, though recall that this itself was an analysis of Latin based on the Greek system.

More interesting from our point of view was the demand of the speculative grammarians that more emphasis be put on syntax, and it was in this time that many of the grammatical notions that are the basis of syntactic analysis were introduced. Surely, therefore, this is the place to look for the roots of the phrase.

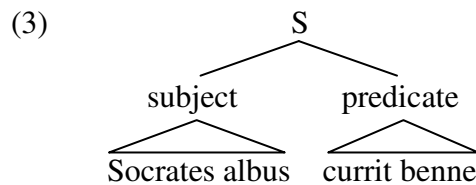
For example, although Greek linguists had recognised that complete sentences contain a nominal element and a verbal one (though some of them classified adjectives as verbal in order to extend this observation to other examples of predication), and in logic analysed sentences as containing a logical subject (subiectum) and a predicate (preatdicatum), it was the speculative grammarians who first applied the notion of a syntactic subject (suppositum) and predicate (appositum).

Robins (1967) gives the following description of an analysis by Thomas of Erfurt (c 1310):

Socrates albus currit benne (= white Socrates runs well) –

Socrates is the subject and *currit* is the predicate while *albus* is a subordinate element of *Socrates* and *benne* is subordinate to *currit*.

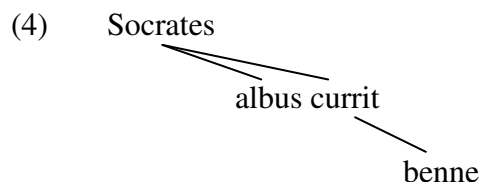
This seems to come very close to an analysis that we might represent as:



Note, however, this is not entirely accurate as it is not claimed that *Socrates albus* is the subject, but only *Socrates*. Furthermore, as with the Greek scholars, it is not at all clear that the notion of ‘subordination’ is meant to imply inclusion within a structural unit: the word *albus* is said to be subordinate to the word *Socrates*. Surely this does not imply that one word is supposed to be included in another. It is more sensible to interpret what is meant here by subordination as a less important element in a relation: *Socrates* is the main word and *albus* is related to it as a modifying element. This is more like a dependency relation than a phrasal one and that this is what the intention was is made clear by the following quote from Thomas of Erfurt (Robins’ translation):

“One part of a construction stands to another either as depending on it or satisfying its dependence”

Apparently Thomas of Erfurt believed that the subject is the most important element of the sentence and therefore the verb is dependent on it. This was because his dependency relationships were based on inflectional properties, rather than a syntactic or even semantic notion, such as *head*. As the verb shows morphological agreement with the subject, it was taken to be dependent on it. Therefore, the analysis might be better represented as follows:



It is clear that this conception of clause organisation is not tantamount to conceptualising phrases. We are therefore once again disappointed in our search for the origins of the phrase.

1.4. The Early Modern Period: the Renaissance

While the Middle Ages might be thought to start with the fall of the Roman Empire, it has been said that they ended with the Renaissance. This seems to have been a rather confusing time with contradictory attitudes being adopted, sometimes by the same individuals. It was the time of the rediscovery of classical learning, especially of the Greek philosophers, but it was also the time of the rejection of old ways of thinking. It was the time where the classical linguists, who had spent all their efforts on the sole study of Greek, were revered, but it was also the time that, due to the rise of nationalism, the study of one's own language was important. Philosophically it was also the time of the start of the debate between (British) empiricists and (French) rationalists.

On the syntactic front, despite the increased interest in studying a range of different languages, especially ones which were not as inflectional as Latin and Greek and so which displayed much stricter word orders, there were unfortunately few innovative analyses put forward, with most attention being paid to the categorisation of words. In this respect, the main method was to start with the Priscian categories of Latin (based on Thrax's categories for Greek) and then alter these to fit the language under study. The Port Royal grammarians made the unfortunate step which has hindered linguistics ever since of redefining the traditional Greek categories on semantic grounds, breaking with the traditional Greek methodology of basing categories on morphological properties.

Of particular interest, however, is the Port Royal approach to subordination. We have already seen how the existence of the notion of subordination does not necessarily entail a rudimentary view of constituent structure, but the Port Royal grammarians took a view which necessarily prevents the conception of constituent structure. In their view, subordination was theoretically a superficial representation of independent constructs. For instance, the following would be an analysis of a superficial sentence into its underlying constructs:

- (5) a the invisible God created the visible world
 b God, who is invisible created the world, which is visible
 c God is invisible. God created the world. The world is visible.

Thus, while (5a) looks to be a single sentence, it is in essence three separate sentences.

There is little else in the linguistics of this time that might lead us to consider that the idea of a phrase had been conceived and despite the increased interest in languages of different natures to classical ones, in which perhaps phrase structure was not so greatly obscured, it seems that linguistic interests remained mostly on issues that came out of classical studies, such as phonetics and categorial analysis.

1.5. Comparative Linguistics and the Neogrammarians

At the beginning of the 19th century a new development in linguistic study in Europe was to sweep almost all other interests to the sidelines. This was in part ushered in by the returned interest in classical languages in the Renaissance period, but it was also directly caused by the European discovery of Indian linguistics.

The idea that different languages are related to each other historically is a fairly old one. However, early ideas, such as Latin developed directly from Greek, or all languages developed from Hebrew, were hopelessly inaccurate and clearly not the basis for serious scientific investigation. Strangely enough, it was Christian doctrine that accidentally led to the foundation of the idea of the Indo-European family (Campbell 2001). Based on the biblical story of Noah, it was believed that Japheth, one of Noah's sons, was the father of Europe and hence that all European languages must come from a single source. This notion

eventually lead to the Goropoius' (1569) 'Scythian hypothesis': that a by now extinct language (Scythian) was the mother of most European languages. This hypothesis was perpetuated by more scientific study in the next few centuries (Scaliger 1610; Boxhorn 16??, Jäger 1686) and when in 1733 Walter added Sanskrit to the Scythian family, the roots of Indo-European were firmly laid.

In Europe as a whole, and particularly in Germany, the Comparative Method became the main force in linguistics, which aimed at discovering connections between languages through their comparison, mainly of their vocabularies. This study turned mainly to the phonological correspondences between languages, and it is in this period that the sound laws were first proposed. In the latter part of the 1800s, a group of linguists, called the Neogrammarians, dominated linguistic study in Europe, adopting the rigid principle that laws of sound change were exceptionless and being highly critical of previous studies.

You will note that we have not said much about syntax here, let alone the roots of the notion *phrase*. In truth, there is very little to say. The comparison of the vocabularies of languages is unlikely yield much insight in to the syntax of those languages. Indeed, the serious study of the historical aspects of syntax did not start before about 30 years ago. To be fair, the comparativists and the Neogrammarians suffered from the same problems that their predecessors did: the ancient languages available to them were all highly inflecting languages which allowed a good deal of word order variation. It is also very difficult to recreate the syntax of a proto language as the principles of syntactic change are not very well known. As in all previous cases then, we must abandon our search for the origins of the phrase in this period of linguistic history.

1.6. European Structuralism

There is a ray of hope in the name of the linguistic movement that followed the Neogrammarians. Surely the structuralists must have come up with the idea of hierarchical syntactic structure. Unfortunately, this was not to be – the structure of the structuralists turns out to be something quite different to what a modern syntactician might mean by the term.

European Structuralism is said to have started with the publication of Ferdinand de Saussure's course in general linguistic, which he gave between 1907 and 1911 but which was compiled and published by his students in 1916, three years after his death. Like everything else reviewed here, I will not give a full discussion to Saussure's work as my interest is the history of the phrase rather than the history of all linguistic ideas. But we do need to understand why the structuralism of Saussure is not the right place to find constituent structure.

Among the ideas that Saussure is noted for, what gives rise to the title of the movement which stems from his work is the idea that language is a system, understandable only in terms of its elements and their relationship to each other. The elements of language are the *signs*, comprising of a *signifier* (a form) and a *signified* (a meaning) which are arbitrarily linked. The point is that the system has to be taken as a whole, and the individual units cannot be seen as independently defined elements which the system is built from. They are elements which get their properties by being part of the system. Saussure gave the example of a train system to clarify this idea. A train might be identified as 'the 8.25 to Paris'. What identifies this object as such is nothing to do with the actual object itself, however. Clearly this train could have different properties on different days: a different engine, different carriages, different drivers, etc. However it would remain the 8.25 to Paris despite these. The 8.25 to Paris may not even leave at 8.25 on a particular day (it might be delayed) and yet, it would still be the 8.25 to Paris. What makes it so is the way that it fits into the system – some trains go to Paris, others don't; some trains that go to Paris are

scheduled to leave at 8.25 and others are not. It is only within the system then that the sign makes sense.

It is obvious, given that the focus of this approach is on the signs and the systems that they belong to, that it has in common with all previous approaches we have reviewed that it has very little to say about syntax. Indeed, Saussure doesn't say much about the ways in which words are put together to form sentences – this was just not something he was investigating.

Following Saussure, probably the most influential school of thought in European linguistics was the Prague school, with its most well known members being Trubetzkoy and Jakobson. These are, of course, mostly known for their phonological work on the phoneme, and especially in the development of the notion of the distinctive feature. The other thing they are known for is work on stylistics. While there was some work on the comparative syntax of Slavic languages, it does not appear to have had much influence in the development of syntactic theory, and certainly there is no evidence that the notion of the phrase was coined at this time.

1.7. Conclusion

We have reviewed the history of linguistic thought from about 500 BCE to, roughly, the end of the second world war, nearly 2500 years. The idea that words are put together to form structural units smaller than sentences seems not to have arisen in all that time. Perhaps this is a quirk of the languages on which initial investigations were concentrated, though it seems that once one moved away from these, to languages with more strict word orders, these first investigations influenced the field to such an extent that no one thought of syntax as much of an issue. Far more work had been put into the development of Phonetics, phonological and morphological theories and the historical development of language (i.e. the traditional areas of linguistic investigation).

But the notion of the phrase was invented. To find its roots, we will have to shift our attention from European (and Asian) scholars, and look further westward, to America.

2 The foundations of the phrase

2.1. The roots of American Structuralism

The father of American linguistics is often claimed to be Franz Boas, a German anthropologist who worked mainly on Amerindian cultures and languages. Boas was driven by the rapid demise of many Indian cultures and was compelled to study them before they died out. The need for field work that would yield rapid but accurate descriptions of the languages of these peoples led Boas to develop methods of investigation that researchers could easily apply by asking native speakers questions about their languages. These became known as 'discovery procedures'.

Spurred on by the fact that Amerindian languages look to be very different from most European languages and based on the psychology of Humboldt, who believed that languages have distinct 'inner forms' – a system of concepts which influences how language is used to express thought – Boas rejected the idea that had been the basis of most of the work in European linguistics from the classical period, that one could study a language based on terms and concepts developed for the description of other languages. Clearly this had been an underlying assumption of the Comparativists and without it, it is doubtful that the idea of linguistic families would not have been developed. Instead, Boas thought that each language should be studied in its own terms and that generalisations based on what we know of different languages should not be made. This idea came to be called 'linguistic relativity' and it is on its assumption that the discovery procedures were developed.

One of the best known discovery procedure developed by Boas was based on the notion of distribution. This is now a widely referred to notion in many areas of linguistic analysis, but its first uses were in the areas of phonology and morphology, where its use is fairly uniform. It wasn't until much later that it was used in syntax, especially in determining the phrase structure of a sentence. The obvious reason for this is that the notion of a phrase did not itself emerge until later. However, the notion of distribution used to determine phrase structure is not the same as that originally developed by Boas. Used in phonology and morphology, distribution determines which forms relate to underlying phonemes and morphemes. One application of this is in the minimal pair test: if two words differ in one sound which appears in the same context, then we can determine that these sounds are different in the language. In syntax, there is no 'minimal pairs' to investigate the distribution of elements. In fact, while in phonology if two things have the same distributions they are considered to be related to different phonemes, in syntax, identical distribution is taken as an indication that the two elements have the same status. The notion of complementary distribution is used in syntax only to determine word category.

Although Boas may have founded a specifically American branch of linguistics, he, like his European contemporaries, had no conception of the phrase.

2.2. Bloomfield 1914 and 1933

Leonard Bloomfield was the founder of American Structuralism and, initially at least, was very much influenced by Boas. In particular, Bloomfield was resistant to generalising across languages and thought that linguistic systems had to be studied in their own terms.

Bloomfield trained as a linguist in Europe, however, under Neogramarians. It was here that Bloomfield came into contact with the German psychologist Wilhelm Wundt, the founder of Structuralism in Psychology, whose aim was to make the field of psychology more scientific through conducting controlled experiments. From Wundt, Bloomfield mainly took this desire to be scientific and he spent his life attempting to do the same to the field of linguistics.

Back in America, following the philosophies of Wundt and Boas, Bloomfield wrote an introductory text book *An Introduction to Linguistic Science* in 1914. This was a rather short piece of work and it dealt with all aspects of linguistics, including syntax. Interestingly, the word *phrase* appears only twice in this book, and both times it is used to refer to what we call an idiom (i.e. 'set phrase'). This indicates that at this time Bloomfield had not yet conceived of the notion of phrase structure and we can therefore date the notion at some point after 1914.

It was at some point after this that Wundt came to be criticised for not being exactly what he was trying to be: scientific. Wundt's main method of investigation of psychological phenomena was introspection: he thought that it was possible, if subjects were trained, to get them to be conscious of what underlies their psychological processes. This rather dubious assumption became rightly but severely criticised and it seems that because of this, Bloomfield abandoned his association with Wundtian psychology and went in search of another, which he found in the form of a colleague Albert Weiss, the founder of Behaviourism in America. With his adoption of Behaviourist beliefs, Bloomfield's linguistics also underwent a drastic change and it is at this point that we might say that American Structuralism was born.

Behaviourism rejects the assumption of *mind* as an essential part of the study of psychology: all that is necessary to explain human behaviour is observation of the stimulus of the environment an individual finds himself in and the behavioural response to those stimuli. Obviously this took an extreme view on empiricism, eschewing the assumption of anything that could not be directly observed. Bloomfield's take on this in linguistics is interesting, as

there is not much in linguistic systems that can be directly observed. Instead, he held that one could envisage elements of the system that were not directly visible, as long as they were well established on things that could be directly observed. As what can be observed is sound, the phonological system was to be directly built on phonetic observation (with the use of distribution, of course). Then the morphological description could be based on the phonological one, and the syntactic one on the morphological one. Semantics was not part of Bloomfield's linguistic programme, studiable only by other disciplines such as philosophy and physics (he thought that the real meaning of a word could only be given in terms of the full physical description of the object that it referred to).

It must have been during this period that the notion of the phrase was first introduced. We know this because in 1933 Bloomfield rewrote his 1914 introduction as a much larger work *Language*. In this book his chapter on syntax discusses the analysis of 'immediate constituents', i.e. what we call phrase structure these days. Moreover, although he did not mention the notion *phrase*, Bloomfield showed definite sympathy to the behaviourist position in his 1923 review of Saussure's *Course in General Linguistics*.

It was probably the combination the distributional method and the assumption that each successive abstract level of description must be based on directly observable material which lead to the notion. It is easy to see how this came about: a phoneme is defined as a set of phones with a certain distribution; a morpheme is defined as a combination of one or more phonemes with a certain distribution and a phrase is defined as a combination of one or more morphemes with a certain distribution. The sentence could then be defined as a combination of one or more phrases with a certain distribution.

So here at last, somewhere in the 1920s, we find the origins of the phrase. This makes the notion less than 100 years old: a relatively new idea given the more than 2500 years of the history of linguistic studies. To give some perspective on this, if we fitted the study of language into one hour, the notion of a phrase would have been in existence for less than 15 seconds.

2.3. IC analysis

Although we can credit Bloomfield with coming up with the phrase, syntax was not his major concern and his book *Language* has only a relatively small section about phrases and their combinations. It was after his death, in 1941, that his followers (especially Harris and Hockett) developed the 'Immediate Constituent Analysis' further.

In his 1933 book Bloomfield defines a phrase as a "larger [than words] free form" (i.e. something not a 'bound form' (= bound morpheme)) and offers a rudimentary analysis of certain sentences (actor-action constructions) into 'a nominative expression and a finite verb expression' (e.g. an NP subject and a VP predicate).

Moreover, Bloomfield refers to the notion of a head, differentiating two different kinds of phrases: endocentric (those with a head) and exocentric (those without). Not much detail is given about this distinction and some rather unilluminating examples are discussed. To Bloomfield, a head is a word which can stand in place of the phrase it is contained in, i.e. he adopts a distributional definition. His example of an endocentric phrase is:

(6) poor John

Thus the fact that *John* has the same distribution as the phrase *poor John* means that the noun *John* is the head of this phrase. Examples of exocentric phrases are prepositional phrases and subordinating expressions such as (*if John ran away*). Not much discussion is given further to this, though this much by itself raises an enormous number of questions. For example, what is standardly thought of as a simple noun phrase these days (e.g. *the man*) does not have a head

in Bloomfield's terms as neither the determiner nor the noun distribute in the same way that the phrase does. Yet it is clear that the phrases *poor John* and *the man*, belong to the same category as they both have the same distribution. It therefore must follow that the notion *head* has nothing to do with the category of the phrase, as it does under present assumptions. It is clear therefore that Bloomfield's notion of a head is not only not the same as is conceived of in X-bar theory, but it also places far fewer restrictions on possible phrase structures. In principle, under Bloomfield's conception, a phrase of one category could, in principle, contain a head of a different category, as heads are defined on fairly arbitrarily determined observed distribution.

The most interesting discussion that Bloomfield gives in terms of phrase structure concerns what he terms closed and partially closed phrases. A closed phrase is one that nothing more can be added to (presumably 'without changing into another type of phrase' should be added, though this isn't explicitly stated). For example, we can take a noun and add an adjective or a determiner to it, but only in the latter case can we not add anything else:

- (7) a black dogs → the black dogs
 b the dogs → * black the dogs¹

However, Bloomfield also noted that once an adjective had been added to a noun, we are not free to add everything that might be added to a noun:

- (8) a black dogs → big black dogs
 b big dogs → * black big dogs
 c big dogs → the big dogs

As we can see from (8c), the phrase *big dogs*, is not closed, as the determiner can be added to it. Yet we cannot add the adjective *black* which obviously could be added to the noun. Bloomfield referred to this as a 'partially closed' phrase.

This discussion gives a good example of the kind of syntax that Bloomfield was concerned with. Note that there is no explanation for the observed phenomena in any of this discussion and the terms 'closed' and 'partially closed' add very little to our understanding of what is going on; they merely name the observations.

Bloomfield's chapter on syntax amounts to 22.5 pages, a lot of which is spent talking about things which would these days be thought of as central to the subject. His examples are very basic and not particularly revealing and at no point does he attempt to represent the kinds of phrase structures that would follow from his analysis. It is very difficult therefore to evaluate his version of these ideas. Indeed, it would appear that he did not particularly consider the introduction of the phrase to be an important step in the development of syntactic analysis.

It was only after the second world war that the post Bloomfieldians really started to develop the IC analysis. For example, Hockett 1958 contains a rather lengthy few chapters which are dedicated to demonstrating how syntactic analysis can proceed and be represented. This is interesting because it shows that the notion of the phrase that was adopted at this time is still not exactly that which we find in current syntactic analyses.

¹ It is important to note that I am using a modern notation (some might even say concept) in representing the ungrammatical sentence here. In Bloomfield's times, ungrammaticality was not considered an interesting concept and was never represented in texts. The ungrammatical 'star' was introduced by Chomsky in the 1950s with the assumption that the linguists job was to provide a grammar which could not only identify all the grammatical sentences in a language, but the ungrammatical ones too.

Like Bloomfield, Hockett uses the term *head* for a word that can replace a phrase. Also like Bloomfield, this definition leads to some rather strange results. Thus a VP containing a transitive verb is exocentric whereas one containing an intransitive verb is endocentric, having a head:

- (9) made a sandwich * he made
 hid in the cellar he hid

The distinction is not particularly informative and merely points to the fact that transitive verbs must be accompanied by an object whereas intransitive verbs do not. As this is the definition of transitive and intransitive verbs anyway, not much is gained by the use of the concept *head* in this case.

More interesting is Hockett's representation of phrase structure. Although he claims that 'diagramming structures' is not an end in itself, but merely a useful way of revealing structure, the fact is that the diagrams reveal facts about Hockett's conception of a phrase. The method of diagramming that he uses is sometimes called 'Chinese Boxes'. These entail drawing boxes under a sentence to represent which words go together to form phrases. For example:

(10)

John	like	-s	Mary

We start with each morpheme in a separate box and then the boxes are made successively larger to demonstrate how the phrases contain more material. So in the first line under the string of morphemes it is represented that the verb and its inflection form a constituent. Under that the inflected verb and its object form a constituent and finally the subject is added to form the entire sentence.

At first it might appear that this is just another way to represent the kind of structures we envisage today. However there are a number of differences. First note that Hockett's Chinese boxes lack any indication of categories. This is deliberate, to avoid the problem that is it not any element of a given category which can be substituted into any given box. For example, although the diagram in (10) indicates that the inflected verb *likes* can sit in a box immediately following the subject *John*, this would not be so if the subject were *I*:

(11)

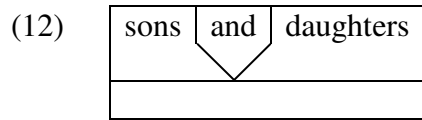
I	like	-s	Mary

To combat this, Hockett introduces the concept *construction*: members of the same category can belong to different constructions and only members of similar constructions can be put together in a sentence. Thus *John* and *I* belong to the same category but different constructions, but *John* and *likes* belong to different categories but the same construction. Hence, *John* can be accompanied by *likes*, but *I* cannot.

Clearly in today's tree diagrams, we represent categories but not constructions. One might be able to think of a possible representation for constructions that could be added to tree diagrams, but it would be a complication and not something that follows from the diagram itself. Generally these days it is not considered relevant to structurally represent this

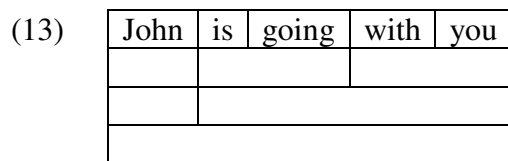
sort of information but instead it is viewed as being taken care of via other syntactic processes such as agreement, which is not itself a structural notion.

A second difference between modern trees and Hockett's boxes is that there appears to be a way of making elements disappear from the structure using the box notation. Hockett discusses this in relation to elements he calls *markers*, which are elements of a sentence that are not part of the constituent structure. He cites conjunctions as an example of this²:

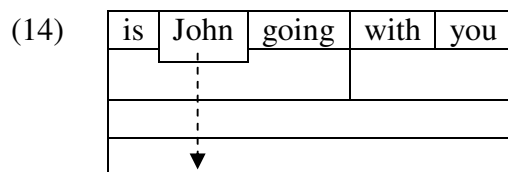


Apparently what is supposed to be represented here is that the structural existence of the conjunction disappears at the level where the two conjoined nouns come together. Regardless of whether this is seen as a justifiable analysis of this construction, it is clear that such a representation could not be replicated in terms of a tree diagram.

A final example of the difference between Hockett's version of constituent structure and that adopted today concerns discontinuous constituents: parts of a constituent which are interrupted by material which is not part of that constituent. The example that Hockett discusses concerns auxiliary inversion. Hockett, like many linguists after, believed that auxiliaries form a constituent with the verb independent of whatever else might be in the VP. Thus he would adopt the following analysis:



When the finite auxiliary inverts with the subject, the constituent formed by the auxiliary and the verb becomes discontinuous, interrupted by the subject. Hockett discusses a number of ways that this situation might be represented. For example, we might try to ignore the structural position of the subject until the level at which the subject is normally included into the structure, next to the VP:



Discontinuous constituents are impossible to represent in a tree diagram which conforms to the standard assumptions concerning the impossibility of crossing branches. For this reason, our current view of phrase structure does not allow for the existence of such things. That they were considered to exist by the Bloomfieldians indicates that their notion of phrase structure was quite different that what is adopted today.

Essentially, the American structuralists adopted no theory of structure. Being dependent on observations concerning distribution and eschewing any idea of a mental grammar meant that they were free to describe syntactic phenomena in any convenient way

² Hockett seemed to believe that conjunctions do not carry meaning – an odd assumption given that work in logical semantics had identified the different meanings of conjunctions such as *and* and *or* more than a century before.

that took their fancy. Hence their conception of what a phrase is was far less constrained and more loosely defined than is typical of the present conception.

3 Phrases Today

3.1. Chomsky's representation of American Structuralism

Zellig Harris was one of the main proponents of Bloomfeildian linguistics after his death at the end of the second world war. In the late 1940s Noam Chomsky started his BA degree and became a student of Harris'. Obviously Chomsky was trained in the American Structuralists tradition. However, by the time he wrote his MA thesis, he had started to question this approach and was beginning to develop his own. In 1957 Chomsky published a small book based on a course that he taught to computer science students at MIT. This book, *Syntactic Structures*, was to revolutionise the study of syntax and in a short period of time bring down the Bloomfeildian school as the main school of linguistics in America³.

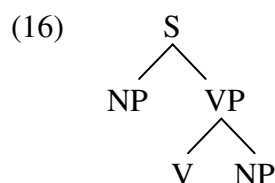
The success of this book is partly due to the analysis it contains, but it is also due to the somewhat veiled criticisms of the Immediate Constituent analysis of the Bloomfeildian school. What Chomsky actually did was to formalise his own version of the IC analysis and then show how it couldn't cope with real linguistic phenomena. In some ways, this was like building a straw man out of Bloomfeildian ideas in order to knock it down and favour Chomsky's own approach. However, apart from Harris, no Bloomfeildian was interested in formalising the IC approach, and Chomsky's point was that this had the effect of obscuring its defects.

Behind Chomsky's version of the IC analysis was what he termed a Phrase Structure Grammar, which consisted of rules such as the following:

- (15) $S \rightarrow NP VP$
 $VP \rightarrow V NP$

These kind of rules, known as 'rewrite rules' (the first rule is 'pronounced' as : 'S rewrites as NP followed by VP'), are now familiar to anyone who has studied basic syntax. Such rules analyse sentences into their constituents and these constituents into their own until we get down to the words. Therefore, we can see immediately how they might be taken to be a representation of the ideas behind the IC analysis.

Chomsky also introduced a new representation for the analyses produced by these rewrite rules, the tree diagram:



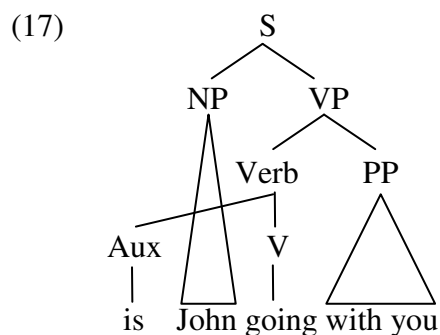
Visually speaking, this representation is much clearer than Hockett's Chinese Boxes and moreover, the relationship between the rules that produce the structure and its representation is immediately obvious: the first rule in (15) is responsible for the top of this tree diagram and the second rule for the bottom level.

However, there are a number of ways in which the ideas behind the Bloomfeildian IC analysis and Chomsky's representation of this differ in important ways. First of all, Chomsky

³ Two years later Chomsky's *A Review of B. F. Skinner's Verbal Behavior* was to do the same thing for the psychological school of Behaviourism that has so impressed Bloomfield.

rejected Bloomfield's empiricism. He claimed that the grammars that linguists produce are models of the grammars that exist in the human mind and not mere aids to the description of linguistic behaviour. Therefore he put more emphasis on the development of grammars than on the description of the phenomena – to Chomsky we can only satisfactorily describe phenomena from within a well developed and justified grammar. We have seen how Hockett's approach above gave rise to unsatisfactory analyses and most of this dissatisfaction arose from the lack of any theoretical underpinning of the analysis.

More important however is the fact that tree diagrams and the phrase structure grammars that produce them do not allow the flexibility that the IC analysis needed. As mentioned above, there are a number of things that the Structuralists assumed as part of their analyses that are simply impossible using a phrase structure grammar. Things that are not part of the structure cannot be introduced into a sentence, as Hockett did with conjunctions, and discontinuous constituents cannot be produced by a phrase structure grammar, which as its rules are restricted to stating relations between mothers and daughters and sisters cannot produce crossed branched trees that would be needed:



To produce this structure we would need rules that could tell us that the auxiliary precedes the subject. But as these stand in a 'great aunt' to 'great niece' relationship and phrase structure rules can only tell us that one sister precedes another, they could not produce this tree.

This was one of the main criticisms that Chomsky levelled at this analysis and used it to argue in favour of a new approach. It may seem a little dubious to argue against the IC analysis on grounds that those who championed the analysis never stood on. However, as most proponents of the IC approach never stood on any ground, Chomsky was not left with any other choice than to propose his own version of their ideas and show that this was inadequate. It may be that if another formal representation had been adopted, it would not have suffered the same problems that Chomsky's phrase structure grammar does. But no one has proposed such a thing and so it remains an open, though doubtful, issue of whether such a representation possibly exists.

3.2. Chomsky's own views

In *Syntactic Structures*, not only did Chomsky argue against IC analysis as being adequate for analysing natural language sentences, but he also proposed what he thought was a better theory. In actual fact, Chomsky did not entirely reject Phrase Structure Grammar but suggested that a basic set of phrase structure rules form one component of the whole system which was to be augmented with rules of a different sort entirely: transformations.

In *Syntactic Structures*, transformations were rules which take sentences produced by phrase structure rules (kernel sentences) as their input and return a wider range of sentences as output. Of course, these transformational rules were what developed into the movement rules that current syntactic theory makes use of. One of the first and most important

developments of the notion of a transformation however was to view their operations on structures rather than sentences. Thus transformations in the 1960s were seen as taking structures, identified as D(eep) structures, as their inputs and giving back other structure, called S(urface) structures.

This development led to the possibility of restricting transformations so that they do not alter the structures provided by the phrase structure component. This is an important development for the notion of a phrase, as it means that all phrase structures conform to the patterns set out by the phrase structure component of the grammar and transformations do not add anything to our concept of the phrase.

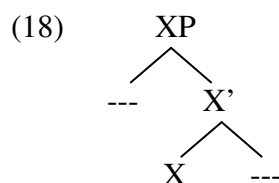
3.3. The development of the phrase

The phrase structure component of the grammar has also undergone a number of changes over the years, and these have had an impact on our notion of a phrase. The main one of these has been the introduction of X-bar theory.

Chomsky is usually credited with the introduction of X-bar theory in a paper he wrote in 1970: *Remarks on Nominalisation*. In this paper, the introduction of this revision of phrase structure is highly theoretically motivated and we do not need to go into the relevant issues here. What is important to note is that the basic ideas of X-bar theory were introduced in the last few pages of the paper, and it is not entirely clear that even Chomsky realised the important consequences of the development at the time. It is worth mentioning however that Chomsky was not the first to use the concept of the 'bar' to give a more hierarchical analysis to structures. That honour falls to Zellig Harris, Chomsky's teacher.

It is true that Harris' concerns were not the same as Chomsky's. The problem faced by Harris was more a morphological one. He noticed that there are morphological rules which take a word of one category and give back a word of the same category. For example, we can take a noun such as *boy* and add the morpheme *hood* to it to get another noun, *boyhood*. However, we cannot take a noun formed by this process and feed it back into the same rule, otherwise we would get nouns like *boyhoodhood*. The problem is how to stop this undesired multiple application of the rule, given that its input is a noun and *boyhood* is a noun. To cope with this, Harris introduced a representation very similar to the bar notation of X-bar theory, using raised numbers instead of primes. The idea is that we give a number 1 superscript to nouns which have not be subject to the morphological rule. Thus *boy* would be represented as *boy*¹. We increase this number to nouns which are the output of such rules, so *boyhood* would be *boyhood*². Then we restrict the application of the rule to those nouns with a superscript 1, preventing it from reapplying to a noun that it formed.

The use of the bar notation in Chomsky's version are different and a little more varied. For one thing, Chomsky's X-bar theory is to do with phrase structure not derivational morphology. Essentially X-bar theory admits the existence of phrasal elements which are bigger than words but smaller than phrases:



Here the X stands for the word and XP for the phrase. X' contains a word plus other possible material and hence is not a word. However, it is a component of the phrase and so is not a phrase either.

One consequence of adopting this view of the phrase is that it introduces a structural difference between two other components of the phrase, what Chomsky called the specifier and the complement. Without the X' these two elements would be structurally indistinguishable. This has proved to be an important distinction in the development of syntactic theory, with different behaviours noted for elements in these positions – for example, English specifiers always precede the head while complements follow.

Another aspect of X-bar theory is that it formalises the notion of a head in a way that is very different to the Structuralist view of this notion. For the structuralists, the notion was distributionally defined (a head is something which has the same distribution as the phrase). But in X-bar theory, the head is the word which controls the category of the phrase: if the head is a verb, then the phrase must be a verb phrase, etc. Of course, it also follows from this perspective that some heads have the same distribution as phrases, if they appear as the only element in the phrase with no specifier or complement. The confusion of the structuralists on this point was their failure to distinguish between optional elements in a phrase, such as adjuncts, and obligatory ones. Thus the reason why *John* has the same distribution as *poor John* (Bloomfield's example) and *hide* has the same distribution as *hide in the cellar* (Hockett's example) is that the accompanying elements are adjuncts and so optional. The reason why *man* does not have the same distribution as *the man* or *make* the same distribution as *make a sandwich* is that these phrases contain obligatory elements besides the noun and the verb. Clearly this is not a matter of distribution.

A later development in X-bar theory, and therefore in the theory of phrases, is the assumption that the structure in (18) is now thought to be applicable to all phrases. In 1970, Chomsky stated that the applicability of the theory was restricted to NP, VP and AP. These days, it is assumed that there is a one to one correspondence between words and phrases: every word is a head and every head projects an X-bar structure above it⁴. Thus today's concept of a phrase is something far more general and universal than was conceived of by the Structuralists.

3.4. Do we need phrases?

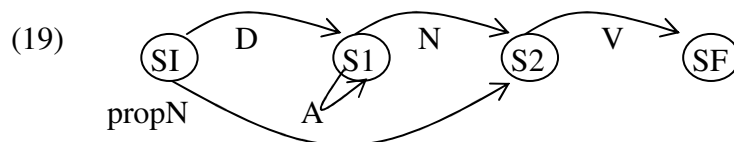
To some extent, there is a certain amount of irony that current syntactic theory puts so much weight on the importance of the notion of the phrase. As we have seen, the notion came out of a combination of two beliefs of early American Structuralism: an extreme version of empiricism and the idea of discovery procedures as a way of determining the grammar of a language. Chomsky has been scathingly critical of both of these aspects of structuralism and yet he has willingly adopted the phrase, which follows from them.

In *Syntactic Structures*, Chomsky offered two main arguments for accepting phrase structure. The first was a demonstration that a grammar which does not function on the basis of phrase structure, which he called a finite state grammar, cannot cope with natural language phenomena. The second was an observation that syntactic processes seem to be 'structurally dependent'. We will consider these separately.

We have seen how Chomsky 'set up' a phrase structure grammar, his version of the structuralists IC analysis, in order to demonstrate its shortcomings and favour his transformational approach. In fact, in *Syntactic Structures*, this argument starts with a setting up of another, non-phrase structure, grammar which operates on linear order. We can best get an idea of this kind of grammar if we envisage a computer system parsing a sentence. The idea is that we feed the computer the sentence one word at a time and it will tell us whether

⁴ This is complicated by two facts: some heads are bound morphemes and so end up being parts of words at the surface; also some heads are phonologically unrealised so it is not so obvious that every phrase has a corresponding word.

the sentence is grammatical or not. The system works as follows: the computer can be in any one of a number of states which are connected in a network of states which the computer travels, from state to state, as it parses each word. The current state will determine which other state it will move to, when fed a word. If the word is in a grammatical sequence, this will cause the computer to enter into another state, where it will be ready to receive another word. If the word is not in a grammatical sequence, however, the parse will fail and the sentence will be deemed ungrammatical. The sentence will be grammatical if the last word of the sentence enables the computer to enter the final state. The following is a simple diagram of how this might work:



Starting at the initial state, SI, the system reacts to being given a determiner by changing to state S1 or if it is given a proper noun it changes to state S2. From S1 it can move to S2 if it receives a noun and from S2 it can move to the final state on being presented with a verb. Recursion can be achieved by returning to the same state: when in S1 the system returns to S1 when given an adjective. This small finite state grammar does not accept any other possibility, but obviously it could be expanded to parse other sentences. As it is, the system will parse as grammatical sentences such as the following:

- (20)
- a John left
 - b the man left
 - c the old man left
 - d the old forgetful man left
 - e etc.

Note that this grammar parses the grammatical sentences without their being any notion of a phrase built into it.

Chomsky's criticism of this system was that it could not handle a lot of natural language phenomena. One thing it does not handle very well is embedded sentences. For example, consider the case of a relative clause:

- (21) the man who likes Mary left

Even supposing that we build into the system a way to recognise a relative clause, say by having it move into a particular state when presented with a relative pronoun after having been given a noun, the problem is that the relative clause is a clause and it can have everything that a clause has. This would mean that we would have to replicate the whole of the clause network within the network that parses relative clauses: every state and every transition from one state to another. Yet, we wouldn't be able to link the state after the parsing of a noun back to the initial state of whole network, as this would give us a situation in which once the relative clause was parsed we would be in the final state and the system would not know that the rest of the main clause needed to be parsed – i.e. there would be nothing to tell the system that it was parsing an embedded sentence instead of a main sentence. Hence the following would be taken to be a complete grammatical sentence:

- (22) the man who likes Mary

There are many other problems with such finite state grammars which we do not need to go into. Let it be sufficient to note that Chomsky quite convincingly argued that they are not good models for human grammars. Yet this does not argue that there are no linear based grammars that can cope with such phenomena – only that finite state grammars can't. Again, this was an exercise in building a straw man to be knocked down to support the transformational model. As it turns out, there are better linear based grammars to be found, though they are based on principles that were not available at the time Chomsky was writing *Syntactic Structures*. We will return to these.

Next consider Chomsky's second argument against non-phrase structure based grammars. His famous example of why linear grammars cannot cope with natural languages is the following:

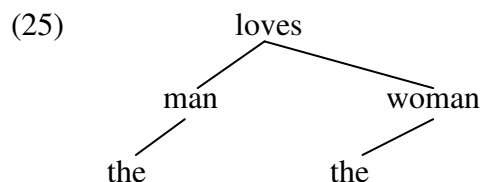
(23) is the man who is tall winning

This sentence involves subject auxiliary inversion in which the auxiliary verb is moved to the front of the clause. But there are two auxiliaries in this sentence, can both be involved in the process of inversion?

(24) * is the man who tall is winning

Apparently not. This is a demonstration of what Chomsky calls the structural dependency of syntactic processes – inversion is dependent on structure in that it is not the first auxiliary in the linear order of word in the sentence that inverts (or the second, or indeed any auxiliary defined in terms of its linear order), but the one associated with the main clause. This, Chomsky claims, must be defined structurally. Obviously, if processes are structurally dependent, there must be structure.

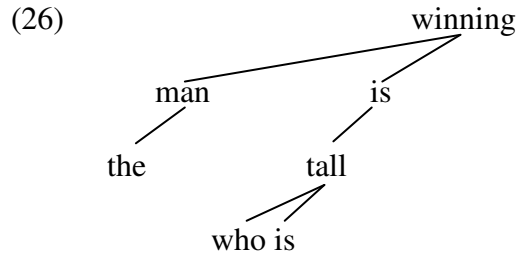
While these arguments have both been very influential, to the extent that these days the vast majority of syntacticians operate under the assumption of some version of phrase structure, recent developments in linguistics have demonstrated that they are dependent on certain assumptions about how linear grammars operate. If we change those assumptions, these arguments do not hold and therefore they do not conclusively demonstrate that phrase structure is necessary. For example, the argument that processes are structurally dependent can be challenged from the point of view of dependency grammar. This takes a rather traditional perspective on syntactic organisation, with words being connected not in terms of forming structural units, but by having simpler dependency relationships to one another. This is a little like the argument structures which are envisaged as part of the lexicon in generative theories:



What this diagram shows is that the verb is the head word of the sentence, with its arguments are dependent on it. The nouns are the head words of the argument and each of those has a determiner dependent on it. This is a simple analysis for demonstrative purposes, and one could have provided other analyses more in line with current opinions, such as making an inflectional element the main head word of the sentence, in line with the IP analysis of

current X-bar theory, and the determiner the head word of the argument, in accordance with the DP analysis.

An account of inversion can be given from this perspective without having to conceive of phrase structure simply by determining that the inverted auxiliary is the one dependent on the head word of the matrix:



Here the auxiliary which is dependent on the superordinate verb will be the one that inverts and this can be identified without forming any concept of a phrase. Of course, there are ways to define phrases on the basis of dependency relations and it has been demonstrated that all dependency grammars can be converted into phrase structure grammars (Robinson 1967), but the point is that we don't have to do this in order to identify the relevant auxiliary for inversion.

The linear grammar that Chomsky reviewed, the finite state grammar, is certainly very limited. However, it is not the only linear grammar possible. One, which overcomes problems of finite state parsing, is an alignment grammar. This is based on a dependency system and so is capable of solving the previously discussed problem, but it addresses the main weakness of dependency grammars, how to account for word order, by claiming that dependent elements compete against each other for positions defined with respect to each other. Thus linear order is established not on the basis of absolute positions, but on the basis of relatively defined positions. The principles which establish these orders, known as alignment constraints, such as 'agent precedes patient' and 'verb is adjacent to inflection', are applicable equally to superordinate and subordinate elements, and so need only to be stated once. Therefore the system does not fall foul of the problems facing finite state grammars.

Having established that Chomsky's main arguments against linear grammars can be avoided, we should now turn to the question of whether there is any reason to suspect that they should be preferred over phrase structure based grammars. One argument to this effect is based on distribution. If all that were needed to account for distribution was the assumption of immediate constituents structure, as some of the Structuralists appeared to have believed, then there are some empirical problems that follow. For example, consider complementary distribution patterns. It should follow that if A is in complementary distribution with B and B is in complementary distribution with C then A therefore must be in complementary distribution with C. In other words, complementary distribution is a transitive relation. However, there are a large number of observations cross-linguistically which do not seem to demonstrate this pattern, for example:

- (27)
- a * I wonder who if he knows
 - b * if had I known ...
 - c who had he met

(27a) shows that fronted wh-elements and complementisers are in complementary distribution, and (27b) shows that complementisers and inverted auxiliaries are in complementary distribution. It should therefore follow that fronted wh-elements and inverted

auxiliaries should be in complementary distribution, but they are not, as shown by (27c). Current theory explains this apparent anomaly by assuming that the complementary distribution between the fronted wh-element and the complementiser has nothing to do with structure – i.e. they do not occupy the same structural position. Instead, some other principle prevents the two from appearing together. These principles are typically of a linear basis: wh-elements cannot precede complementisers. Therefore current theory attempts to account for distribution with a combination of phrase structural conditions (two things cannot occupy the same structural position) and linear conditions (X cannot precede/follow Y). However, this position has been reached without considering a third possible option, i.e. that distribution can be accounted for on the basis of linear conditions alone. Clearly if this could be shown to be true, it would be preferable to the current position as it utilises only one kind of condition, linear, as opposed to utilising both phrase structure and linear conditions. This at least argues in favour of the exploration of systems that do not assume phrase structure, but as yet few syntacticians have taken this turn.

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