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Chomsky's Contribution to Linguistics: A Review

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Abstract

This review seeks to highlight Chomsky's major contributions to the field of linguistics. He changed linguists' conception about the nature of language from an externalized to internalized approach. This shift also resulted in the language being thought of as a cognitive phenomenon rather than as a set of structures to be analyzed for their correctness or incorrectness to prove his stance introduced the concept of language faculty, its workings, Universal Grammar, Principles and Parameters, and Transformational and Generative Grammar. The TGG also significantly overhauled the existent phrase structure rules. These rules were brought to follow binarity principles that dictated that a node cannot have less than or more than two branches. Besides the concept of Universal Grammar, along with its principles and parameters, Chomsky simplified how the language acquisition process can be understood: instead of learning hundreds of rules, the human mind has to install a handful of principles and parameters.

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Key Words: Cognition, Language Faculty, Universal Grammar, Principles and Parameters, Transformational Generative Grammar, Phrase Structure Rules, Transformations.

Introduction

Avram Noam Chomsky is to English linguistics as William Shakespeare is to literature. He modernized, revolutionized, and turned linguistics on its head. Roaming in the dreary worlds of philosophy, philology, morphology, and phonology, the study of linguistics was brought to bear upon real linguistic concerns: the nature, acquisition, and workings of language. In order to understand Chomsky's contribution thoroughly, it is of paramount importance to have a brief overview of what linguistics was like before the entry of Chomsky into the field. Only then will we be able to appreciate the change wrought by him.

Linguistics before Chomsky

Till the 1950s, linguistics was thought to be a dull field of study where there was little scope of research. In the most revered text of the times, linguistics was defined as "the science which attempts to understand the language from the point of view of its internal structure." (Gleason, 1955). This authoritative text of its era makes only a passing mention of syntax. Even that small discussion seems to imply that syntax is some petty sub-branch of morphology.

"Syntax may be roughly defined as the principles of an arrangement of the constructions formed by the process of derivation and inflexion (words) into larger constructions of various kinds." (Gleason, 1955).

It is quite possible that Gleason has some rudiments of derivational rules that were going to be propounded by Chomsky and his followers later on and that we're going to be the very fabric of modern syntax. "The formulation of generative grammar developed in LSLT and SS contains two explicit grammatical mechanisms as the processes for constructing sentences: phrase structure rules and transformations." (Freidin, 2013) But unfortunately, Gleason did not clarify in the text what principles he had in his mind. The paucity of research in that era owes a lot to such ambiguous definitions brought forward by contemporary linguists.

Linguistics – A Shift from Descriptive to Cognitive View

So, from this point where the language was thought to be descriptive and taxonomic, i.e. based on categories like parts of speech, etc., Chomsky started his landmark revolution to introduce language as a cognitive phenomenon. His most prominent contribution to linguistics are:

- Making language a cognitive phenomenon and consequently leading the linguists to peep into the human mind to understand language thoroughly,
- Proposing that human beings possess a unique language faculty that contains grammar,
- Arguing that there exists a universal grammar hard wired in the human mind and that it contains general principles and specific parameters in order to keep the grammar rules to the minimum possible number,
- Transforming the view about how language is *learned*,
- Specifying what those principles and parameters are,
- Coining the terms like generative grammar that later on became transformational generative grammar,
- Improving the concept of phrase structure rules in grammar.

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"A grammar of a language purports to be a description of the ideal speaker-hearer's intrinsic competence." (Chomsky, 1965)

The focus of all the theories propounded by Chomsky has been on what we know about language, where it comes from, and where the acquired knowledge is stored in the human mind. Therefore, his theories deal with generalities instead of peculiarities and idiosyncrasies. Language came to be thought of as an internalized system instead of being a set of infinite sentences. Although Ferdinand de Saussure (Saussure, 1959) had certainly introduced a somewhat related concept of langue and parole, his motive was never to dig into the real workings of language inside the human mind. It was Avram Noam Chomsky who brought forward the dichotomy of competence and performance. From these two concepts originated a series of innovative and transformational research works that changed the world of linguistics for good.

Shift from E-Language to I-Language

Another approach to linguistics that held sway before Chomsky was the E-Language approach: language was viewed as purely external. Linguists used to collect samples of language and then analyze the data to find out its properties. (Bloomfield, 1933) They set out to find patterns and regularities in the collected samples without thinking about how they would have been produced in the first place. Chomsky raised allegations that such an outlook is farthest from reality. He was of the view that any notion about language not taking mind into view was bound to be faulty and defective. (Chomsky, 1986)

As a result of Chomsky's revelations, language now came to be thought of as I-Language, i.e. internalized language as opposed to externalized. I-Language linguists tried to bring out what a speaker of a language knows about the language. But since such knowledge is tacit or unconscious, it was not easy to be studied. For this to be accomplished, data had to be studied and analyzed. This might look like the same scenario as present in Bloomfieldian times. But there was one radical difference in the way that data was analyzed. Instead of trying to unearth patterns and regularities, I-Language linguists tried to find some enlightenment about the producer – the mind itself. They treated language as an internal property of the human mind rather than something external. Chomsky claimed that language actually consists of a system of principles and parameters (these principles are going to be discussed in detail under a latter heading). E-Language linguists relied on corpora of sentences, whereas I-Language linguists dealt with the knowledge of potential sentences, intuitions. Externalized language focused on what people had done. Internalized language concentrated on what people were capable of doing. In short, the externalized view of language led to analyses of performance, while the internalized view deemed performance as degenerate and imperfect, resulting in an emphasis on competence.

Language is Acquired, and not Learned

As Chomsky revolutionized the very concept of what language is, he also changed the conception of language *learning*. He refuted the idea that language is a skill that people can learn on the basis of re-enforcement and punishment. Skinner was the leading figure that regarded language as a behavior like many other human behaviors (Skinner, 1957). According to this viewpoint, if certain structure is received with encouragement, it is positively reinforced and is highly likely to be produced again.

"When appropriate behavior has been established, its consequences work through similar processes to keep it in force. If by chance the environment changes, old forms of behavior disappear, while new consequences build new forms." (Skinner, 1957)

On the other hand, if a learner is reproached for uttering something ungrammatical, the error will be extinguished because it has got negative feedback. The audiovisual method of language learning (Mueller, 1955) and (Postman, 1961) was inspired by this approach towards language learning. It suggested that the students go through vigorous drilling of correct structures so that they could learn them thoroughly. Audiovisual aids were also given special attention as the proponents of the method thought that input for learning came through any of the five senses—the more senses involved in the teaching-learning process, the better.

As has already been clarified, Chomsky proposed with a range of arguments that language was not a behavior (Chomsky, 1959). It is an innate faculty that needs an environment for activation. The human mind possesses this inherent ability to internalize language on the basis of very little and faulty input. A few principles and parameters (Chomsky, 1965) are to be learned in order to develop competence in a language. This kind of stance about language was dubbed as the innateness hypothesis, as opposed to the behaviorist approach advocated by B. F. Skinner and his followers.

When Chomsky had changed the conception of language, it inevitably led to a change in the way language was allegedly *learned*. Chomsky stipulated it was literally impossible that language could have been learned. Instead, it is acquired and internalized gradually. This view about the process of language acquisition (later came to be known as the innateness hypothesis) went a long way to strengthening the view that language was really a cognitive phenomenon. "The innateness hypothesis is the hypothesis that the human brain is 'programmed' at birth in some quite specific and structured aspects of natural human language." (Putnam, 1967) Chomsky argued that human beings are born with an innate ability to learn any language to which they are exposed. This ability was called language faculty.

Language Faculty

Chomsky postulated (Chomsky, 1959), (Chomsky, 2006) that humans are endowed with the language acquisition device that grants us a language faculty. This position was taken and justified by many subsequent authors. For example, Ray Jackendoff reiterates this stance in the following words:

"A working hypothesis in generative grammar has been that . . . the language faculty is nonredundant, in that particular phenomena are not 'overdetermined' by principles of language." (Jackendoff, 1997)

Just like a computer, this language faculty gets input from the environment, processes it, and then delivers output (Radford, 2009). Similarly, an enormous amount of data is also stored in the repository of this faculty. This storehouse is called *competence* in Chomsky's terminology (Chomsky, 1965). The output delivered after due processing is called the *performance*. Skinner's behaviorist model of language learning was strongly challenged by Chomsky mainly on the basis of competence and performance.

"We thus make a fundamental distinction between competence (the speaker-hearer's knowledge of his language) and performance (the actual use of language in concrete situations)." (Chomsky, 1965)

Skinner was of the view that language was a behavior learned through the process of positive and negative reinforcement (Skinner, 1957). Correct and acceptable structures can be learned if a learner gets positive feedback. Negative feedback serves to extinguish learning. Hence, if a student is punished for writing an ungrammatical sentence, most probably he will never do it again. Chomsky contended that it was an erroneous conception of language if it is considered thus. He justified his stance by claiming that children often produce utterances that they have never heard. They make generalizations on the basis of inferred rules. It is frequently observed that children say *good* and *cut* (incorrect regular past forms instead of correct irregular, as generalized by them) instead of *went* and *cut*. Moreover, they are fed by what Chomsky called *degenerate input* by the environment. (Chomsky, 2012) By this term, he meant that children develop perfect competence despite being exposed to utterly imperfect performance. It is highly unlikely that children listen to all the possible grammatical structures to be produced. A record of natural speech will show various false starts, violations of rules, changes of plan in the middle of conversations, and so on. "An adult native speaker of a language knows things that he could not have learned from the samples of the speech he has heard; since this knowledge is not based on his experience of the world, it must come from some property inside his own mind." (Cook, 1983) Thus, children form perfect competence from highly imperfect or degenerate input.

How Language Faculty Operates

As it is clear that language faculty is a storehouse of all knowledge about language, it is all the more imperative to have a peep into its workings. Looking at its operations is in a way going into the actions of internalized grammar, which works by means of different components: Lexicon, Syntactic/Computational Component, Phonetic Form Component, and Logical Form/Semantic Component (Chomsky, 1995) and (Chomsky, 2015).

Chomsky claims that whenever we want to say something, our mind starts from the lexicon, which is our mental dictionary. The collection of words from our lexicon is transferred to the computational component, where they are arranged in an acceptable sequence. Subsequently, the arrangement of words is handed over simultaneously to the phonetic form component and semantic component in order to produce a vocal and logical representation, respectively. It is evident that an utterance has to go through all this processing before being spoken out.

Since language faculty generates structures according to internalized principles and parameters, such cognitive grammar is referred to as generative grammar. But there arises a problem when we consider a sentence like the following:

The man I saw was holding a bag.

Consistent with the operations of our language faculty, let it be supposed that our lexicon selects vocabulary items, which are arranged systematically by computational component, and then handed over to phonetic form component and logical component. But the resultant structure seems to have nothing in the slot of the object of the transitive verb *saw*. How can it be justified? All structures that are given concrete phonetic representation are termed surface structures, and those that lie deep beneath in the language faculty, at the unconscious level, are called deep structures. (This deep and surface structure dichotomy will be dealt with in detail in a later section.) This dichotomy of deep and surface structures (Chomsky, 1964) sits at the core of transformational generative grammar (TGG). Transformational Generative Grammar, as it is evident from its very title, is an advanced form of generative grammar. The sentence under discussion can only be justified that the transitive verb *saw* certainly had an object at the deep structure level, but on its way to being surface structure, it underwent a key transformation in the form of *movement*.

The man I saw ~~the man~~ (who) was holding a bag.

When an element in the generated structure is moved to another slot, this transformation is called either movement or internal merger. This bifurcation of the external and internal mergers of constituents is interesting. When vocabulary items are taken from the mental dictionary (lexicon) and arranged in syntax, such a merger is called an external merger. When such an arranged structure undergoes some transformation (movement), the operation is called an internal merger because the transformation is taking place in the structure that has already been arranged. This notion of transformational generative grammar is the most important contribution outside of his pronouncement of language as a cognitive phenomenon rather than a descriptive one.

Principles and Parameters – Universal Grammar

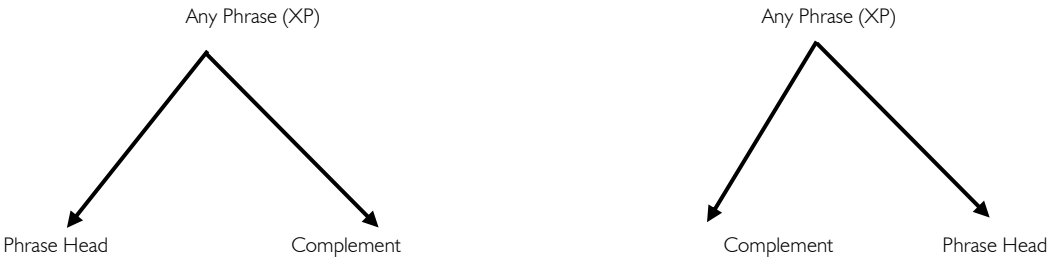
How do children perform the amazing feat of delivering output far better than the input? The answer lies in a concept dubbed Universal Grammar. Just like the concept of language acquisition device or language faculty, Chomsky and his followers think that

human beings are born with instinctive knowledge about language. Therefore, human beings do not acquire rules and regulations that govern different structures because, in this way, the process would have become extremely exhaustive and hectic, and a large majority of language users would have been deprived of a good many structures that would be learned only by intellectuals. Instead, people acquire knowledge about language unconsciously. All this is made possible through principles and parameters (Chomsky, 1981) and (Chomsky, 1986)

The concept of universal grammar entails that humans are born with a set of general principles and yes/no parameters. The human mind unconsciously switches a parameter to yes or no according to the received input. For example, the null subject parameter involves constructing sentences with or without an overt subject. English language does not allow omission of subjects but Spanish and some other languages do.

Maria speaks French. *Speaks French. (Radford, 2004)

Another parameter titled *head parameter* requires a user to set the position of the head before its complement or the complement before the head. In other words, any given phrase in a language may have only one of the two structures portrayed below.



During early childhood, children usually set the parameter to yes or no, or as needed. The best benefit of principles and parameters is that a user has to internalize very few principles and parameters. Thus, with the help of universal grammar and its associated principles and parameters, one can easily unearth the workings of the human mind in the field of language.

In the same vein, the idea of principles serves a beneficial purpose in internalizing language when a user comes to know that there are a few constraints within which construction can be built. For example, the Locality Principle dictates that all grammatical operations are local. It implies that no foreign element can intrude when language faculty is taking items from the lexicon and merging it internally and externally.

These principles are also called linguistic universals in that they are applicable to every language being used or having been used in the world.

"The study of linguistic universals is the study of the properties of any generative grammar for a natural language. Particular assumptions about linguistic universals may pertain to either the syntactic, semantic, or phonological component, or to interrelations among the three components." (Chomsky, 1965)

No language in the world violates these principles, although it may not use certain principles in certain contexts. The analogy of Newton's apple may be helpful in this regard. He discovered the law of gravitation by observing a falling apple. But it does not mean that the law was applicable to apples only. Similarly, when Chomsky introduced the notion of Universal Grammar and linked principles and parameters, he proclaimed that his discovered principles are applicable to all languages without any exception.

Arguments in Favour of Universal Grammar

But Chomsky's theory of Universal Grammar is not built in the thin air. It has solid grounds on which it stands (Valian, 1986). It has descriptive adequacy insofar it is capable of describing the working of any language: this is what makes it *universal*. It would have failed to justify its title had it fallen short of describing merely a few languages. Principles and parameters of UG are there for every language, and all that a user has to learn is their settings. This theory of UG also has explanatory adequacy. It means it can explain "Why do grammars of human internalized languages have the properties they do?" (Radford, 2004)

This logical problem of language acquisition leads to a hypothesis that since received input is much less than required, and since even that paltry input is degenerate (slips of the tongue, false starts, etc.), there must be an inborn ability in every human being that enables him/her to internalize a language. The hypothesis that the process of language acquisition depends on an innate language faculty is called the innateness hypothesis. The innateness hypothesis, put forward by Chomsky, claims that the process of language acquisition is genetically predetermined by an innate language faculty. This language faculty incorporates a set of universal grammatical principles that influence the way grammatical operations work.

When a child has developed sufficient knowledge about a language, they can easily judge what structure is grammatical and what is not. This is despite the fact that no one has even elaborated the grammatical aspects of the learned utterance before him/her. Since this judgment comes without anyone's teaching or demonstration, there must be an in-built ability to incorporate and set grammatical rules, generalize them, and store them in the human mind.

Furthermore, the very process of language acquisition points to the existence of innate ability in human minds. A child usually produces the first single word/s at the age of twelve, though individual differences may exist and vary widely. For the next six months, children generally acquire five words per month till the age of eighteen months or so. From there to the age of thirty months, there is a considerable rapidity in language acquisition. Children move to two-word constructions and then to proper sentences. This pattern exists regardless of what language children are exposed to. The fact that such uniformity exists and that the process undergoes acceleration at a certain age is sufficient proof that there is an inherent ability inside human minds that is specifically meant for language acquisition. Clearly, no such pattern can ever be drawn in case of *learning* anything. Individuals' IQ levels vary so widely that such uniformity would have been impossible had they been *learning* it.

Transformational Generative Grammar

Transformational Generative Grammar as a theory was propounded by Chomsky in 1957 (Chomsky, 1957), though he did not use this term explicitly in this work. This mighty influential writing contributed a great deal towards creating enormous interest in syntax all over the world. Chomsky proposed that the purpose of every linguistics analyst is to sever what is grammatical from ungrammatical and then go on to study the grammatical structures. He regards grammar as a device that produces grammatical and only grammatical strings. He is of the view that grammaticality or unacceptability of a sentence can neither be decided with reference to any available corpus, no matter how large it is, nor to the sense that the sentence conveys.

When it comes to finding a redressal of the issue, Chomsky argues that the first and foremost requirement of the desired device is that it be finite, as an exhausting list of rules will be of no use at all. He brings forward and then rejects a finite state grammar which dictates that a finite apparatus can generate an infinite number of constructions. He wants grammar to be a more abstract device. Subsequently, he proposes phrase structure as another model for the purpose of having a device that could explicate and justify grammaticality and generate grammatical sentences. By bringing forth the limitation of the phrase structure model, which was originally based on immediate constituent analysis, he rejects it too.

He comes up with his own model, which was called Transformational Generative Grammar later on. This model combines phrase structure rules, transformational rules, and morphophonemic rules. Chomsky coined the term generative for his model because he argues that a finite set of rules generate an infinite number of sentences. Transformation refers to the movement of constituents, and it is either obligatory or optional. Obligatory transformation produces kernel sentences of a language, which are simple, active, affirmative, and declarative. In order to form interrogative, passive, and complex sentences, one or more of the optional transformations have to be applied.

Here, the concept of constituent also needs attention. It is a group of words that syntactically and semantically behaves as a unit. When it comes to movement or transformation, such a unit moves together. It cannot be broken in the arrangement or transformation of sentences. For example, a sentence is the largest constituent. It can be subdivided into a noun phrase and a verb phrase. All constituents keep on being divided until there only remain single words. The rules that govern the construction of sentences through smaller constituents are referred to as phrase structure rules.

S→NP, VP

VP→ V, NP

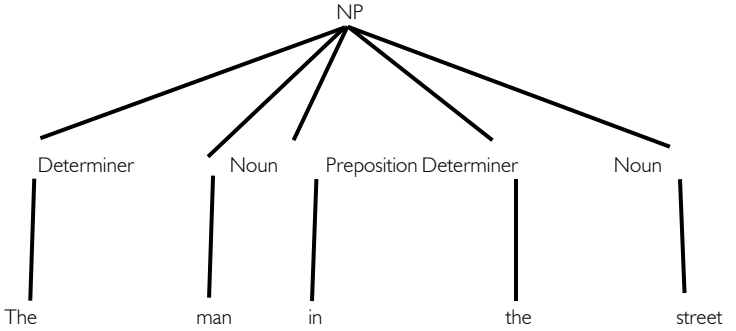
NP→ Det, AdvP, AP, N, PP

PP→ P, NP

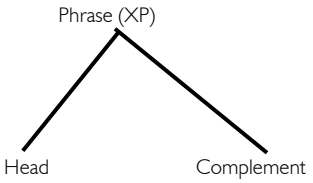
There is also recurrence in these phrase structure rules. For example, the rules specify that not only an NP has a PP but also vice versa. In this way, there is a possibility of an extremely complex NP or PP that goes on expanding infinitely. But here comes the efficacy of the logical form component. Construction must be phonetically sound as well as semantically intelligible. Anything that breaches the intelligibility tends to be filtered out by human language faculty.

Evolution of Phrase Structure Rules

Phrase structure rules, which were introduced in the course of developing the theory of transformational generative grammar, have undergone a tremendous overhaul in the past 60 years or so. The beginning form of PS rules followed a flat representation of constituents. There was no way to show, for example, that in a noun phrase, the complement preposition phrase is governed by the head noun. Consider the tree diagram representation of the noun phrase 'the man in the street'.

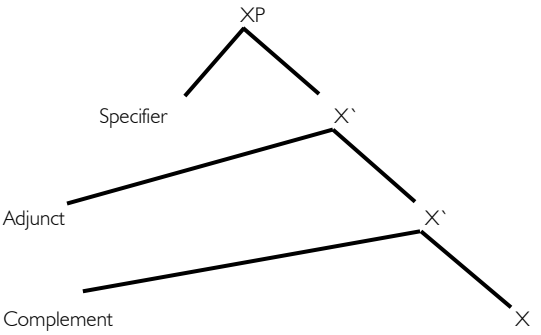


It seems as if all the constituents of this noun phrase are at the same level, which is not the case at all. This kind of representation is called a flat structure. The first and foremost reason to go against such representation is that only complement can be portrayed on the same level as the head. But it is as clear as a day that there is no compliment here. (It is mostly of-phrases that can be regarded as complements. Almost every other prepositional phrase is an adjunct.) Chomsky theorized in 1970 that not only a noun phrase but also all other categories bear the same internal structure. The theory went so far that it proposed the same structure for the sentence itself. (Chomsky, 1970) It was the first instance when a sentence was portrayed as a phrase, inflection phrase (IP). The theory proposed the following phrasal structure:

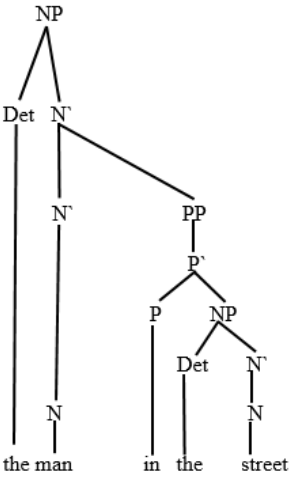


But this structure gives birth to a lot of questions that Chomsky (1970) discusses in detail. The final form of the theory stipulated that there must be three levels of projection in every phrase:

1. Maximal Projection (XP)
2. Bar Level Projection (X`)
3. Lexical Projection (X)

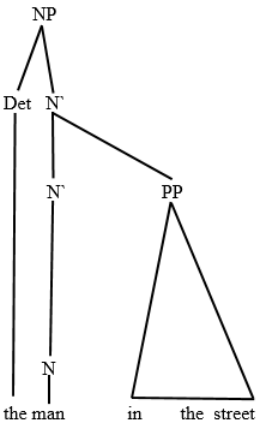


Further rules clarify that complements are always sisters of lexical projection and daughters of bar level. Adjuncts are sisters as well daughters of bar level projection. Specifiers are sisters of bar level and daughters of maximal projections. As stated earlier, the main point raised by the theory is a cross-categorical generalization – that every phrase has the same structure. Viewed from this theoretical angle, the noun phrase under discussion will be portrayed in the following way.



An abnormality that can be observed easily from such projection is that, sometimes, when there is no element to connect with, a projection goes empty. For example, in the preposition phrase of the tree diagram given above, since there is no complement of

the head noun *street*, the lexical level has only one branch. Sometimes, such structures are simplified by means of a triangle when we do not want to show the internal detail of a phrase.



This simplification is less distracting, of course. But even this portrayal has an empty lexical category on the lexical level projection of the noun phrase *the man*. This is because of the fact that the noun has no complement.

Evidently, despite the claims of obliterating cross-categorical differences, there is one glaring difference that emerges in tree diagrams – the number of nodes is not equal. This inequality expands even to three nodes if we come to the sentence level. Early X-Bar theory specified that a sentence has three nodes originating from the maximal projection: NP, VP, and I. I stood for inflection. But later versions of the same theory at least tried to systematize its postulates by claiming that the sentence itself is an IP (Inflection Phrase).

Later on, the phrase structure rules evolved even further and accommodated the binary branching criterion for every structure and every level. Simplicity was introduced by showing no empty category or putting a null symbol if it was necessary to show the null element.

Transformations

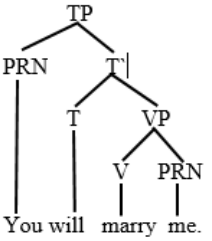
Chomsky's cognitive grammar, or internalized knowledge about language, is transformational generative grammar, as has already been stated. It can generate correct structures, but sometimes, the produced structures are not exactly the ones generative by the computational component of the grammar. They are the surface versions of the deep structures. For example, every passive structure is, in fact, a transformed version of a deep active structure. The original structures are only declarative and active. Even interrogation is made possible through some kind of transformation. Head movement and WH movement are really important as far as the discussion of transformation is concerned.

Head Movement

Before moving ahead in this discussion, it must be borne in mind that transformation and movement operations are also referred to as internal merger. This is so because the movement takes place only after a core structure has been formed by the computational component. The rest of the operations are performed within the arrangement that has been finalized. For instance, take the following sentence:

- Will you marry me?

This direct question was formed from a declarative affirmative sentence: *You will marry me*. The projections used hereon will follow the binarity principle mentioned in the previous section under the head of phrase structure rules. This principle tends to minimize the tedious levels proposed by X-Bar theory and projects only what exists, or at least what can exist as a result of subsequent transformation.



Another change that can be observed here as compared to the tree diagram of the previous section is that the maximal projection is TP (Tense Phrase) instead of IP (Inflection Phrase). The reason for this change is that the term inflection was carried on from the older flat structure where the sentences with auxiliaries used to have three branches, NP, I, VP. This was not possible according to the binarity principle. The change of term followed the change of projection method because if there is more than one auxiliary in a sentence, the tense is shown only by the first of them. None of the other auxiliaries is inflected. Moreover, auxiliaries do not comprise the only category to show inflections. Inflectional variations exist even in nouns (for number) and pronouns (for cases). Therefore, keeping all these postulates in view, it was most appropriate to use the term *tense* instead of *inflection*.

Coming back to the sentence under discussion, if it has to be changed into an interrogative sentence, its tense marking part (*will*) has to move to some position before the subject. But this condition poses a fundamental problem as there is no position that the moved will can occupy.

The solution to this problem is provided by considering the following two structures.

- I ask if you will marry me.
- *I ask if will you marry me.

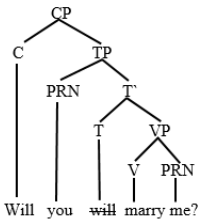
The second sentence is not acceptable. First, a glimpse at a traditional rule will help us understand the issue at hand. Conventional rules dictate that subject-verb inversion takes place only in direct questions. In indirect interrogatives, the verb is not fronted.

But the traditional grammar did not know the reason: Why was such inversion prohibited in indirect questions? Chomsky's transformational generative grammar supplies us with the real cause of the hindrance. A hint of the cause is clear from looking at the second incorrect structure. In the presence of *if*, it will not come in front of the sentence as it does in the direct questions. In other words, either *will,* or *it* can take the position before the subject. They both are mutually exclusive: only one of them can take the initial position.

However, one problem still exists: what do we call the position that is to be occupied by an element before the subject? In order to have an idea about it, let's have a look at the following sentences:

- He told me *that* he was ill.
- *How* he achieved his ambition is a mystery open to debate.

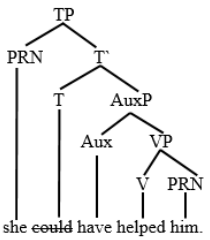
The word in italics has got the position prior to the subject in the relevant clauses. These are commonly called complementizers. Thus, the node open to receive a moving element in an interrogative sentence is C. This will be governed by the Complementizer Phrase (CP). So we have got the following situation as a result of transformation:



The struck off will is the trace of the moving head T. There are solid justifications for the existence of this trace. The justification can be dug out from the cliticization of auxiliaries as in the structure given below:

- He could have helped her, or [she have helped him]. (Radford, 2009)

The clause in the parenthesis can be portrayed in the following way:



Although this example pertains to copying and deletion rather than movement, it does serve as a solid justification that null constituents exist. There are a couple of key arguments in this regard:

1. If we consider this clause as an isolated structure, it becomes unacceptable because the third person singular subject *she* cannot take uninflected *has* with it.
2. Cliticisation of she with have in the form of *she's* is not possible here as it would have been possible in the full structure (*she could've*). What is blocking the cliticization here? It is certainly the trace of the deleted element *could*.

One indispensable rule for transformation states that it is triggered only and only if some strong attracting feature exists on the destination node. In this particular case, a strong Q feature exits in the head C slot. It must be overt and explicit. If it is null, covert, or implicit, the structure becomes unacceptable. That is why the mental computational component takes care that in direct questions, the complementizer (C) slot is never null.

WH Movement

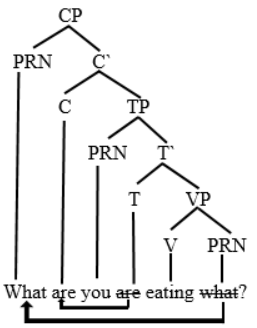
WH movement is an example not only of the transformational phenomenon but also of another UG Principle – The extended Projection Principle. This has already been observed in the TP when it has one additional projection (T`) where all other phrases have only one projection. For the purpose of illustration of how this appears practically, take the following sentence:

- What are you eating?

As seen earlier, this is also a surface structure of a simple declarative sentence at a deeper level.

- You are eating apples/bananas/pudding (what).

There are two kinds of movements in this sentence: head to head movement and WH movement. The former transformation is triggered by the strong Q feature on the C head, whereas the latter is triggered by the expended projection requirement of CP in WH initiated questions.



The existence of traces can be justified here, too, but this would unnecessarily prolong the discussion.

To conclude the discussion on transformation, it can be said that transformations are the tools of our minds' minimalistic tendency. Without the presence of transformations, our mental grammar would have suffered a great deal as it would have to internalize a much larger number of rules.

Conclusion

Avram Noam Chomsky brought an upheave in the world of linguistics. No other factor can serve to illustrate his contributions and influences better than the fact that the modern syntax can never be complete unless a learner takes Chomsky's works into account. Traditional grammar, with its plethora of rules and corrective measures, with its judgmental approach and obsession with *correctness*, has almost been thrown into the abyss of oblivion except by a paltry number of institutes that have still chosen to stick to the Grammar Translation Method. The world has increasingly developed an awareness that language is beyond being correct or incorrect: the important thing is to understand how it works and how it is produced in mind. The introduction of computational component, phonetic form component, and logical component of human language faculty or internalized grammar have enlightened scholars all over the world that when given sufficient input, the human mind can, with the help of set principles and parameters, generate an infinite number of structures. And this generation process is not mere copying. It can produce a sentence never heard of. This is possible only by dint of linguistic competence. The generation process is strengthened further by transformations that can turn simple deep structures into complicated structures by means of different movement operations.

In short, Chomsky has given syntax a whole new world to explore. His lines of research are being carried forward by his followers, providing new insights ever into human language. Chomsky's innateness and cognition-based approach has transformed language from an arbitrary phenomenon to pure science. Any further work on syntax, transformational generative grammar, minimalism, language acquisition, and the very nature of language is bound to carry a subliminal imprint, an emblem of Chomsky's name.

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