

# **Chomsky's Generative Transformational Grammar and its Implications on Language Teaching**

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## **Abstract:**

The relationship between language and mind has had a considerable interest and research among psychologists and language specialists alike. This relation is often regarded as being intricate due to the nature of language itself and the difficulty of studying the mind as a subject matter. The present contribution attempts to highlight and explain the interrelationship between human language and the mind on the basis of Noam Chomsky's works (namely, 1957,1968) focusing on generative linguistics and innateness. In this respect, this paper sheds light on the implications of Chomsky's cognitive views of language on the teaching / learning of English as a Foreign Language (EFL). It also suggests some pedagogical implications so as to alleviate, if not, eradicate some of the problems encountered by the pedagogical couple (the language teacher and the learner).

**Key words:** *Language, mind, innateness, EFL. Generative linguistics, Noam Chomsky*

## **1-Introduction**

Undoubtedly, Chomsky's contribution to the world of linguistics is one of the most important achievements of the twentieth century. The era known as the Chomskyan era is referred to the period beginning shortly after the publication of the revolutionary book "Syntactic Structures" (1957) in which Chomsky developed a syntactic theory aiming at the specification of the grammatical rules underlying the construction of sentences of the language.

The aim of this paper is twofold; first it traces back the Chomskyan revolution beginning by a brief discussion of the main tenets of the revolution and then discussing some pedagogical implications of Chomsky's theories on language teaching. Chomsky has accounted for the three models in Syntactic Structures; the Finite State Grammar, Phrase Structure Grammar (PSG) and Transformational Generative Grammar (TGG) discussing the amendments incorporated into "Aspects of the Theory of Syntax" (1965), i.e. what has become to be known as The Standard Theory.

## **2-A Brief Account of Syntactic Structures (1957)**

The publication of Syntactic structures has made a revolution in linguistics. Chomsky developed a theory known as Transformational Generative Grammar

(TGG) because of its aim of constructing a device that would generate all and only the sentences of the language; " the grammar of L will thus be a device that generates all the grammatical sequences of L and none of the ungrammatical ones " (Chomsky, 1957:13).

Moreover, Chomsky changed the subject matter of linguistics arguing that instead of the appropriate subject matter of linguistics being a randomly or arbitrarily selected set of sentences, the proper object of study was the speaker's underlying knowledge of the language; his linguistics competence that enables him to produce and understand sentences he has never heard before.

The Chomskyan revolution can be summarised in the following chart:

	Structuralism	Generative Grammar
Subject Matter	Corpus of utterances	Speaker's knowledge of how to produce and understand sentences, his linguistic competence
Goal	Classification of the elements of the corpus	Specification of the grammatical rules underlying the construction of sentences
Methods	Discovery procedures	Evaluation procedures

(John R. Searl, Chomsky's Revolution in Linguistics, June 29, 1972).

In *Syntactic Structures* (1957), Chomsky proposed three models for the structure of the language; the Finite Markov Process, Phrase Structure Model, which is based on immediate constituent analysis and Transformational Generative Grammar TGG. All in all, the aim of the linguistic theory expounded by Chomsky in *Syntactic Structures* was essentially to describe syntax, that is, to specify the grammatical rules underlying the construction of sentences.

The TGG model has two major components and a minor component:

- Phrase Structure; which contains a set of rules (PS-rules). These rules generate the underlying strings
- Transformational Structure; which contains a set of transformational rules (T-Rules) that convert the underlying strings into derived strings and later into surface structure. These rules add, delete or change the order of formatives in the terminal string produced by the PS-rules. Some of the transformational are *obligatory*, and others are *optional*.
- Morphophonemic Rules are in a way "spelling notes" which represent the surface structure of the sentence.

Chomsky added: "When transformational analysis is properly formulated we find that it is essentially more powerful than the description in terms of phrase structure" (Chomsky, 1957:47).

### **3-Amendments of Aspects of the Theory of Syntax**

#### **3-1-Important Dichotomies**

##### **3-1-1-Competence /Performance**

In aspects (1965) Chomsky distinguished between competence and performance and asserted that generative grammars theories of linguistic competence.

Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance. (Chomsky, 1965:3)

So, Chomsky has characterised a generative grammar of language as an explicit description of the 'ideal speaker-hearer's intrinsic competence'. A person's linguistic competence is his tacit knowledge of his language in how to produce and understand an indefinite number of utterances never heard before. However, performance is considered to be the physical representation, usually in utterances of any type of the human competence which refers to how someone uses language. Chomsky considered performance as faulty representation of competence because of psychological restrictions such as memory lapses and limitations, distractions, changes of directions halfway through sentence, hesitation and so on. Performance, in a way, accounts for the failures language users have when transposing their competence into actual linguistic production.

It is important to note that Chomsky made a distinction between grammaticality and acceptability. The latter is a concept that belongs to the study of performance whereas the former belongs to the study of competence.

##### **3-1-2-Deep /Surface Structure**

Chomsky developed the idea that each sentence in a language has two levels of representation; a deep structure and a surface structure. The deep structure represented the semantic relations of a sentence and was mapped onto the surface structure (which follows the phonological form of the sentence very closely) via transformations. The surface structure refers to the mental representation of a linguistic expression derived from deep structure by transformational rules.

Chomsky believed that there would be considerable similarities between languages' deep structures, and that these structures would reveal properties common to all languages, which were concealed by their surface structures. This has come to be

known as Universal Grammar (UG) that is explained through the theory of principles and parameters

#### **4-Modifications in Chomsky's Grammar**

Chomsky's system of transformational grammar was substantially modified in *Aspects of the Theory of Syntax* (1965). Perhaps the most important modification was the incorporation, within the system, of a semantic component, in addition to the syntactic component and phonological component (replacing the morphophonemic component of *Syntactic Structures*). The rules of the syntactic component generate the sentences of the language and assign to each not one but two structural analyses: a deep structure analysis, as represented by the underlying phrase marker, and a surface structure analysis, as represented by the final derived phrase marker. The underlying phrase marker is assigned by the rules of the base; the derived phrase marker is assigned by the transformational rules. The meaning of the sentence is derived from the deep structure by means of the rules of semantic interpretation; the phonetic realisation of the sentence is derived from its surface structure by means of the rules of the phonological component. The grammar ("grammar" is now to be understood as covering semantics and phonology, as well as syntax) is thus an integrated system of rules for relating the pronunciation of a sentence to its meaning. The syntax, and more particularly the base, is at the heart of the system, as it were, it is the base component that generates the infinite class of structures underlying the well-formed sentences of a language. These structures are then given a semantic and phonetic "interpretation" by the other components. These modifications came to be known as the Standard Theory.

#### **5-The Standard Theory:**

The theory was developed by Chomsky in *Aspects of the Theory of Syntax* (1965) who pointed out

This system of rules can be analysed into the three major components of generative grammar, the syntactic, phonological, and semantic component. The syntactic component specifies an infinite set of abstract formal objects, each of which incorporates all information relevant to a single interpretation of a particular sentence [.....]. The phonological component of a grammar determines the phonetic form of a sentence generated by the syntactic rules [.....]. The semantic component determines the semantic interpretation of a sentence.

(Chomsky, 1965:16)

Put it like that, the complete grammar of a language must have three parts, a syntactical component that generates and describes the internal structure of the infinite number of sentences of the language, a phonological component that describes the sound structure of the sentences generated by the syntactical component, and a semantic component that describes the meaning structure of the sentences. The heart of the grammar is the syntax, the phonology and the semantics are purely "interpretive"; "Both the phonological and semantic component are therefore purely interpretive" (ibid: 16).

Furthermore, the base component consists of two parts; a set of categorical rules and a lexicon. Taken together, they fulfil a similar function to that fulfilled by phrase structure rules of the earlier system. But there are many differences of detail. Among the most important is that the lexicon lists, in principle, all the vocabulary words in the language and associated with each of all the syntactic, semantic, and phonological information is represented in terms of what are called features. For example, the entry for “boy” might say that it has the syntactic feature: [+Noun], [+Count], [+Common], [+Animate], and [+human]. The categorical rules generate a set of phrase markers that have in them, as it were, a number of “slots” to be filled with items from the lexicon. With each such “slot” there is associated a set of features that define the kind of item that can fill the “slot”. If a phrase marker is generated with a “slot” for the head of a noun phrase specified as requiring an animate noun (i.e. , a noun having the feature [+Animate] ), the item “boy” would be recognised as being compatible with this specification and could be inserted in the “slot” by the rule of lexical substitution. Similarly, it could be inserted in “slots” specified as requiring a common noun, a human noun, or a countable noun, but it would be excluded from positions that require an abstract noun (e.g. sincerity) or an uncountable noun (e.g. water). By drawing upon the syntactic information coded in feature notation in the lexicon, the categorical rules might permit such sentences as “the boy died” while excluding (and thereby defining as ungrammatical) such non sentences as “the boy elapsed”.

The role of the phonological component of a generative grammar is to assign a phonetic “interpretation” to the strings of words generated by the syntactic component. These strings of words are represented in a phonological notation and have been provided with a surface structure analysis by the transformational rules. The phonological elements out of which the word forms are composed are segments consisting of what are referred to technically as distinctive features. For example, the word “man”, represented phonologically, is composed of three segments: the first consists of the features [+vocalic], [+front], [+open], etc; and the third of the features [+consonantal], [+alveolar], [+nasal], etc.

## **6-Theory of Knowledge: Generative Grammar and Cognitive Theory**

Most of Chomsky’s works concerning the nature of knowledge pertain specifically to the construction and use of language. The theory of Generative Grammar, though constantly developing, stands as a microcosm of his views on the human mind’s methods of taking in and storing information. Whereas much of it is primarily applicable to the field of language, there is more than enough here to illustrate his core ideas about education and the formation of human thought and knowledge.

Human thought has been formed through centuries of man’s consciousness, by perception and meanings that relate us to nature. The smallest living entity, be it a molecule or a particle, is at the same time present in the structure of the earth and all its inhabitants, whether human or manifesting themselves in the multiplicity of other forms of life.

(Chomsky, 1986:xi)

In its core, Chomsky's theory of Generative Grammar is a way of describing the way people learn to communicate. The heart of this theory is the idea that all human language originates from a common source, an innate set of grammatical rules and approaches that is hardwired into the human mind. This is a very naturalistic approach, but one that has found ever increasing acceptance amongst experts in the field (Chomsky, 1986).

The fundamental approach to knowledge is very similar to that used in Information Processing Theory (IPT). According to Chomsky, in order for knowledge to be retained, there must be previous knowledge already present for the new information to be associated with. He typically refers to this process as "building" on prior knowledge, but it has obvious parallels with the "networking" described by IPT. Particularly in the process of taking in information initially, generative grammar has direct parallels with the ideas put forward for information processing theory.

Furthermore, Chomsky (2000) claimed that it is the idea of innate and natural grammar that really sticks. While there is little disagreement about this point that some of the more fundamental functions of the human brain are transmitted as instincts. We don't have to be taught to breathe, after all. The concept of an underlying mental matrix that informs all of human language is a bit of a departure from more traditional views on the origin of verbal communication.

This view is apparently naturalistic. Rather than the cultural development of spoken language through generations of trial and error, this would imply that it has all been merely a reconstruction of instincts that were already present. Each of every language spoken today, then, would have a common root in the language center of the human brain. The different forms that those languages then took could be attributed to different opportunities and approaches to networking the new verbiage and syntax.

## **7-Implications for teaching: Discussion**

In this section we endeavour to discuss the implications of Chomsky's works on language teaching. It has been noted that before the 1970s grammar had a controlling influence on language teaching. Approaches to grammar teaching and the design of course books at the time reflected a view of language, language learning, and language use. The goal of language teaching was to understand how sentences from lower-level grammatical units such as phrases and clauses, and to practice using them as the basis for written and spoken communication. Syllabuses were essentially grammar-based and grammar was a primary focus of teaching techniques. Correct language use was achieved through a drill and practice methodology and through controlled speaking and writing exercises that sought to prevent or minimise opportunities for errors.

During the 1970s Chomsky's theories of language and his distinction between competence and performance were beginning to have an impact on language teaching. Especially with regard to his theory of transformational generative grammar with core kernel sentences that were transformed through the operation of rules to produce more complex sentences sought to capture the nature of speaker's linguistic competence. It seemed to offer an exciting new approach to grammar teaching and for a while in the early seventies was reflected in ESL textbooks.

Moreover, Chomsky emphasised the cognitive nature of language learning and the fact that children appear to be born with abstract knowledge about the nature of language, that is, knowledge of universal grammar which came to be known as Language Acquisition Device (LAD). Exposure to language was sufficient to trigger the acquisition processes and initiate the processes of hypothesis formation that were evident in studies of language acquisition.

It is worth mentioning that a little of research has been carried out about the implications of Chomsky's theories on language teaching and learning. Nevertheless, his work had had a remarkable impact on education and pedagogy.

## **8- Conclusion**

The present work discusses Chomsky's Generative Grammar and its development and has shown that Chomsky's ideas, thoughts and theories are in constant state of change and he himself admitted repeatedly that a change is a sine qua non condition for the development of any linguistic investigation. The Standard Theory was developed into the Extended Standard Theory that includes the X-Bar Syntax and some constraints to the generative rules. By the 1990s, however, there had been further developments in Chomskyan theory. Chomsky's theory of universal grammar had been elaborated to include innate knowledge about the principles of language (i.e. that languages usually have pronouns) and their parameters (i.e. that some languages allow these to be dropped when they are in subject position), and this model was applied to the study of both first and second language acquisition (Schmitt 2002).

Chomsky's works have received many critics claiming that he idealises the language and overlooks real and pragmatic communication. The linguistics competence has become communicative, pragmatic competence, etc.

All in all, Chomsky's position in the world of linguistics is unique and it is hardly to find a book of linguistics overlooking his theories and ideas.

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