

The Role of Transformational-Generative Grammar in Language Teaching and Learning

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Abstract:

Transformational-Generative Grammar has contributed to a shift in language pedagogy from rote memorization and repetition toward competence-oriented approaches emphasizing linguistic competence, cognitive development, and creativity. Using a descriptive-analytical approach, the study highlights the role of this theory in rethinking language teaching practices and enhancing learners' linguistic abilities. The study concludes that TG Grammar supports a transition from mechanical learning to a more cognitive and generative understanding of language. It further recommends integrating its principles into language curricula and developing more effective pedagogical strategies.

Keywords: Transformational-Generative Grammar; Language Teaching; Language Learning; Linguistic Competence; Linguistic Creativity.

Résumé :

Cette étude examine le rôle de la grammaire générative transformationnelle dans l'enseignement et l'apprentissage des langues, en considérant le langage comme une capacité mentale innée fondée sur la compétence linguistique et la créativité. Elle vise à mettre en évidence les contributions de cette théorie au développement de l'enseignement des langues et au renforcement des capacités linguistiques des apprenants. En adoptant une approche descriptive et analytique, l'étude conclut que cette théorie a contribué à faire évoluer l'enseignement des langues, passant d'une logique de mémorisation et de répétition à une approche centrée sur la compétence linguistique ainsi que sur les capacités cognitives et créatives des apprenants. L'étude recommande d'intégrer les principes de la grammaire générative transformationnelle dans les programmes d'enseignement des langues et de développer des stratégies pédagogiques plus efficaces.

Mots-clés : Grammaire générative transformationnelle ; Enseignement des langues ; Apprentissage des langues ; Compétence linguistique ; Créativité linguistique.

Introduction:

Contemporary linguistics has witnessed profound transformations in the study and teaching of language as a result of the emergence of various linguistic theories that have sought to explain the nature of language and the mechanisms underlying its acquisition and learning. Educational thought, particularly in the field of language pedagogy, has long been dominated by approaches derived from structuralism and behaviorism. These approaches primarily relied on memorization,

rote learning, and the presentation of linguistic knowledge in the form of ready-made rules and responses to external stimuli. Over time, however, their limited effectiveness in developing learners' linguistic competence and creativity became apparent, negatively affecting educational outcomes and weakening learners' ability to use language effectively in different communicative contexts.

Against this backdrop, Noam Chomsky's Transformational-Generative Theory emerged, offering a new conception of language as an innate mental faculty and a creative activity governed by underlying cognitive rules that enable individuals to produce and comprehend an unlimited number of linguistic structures. Consequently, the learner is no longer viewed as a passive recipient of linguistic knowledge but rather as an active participant in constructing linguistic competence through the activation of cognitive abilities and the use of language in diverse communicative situations.

In light of these developments, the present study addresses the following research question: **How can Transformational-Generative Grammar be effectively translated into pedagogical practices that enhance learners' linguistic competence and creativity?**

Based on this question, the study hypothesizes **that language is an innate human capacity rooted in inherent cognitive and mental structures, that the generation of linguistic forms is governed by systematic internal rules, and that meaningful communicative use of language contributes to the development of learners' linguistic competence and the expansion of their linguistic repertoire.**

The study aims to introduce Transformational-Generative Theory and trace its emergence and development, highlight its intellectual and cognitive foundations, and examine its conception of language acquisition and learning mechanisms. It also seeks to identify its contributions to language pedagogy and to the development of learners' linguistic and creative abilities, as well as to demonstrate how the principles of Transformational-Generative Grammar can be employed to design more effective educational practices.

To achieve these objectives, the study adopts a **descriptive-analytical approach** by describing the major concepts and linguistic foundations of Transformational-Generative Theory and analyzing their implications for language teaching and learning. It also employs a **deductive approach** to derive educational applications from the principles of this theory and to clarify their role in improving educational practices.

The study is divided into three main sections. **The first section examines the emergence and concept of Transformational-Generative Theory. The second section explores the stages of its development and evolution. The third section addresses the fundamental principles of the theory and the rules governing language acquisition and learning.** Finally, the study concludes with the main findings and a set of recommendations and suggestions related to the research topic.

1. The Emergence and Concept of Transformational-Generative Theory

Transformational-Generative Theory emerged in the United States in 1957. Its foundations were established by Noam Chomsky in his seminal work *Syntactic Structures*, in which he focused

on the principles of generation and transformation in sentence formation. For this reason, it became known as Transformational-Generative Theory. This theory is considered one of the most influential modern linguistic theories, as it postulates that linguistic competence is an innate faculty with which human beings are naturally endowed at birth. Chomsky's intellectual orientation was significantly influenced by rationalist thinkers such as René Descartes and Wilhelm von Humboldt.

Chomsky conceives language as a mental system residing in the human mind and consisting of a set of signs and symbols characterized by phonological, semantic, and syntactic properties. It is this system that enables individuals to generate an infinite number of sentences. In this regard, it has been noted that "this theory regards language as existing in the human mind in the form of a system that distinguishes the phonological, syntactic, and semantic properties of an infinite set of potential sentences" (Al-Sayyid, 2003).

Through his theory, Chomsky sought to formulate universal grammatical principles concerned with sentence structure across all languages, based on the assumption that human languages share a set of common linguistic characteristics. In this respect, Alwer states that "the primary assumption of Transformational-Generative Grammar is the establishment of universal rules, or the construction of a grammatical theory capable of explaining the rules underlying all languages" (Qaddour, 2008). Accordingly, the universal grammar that Chomsky endeavored to establish is grounded in mental activity, which itself requires a set of principles and rules to regulate and direct its functioning.

2. Stages in the Emergence and Development of Transformational-Generative Theory

The emergence of Transformational-Generative Theory is closely associated with the publication of Noam Chomsky's *Syntactic Structures* in 1957, as previously mentioned. The ideas advanced in this work diverged significantly from the prevailing structuralist and behaviorist approaches to language. Consequently, Chomsky's propositions were met with considerable criticism from linguists and researchers whose work had been shaped by structuralist and behaviorist traditions. This intellectual debate led Chomsky to publish another major work in 1965, entitled *Aspects of the Theory of Syntax*, in which he addressed and revised some of the limitations of his earlier formulations, thereby further clarifying the foundations of Transformational-Generative Theory.

The following section presents the principal stages through which Transformational-Generative Theory evolved before reaching its present form.

2.1. The Stage of Syntactic Structures

In *Syntactic Structures*, Chomsky relied on the method of Immediate Constituent Analysis, an approach widely employed within American structural linguistics, particularly by Leonard Bloomfield and Zellig Harris. This method analyzed speech in terms of position, distribution, and constituent categories. At this stage, Chomsky emphasized the necessity of evaluating grammatical rules according to explicit criteria and adopting those rules that most adequately account for linguistic data. In this context, he distinguished among three different types of formal rules:

1. Finite-State Grammars;
2. Phrase-Structure Grammars;
3. Transformational Grammars.

These formal rules reveal Chomsky's concern with three fundamental components of language: the syntactic component, the phonological component, and the semantic component.

2.1.1. The Syntactic Component

The syntactic component generates an infinite set of syntactic structures that contain both a semantic representation, derived from the semantic component, and a phonological representation, derived from the phonological component. Thus, the syntactic component functions as a bridge between meaning and sound (Michel, 1985, p. 108).

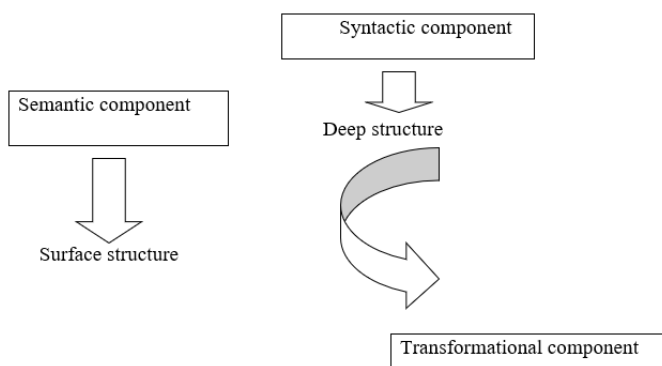
It can therefore be observed that the syntactic component encompasses the creative aspect of language, enabling speakers to generate an unlimited number of linguistic structures. This component itself consists of two subcomponents.

A. The Base Component

The phrase structure rules generate a phrase marker associated with each sentence and replace its terminal symbols with lexical entries, thereby yielding the sentence in its deep structure. This replacement process is governed by specific constraints according to the features of the lexical entries (Michel, 1986). It can be observed that this component contains a set of rules and a set of lexical entries encompassing syntactic, phonological, and semantic features.

Thus, the rules in this context are rewriting rules that rewrite a given sentence in the form of a set of symbols. In this way, the characteristics of the deep structure become apparent, which is subsequently transformed by the grammatical process into a surface structure. The transformational-generative school considers rewriting rules in any language to be “a set of laws through which the researcher can expand the initial symbol ‘S’ into its various constituents at different levels until the sentence is generated” (Ben El-Touati, 2008).

Figure (01): This diagram represents the functioning of the syntactic component



Semantic representation (Michel, 1986, p. 17)

B. The transformational component

This component contains a set of transformations, each of which replaces one constituent marker with another constituent marker. These transformations are governed by certain constraints, some of which are universal and others are language-specific (Michel, 1986, p. 17). This component includes both obligatory and optional transformations, and each transformation occupies a specific position within the overall set of transformations. Therefore, it is necessary to distinguish between obligatory transformations, which “must be applied, are explicit, declarative, modern, and simple, and whose result is the kernel sentence” (Fouc & Gouvic, 1984), and optional transformations, which generate derived sentences that contrast with the kernel sentence; that is, they may be negative, interrogative, or complex, etc.

2.1.2. The phonological component

This component is based on “various morphological structures in terms of their phonetic effects in formation, and it includes a set of phonological rules that derive the phonetic change of each sentence starting from its surface structure” (Michel, 1985, p. 31). Thus, it becomes clear that the phonological component is responsible for assigning each linguistic structure a specific phonetic sequence based on defined linguistic rules.

2.1.3. The semantic component

This component is concerned with interpreting the meanings of deep structures, as it “assigns an overall meaning to each structure based on the individual meanings of morphemes (morphèmes), (...) and it deals with the structures generated by the syntactic component, assigning each of them a semantic representation” (Michel, 1985, p. 31).

Accordingly, the semantic component focuses on the meanings conveyed by morphemes, which significantly contributes to the process of sentence transformation by partially altering meaning at each stage.

2.2. The Aspects Stage

The transformational stage is considered one of the most important phases in the development of Transformational-Generative Theory developed by Noam Chomsky. It emerged within the shift from descriptive structural linguistics to an explanatory linguistic approach with a cognitive orientation. This stage focuses on explaining language as an innate mental capacity in human beings, enabling the production and comprehension of an infinite number of sentences based on a finite set of rules (McGilvray & Britannica Editors, 2026).

The Chomskyan framework is based on a fundamental distinction between two levels of sentence structure: deep structure, which represents core meaning and semantic relations between elements, and surface structure, which represents the final form of a sentence as it is spoken or written. The transition between these two levels is achieved through so-called “transformations,” which are syntactic rules that map deep structures onto surface structures, generally preserving meaning, although in some cases they may affect aspects of interpretation depending on the syntactic operation applied (McGilvray & Britannica Editors, 2026).

the generative model has contributed to explaining several linguistic phenomena, such as the relationship between active and passive constructions, as well as the phenomenon of linguistic ambiguity, where a single sentence may allow multiple interpretations. Consequently, this stage marked a radical shift in the study of language, moving the focus from merely describing sentences to explaining the cognitive capacity that enables humans to produce and understand language.

2.3. The Minimalist Program Stage

The Minimalist Program is considered one of the most recent developments in Noam Chomsky's Transformational-Generative Theory, officially introduced in the 1990s with the publication of *The Minimalist Program* (Chomsky, 1995). This stage aims to reformulate linguistic theory in the simplest possible way by reducing the grammatical apparatus to the minimal set of principles and operations. Its core idea is that language is an economic cognitive system that seeks to achieve maximum efficiency with minimal theoretical structure and assumptions.

This model is based on the principles of economy of derivation and representation, where syntactic structures are generated through optimally efficient derivations that minimize computational cost. It also assumes that Universal Grammar provides a single computational system shared by all speakers, while cross-linguistic variation is explained in terms of differences in morphological and lexical features rather than in core grammatical rules. Consequently, the complex transformational rules that characterized earlier stages are significantly reduced.

Furthermore, this framework distinguishes between two fundamental interface levels: the conceptual-intentional system responsible for meaning, and the articulatory-perceptual system responsible for phonological form. All syntactic operations are designed to satisfy the conditions imposed by these interface levels. Thus, the central goal of the Minimalist Program is to explain language as part of the human cognitive system, emphasizing explanatory simplicity and structural economy, making this stage more abstract and closely aligned with modern cognitive science (Chomsky, 1995).

Table (01): Theoretical Evolution of Transformational-Generative Grammar and Its Pedagogical Implications

Stage	Main Focus	Linguistic Concept	Teaching Implication
Syntactic Structures	Rule-based grammar	Transformations	Sentence manipulation exercises
Aspects Model	Competence vs performance	Deep/Surface structure	Focus on meaning-based teaching
Minimalist Program	Economy & simplicity	Merge, economy principles	Simplified grammar instruction

3. Foundations of Transformational Generative Theory and the Rules of Language Acquisition and Learning:

Through this section, we attempt to highlight the role of Transformational Generative Theory in language acquisition in general, and in language learning in particular within schools,

through its applications in the field of language pedagogy. This will be achieved by analyzing the principles upon which this theory is based, as follows:

3.1. Linguistic creativity

Chomsky emphasized in his research that language is a uniquely human characteristic, as other living beings are unable to create or vary linguistic use. In other words, they can only transmit a limited number of instinctive messages with fixed meaning, and animals are also incapable of generating or forming new sentences (Lyons, 1995). Transformational generative grammar focuses on this creative property and links it to the human mind; it is an unlimited capacity and ability that enables humans to produce an infinite number of sentences, whether they have heard them before or not. Based on this notion of creativity, Chomsky's concept of language was established, where every use of language is a renewed act not determined by external influences or circumstances. Consequently, what a person says cannot be considered mere repetition of previously heard or learned utterances. Therefore, language learning is closely linked to human cognitive activity.

3.2. Linguistic competence and performance

Transformational generative theory is concerned with studying the linguistic competence of the speaker as the ability to produce a vast number of sentences. It distinguishes between a speaker's knowledge of language and their actual use of it, i.e., between linguistic competence and performance. Chomsky defines linguistic competence as: "a characteristic of the species, universal among its members and essentially limited to it in its fundamental properties, capable of producing a rich, detailed, and complex language based on minimal linguistic input" (Michel, 1985, p. 152).

Thus, linguistic competence is considered a property of the human species, meaning that every individual is able to express themselves in the language of the environment in which they were born and raised. It is defined as the speaker's implicit knowledge of the rules of their language (Michel, 1985, p. 154).

In contrast, performance represents "the actual manifestation of this knowledge in the real-time use of language" (Michel, 1992). Performance is the concrete realization of language in practice, which becomes a fully structured system after the application of the principles and rules of linguistic competence, with only minor adjustments such as the addition of lexical items. Thus, internally constructed language is a rational form related to cognitive structures and processes, as it assumes essential features of a language acquisition system through the general framework it provides for linguistic material (Al-Khawalda, 2006).

3.3. Generation and Transformation

Chomskyan theory is based on two fundamental principles: **generation** and **transformation**. According to Chomsky, these two principles are common to all languages. Generation is linked to the creative aspect of language. Its primary feature is that it is "a creative process that characterizes human beings; it is the emergence of a structure or a set of structures from a basic sentence, known as the generative sentence. The most important characteristic of the

generative sentence is that it conveys a meaningful message while using the smallest possible number of words, and it is free from all types of transformations” (Astitiyah, 2005).

Thus, the concept of generation is closely related to creativity, which is a human capacity that enables individuals to produce an infinite number of sentences based on a limited set of rules.

As for **transformation**, it is considered one of the mechanisms adopted by Chomsky in his linguistic analysis. He derived the notion of transformation from his teacher Zellig Harris. Chomsky’s principle of transformation can be summarized as follows: speakers of a language are capable of transforming a single sentence into a large number of different sentences (Astitiyah, 2005, p. 89).

For example, if we take the sentence: “The children of Algeria expelled the colonizer,” and apply transformations to it, we can derive several sentences, such as:

1. The colonizer was expelled (passive construction).
2. The colonizer was expelled by the children of Algeria (word order variation and addition).

Transformations in language are divided into two types:

A. Obligatory transformations

These are transformations that must be applied, and their result is the kernel sentence. Such sentences must have four properties:

1. They are simple sentences (not complex).
2. They are active sentences, not passive.
3. They are affirmative, not negative.
4. They are declarative, not non-declarative or interrogative (Fouc & Gouvic, 1984, p. 77).

B. Non-obligatory (optional) transformations

These are transformations that generate derived sentences. Derived sentences lack the four properties of the kernel sentence and include negative, interrogative, and complex sentences, etc.

3.4. Surface Structure and Deep Structure

These two terms appear prominently in Chomsky’s book *Aspects of the Theory of Syntax*, where he introduces them with the aim of facilitating the study of language in both its spoken and written forms. Chomsky’s distinction between deep structure and surface structure stems from his Cartesian rationalist philosophy in general, as well as from his view of human beings as entities fundamentally different from other creatures, distinguished by several capacities, most notably language, intelligence, and the ability to think (Al-‘Usayli, 1999).

This idea recalls Chomsky’s concept of creativity, which is rooted in the human mind. Every sentence, according to this theory, has both a deep structure and a surface structure. The deep structure represents “the abstract mental basis of a given meaning that exists in the mind (...) and it is the core necessary for understanding the sentence and determining its semantic meaning” (Khalil, 2007).

Thus, the deep structure is an abstract form existing in the mind of the language user and reflecting the ideas present in their cognition. It serves as the core of the surface structure and determines its nature, as it consists of the syntactic relations that define sentence meaning. In some

cases, a single surface structure may correspond to more than one deep structure. For example, the sentence:

“God, the invisible, created the visible world.”

This surface structure contains three deep sentences:

1. God created the world.
2. God is invisible.
3. The world is visible.

Sentences (1) and (2) are merged into the main sentence through transformational rules, which in Arabic, at least, allow the transformation of a predicate of a subject into an adjective modifying it. Thus, sentence (1) can be considered as derived or generated from these three underlying sentences through specific transformational rules (Muhsib, 2008).

It is evident that, in this theory, deep structure is a mental reality, which reflects the rationalist philosophy underlying Chomsky's theory. Deep structure serves as the nucleus of surface structure and can be transformed through transformational rules into surface structures that represent actual sentences in use, which vary from one speaker to another. Therefore, surface structure is a reflection of deep structure, and this enables speakers or language learners to acquire a broader linguistic repertoire through communication.

3.5. Intuition

Chomsky defined native speakers' linguistic intuition in his later works as “part of the linguistic data that grammar rules are expected to explain and account for. Indeed, he now relies on the validity of this intuition more than before, when he was concerned with testing it through precise technical procedures” (Lyons, 1995, p. 79).

In Transformational Generative Theory, intuition is considered a criterion and judgment mechanism through which a native speaker can distinguish between correct linguistic structures and incorrect ones, thereby excluding ungrammatical forms from the linguistic domain.

Intuition is particularly helpful for learners, especially in oral expression, as it enables them to select appropriate and correct expressions, which in turn facilitates the development of their linguistic skills.

Transformational-Generative Grammar does not directly prescribe specific teaching methods; rather, it provides a cognitive model of language that can inform pedagogical strategies focused on creativity, sentence formation, and the implicit acquisition of grammatical rules. Despite its strong theoretical influence, it remains primarily a linguistic theory rather than a fully developed pedagogical framework. Moreover, it has been criticized for its high level of abstraction and limited empirical validation in classroom contexts, as well as for its focus on idealized linguistic competence, which is sometimes seen as detached from authentic communicative language use. However, its cognitive orientation has significantly influenced modern communicative and cognitive approaches to language teaching, particularly in emphasizing creativity, internal rule formation, and learner-centered approaches to language acquisition.

Conclusion:

After examining Transformational-Generative Grammar and its stages of emergence and development, it becomes evident that this theoretical approach has brought about a significant shift in modern linguistic studies. Linguistic research has moved from the dominance of structural approaches grounded in empiricist traditions to a rationalist perspective established by Chomsky. This perspective emphasizes language as an innate human faculty located in the mind, and maintains that language acquisition results from the activation of this internal cognitive capacity through linguistic exposure and meaningful interaction.

This study is primarily theoretical in nature and does not involve empirical classroom-based investigation. Therefore, future research is encouraged to explore the pedagogical effectiveness of Transformational-Generative principles through experimental studies in real teaching and learning contexts.

Based on the above, the following results can be drawn:

Findings:

1. Transformational Generative Theory contributed to a significant shift in modern linguistics by focusing on the cognitive dimension of language.
2. The theory confirmed that language is an innate human capacity rather than a behavior acquired merely through imitation and repetition.
3. It highlighted the importance of distinguishing between linguistic competence and performance in understanding language production and use.
4. It demonstrated that generative and transformational processes explain the diversity and unlimited creativity of linguistic sentences.

In light of these findings, the following recommendations are proposed:

Recommendations:

1. It is necessary to apply the principles of Transformational Generative Grammar in language teaching by encouraging learners' freedom of expression and linguistic generation.
2. Linguistic intuition should be utilized in evaluating learners' performance and correcting errors in a constructive manner.
3. Oral interaction activities in the classroom should be enhanced through dialogue and discussion to develop communicative competence.
4. Teachers should be trained to employ modern linguistic approaches and integrate information and communication technologies into the educational process in order to keep pace with scientific and technological developments.

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