

The Linguistic Zero Theory: A New Approach To Universal Grammar

The Language Production System in the Brain

By Dr. Sana Al-Bayati

Numerous linguistic studies have attempted to uncover the system responsible for language production in the human brain. Among the most prominent scholars in this field is the American linguist Noam Chomsky, particularly through his Transformational-Generative Grammar theory. In this context, I present another theory that reveals the mechanism through which the brain operates to produce language, which I have named “**The Linguistic Zero Theory of Universal Grammar.**” This theory describes the operational system of the language production mechanism in the brain.

What does the zero mean in “The Linguistic Zero Theory”?

By comparison with zero in mathematics, numerical zero represents a numerical stage between increasing numbers and decreasing numbers. From zero, counting begins and extends infinitely in both directions, through increasing and decreasing sequences of numbers. Likewise, the human brain’s language production system represents the intermediate stage between the ideas intended to be expressed and the sentences that convey those ideas. From this stage, and based on the mental linguistic system, an infinite number of sentences are generated to express an infinite number of thoughts.

The Language Production System in the Brain

The Linguistic Zero Theory proposes that the human brain contains an apparatus that operates according to a specific system for producing language. The theory has revealed this system, which linguists have referred to as the “**black box.**” According to this theory, the language production system in the brain processes the idea and begins by constructing it through a transition from the whole to the parts. This process corresponds with human perception of objects according to **Gestalt theory**, as humans perceive things as complete wholes before shifting their perception toward details. In the same manner, the sentence is constructed, beginning with its general meaning and moving toward the connection and organization of its components.

Therefore, the Linguistic Zero Theory proposes that the language production apparatus in the brain operates according to a system consisting of the following stages:

The First Stage:

In this stage, the general meaning of the idea is determined, whether it is an affirmative statement, a negative statement, an interrogative form, a conditional structure, or another type of meaning. The identification of the general meaning of the idea may occur either without a linguistic marker, as in the case of an affirmative declarative idea, or through the use of a marker that specifies the meaning, as in interrogative, conditional, or negative ideas.

The Second Stage:

This stage may be referred to as the “**Directorate of Linking,**” in which the relationships between the meanings of the components of the idea are

established. In other words, concepts and mental images are connected through semantic relations that represent grammatical meanings. The Linguistic Zero Theory categorizes these grammatical meanings into four principal types:

1- Predication (Al-Isnad):

This relation represents the peak of the hierarchy and the central core within the Directorate of Linking meanings. It is the fundamental mental meaning upon which the sentence is constructed, and it establishes the relationship between the predicate and the subject.

2- Specification or Determination:

This is a grammatical meaning that connects all objects, adverbial elements (circumstantial expressions), and the element of distinction (*tamyīz*) to the predication relation.

3- Addition or Relation:

This is a grammatical meaning that connects the annexed element (*mudāf ilayh*) to the annexing element (*mudāf*), with both being connected to the predication relation.

4- Clarification or Subordination:

This is a grammatical meaning that connects the adjective to the described noun, the substitute (*badal*) to the replaced element, and the emphatic element to the element being emphasized. All of these relations are connected to predication.

All grammatical meanings are connected to predication either directly or indirectly. Through this process of linking the components of the idea, a network of relationships is formed among the meanings, preventing the separation of the elements that constitute the idea.

The Third Stage:

In this stage, the appropriate linguistic forms are identified and selected from the mental lexicon. The brain connects each meaning—after it has already been associated with other meanings through grammatical relations—with the linguistic sign that corresponds to it. Consequently, the words that match the mental image stored in the brain are selected.

According to the Linguistic Zero Theory, the selection of words occurs in the final stage of the language production system. After these stages have been completed, the idea has achieved its full mental formation, and only its external representation remains, either through vocal expression or written form. .

The Success of the System in More Than One Language Upon Application

The existence of this apparatus in the brains of all human beings makes translation from one language to another possible, as the translator relies on this system to move from the source language to the target language in literal translation. However, the differences among languages lie in the way this apparatus is managed and in the specific organizational patterns agreed upon by the speech community of each language within the broader shared linguistic organization. This generates language-specific rules, such as placing the adjective before the noun it describes in English, while placing it after the noun in Arabic.

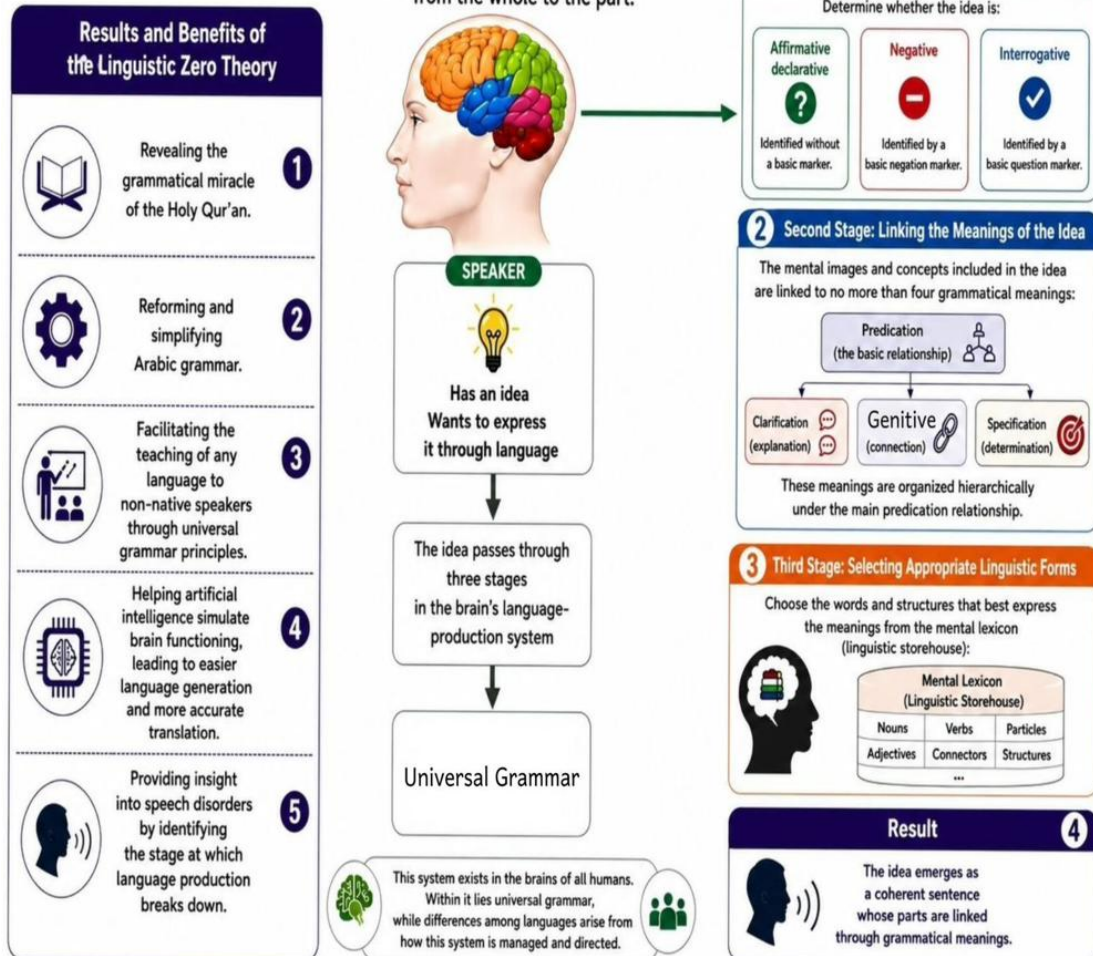
The following presents a model of the brain's operational mechanism for language production:

On the right side of the model, there are three stages through which the idea passes, moving from generality to specificity: that is, from determining the general meaning of the idea, to establishing relationships among the meanings of its components, and finally to selecting the appropriate linguistic forms corresponding to those meanings.

On the left side, the model presents the general outcomes and benefits of applying this system, both in language in general and in the Arabic language in particular.

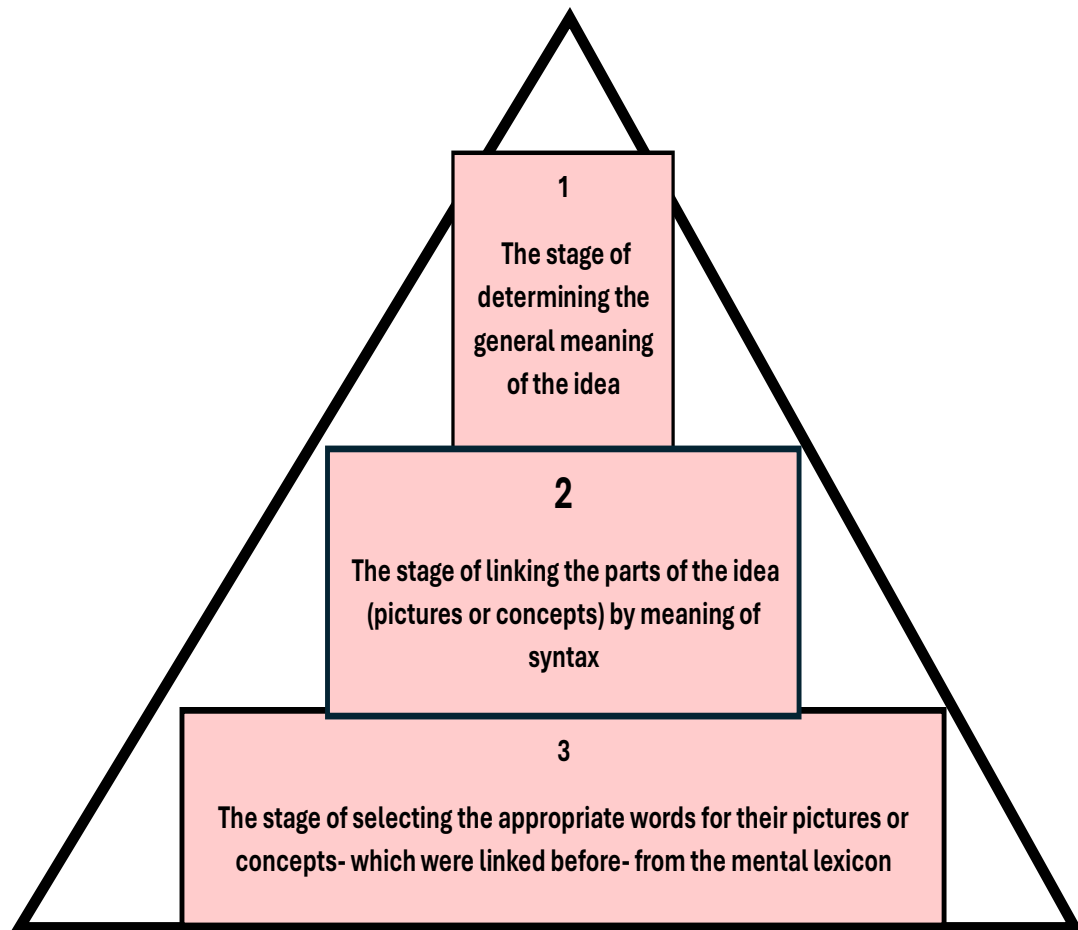
The Linguistic Zero Theory Model

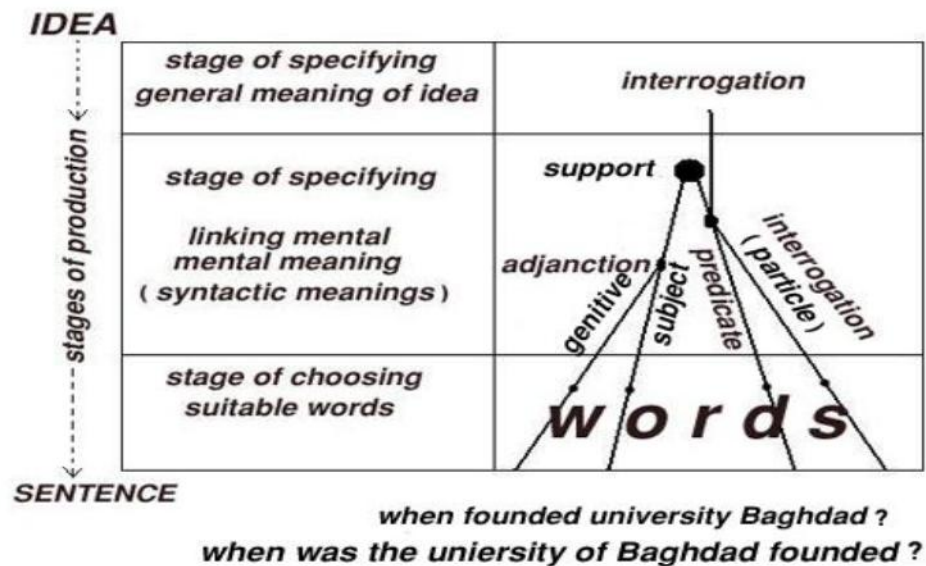
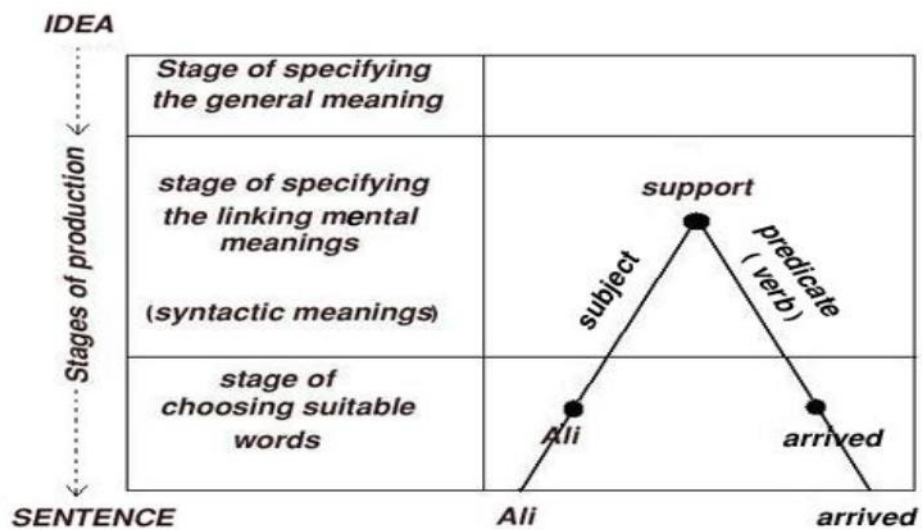
A system that explains how the brain works from the whole to the part.



The hierarchical organization of language production processes

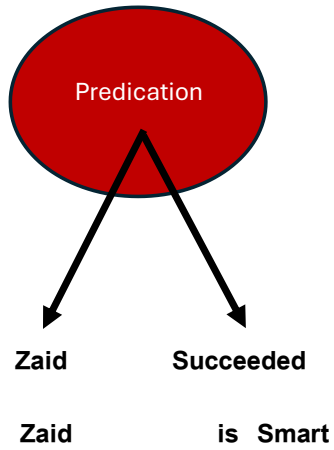
Sections of the sentences production lab in the brain



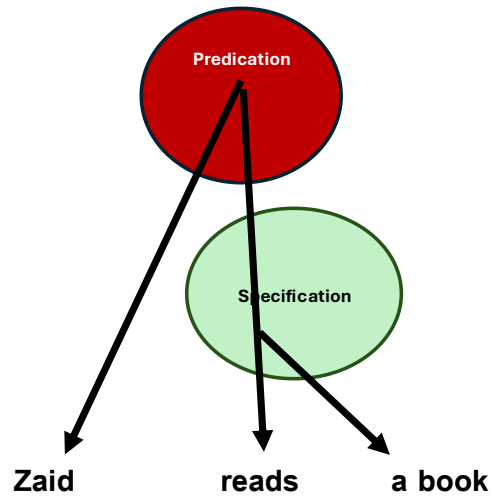


4 Main Links/ Universal Grammar

The First Link / Predication



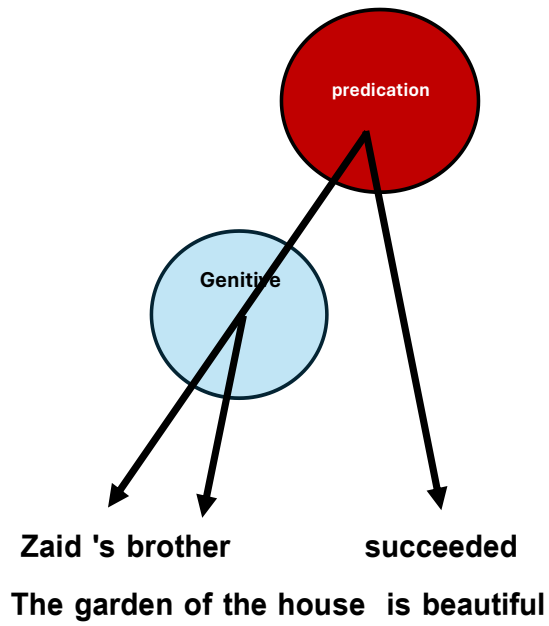
The Second Link / Specification



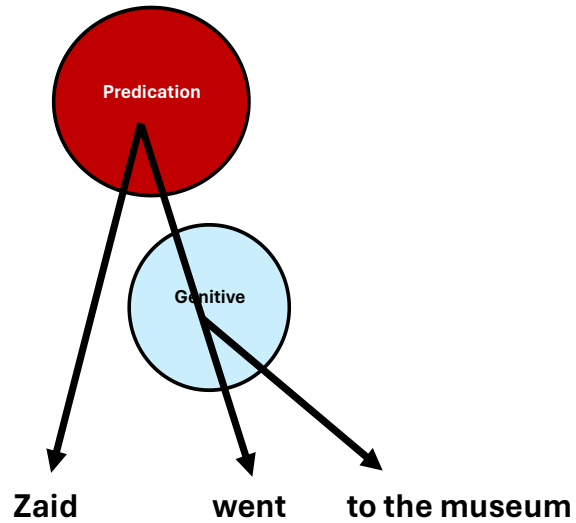
The third link

Genitive (direct or by prepositions)

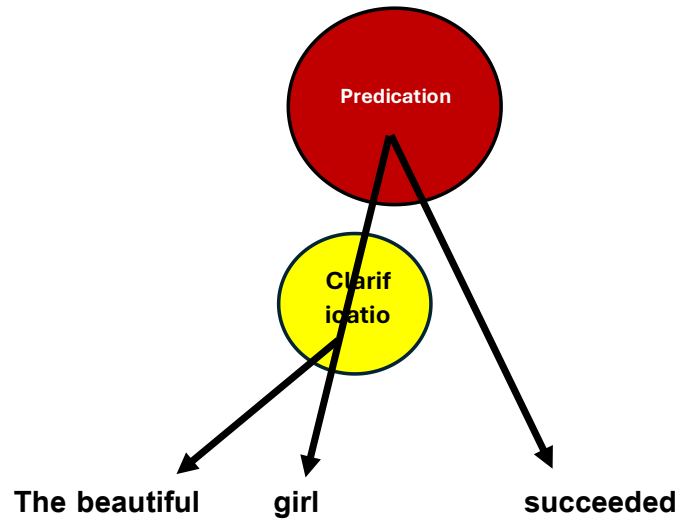
z



Genitive by prepositions



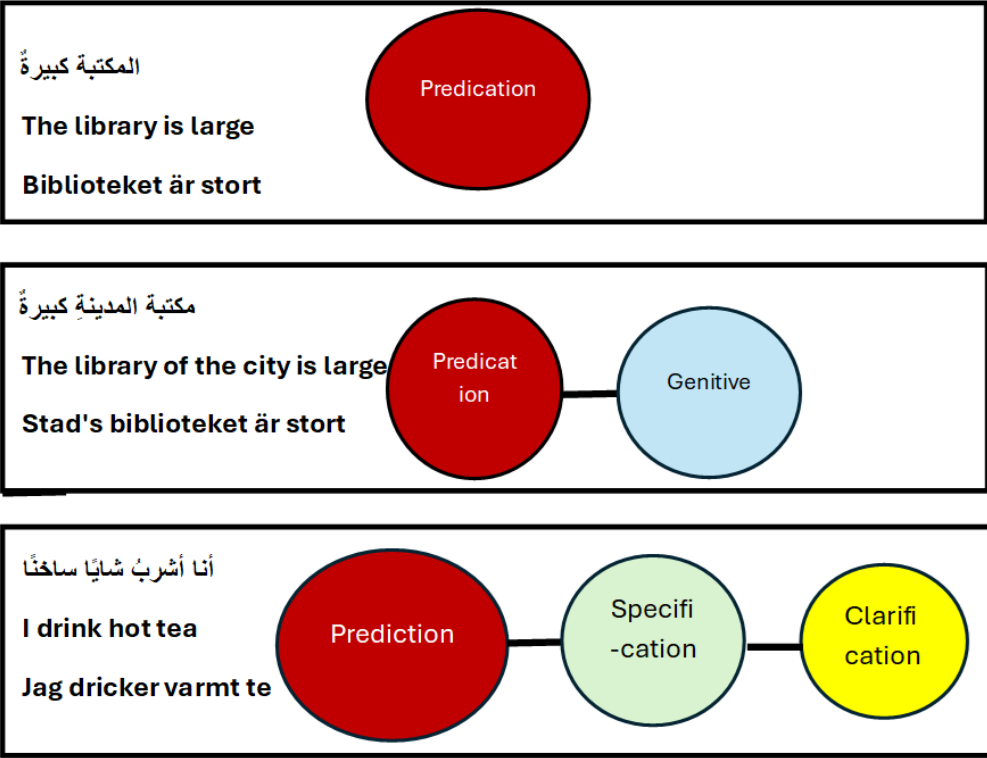
The fourth Link / Clarification by adjective



Each word in any sentence must be linked to one of those four mental processes shown in the diagram

Testing the Sentence Production System and Universal Grammar in the Brain Across Multiple Languages:

Arabic, English, and Swedish



This model represents a limited set of fundamental underlying rules shared across languages. These fundamental rules remain essentially constant across languages; what differs is not the rules themselves, but the ways in which each language organizes, manages, and implements them through its own linguistic mechanisms, including differences in word order, definition, and other language-specific structures. The very possibility of translation between languages provides strong evidence for the existence of these shared underlying rules, as represented in this model.