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Survey of Bounding Theory in Arabic Language

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Abstract
Government and Binding Theory or Principles and Parameters Theory is a universal theory of Chomsky. Linguists of world believe that Chomsky made a revolution in linguistics by this theory. One of the sub-theories of Government and Binding Theory is Bounding Theory which explains the restrictions of grammatical movements. Chomsky claims that his theory is universal and you can perform it in all languages. This essay considers this sub-theory (Bounding Theory) in Arabic language whether is performable in this language. If the answer is positive which grounds movement include off? Some of the movement restrictions of Arabic language are like the other languages, but some of the restrictions and movements are more than what is said in this sub-theory by Chomsky.
Key words: bounding theory, □ criterion, argument movement, □ argument movement.

I.   Introduction

Three approaches dominant the theoretical linguistics: formal, functional, and cognitive linguistics. The first sees language as a structural and mathematical system. Language is a system to communicate in the second's perspective. The third looks at language as a cognitive system [1-3].

Chomsky is one of the linguists who believe in the cognitive linguistics.

He caused a revolution in linguistics by his Government and Binding Theory that is called Principles and Parameters Theory too. The previous forms of generative grammar only deal with theorizing in English language, but Government and Bounding Theory is a universal theory. It includes some sub-theories: X bar roles, θ Theory, Bounding Theory, Government Theory, Case Theory, Control Theory, and Binding Theory.

Bounding theory deals with languages restrictions in movements of sentence constituents and defines them. Chomsky claimed the Government and Bounding Theory is a universal theory. This paper performs the Bounding Theory in Arabic language and defines the movement restrictions of constituents. It is needed to use θ theory and X bar roles too, because the Government and Bounding sub-theories are related closely to each other.

Bounding theory

Different languages have some restrictions in sentence structure. Some of them are related to the movement of sentence constituents and some of them are related to the restrictions of amount or direction of movement. The universal grammar of Chomsky tries to find different types of these two restrictions. Some of them are performed in all languages and some of them are specialized to some languages and

they have been called parameters. First of all, it is needed to explain some terms.

Bounding node

Based on the bounding theory, if there are many bounding nodes between the first and last positions of movement it cannot be done. The starting position should not be adjacent to the goal position. In another word, it shouldn't be farther than one bounding node. Bounding nodes in English includes sentence, bar sentence, and noun phrase (S, S', & NP).
The movement should be done from one empty position to another empty position [4].

Adjacency Principle

Principle of adjacency is performed in the Bounding Theory: a movement more than a bounding node is forbidden for constituents [5].

Chomsky believes the restriction in all languages concludes bar sentence and noun phrase. The change parameter is that a language counts the sentence as a bounding node or no [6].

Lexical entry

The lexical entry gives the speaker some information about the noun phrase, verb, and sentence to express a correct sentence grammatically. For example, the lexical entry of this verb:"یعتقد"(believe) shows that it needs a noun phrase in the position of subject and a sentence in the position of object. The lexical entry of verb defines the appropriate roles for different categories. These are different from some roles like the subject and object. They are called θ roles. Semantic roles have been assigned by heads are called theta roles [7-11]. Every category has a θ role in a position that is

proportional to it. Every θ role is given to one category not more.

Argument and A̅rgument position

Argument positions are defined based on grammatical rules. A lexical entry only assigns the θ roles to positions are correspondence with grammatical features like subject and object. Argument position includes some positions like subject and object in deep structure of the sentence, but A̅-position is some kind of position you cannot assign them to θ roles like determiner and comp.

Every category just has a θ role, and every θ role is just assigned to one category.

θ roles

θ roles are different and they have different names:
1. Agent: carries out a work.
2. Theme: is affected by other things in external cases.
3. Patient: is influenced by the work.
4. Experience: experiences internal cases.
5. Beneficiary: receives benefits of work.
6. Goal: is affected by work. The work has been done for that, or someone gets something.
7. Source: is a place that work is starts from it.
8. Location: is a place that work is done within that.
9. Cause: is something causes a work without any special intent.
10. Instrument: is something or someone that work is done by means of that.

Argument and A̅rgument Movements

There are two kinds of movements in languages: argument and a̅rgument movements. In argument movement, a constituent is transferred from one argument position to another. The movement from an argument position to an a̅rgument position is called a̅rgument movement.

It is needed to define some empty positions in surface and deep structures to observe the characteristics of lexical entry in all grammatical levels. The movement keeps a relation between the characteristics of lexical entry. The movement is a relation between the surface and deep structures.

The lexical entry of a verb shows you θ roles of the verb. In this way, the lexical entry helps you to define the deep structure of sentence. Then you should compare the surface and deep structures to define the changes have been made.

Arabic Language and Argument Movement
Movement in making a Passive Verb

There are some movements in sentences with a passive verb. We consider this sentence as an example: " زید أعطي قلما ". The lexical entry of "أعطى" is this: verb: [1. <N.P., agent>, 2. <N.P., goal>, 3. <N.P., theme>] It means this verb has two noun phrases as two objects. θ role of agent accepts the subject role, but you just see the roles of goal and theme, and there is no θ role of agent. It is clear that all changes have been made in the deep structure. The deep structure of sentence is this: " أعطى زیدا قلما e " you see the empty category is placed in the empty position. The subject (الأستاذ) with the θ role of agent have been eliminated and the object (زید) with the θ role of goal have been transferred. Without eliminating the subject from the sentence and making the position empty, there was not possible to move any category to this position. After the movement, there will be a trace in the object position with θ role of goal to not be empty. Another reason for this movement is that it is not possible to give two θ roles to an argument position. This movement is called argument movement, because both positions of subject and object are argument positions.

II.   Subject Movement

There are two kinds of sentences in Arabic: esmiah (اسمیة) which starts with a noun, and fe'liah (فعلیة) which starts with a verb. esmiah sentence has two types: 1. There is a verb in the predicate. 2. There is a noun in the predicate. In the second type, the predicate has to come at the first of sentence whenever the predicate is shebh al-jomlah (شبه الجملة), and the subject is unknown. The predicate can come at the beginning of sentence with a known subject. The subject of sentence " عندي قلم " (I have a pen) is "قلم", but it has placed at the end of sentence. How did it go to the predicate position while that position is filled with "عندي"? Every position just accepts one category. If a position is filled with one category it will be impossible to put another category in that position. Both categories of this sentence are moved to the other positions: the subject category is transferred to the predicate category position and the predicate category is moved to the subject category position. The movement is performed between both categories, so there wouldn't be any position without a category.

You see subject movement in some sentences like " في الدار صاحبها "(His owner is in the house). The subject is "صاحبها" and it placed in the argument position of predicate category. This movement is not optional. If the subject sits in the first position of sentence it will be grammatically wrong. Subject category has a pronoun (ها) which returns to the predicate (الدار). The following

grammar governs the sentence: Returning a pronoun to the last category is forbidden while its position is the end of sentence, and it is placed over there verbally. The deep structure of sentence is like this: " الدار " returns to " ها " ."صاحبها في الدار " which its position is the end of sentence and verbally it is placed over there. But this grammatical issue doesn't let the subject category sit in its position and transfers it, so it won't be returned to a noun phrase in a wrong position. The predicate category position is filled by " في الدار ". Two categories cannot be in one position, so two categories of subject and predicate change their positions. The subject category is moved to the predicate category, and the predicate category is transferred to the subject category. This movement is called argument movement, because both positions of subject and object are argument positions.

Arabic Language and A̅rgument Movement
1. Interrogative sentence

Interrogative words are used in esmiah and fe'liah sentences. We consider some different examples with interrogative words to realize the movements in them:"أین الطریق؟ " , " هل أنت تدرس؟ " , "ماذا أنت أكلت؟" , "أین هم ذاهبون؟ " and "هل أنت تقرأ؟" .

هل أنت تقرأ؟ (Do you read?)

There is not any movement in sentences start with "هل" and "أ". Based on θ- theory, the lexical entry of "تقرأ" is like this: verb [1. <N.P., agent>, 2. <N.P., theme>] The verb has given the agent role to the noun phrase, but it needs a theme role too. θ-criterion doesn't let the interrogative word "هل" sit in the theme position even in the deep structure of sentence, because this word doesn't ask about the theme. It asks about occurrence of verb by the agent and it doesn't relate to the theme role, so the theme role has been eliminated of the sentence. Its trace has been remained in the deep structure of sentence. The interrogative word will remain in its position without any movement. It means it is placed in the specifier position of Complementizer phrase. The complementizer phrase is divided to two branches: specifier and 'complementizer. All interrogative words are placed in the specifier position. 'complementizer phrase is divided to two branches: complementizer and sentence. Complementizer prepositions are placed in the complementizer position. (Tree diagram number 1)

أین الطریق؟ (where is the way?)

The interrogative word of this sentence is placed in the predicate position. θ-criterion doesn't let an interrogative word sit in the argument position, but you see it is placed in the argument position. It is needed to consider the deep structure of sentence to know the movements. This sentence needs a subject

and predicate categories. Subject category of this sentence is "الطریق", but the predicate has been eliminated: "الطریق trace". Interrogative word of "أین" has come to ask about the predicate, so it is placed in the predicate position: "الطریق أین؟" . But this position is not appropriate for an interrogative word, so it is moved to the specifier position of complementizer phrase. This new position is an a̅rgument position, so it is called a̅rgument movement. (Tree diagram number 2)

"ماذا أنت أكلت؟" (What did you eat?)

The lexical entry of this verb "أكل" is this: verb: [1. <N.P., agent>, 2. <N.P., patient>] "أنت" has been given the agent θ-role by the verb. The verb needs a patient θ-role. The interrogative word of "ماذا" asks about this role, so it can sit in the patient θ-role. The deep structure of sentence is this: " أنت أكلت ماذا؟ ". We have the movement issue. "ماذا" is transferred to the a̅rgument position and its trace will be remained. Now it is clear why the verb needs a patient θ-role. (Tree diagram number 3)

You can see such a movement in esmiah and fe'liah sentences which the predicate is called "شبه الفعل"(a noun carries out like a verb) like " ماذا أنتم آكلون؟" .

"إلى أین تذهب؟" (Where do you go?)

Some interrogative sentences start with prepositions, and then interrogative words come after that. The lexical entry of "تذهب" is this: [1. <N.P., agent>, 2. <N.P., goal>], and also it defines that θ-role of goal comes as a preposition phrase. Pro-drop parameter shows the reason of eliminating the agent θ-role. You observe this parameter in some languages like Arabic. The universal grammar theory believes sentences like this have empty subjects. The main hypothesis is that all languages have subjects, but they are hidden in pro-drop languages. Although the subject has to be in the sentence structure, but the subject position is empty in pro-drop languages. (Cook, 1995: 65)

The subject of some verbs in fe'liah sentences is an eliminated pronoun. These verbs include 1, 4, 7, 13, and 14 صیغة (sighah).

The other constituent has been eliminated from the sentence is the goal θ-role, and the deep structure is like this: " تذهب إلى trace ؟" .Interrogative word of "أین"(where) is an appropriate word to be placed in this position: " تذهب إلى أین؟" . You see the preposition phrase has been placed in the first of sentence. Putting the preposition with interrogative word is one of the parameters, because some other languages like English don't have this characteristic. In some languages like Arabic, the preposition comes with the interrogative word at the beginning of sentence, and it is placed in the specifier position of

complementizer phrase. Its trace will be remained in the sentence:"?trace إلى أین تذهب ". This movement is argument movement, because the transferred phrase goes to an argument position.

2. Verb Movement in Fe'liah (فعلیة) Sentences

It is better to refer to tree diagram of sentences with "verb subject object" order, to realize the verb movement in fe'liah sentences.

There are different ideas about tree diagram of these sentences. One of those who expressed their ideas about this issue is Homeidi. He believes that the tree diagram of this sentence ". قرأ الطالب الكتاب في المدرسة" (The student read the book at school.)is number 4: (Homeidi,2011:12)

But there is a problem in this tree: there is no difference between tree diagram of this sentence which is esmiah and fe'liah sentences with the order of "subject verb object".

Hageman has an idea that is more correspondence with Arabic features. He tries to express a kind of tree diagram to release the differences. He said that I think a sentence will be constructed in Arabic like English. At first the verb comes and then the subject of sentence. Then the verb phrase will combine with the inflection, so the verb will be remained in that position. (Haegeman, 1000: 272)

You can see in his tree diagram (Tree diagram number 5) the trace of verb. At first the verb doesn't have the characteristics of time and correspondence, but after moving to the inflection position gets the mentioned characteristics too and the result will be "كتبتُ". The subject is placed in the below of verb phrase branch. It shows the verb governs the subject. The movement of verb is done from an argument to an argument position, so it is called an argument position.

3. Subject Movement "الضمیر البارز"

Some kind of subject in Arabic is " الضمیر البارز". It is a pronoun which adjoins the verb. For example, "تُ" in "كتبتُ" is a " الضمیر البارز". In the deep structure of this sentence "كتبت رسالة" (I wrote a letter.), the subject is "أنا" and it is placed in its position. Based on a grammatical point, " الضمیر البارز" won't be separated of the verb. θ-Criterion doesn't let a verb and its subject sit in one position, so the movement and its trace helps us to solve the problem. The subject "أنا" moves to the inflection position and will be combined with the verb. Then you see "كتبتُ" in surface structure. It is an argument movement, because the movement is done from an argument position to the argument position. (Tree diagram number 6)

III. Result

This essay had a survey on performing the bounding theory in Arabic. At the end, we resulted this sub-theory is performable in Arabic. The argument and argument movements have its cases in this language. The movement in English includes some issues like using passive verb, interrogative sentence. There are two kinds of argument movement in Arabic: 1. the noun phrase movement to the subject position in a sentence with passive verb. 2. The movement of "نكرة" nakearh (unkown) subject in "إسمیة" (esmiah) sentences while the predicate is "شبه الجملة" (shebho al-jomlah). The argument movement includes three issues in Arabic:1. The movement of interrogative words in interrogative sentences. There are some differences between them based on the "إسمیة" (esmiah) or "فعلیة" (fe'liah) sentences. 2. Verb movement in "فعلیة" (fe'liah) sentences, 3. Subject movement in "فعلیة" (fe'liah) sentences while it is " الضمیر البارز" (a pronoun which adjoins the verb).

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