On the Unbounded Movement of Wh-Elements in Arabic: Evidence Against Successive Cyclicity

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Abstract

Chomsky (1973, 1977) argues that the movement of Wh-elements from the embedded clauses to the beginning of the matrix clauses is successive-Cyclic. First the movement is to the Comp of the embedded clause and this is followed by another (other) movement(s) to the comp of the matrix clause. The need for this is dictated by the adherence to the general principle of subcategorization that governs movement in syntax. Arabic presents evidence for the opposite. The movement of Wh-elements in Arabic is unbounded—i.e., it is done in one step rather than successively. Structures showing this are of the following structural configuration.

\[
[[\text{Comp}_1]]S_1[...[S_1[[\text{Comp}_2]]S_1[[\text{Topic}]][[\text{Comp}_3]...[\text{Wh}]]]]
\]

No movement to \text{comp}_1 is possible since Wh-elements cannot precede Topics in Arabic and therefore \text{Comp}_1 is not a suitable place for the movement of Wh-elements. The movement of Wh-elements must therefore be from \text{comp}_2 to \text{comp}_1 in one step, a process which violates subcategorization. The problem is solved by adhering to an alternative analysis suggested by Bresnan and Grimshaw (1978). There, they argue for unbounded deletion that is governed by a coindexing Process. I suggest our extention of this analysis by letting movement processes be unbounded. The grammaticality or otherwise of the outputs would be explained by the bounded nature of the following coindexing device subcategorization is thus a function of coindexing and not of movement.
It has been observed that some languages exhibit unbounded movement of elements in sentences, such as Wh-elements and NP's. This movement has long been acknowledged in the literature of transformational generative Grammar. At first, it was assumed to be the product of transformations applying across unbounded distance (cf. Ross 1967). An alternative account of this phenomenon was later proposed by Chomsky in which this seemingly unbounded movement of elements is produced by successive application of cyclic transformations; transformations that obey the principle of cyclicity (cf. Chomsky 1973, 1977). Behind this lies the attempt to account for all dependencies - e.g. relation between antecedent and trace - in a similar fashion in Universal Grammar. This is also implied in the position taken be Bresnan (1976) and Bresnan and Grimshaw (1978) who argue, in addition to other such as Postai (1972), that transformations should not be bounded.

In this paper I shall present evidence for unbounded movement of Wh-elements in Arabic complex sentences. The evidence involves sentences in which a wh-element has moved from the deeply embedded clause to the beginning of the matrix clause. In such sentences the movement of this element seems to be achieved in one step, crossing over the cyclic categories, a mode of movement which violates the general principle of subcyclicity that governs movement rules as has been stipulated in the literature within Extended Standard Theory.

Chomsky (1977 and earlier publications cited therein) argues that major non-root transformations whose order of application has to obey the principle of the strict cycle can move elements only one step up the hierarchy of the cyclic domains in the sentence following the principle of subcyclicity defined as in (1)

1. In a structural configuration of the following form

$${c \left[ \ldots X \ldots \right] _{a} \left[ \ldots \right] _{b} \left[ \ldots \right] _{c}}$$

no rule may move the constituent X which is in the cyclic category a to a position Y in the cyclic category c if c includes a cyclic category b which includes a.

Many apparent violations to this principle have been noted in languages that exhibit Wh-raising as in the case of (2)

2. What did John believe that Mary said that Nancy bought?
Given a phrase marker like (2')

$${2'. S_{1} [\text{comp}_{1} \text{what}] S_{1} \left[ \text{John believe S}_{2} \left[ \text{comp}_{2} \text{that} \right] S_{2} \text{Mary said S}_{3} \left[ \text{comp}_{3} \text{that} \right] \right]}$$
\[
S_3\left[\text{Nancy bought } t \right]\]

The movement of the wh-element what in (2) from the embedded \(s_3\) to \(\text{comp}_1\) of \(s_1\) violates subadjacency since it has moved over the two cyclic domains; \(s_2\), and \(s_1\), taking \(s\) to be the cyclic domain in English. The solution to this apparent violation was to stipulate that the movement of wh-elements from \(s_3\) to \(\text{comp}_1\) of \(s_1\) is successive. (2') is not the direct derivation of (3).

3. \(s_1\left[\text{comp}_1\left[\quad\right]\right] s_1\left[\text{John believe } s_2\left[\text{comp}_2\left[\text{that}\right]\right] S_2\right.\]
   \[
   \left.\text{[Mary said } s_3\left[\text{comp}_3\left[\text{that}\right]\right] S_3\left[\text{Nancy bought what}\right]\right]\]}\]

Rather, the wh-element moves first to \(\text{comp}_3\) of \(S_3\), then to \(\text{comp}_2\) of \(S_2\), and finally to \(\text{comp}_1\) of \(S_1\). This successive cyclic application of the rule abides by subadjacency.

The subadjacency-abiding application movement transformation is evidenced in the ungrammaticality of sentences where the wh-element has moved over a complex Noun phrase as in (4):

4. 'What did you believe the claim that Mary bought?
   with an initial phrase marker like (4')

4. '\(s_1\left[\text{comp}_1\left[\quad\right]\right] s_1\left[\text{you believe}_{NP_1}\left[\quad\right]\text{the claim } s_2\left[\text{comp}_2\left[\text{that}\right]\right] S_2\right.\]
   \[
   \left.\text{[Mary bought what]}\right]\]

The movement of the wh-element to \(\text{comp}_1\) of the matrix clause is blocked because it violates subadjacency; after the first movement to \(\text{Comp}_2\) of \(S_2\), it has to cross over cyclic domains: \(NP_1\), and \(S_2\).

One other reason that dictated this successive cyclic application of wh-movement stems from the requirement in the logical form of semantically interpretable sentences that anaphors be bound to their antecedents, which broadly means that an anaphor such as (trace) or PRO, and its antecedent may not be interrupted by a major category. With a step-by-step movement of the wh-element the intermediate comps that the wh-element passes through will be indexed through the traces that this element leaves behind. This ensures the necessary proper binding (cf. Chomsky 1977).
Turning to Arabic, we find that Arabic may exhibit the same phenomenon of wh-movement and raising that we find in English. In complex sentences the wh-element moves from its original place in the embedded clause to the beginning of the matrix clause. We shall assume that the movement of the wh-element is to the Comp node in Arabic without going into the details of the arguments for this assumption. In Bakir (1979), it is argued, on grounds of mutual exclusion of complementizers and wh-element in Comp position, that wh-movement in Arabic is to the Comp position at the beginning of the sentence. Thus in (5) and (6)

6. man talab-ta ? an taraa faatimat-u? who asked-you that sees Fatima-nom? 'who did you ask Fatima to see?'

with the following phrase markers,


One can assume that the wh-elements maa₃ aa and man in the above sentences have moved from their original places indicated as t in the embedded clauses to Comp₁ or S₁ in two steps abiding by subjacency. First, they move to Comp₂ of S₂, and from this position they move to Comp₁. The sentences will receive proper semantic interpretation since the moved elements will have left traces in the intermediate comps, and thus there would not be any free anaphor: all traces will be bound.

Moreover, there is another class of sentences in Arabic in which this mode of movement is not possible. In questions like (7) and (8)

7. man qaala muhammadun? inna zaydan ra?aa who said Muhammed that Zayd saw 'who did Muhammed say that Zayd saw'

8. maa₃ aa za'am-ta ?anna fatimata ?istarar what claimed-you that Fatima bought 'what did you claim that Fatima bought?'

With initial phrase markers like (7') and (8')
7'. \[ \text{comp}_1 \] \text{S}_1 [ \text{comp}_2 \] \text{qaala muhammadun} \text{S}_2 [ \text{comp}_3 \] \text{? inna} \text{S}_1 \]
\[ \text{Topic} \_ \text{zaydan} \] \text{S}_3 [ \text{comp}_3 \]
\[ \text{S}_2 [ \text{ra ? aa man} \] ]]

8'. \[ \text{comp}_1 \] \text{S}_1 [ \text{za'am-ta} \text{S}_2 [ \text{comp}_2 \] \text{?anna} \text{S}_1 \] \text{Topic} \_ \text{faatimata} \]
\[ \text{S}_3 [ \text{comp}_3 \] \text{S}_2 [ \text{? istarat maa\text{aa}} ]]

we find the sentential complements of the matrix verbs qaala and za'ama are themselves complex sentences composed of a topic and sentential comment structure. These complements will be analysed as S's consisting of topics (4) and S's following the analysis offered in Chomsky (1977) for similar structures in English.

At first glance, we can still assume that the wh-elements man and maa\text{aa have moved to the matrix clause in three steps in a successive-cyclic way; first to comp3, then to comp2, and finally to comp1. However, comp2 in the above structures is not a proper place for wh-elements to move into. One fact about the structures of Arabic sentences of the structure topic-sentential comment is that wh-elements from the comment sentences never occur in a pre-topic position; thus sentences like (9) and (10) are ungrammatical.

9. maa\text{aa muhammadun} ?istaraa ?axuu-hu
   what muhamed bought brother-his
   'what did Muhammed’s brother buy’

10'. man Zaydun ra?at ?umuu-hu
    who zayd saw mother-his
    ‘Who did Zayd’s mother see’

With initial phrase markers like (9') and (10'):

9'. \[ \text{S}_1 [ \text{comp}_1 \] \text{S}_1 [ \text{comp}_2 \] \text{muhammadun} \text{S}_2 [ \text{comp}_3 \] \text{? istaraa ?anuda maa\text{aa} ]]
]]]]
10'. $S[$comp$_1[$ ]$S_1$, Topic[$zaydun$]$S_2[$comp$_2[$ ]$S_1$, ra?at ?ummahu man$]]$]

The ungrammaticality of these sentences stems from the fact that the movement of the wh-elements ma?aa and man to comp$_1$ of $S_1$ is blocked. They can only move to comp$_2$ of $S_2$; that is to the right of the topic NP's muhammadun and zaydun. From (9) and (10) we can infer that comp's are sisters of S’s are not an appropriate place for wh-elements to move into. In other words, they are not specified with a [wh] feature. Only comp's that are sisters of S’s are, and would therefore, admit wh-elements to move into them. Comps in Arabic appear to be subcategorized for their availability for wh-movement. This, in turn, means that in (7') and (8'), after the first step movement of the wh-elements from their original place to comp$_3$, the second step movement from comp$_3$ to comp$_2$ is not possible since comp$_2$ is the same kind of comp that we have in the matrix clauses of (9') and (10'); i.e., a comp which is a sister of S. Nevertheless, the wh-elements in (7') and (8') can appear at the beginning of the matrix clauses, i.e., they can move into comp$_1$ of $S_1$, as is evidenced in the grammaticality of sentences (7) and (8).

All this suggests a second step of a different kind. We have to say how that this second step movement is from Comp$_3$ to Comp$_1$ directly. But this movement will violate subjacency. It crosses two cyclic domains: $S_2$ and $S_1$, if we take S to be cyclic in Arabic, or $S_3$ and $S_2$ if S is to be taken to be as cyclic. And if matters are such, then there is no reason why the movement of wh-elements in these sentences has to be done in two steps. Why couldn't it be achieved in one step from the original place where these elements are generated to the position at which they appear on the surface? We are led by all this to adopt the theoretical alternative suggested by Bresnan (1976) and Postal (1972) and to claim with them that transformations need not be bounded.

Another class of Arabic sentences that exhibits the same phenomenon is that of sentences containing free relatives. Free relatives in Arabic may or may not show resumptive pronouns. The fact that there is no resumptive pronoun in object position does not affect the grammaticality of the sentence, as in (11) and (12).

11. re?ay-tu man qul-ta l-lii ?inna muhammadan tazawwaja---
saw-1 who said-you to-me that Muhammed married '
I saw who you told me that Mohammed married'

12. ?aali?ika man ‘alima al-naasu ? anna zaydun qad fa$^c$ ala-
that what knew def-people that zayd had did
‘That is what people know that Zayd had done.

A possible analysis will involve a wh-movement from the place of the gap to the beginning of the relative clause. The relative clause in (11') and (12') will have phrase markers like (11) and (12) respectively.


Again, if we assume a successive-cyclic application of the movement the wh-elements from their original position, indicated as t, to Comp₁ of S₁, we will have to stop after the first step. The second step which moves the wh-elements from Comp₃ to Comp₂, is blocked since Comp₂, being a sister of S₁, is not specified with the feature wh. The fact that the wh-elements do show up in Comp₁ in these two clauses is an indication that if we want to make the movement successive then the second step will have to be from Comp₃ to Comp₁ directly, crossing over Comp₂ and violating subjacency.

An alternative analysis for free relatives in Arabic has been provided by Suaiheh (1980). According to this analysis no movement of wh-element takes place from the position indicated by t, to comp₁ in (11') and (12'). Instead, all free relatives are derived with base-generated resumptive pronouns at the place of the gap in (11) and (12), which may be deleted through a process of controlled pro-deletion. This process, however, exhibits the same property that wh-movement shows; i.e., it is unbounded since it will have to be across cyclic boundaries as the examples illustrate.

To give an observationally adequate account of these two classes of sentences in Arabic we will have to turn to the other theoretical model in which movement rules are unbounded and subjacency as a constraint on movement is dispensed with. To repeat what has been said, this approach has been proposed by Postal (1972), Bremsnan (1976) and Bresnan and Grimshaw (1978) when dealing with movement and controlled pro-deletion in English. The wh-elements in the above sentences move on one step from the place they are generated at in the embedded clauses to the Comp's of the matrix clauses.

The problem of proper binding can be solved with a process of Comp-coindexing that coindexes all the immediate Comp's with the referential index of the wh-element successively. That is, in the above sentences Comp₂ will be coindexed with the referential index that Comp₁ is indexed with; i.e., the referential index of the wh-element. Comp₃ will be coindexed with Comp₂ and so on. This coindexing of Comp's is
subject to subjacency in that the two Comp's involved in this process have to be subjacent to each other, thus intervening major categories will block this coindexing process, as suggested by Goldsmith (1979) and formulated as (13):

13. Comp\_x \ldots \alpha \ldots Comp \ldots \alpha \ldots Comp \_x

Condition \( \alpha \not\in \{S, Np, PP\} \)

The sentence under discussion will thus be properly bound. There will be no intervening major category between the lowest Comp and the trace of the moved wh-element, since all the Comp's in these sentences will have been indexed through the above process.

In conclusion, these two classes of sentences in Arabic provide empirical evidence against a universal principle of successive, subjacency-abiding application of wh-movement transformations such as has' been advocated in the Chomskyan model of 1977 and earlier publications. The adoption of a model that does not impose such constraints is not a matter of a choice between two adequate alternatives as far as Arabic is concerned\(^6\), rather it is the only answer in our quest for observational adequacy.

Notes

1. But cf. Koster (1978) and other references cited therein for arguments against that, and for considering the S to be a cyclic category.

2. The variety of Arabic that we are concerned with here is modern literary, which shares basically the same syntactic properties with Classical Language. No attempt is made to include the spoken colloquials in this analysis.

3. For expository reasons, only wh-words man 'who' maa 'what' are exemplified. No examples were given for moved wh-phrases of the form [p + wh] although they behave similarly, but with a slight morphological change in the wh-word maa. Apparently, preposed wh-phrases of the form P + maa and p + maa are reduced to single lexical items. So instead of 'annan about whom and an maa about what, we have 'amman 'amma. Similarly we have bima in what instead of bi maa, and 'alaam on what instead of 'ala maa: e.g.

\[(i)\] 'amma quita lil 'anna muhammad - an 'araada 'an yas: ala about what said you to me that Mohammad wanted to ask.

\[(ii)\] bima ?itaqada al-hassen 'anna saaliman qad?insagala?

in what believed-def people that Salim was occupied

'what did people believe Salim was occupied with'\(^6\)

4. In Chomsky (1977), where 'topic' was proposed for the first time as a immediate constituent of S, no details were given as to the categorical status of this constituent. It was as if 'topic' - a functional concept has acquired a categorical characteristic on par with NP, V, S, etc.. However, in that paper and in subsequent papers in the literature, topic has always been assumed to be an NP. The fact that the topics in the examples given here were not given any further labelling is only done in conformity with the configuration that was originally devised by Chomsky in the above mentioned paper.

5. This claim for unbounded rule application receives further support from research within the government - binding theory, cf. Baltin (1983), Manzini (1983) and Koster (1984). This was kindly brought to my attention by anonymous reviewer of A.J.H.

6. Neither of the two theoretical models discussed here should make any claim for universality. It seems that they can only be assumed as alternative features characterizing the application of specific rules in a given language. They should not even be assumed as the sole modes of transformational rules that subcategorize languages. As has been argued by Chung (1982), there are languages such as Chamorro which exhibit both successive-cyclic and unbounded transformations.
Bibliography


