

A recursive linearization approach to Arabic noun phrases

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1 Introduction

In this paper, I will argue that Arabic noun phrases can be analyzed elegantly using a recursive linearization approach. The main argument of the paper is that the predominant order in Arabic noun phrases is Head-Comp-Spec. Since there is not sufficient evidence to support the idea that there is large-scale movement of Comp, followed by head movement, the data suggests that this order is largely base-generated.¹ A recursive linearization approach allows us to express this observation, and still maintain a principled way to derive word order from a hierarchical structure.

I will start with a discussion of the most common noun-phrase specifiers in Arabic, and argue that they always occur after the nominal head, and indeed after the complements of that noun. Then I will make a short digression to the difference between specifiers and complements. This discussion is based on Arabic, and although there is probably some universal idea behind it, I shall make no attempt here to extend it to other languages.

I will then return to the main argument of the paper, and show that other modifiers are also best analyzed in the same way.

2 Post-head specifiers

As Fassi Fehri (1999) shows, most modifiers² in the Arabic noun phrase can occur both before the head noun and after it. The unmarked position differs from modifier to modifier, but, as Shlonsky (2000) notes, there is a remarkable difference between the postnominal and the prenominal modifiers.

2.1 Adjectives and numerals

In general, postnominal modifiers agree with the head noun in gender, number and case.³ This is demonstrated in the following examples:

¹Although I will not argue that there is no movement at all in Arabic noun phrases, I do believe that movement is rather restricted.

²I will use the term “modifier” in a somewhat pre-theoretic sense, referring to any constituent in the noun phrase besides the head noun.

³With the exception of the genitive, which I assume is a complement.

- (1) a. al-sayyāra-t-u -l-ḥamrā'-u
the-car-f-NOM the-red.f-NOM
'the red book'
- b. al-dars-u -l-rābi^c-u
the-lesson-NOM the-fourth-NOM
'the fourth lesson'
- c. al-buyūt-u -l-ḥamsat-u
the-houses-NOM the-five-NOM
'the five houses'

In (1), I have demonstrated the use of the adjective, and of cardinals and ordinals. The noun in (1a) is feminine, the other two nouns are masculine. The modifiers agree in gender, so that the modifier in (1a) takes feminine form, whereas the others take masculine agreement.⁴ The modifiers also agree in case, which is nominative here throughout. The adjective and the ordinal both have a singular form, because the head nouns are singular.⁵ The cardinal is inherently plural, of course, although it does not have a plural form. Lastly, all three postnominal modifiers agree with the head noun in definiteness.

The difference between postnominal and prenominal modifiers is that the latter do not agree with the “head” noun. Instead, they take what is presumably a default form, masculine singular:

- (2) a. wāfir-u -l-iḥtirām-i
abundant-NOM the-respect-GEN
'much respect'
- b. tālīt-u marra-t-in
third.m-NOM time-f-GEN
'the third time'
- c. 'arba^ca-t-u kutub-in
four-f-NOM books.m-GEN
'four books'

In (2a), the adjective *wāfir* precedes the noun. The adjective has nominative case, whereas the noun (invariably) has genitive case. The number and gender of both the noun and the adjective happen to be the same (masculine singular), but that is accidental. Had the noun been feminine plural, the adjective would still have been masculine singular.

(2b) has much the same structure: the ordinal *tālīt* precedes the noun, and has masculine singular form, even though the noun is feminine. And again, the noun invariably has genitive case, whereas the case of the ordinal varies in accordance with the position of the noun phrase in the clause.

(2c) is a special case. Here, there is again no agreement in case: the noun takes genitive, whereas the cardinal takes its case according to the position it is in. There is, however, a peculiar sort of agreement, something that is usually termed “polarization” in Semitic linguistics: the cardinal takes feminine form if the noun is masculine and masculine form if

⁴The gender agreement on the cardinal shows a strange phenomenon, called polarization. See below.

⁵Note that plurals of inanimate objects are always treated as if they were feminine singular. That is, modifiers, verbs, etc. that agree with them take feminine singular form. Nonetheless, I will take this to be a form of number agreement.

the noun is feminine.⁶

The adjective construction and the ordinal construction show all the characteristics of a basic genitive structure (construct state): the head nominal (here the adjective and the ordinal) do not take a definite article or an indefiniteness marker, the complement (here the noun) takes genitive case, and no other modifier can appear between the head nominal (the adjective/ordinal) and the complement. Following the usual assumption that in a normal genitive structure, the genitive noun is the complement of the head noun, we must conclude that the adjective/ordinal is in fact the (syntactic) head of the construction, and the noun is its complement. This is in fact a conclusion that Shlonsky (2000) also reaches.

In the case of the cardinals, this point may be less obvious, but it should be noted that there as well, the cardinal imposes its requirements on the noun. It is the cardinal that determines whether the noun is singular or plural, and what case the noun takes. In any case, the noun never takes the case that is assigned to the syntactic position that the noun phrase is in. If that case is expressed at all in the noun phrase, it will be on the cardinal.

Under normal assumptions, a noun is a syntactic argument of the element from which it receives case, and the head of a noun phrase is the element that carries the case that is assigned to the noun phrase. The facts then clearly indicate that the cardinal (and also the adjective and the ordinal) in (2) is in fact the head of the construction, and the noun is the complement of this head.

There is another fact that points towards this conclusion. Prenominal modifiers cannot take any other complement. For example, postnominal adjectives allow a construction as in (3):

- (3) rağul-un kabīr-u -l-sinn-i
man-NOM large-NOM the-age-GEN
'an old man'

In (3), the adjective *kabīr* takes the noun *al-sinn* as syntactic complement, forming the collocation 'large of age', meaning 'old'.⁷ This complex, however, can only be used postnominally. A structure like (4) is impossible:

- (4) *kabīr-u -l-sinn-i rağul-in
large-NOM the-age-GEN man-GEN

It seems reasonable to assume, then, that the modifiers in (2) are in fact the heads of the construction, and the nouns are their complements. In (1), the situation is different. There, the modifiers show all the signs of being specifiers: they agree fully,⁸ and more importantly,

⁶I will not take this "agreement" into account. The cardinal in Semitic languages is rather complicated. The pattern sketched here only applies to the cardinals 3–10. "1" and "2" are adjective-like elements, 11–19 invariably take accusative case, (i.e., they do not decline), as does the noun in those cases, although the noun takes singular form. Furthermore, the agreement pattern in the cardinals 11–19 is rather complicated: partially polarization, partially normal agreement. Powers of ten and their multiples all decline normally, show no agreement or polarization and take a genitive singular noun, except 20–90, which take an accusative singular.

⁷Note that this structure is different in meaning than the one encountered above in (2), although structurally, they are much alike. Here, the adjective *kabīr* does not modify the noun *al-sinn*.

⁸Under standard assumptions, this agreement takes place in a spec-head configuration. In recent minimalist frameworks, that operation is no longer available, however. Elsewhere I show that there is an alternative analysis for this type of agreement.

they do not have to be heads. Instead, they can head projections of their own, as shown in the previous examples. We must conclude, then, that they are indeed specifiers.

2.2 Determiners and demonstratives

If we look at determiners and demonstratives, we see that although these cases are less clear, the data do not constitute any strong evidence against the proposal.

Determiners, under standard assumption, are heads that take the noun as complement. This means that in Arabic, we would expect that the determiner precedes the noun, which is indeed the case. Generally, the determiner is a clitic prefixed to the noun.⁹ Obviously, this analysis poses no problem whatsoever for the assumption that specifiers follow the head, if only because determiners have nothing to do with specifiers in noun phrases.

Demonstratives are slightly more problematic. Fassi Fehri (1999) shows that demonstratives in Standard Arabic can both precede and follow the noun. In both cases, they have the same form, and they agree with the head noun in number and gender:¹⁰

- (5) a. hādā -l-bayt-u
 this the-house-NOM
 b. al-bayt-u hādā
 the-house-NOM this
 ‘this house’

In non-possessive noun phrases, (5a) is by far the more frequent form. Note that the construction depends on the presence of a determiner on the head noun.¹¹ In a possessive construction, the head noun does not have a determiner, which means that the demonstrative cannot precede it. In such cases, the demonstrative always follows the noun, and is placed *after* the genitive complement of the noun:

- (6) sayyāra-t-u -l-rağul-i hādīhi
 car-f-NOM the-man-GEN this.f
 ‘this car of the man’s’ (litt. “the man’s this car”)

The simplest analysis for the demonstrative in Standard Arabic is to assume that it can be generated as a head taking the noun as a complement, or as a specifier of the noun. In the former case, it will precede the noun, in the latter case, it will follow the noun. In that sense the demonstrative is identical to adjectives and numerals, which can also be generated either as heads or as specifiers. The only difference between demonstratives and the other modifiers is then that demonstratives always agree with the noun, whereas the other modifiers only agree when they are specifiers.

⁹As Shlonsky (2000) shows, this is not entirely true in Modern Hebrew and in some spoken dialects of Arabic, where numerals can sometimes stand between the article and the noun:

- (i) il-ḥamas banāt
 the-five girls

(i) is grammatical in Cairene colloquial Arabic. In Standard Arabic, the example should read *al-banātu -l-ḥamsu*. I assume that the article is a separate head, and that its cliticization is a purely phonological process.

¹⁰Furthermore, the dual of the proximity demonstrative also agrees in case.

¹¹That is, the demonstrative does not take the position of the determiner. Instead, the determiner is required if the demonstrative is to be interpreted as a noun modifier.

2.3 Specifiers vs. complements

At this moment, I would like to make a small digression, and discuss the different properties of complements and specifiers. I will limit myself to Arabic noun phrases, since that is the subject I am focusing on here. Presumably, the discussion can be extended to other domains and other languages, but I will not do that here.

I assume that specifiers of nouns are in fact predicates that are predicated of the noun. Such an analysis complies in a straightforward way with the standard semantic analysis of these elements. Take the simple case of an adjective:

- (7) a. the red car
b. $\iota x(\text{car}(x) \ \& \ \text{red}(x))$

The adjective in (7b) is added to the structure simply by means of predication, although this predication does not take place at sentence level.¹² Still, we can make the prediction that noun-phrase specifiers can be used not only as specifiers, but in principle also as sentence-level predicates. If we look at the types of specifiers that the Arabic noun phrase allows in (1), we see that this prediction is indeed borne out: all specifiers can be used as (sentence-level) predicates:¹³

- (8) a. al-kitāb-u 'aḥmar-u
the-book-NOM red-NOM
'the book is red'
b. hādā -l-dars-u huwa -l-rābi^c-u
this the-lesson-NOM it the-fourth-NOM
'this lesson is the fourth (one)'
c. hum ḥamsat-un
'they five-NOM
'they are (with) five'

The fact that they are predicates is one property of noun-phrase specifiers. Complements do not have this property. Consequently, we predict that they can not be used as sentence-level predicates:

- (9) a. bayt-u -l-rağul-i
house-NOM the-man-GEN
'the man's house'
b. *bayt-u -l-'āna -l-rağul-i
house-NOM now the-man-GEN
'(this) house is now the man's'

(9b) is ungrammatical, and remains ungrammatical even if the subject noun takes a definite article.¹⁴ I assume, then, that noun-phrase specifiers are indeed predicates, whereas complements are not.

¹²We can simply consider it secondary predication.

¹³Demonstratives are excluded here, presumably because they have no semantic content, which makes it difficult to use them as sentence-level predicates.

¹⁴Note that English seems to allow this. However, Zribi-Hertz (year?) argues that the 's of the possessive modifier and the 's of the possessive predicate are in fact different elements. On the other hand, it is usually assumed that a pronominal possessive in English is in specifier position.

Another property of specifiers is that they agree with the noun they modify in a configuration that is usually termed ‘spec-head agreement’. In noun phrases, this agreement usually goes from the head noun to the specifier. Or, in traditional terms: the specifier agrees with the head noun, rather than the other way around.¹⁵ I assume this is the case because the elements of agreement (in Arabic, gender, number, case and definiteness) have a semantic function on the head noun, but not on the specifier.

In the previous section, I argued that prenominal demonstratives in Arabic are heads that take the noun as complement. In spite of that fact, there is agreement between the demonstrative and the noun. We also see some sort of agreement (polarization) in the case of prenominal cardinals. Apparently, then, there is agreement in a head-complement configuration, but here it goes from the complement to the head. Or, in other words: the head agrees with the complement.¹⁶

A further difference between specifiers and complements in noun phrases seems to be that complements are assigned case by their heads, whereas specifiers are not. More in general, heads can impose certain formal requirements on their complements, as we saw in the case of prenominal cardinal numbers. In this way, there seems to be a somewhat reciprocal relation between heads and complements,¹⁷ which does not exist between heads and specifiers.

Note that I have talked about agreement and case assignment in somewhat traditional terms, here. Chomsky (1998) argues that case assignment should also be seen as an instance of agreement, and furthermore, he argues that agreement is not a result of a spec-head relation, but that a spec-head relation can be the result of agreement: if a head agrees with a phrase that is in its (c-command) domain, that phrase can be raised and merged with the head, forming a specifier. However, I am not sure to what extent the observations in this section can be generalized, so I will not go into the issue of how they are to be expressed in a minimalist framework. I have merely made them in order to provide a basis for some points I would like to make in the next sections.

2.4 Quantifiers

There is not one single construction that is used for all quantifiers. Some, like *qalīl* ‘a little’, use a prepositional construction (*qalīl min* ‘a little of’). Others appear as a sort of secondary predicate, following the noun and taking accusative case. (E.g., *al-ṭullāb-u ḡamīl-an* ‘the-students-NOM all-ACC.INDEF.’) Most of them, however, appear prenominally, and take the noun as complement, in the familiar construct state:

- (10) kull-u -l-ṭullāb-i
 all-NOM the-students-GEN
 ‘all (the) students’

Again, we see the by now familiar structure: the quantifier takes case according to the position of the noun phrase in the sentence, and the noun itself invariably takes genitive case.

¹⁵This observation seems to hold only in the limited context I am discussing here, cf. the agreement between subject and verb.

¹⁶We are familiar with this kind of agreement in many languages, where determiners agree with the head noun in gender, number and/or case. There are some prenominal quantifiers in Arabic that also show agreement or polarization, e.g., *‘ayy* ‘which’, *biḏ* ‘some’.

I will not go into the question of how this agreement is brought about. Perhaps it is the result of feature inheritance, although the exact mechanism will have to be worked out.

¹⁷Although, as we have seen, only some heads in Arabic agree with their complements.

Furthermore, the quantifier does not have a definite article, nor does it have an indefiniteness marker.

Some quantifiers of this type can also appear postnominally. In that case they take a suffix pronoun that refers back to the head noun:¹⁸

- (11) al-ṭullāb-u kull-u-hum
 the-students-NOM all-NOM-them
 litt. ‘the students, all of them’

There is no problem in calling this type of modifier a specifier of the noun. In fact, it seems desirable: in (11), the noun takes its case according to its structural position in the clause, and the quantifier agrees with it in case. Furthermore, one could say that the suffix pronoun exhibits a sort of agreement of the quantifier in number and gender.¹⁹ It is difficult, if not impossible, to use the quantifier as a sentence-level predicate, but that is presumably for semantic reasons.

The basic quantifier data then seems to confirm the current proposal. We see the same pattern that we saw with other modifiers: they can either occur prenominally as heads, or postnominally as specifiers.

2.5 Relative clauses

The following example demonstrates a standard relative clause in Arabic:

- (12) al-kitāb-āni -llaḍāni katab-tu-humā
 the-books-DUAL.NOM REL.DUAL.NOM.m wrote-I-them
 ‘the two books that I wrote’

In (12), the relative marker *allaḍāni* agrees with the head noun in number, gender and in case. This last fact may seem surprising, but it becomes less so when one realizes that the relative clause contains a resumptive pronoun. The relative marker is not part of the subclause in the way that the relative marker is in European languages. Note, by the way, that relative clauses cannot occur prenominally.

Kayne (1994) assumes that a relative clause is a CP complement of D. The “head” of the relative clause (the noun that is modified) is base generated inside the CP (or rather, IP) and moves out to spec,CP. In cases where the relative marker is a *wh*-element, Kayne assumes that *wh*+noun moves out of CP to spec,CP, and that the noun then moves to spec,*wh*.

Kayne himself notes that case is problematic for this proposal. In relative clauses with a *wh* relative marker, the head and the *wh*-element do not have to have the same case. That is strange considering two facts. First, the *wh*-noun complex starts out as one single phrase, which is case marked in the relative clause. Because it is a single phrase, one would expect it to have one case. Second, when the noun moves to spec,*wh*, it is in a spec-head relation with the *wh*. In an antisymmetric framework, one might expect spec-head agreement in such a configuration, which would copy the case of *wh* onto the noun.²⁰

¹⁸Note that although the translation uses an apposition structure, it is not certain that that is the structure in Arabic as well, since the intonational structure is different.

¹⁹More specifically, I assume that the pronoun exhibits the empty position in the QP that I argue elsewhere must be present in a specifier if it is to agree with its head.

²⁰Kayne assumes that the case assigned to *wh* is only passed on to the noun if this noun does not move further. If it does, the noun can be case marked by another case assigner later. This, however, is hardly a

Another problem has not been noted by Kayne. Many languages, including Arabic, have a resumptive pronoun in the relative clause. The status of this resumptive pronoun is unclear in the analysis that Kayne adopts. There are some proposals (e.g., Pesetsky and Torrego, 2000) that argue that a trace of movement can be spelled out as a resumptive pronoun, which could in principle solve this problem. However, one would still have to explain why in relative clauses this spell-out is obligatory, whereas it is impossible or at least optional in many other instances of movement in Arabic. And of course, if such a solution is adopted, the question why the resumptive pronoun can have a case that is different from its antecedent becomes even more difficult to answer.

As an alternative, I will assume that relative clauses (at least in Arabic) are specifiers, because they show a number of properties that I argued in 2.3 are characteristics of specifiers.

First, the relative marker agrees with the head noun. It agrees in number and gender, and the dual relative marker also agrees with it in case, as I remarked earlier. Furthermore, one can say that the relative marker in fact agrees with the head noun in definiteness, too. The relative marker itself is morphologically composed of the definite article plus another element, that presumably derives from some sort of demonstrative + emphatic element. (Is this entirely correct?)

The relative marker is only present if the head noun is definite. If the head noun is indefinite, the relative clause follows it directly (but after any adjectives), without any marker at all. Therefore, it seems reasonable to assume that the relative marker is in fact a definiteness marker. With that, relative clauses show the same kind of agreement with the head noun, through their relative marker, as do adjectives.

Second, relative clauses can be used as sentence-level predicates, as the following example shows:

- (13) *hādā huwa -llaḏī ra'ay-nā-hu 'amsi*
 this it REL saw-we-it yesterday
 ‘this is the one we saw yesterday’

As I argued above, this is a typical property of noun-phrase specifiers in Arabic. I conclude, therefore, that relative clauses are specifiers of nouns, and furthermore, that they are the highest specifiers of the noun, presumably even of D. As a result, they will always be linearized last.

3 Mirror image effects

In this section, I will discuss the mirror image effects that are found in Arabic noun phrases. First, I will discuss combinations of adjectives, and after that, I will have a quick look at mirror images with other modifiers.

3.1 Adjectives

When a noun is combined with more than one adjective, there is often a clear preference for one specific order of the adjectives. Take the English example in (14):

satisfying analysis, given standard assumptions on case marking.

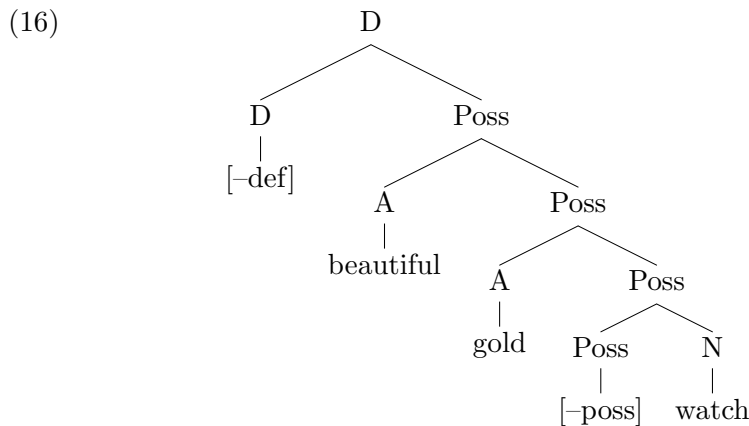
(14) a beautiful gold watch

There are many such preferred orders, which are often related to the category of adjectives combined.²¹ Arabic, a language with postnominal adjectives, mirrors the order of the English examples:

(15) sāʿat-un dahabiyat-un ġamīlat-un
 watch-NOM gold-NOM beautiful-NOM

The advantage of the present proposal is that the mirror image follows automatically: because specifiers are not linearized to the left, as in English, but to the right, the reverse order is inevitable.

The proposal has the advantage that at LF, the adjectives are in the correct hierarchical structure. Take a look at the example above: the adjective *gold* modifies the noun *watch*. The two can be considered to form a semantic unit. The second adjective *beautiful* modifies not just the noun *watch*, but the combination *gold watch*. This is expressed in the hierarchical structure because the adjective *beautiful* is merged not just with the noun *watch*, but with the complex *gold watch*:²²



Technically, one could say that one adjective takes scope over the other. This is reflected by the hierarchical order, and in the linear order by the relative position of the two adjectives to the noun.²³

(16) is not the only possible structure for two adjectives to occur in, however. There are combinations of adjectives that do not show such a strong preference for one order:

(17) a. a sweet, beautiful girl
 b. a beautiful, sweet girl

²¹The difference between stage-level and individual-level predicates may also have something to do with it, given the different interpretations of *a visible invisible star* vs. *an invisible visible star*. (Ø. Nilsen, p.c.)

²²Note that in an antisymmetric approach, this structural hierarchy is still present in English, but lost in Arabic, because one needs to move the lower adjective to a position above the higher one, in order to get the correct word order. One will need to posit a reconstruction process, then, if the correct interpretation is to be derived. The question then becomes which movements must be “undone” at LF, and which do not. I am not convinced that a principled answer to this question is at all possible.

²³That this is correct can be seen best in cases where both orders can occur, but where there is still a clear hierarchical order. The aforementioned phrases *a visible invisible star* vs. *an invisible visible star* are a good example of this.

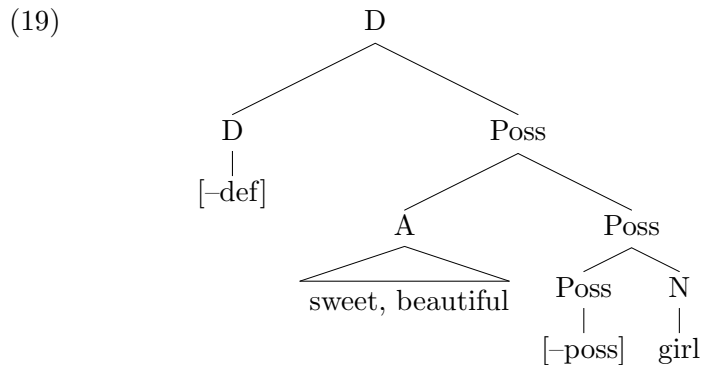
In English, two such adjectives are preferably separated by a comma in writing, although they can also be conjoined by *and*. In Arabic, both orders are possible as well, and there is a strong preference for conjunction with *wa*, ‘and’:

- (18) a. bintun ġamīlatun wa laṭīfatun
 girl beautiful and sweet
 b. bintun laṭīfatun wa ġamīlatun
 girl sweet and beautiful

The remarkable thing is that there is no mirror image effect here. (18a) does not correspond to (17a), as one would expect, but rather to (17b), where the adjectives have the same order. The order of the adjectives is not arbitrary, but it is not determined by scope relations. Instead, there is presumably some pragmatic reason for the ordering, as there is usually a pragmatic reason behind the order of two conjuncts in any conjunction.

The advantage of a recursive linearization approach is that we can have the conjunction be responsible for the relative ordering of the two conjuncts, here the two adjectives. If we assume that this ordering is based on precedence rather than hierarchy, which is not unlikely, we derive the fact that the mirror image effects are absent in these cases. Whatever the reason for mentioning the first conjunct first, it will have the same effect in both English and Arabic.²⁴

The structure of a noun phrase as in (17) would then schematically be the following:



I have not indicated the internal structure of the conjunction, since it is still unclear in the literature and because it is not directly relevant here. What is important to see is that the two adjectives in constructions like this one form a kind of complex adjectival predicate, which has an internal ordering of itself.

3.2 More mirror image effects

As Fassi Fehri (1999) makes clear, mirror images are not only found in the relative order of adjectives. They are also found when different modifiers are combined. Fassi Fehri gives examples in which ordinals and/or numerals are combined with adjectives:

- (20) al-muḥādarāt-u -l-ḥams-u -l-'ūlā
 the-lectures-NOM the-five-NOM the-first-NOM

²⁴I am not sure whether the structure that Kayne (1994) proposes for conjunctions would be compatible with this observation. In his view, the first conjunct a-symmetrically c-commands the second. Perhaps a pragmatic reason is not sufficient to warrant a hierarchically higher position for it.

‘the first five lectures’

As one can see, the cardinal and the ordinal appear in a mirrored order, when compared with English. But, as I demonstrated earlier, these types of modifiers can also occur prenominally. Looking at those cases, we see that prenominal modifiers have the same order as in English:

- (21) ’awwal-u ḥams-i muḥādarāt-in
first-NOM five-GEN lectures-GEN
‘the first five lectures’

Fassi Fehri has more examples, which show that the effect is quite general.²⁵ Again, the mirror image effects can be explained easily if we assume a recursive linearization approach. Given the assumption that the parameter setting for noun phrases in Arabic is generally label-first (resulting in Head-Comp-Spec order), we derive the linear ordering, including the mirror images, without further stipulations.

4 Predicative modifiers

Fassi Fehri (1999) argues that modifiers in Arabic can sometimes occur predicatively, rather than attributively:

- (22) al-ṣuḥufiyy-u -l-ṭawīl-u -l-faransiyy-u -l-’aṣl-i
the-journalist-NOM the-tall-NOM the-French-NOM the-origin-GEN
‘the tall journalist, (who is) of French origin’

Normally, a modifier expressing nationality would appear closer to the noun than a modifier expressing such a quality as ‘tallness’. In (22), however, this order is not adhered to. Rather, the adjectival group expressing nationality, *faransiyy al-aṣl-i* ‘French of origin’, follows the adjective *ṭawīl*. As Fassi Fehri explains, the meaning of such a construction is close to that of a relative clause, and the translation into English often reflects this.

Fassi Fehri does not make it clear what exactly he means by “predicative modifiers” as opposed to “attributive modifiers”. I would like to argue, however, that the difference between them mainly lies in the position in the tree that they take. I have so-far assumed that adjectives are specifiers of a head Poss. Presumably, these predicative modifiers are specifiers of a higher head, perhaps even D. That would explain their position following all other modifiers, and it would explain their interpretation, which puts them on a par with relative clauses: both are specifiers of D.

²⁵However, one informant of mine argued that the position of a numeral depends on the type of adjective. He had a preference for the following orders:

- (i) a. al-^cāmilūna -l-ḥamsat-u -l-judud-u
the-workers.NOM the-five-NOM the-new-NOM
‘the five new workers’
b. al-^cāmilūna -l-faransiyyūna -l-ḥamsat-u
the-workers.NOM the-french.NOM the-five-NOM
‘the five French workers’

I have no explanation for this effect. (and i haven’t tested it with other speakers yet. furthermore, i do not know what the combination of the two adjectives (the five new French workers) would result in)

5 A problem: prepositional modifiers

The proposal faces one major problem. Several solutions for this problem are possible, but none of them is entirely satisfying. The problem lies in the fact that prepositional modifiers always follow any adjectives, even when the prepositional modifier is presumably the complement of the noun, e.g. in the case of deverbal nouns:

- (23) al-huġūm-u -l-šadīd-u ʿalā -l-muqāwamat-i
 the-attack the-violent on the-resistance
 ‘the violent attack on the resistance’

If we assume that the prepositional phrase *ʿalā -l-muqāwama* is in complement position of the noun, we would predict that the adjectives, which are specifiers, follow it, rather than precede it. The problem is that that order is entirely ungrammatical.²⁶

As I said, there are several ways to solve this problem. First, one could posit independent movement of the adjectives, as Fassi Fehri (1999) does. He does not sufficiently explain why the adjectives move, however. The assumption is that it has to do with agreement, but I argue elsewhere that such agreement can take place without any movement.

Another solution would be to say that prepositional phrases are not in complement position at all. Instead, they are specifiers also, and high specifiers at that. There are obvious problems with such an approach, one of which is the fact that the prepositional modifier can contain a reflexive that can be bound by the subject of the deverbal noun:

- (24) išmi’zāz-u-hā min nafs-i-hā
 disgusting-NOM-her from SELF-GEN-her
 litt. ‘the disgusting at herself’

In (24), the deverbal noun *išmi’zāz* ‘disgusting’ has both a subject, the pronominal suffix *-hā* ‘her’, and an object, the reflexive *min nafsihā* ‘at herself’. Assuming that such binding is syntactic, one would have to assume that the subject c-commands the object, and that consequently the prepositional phrase must be in complement position.

There is data, however, that could be taken to argue against such an idea. The prepositional phrase, in spite of the fact that it expresses the object of the verb, can be used as a sentence-level predicate:

- (25) ʾinna išmi’zāz-a-hā -l-ʾāna min nafs-i-hā
 TOP disgusting-ACC-her now from SELF-GEN-her
 litt. ‘the disgusting is now at herself’
 ‘now, she is disgusted at herself’

The topic of the clause is introduced by the topic marker *ʾinna* (and takes accusative case accordingly). The predicate of the clause is the prepositional phrase *min nafsihā*, still containing the reflexive, which is still necessarily bound by the subject of the deverbal noun.²⁷

²⁶Note that an antisymmetric approach faces the same problem. In order to explain the mirror image of the adjective order, one needs to posit the familiar movement of NP to the specifier of the lower AP, and then movement of the lower AP, with the NP in its specifier, to the specifier of the higher AP. But the moved NP contains the complement. The resulting word order would then be the same: N-PP-Adj.

²⁷In the framework of Reinhart and Reuland (1993), it is also relevant to know that the reflexive cannot be replaced with a pronoun under the intended reading.

As I argue in section 2.3, the ability to be used as a sentence-level predicate is a typical property of noun-phrase specifiers. The facts then suggest that prepositional modifiers are specifiers, rather than complements. Given a recursive linearization approach, we easily derive their position: as specifiers, they are simply linearized last.²⁸

It is not clear how the binding facts would be accounted for in this analysis. One option might be to say that the binding conditions apply on a semantic level altogether, rather than (in part) on a syntactic level. But note that no matter how we analyze prepositional modifiers in noun phrases, the example in (25) will always pose a problem for the binding theory.

There is one final argument supporting the assumption that prepositional phrases are in fact specifiers, and that is the fact that a noun with a prepositional modifier can still fill its complement position with a genitive. We saw this in (24), where the deverbal noun not only has a prepositional modifier, but also a genitive phrase, expressing the subject. If we are correct in assuming that this genitive modifier is in the noun's complement position, the prepositional phrase obviously cannot be.

6 Conclusion

Fassi Fehri (1999) demonstrates that the order of modifiers in the Arabic noun phrase is basically the following:²⁹

- (26) a. Q-Dem-Ord-Card-Adj-(Det)-N-(Gen)
 b. (Det)-N-(Gen)-Adj-Card-Ord-Dem-Q

It must be noted that elements from orders (a) and (b) can be mixed, although certain combinations may be out. Summarizing, we can say that the (Det)-N-(Gen) complex is a fixed combination that cannot be split. The modifiers Q, Dem, Ord, Card and Adj can occur on both sides, appear in a fixed order, and show mirror image effects.

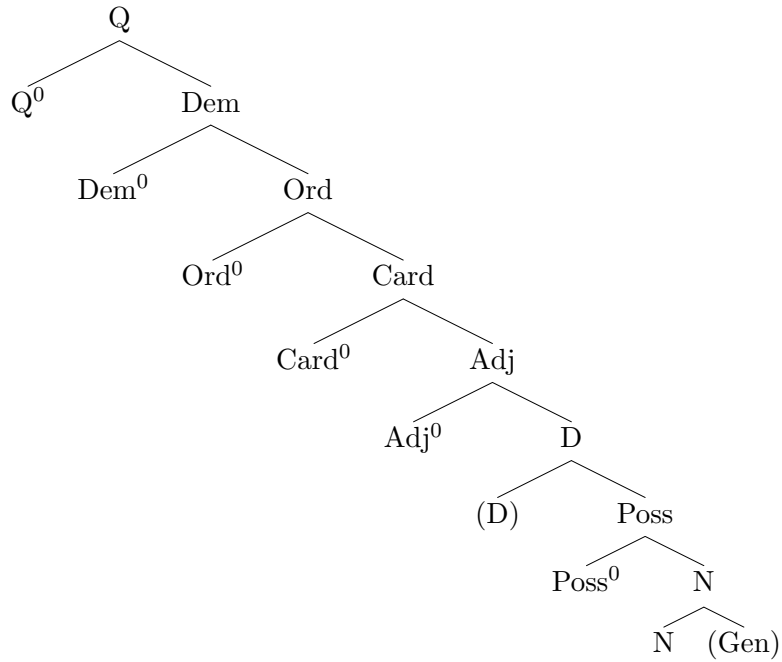
The strength of the recursive linearization approach becomes apparent when we draw the trees that derive the linear orders in (26). Following Shlonsky (2000), I argued that prenominal modifiers are heads taking the noun (or another modifier) as complement, whereas postnominal modifiers are specifiers. That being the case, we can derive the correct orders without any further movements, assuming that all categories in the noun-phrase domain in Arabic are linearized label-first. The tree underlying (26a) is the following:

²⁸Two more solutions for the problem discussed here come to mind. One could also assume that prepositional modifiers must be analyzed in a way similar to what Kayne (1994) assumes for relative clauses. The head noun then originates in a specifier position of the preposition, and possibly moves out. This might provide a solution for the binding facts, if one assumes (as Kayne does) that specifiers can c-command out of the phrase they are in. But it is problematic in terms of theta theory, because it would mean that the specifier of the preposition assigns a theta role to the complement of the preposition, which is an unexpected configuration.

The final alternative is to assume that prepositional phrases obligatorily undergo a kind of heavy-NP shift, or rather, heavy-phrase shift. It may then be possible to combine them with the predicational modifiers that I discussed in the previous section, and with relative clauses. The reason for their shifting would be that all three types of phrases (can) contain noun phrases themselves. As such, they are best placed at the right periphery of the noun phrase, because if they were not, any adjectives or genitives that might follow, could be interpreted as belonging not to the head noun of the entire construction, but to a noun contained in the modifier.

²⁹I have not indicated Rel and PP, because they are somewhat problematic, as I indicated in the text. Furthermore, Det and Gen appear in parentheses, because they occur in complementary distribution.

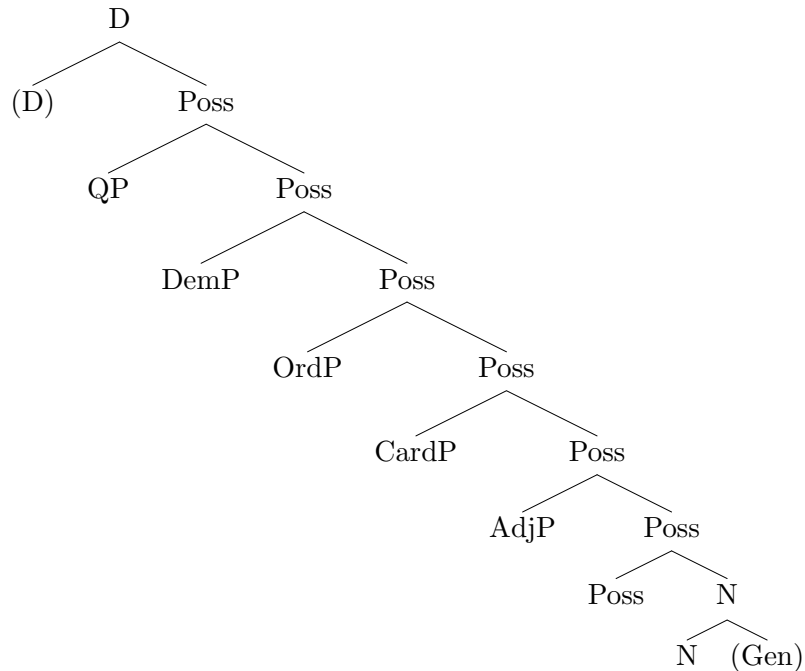
(27)



Given that heads are linearized first, we derive the correct order from this tree: Q will be linearized first, then Dem, then Ord, etc. until the noun is spelled out, possibly with a genitive complement.

For (26b), with postnominal modifiers, the underlying tree is (28):³⁰

(28)



I have followed the convention of drawing specifiers to the left in the tree structure, but one must keep in mind that they are linearized to the right, given that the parameter setting for

³⁰Abstracting away for the moment from the question of which heads the different modifiers are specifiers.

all heads is label-first. That means that in (28), D (being a head, rather than a specifier) is linearized first, followed by Poss-N. (Or, if D is absent and Gen is present, Poss-N-Gen will be linearized first.) Then follows the adjective, then the cardinal, and so on, until the quantifier has been reached.

As one can see, a recursive linearization approach is very successful in the case of Arabic noun phrases. From a standard hierarchical structure, we can derive the correct word orders without further movement, and with only a single stipulation, namely that all noun-phrase heads in Arabic are linearized label-first.

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