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## ON LOCALITY AND DISCONTINUITY AGREEMENT AS ACROSS THE BOARD MOVEMENT

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### 1. Introduction

This study presents an analysis of agreement phenomena based on (i) a structural analysis of prosodic word internal feature morphology and (ii) a strict locality requirement on morphosyntactic covariation. The locality requirement allows covariation only under adjacency. While discontinuous selectional relations are proposed to be continuous in a level of representation from which the surface representation is derived (D-structure), in accordance with the classical transformationalist view, discontinuous agreement relations are proposed to be unified by across the board movement at a level of representation derived from the surface representation (LF).

These conclusions are motivated by (i) an analysis of nominal morphology in Classical Arabic (hereafter Arabic) in which the feature content of prosodic words is argued to be structurally instantiated in a complex syntactic structure which strictly obeys the locality requirement and (ii) the observation that a feature percolation analysis of the 'spreading' of features for the purposes of noun-adjective agreement in Arabic obviates the locality requirement by predicting a large repertoire of possible dependencies which are not attested. Since feature percolation is incompatible with the syntactic approach to morphology, an alternative to feature percolation is developed here in which two components of the across the board movement mechanism subsume agreement phenomena among complex syntactic structures broadly. These are: (i) a component which evaluates syntactic substructures for isomorphy and (ii) a component

which unifies identical substructures syntactically and semantically. Section 2 surveys morphological covariation within the noun phrase and develops a structural account of the observed dependencies. Section 3 discusses mechanisms of noun-adjective concordance, addressing problems with standard approaches, and introducing the across the board mechanism of feature unification. Section 4 concludes.

## 2. Noun Phrase Syntax

Consider the forms in (1).

- (1) a. al-*ṭaalib*-a-t-u  
def-student-sg-fem-nom  
b. al-*ṭaalib*-aa-t-u  
def-student-pl-fem-nom  
c. al-*ṭaalib*-u  
def-student/sg/masc-nom  
d. al-*ṭullaab*-u  
def-student/pl/masc-nom  
e. *ṭaalib*-a-t-u-n  
student-sg-fem-nom-decl  
f. *ṭaalib*-a-t-a-n  
student-sg-fem-acc-decl

The forms in (1a and b) are phonologically identical except for a difference in the length of the vowel following the stem, and they are identical in feature makeup except for number: (1a) is singular and (1b) is plural. Vowel length covaries with number, the short vowel expressing singularity and the long vowel expressing plurality. The connection between vowel length and number obtains for the masculine regular 'sound' plural as well (see (8) below), in which case the quality of the vowel varies with case. That the quality [+back] of the vowel whose length varies with number in (1a and b) does not vary with case suggests that the feature [+back] is associated with the gender marker *t*, or is altogether epenthetic, required because of the impossibility of spreading of case over the gender marker *t*, the absence of which, in (8), allows spreading. The mora to which the case marker associates in the forms in (1) is therefore also epenthetic, inserted to carry the features [+back,+round] which express

nominative case, which otherwise spread to the vowel that expresses number in the absence of the blocking feminine marker in the masculine plurals in (8). Distinct number and case markers therefore do not cooccur in masculine forms, e.g. \**al-ṭaalib-a-wu*. These data place the expression of number to the direct right of the stem.

The morpheme *t* appears in all of the feminine forms (1a, b, e, and f) and none of the masculine forms (1c and d). The *t/∅* alternation covaries with gender, placing the expression of gender to the direct right of the position which expresses number. The vowel following the position which expresses gender covaries with case, as the pair (1e and f) shows.

The definite article, when present, precedes the stem (1a, b, c, and d). When the definite article is absent, a morpheme *n* appears word-finally (1e and f) glossed 'decl[ension]'. In spite of being in complementary distribution with the definite article in singular common nouns, the following considerations indicate that this morpheme does not express indefiniteness: (i) it appears on proper names that do not take the definite article, and (ii) it appears on some plural forms that do take the definite article. That proper names are definite in spite of not appearing with an overt definite article is evidenced by the fact that any modifiers over a proper name take the definite article, in accordance with the standard agreement paradigm, according to which modifiers and modifyees agree in definiteness.

- (2) *samiir*-u-n      *al-wasiim*-u  
samiir-nom-decl def-handsome-nom  
"handsome Samiir"

Further, the final *na* of the plural form *al-muṣallimuuna* in (3) below is pointed out by Fassi Fehri (1993) to share properties with the final *n* of singular indefinite forms such as in (1e and f) and singular definite forms such as in (2). In particular, the final *n(a)* in each of these forms disappears in the construct state, as illustrated in (4). Compare (4a) with (3), (4b) with (1e), and (4c) with (2).

- (3) *al-muṣallim*-uu-na  
def-teacher-pl/masc/nom-decl

- (4) a. muʕallim-uu            al-kiimyaaʔ-i  
 def-teacher-pl/masc/nom    def-chemistry/sg/masc-gen  
 "teachers of chemistry"
- b. ʕaalib-a-t-u            al-kiimyaaʔ-i  
 student-sg-fem-nom    def-chemistry/sg/masc-gen  
 "student of chemistry"
- c. samiir-u            al-qaahir-a-t-i  
 samiir-nom    def-cairo-sg-fem-gen  
 "Samiir of Cairo"

I will characterize this particle as a declension for now and discuss its relation to definiteness below.

The considerations discussed above suggest that the morphological form of nouns in Arabic conforms to the template in (5).

- (5) definiteness > stem > number > gender > case > declension

The following two sections examine the repertoire of morphological covariation among the elements in (5). Gaps in this repertoire are argued in section 2.4 to motivate the proposal that (5) is a spell-out of a complex syntactic structure. For the purposes of this survey, covariation obtains between two elements if one element requires, excludes, or affects the form of, another element. Nonlexical, i.e., purely articulatory, processes such as assimilation or epenthesis are not considered under the rubric of morphological covariation. The following two sections examine, first, linear covariation within (5) and, second, discontinuous covariation in (5).

### 2.1 Linear covariation

Noun phrase features in the ordering in (5) often undergo contraction or suppletion.

Number and gender may contract with the stem in the form of an alteration in the prosodic structure and/or vowel distribution in the stem, as in (1d) with respect to (1c). The feminine forms in (6) display the alternation more clearly.

- (6) a. al-sudd-a-t-u  
 def-couch-sg-fem-nom
- b. al-sudad-u  
 def-couch/pl/fem-nom

Both the short vowel and *t* that express singular number and feminine gender respectively in (6a) are missing in (6b), replaced by a derived prosodic structure and vowel sequence within the stem. Correlatively, the number feature of (6b) is distinct from (6a). The gender feature is the same, however, indicating that the prosodic alteration of the stem in (6b) has absorbed the meaning of *t* in (6a). Hence, the form *sudad* is a contraction of the stem, number, and gender.

There are also feminine forms analogous to (1c and d) in which number and gender contract with the stem in both the singular and plural. The typical short vowel marker of singular number and *t* marker of feminine gender are missing in both forms. Since it is demonstrated above that number and gender features may contract with the stem, then rather than postulate a nonovert singular feminine suffix to describe (7a), its description is formulated here in terms analogous to the representation of (6b) and (7b), in which singular number and feminine gender contract with the stem.

- (7) a. al-daar-u  
 def-house/sg/fem-nom
- b. al-duur-u  
 def-house/pl/fem-nom

Number and gender may also contract with case independently of the stem in masculine words that denote a human being.

(8)

	singular	plural
nominative	muʕallim-u-n teacher/sg/masc-nom-decl	muʕallim-uu-na teacher-pl/masc/nom-decl
accusative	muʕallim-a-n teacher/sg/masc-acc-decl	muʕallim-ii-na teacher-pl/masc/acc-decl
genitive	muʕallim-i-n teacher/sg/masc-gen-decl	muʕallim-ii-na teacher-pl/masc/gen-decl

The distinction in the length of the vowel following the stem mirrors the corresponding distinction in feminine forms. While a short vowel occurs in singular forms, a long vowel occurs in plural forms. In both singular and plural forms the quality of the vowel expresses case.

However, in the plural forms, the accusative and genitive cases neutralize to the long vowel *ii*.

That this neutralization is not phonologically conditioned is demonstrated in (9). In the construct state, as noted previously, the final declension *n(a)* disappears in both singular and plural forms. Following an open syllable, the initial *a* of the definite article *al* (when present) of the following word elides, and the remnant *l* closes the syllable. Long vowels shorten in syllables closed by the definite article. The vowels that express case in (8) therefore occur in phonologically identical environments in the construct state when the second term is definite. All the forms in (9) are masculine and denote 'teacher(s) of chemistry.'

(9)

	singular	plural
nominative	muʕallim-u-l-kiimyaaʔi teacher-sg/nom-def-chemistry	muʕallim-u-l-kiimyaaʔi teacher-pl/nom-def-chemistry
accusative	muʕallim-a-l-kiimyaaʔi teacher-sg/acc-def-chemistry	muʕallim-i-l-kiimyaaʔi teacher-pl/acc-def-chemistry
genitive	muʕallim-i-l-kiimyaaʔi teacher-sg/gen-def-chemistry	muʕallim-i-l-kiimyaaʔi teacher-pl/gen-def-chemistry

(9) shows that neutralization of accusative and genitive case in the human masculine plural also obtains in environments phonologically identical to environments in which the tripartite case distinction holds in the singular. The neutralization of accusative and genitive case is therefore a morphological dependency with number and gender. It occurs only in the masculine plural. The forms in (8) therefore represent an instance of contraction of number, gender, and case.

Case may also contract with the word-final *n* declension following a lexically- (though in some cases prosodically-; see McCarthy & Prince 1990) defined class of stems. In words of this class (termed 'diptotes') the declension and the case marker fuse as illustrated in (10). Compare with the standard three-way ('triptote') case paradigm.

(10)

	triptote	diptote
nominative	tullaab-u-n student/pl-nom-decl	madaaris-u school/pl-nom/decl
accusative	tullaab-a-n student/pl-acc-decl	madaaris-a school/pl-acc/decl
genitive	tullaab-i-n student/pl-gen-decl	madaaris-a school/pl-gen/decl

The ending *un* contracts to *u* in nominative diptotes. The endings *an* and *in* neutralize to *a* in accusative and genitive diptotes, respectively. The evidence that the final vowel of the diptotes is a contraction of case and declension is that the diptotes follow the standard triptote case paradigm when they are definite, i.e., when the declension, which is in complementary distribution with the definite article in singular common nouns, is absent.

- (11) a. al-madaaris-u  
def-school/pl-nom  
b. al-madaaris-a  
def-school/pl-acc  
c. al-madaaris-i  
def-school/pl-gen

The forms in (11) also show that the neutralization of accusative and genitive case in (10) is not phonologically conditioned, since the final vowels in (10) (diptote column) and (11) are in the same phonetic environment, but neutralization takes place in the former but not in the latter.

Thus, the stem, number and gender may contract, number, gender, and case may contract, and case and declension may contract. The only adjacency relation in the Arabic noun phrase that fails to display morphological covariation is that between the definite article and the stem. The form or presence of the article does not affect the form or presence of the stem, nor vice versa. The present study offers no explanation for this lack of interaction despite adjacency.

The definite article also does not covary with number, gender, or case. Such a dependency is not necessarily expected, since the dependencies attested so far are purely linear, and the article is discontinuous with the number, gender, and case markers. Likewise,

there are also no cases in which prosodic alternations in the stem covary with the appearance or form of the discontinuous declension or case particles, i.e., the stem does not covary with declension or case.

Analogously, number does not covary with case. Such a dependency might mirror that in (8), i.e., a singular short vowel before the feminine marker occurs with a tripartite case distinction following the feminine marker, whereas a plural long vowel before the feminine marker occurs with a binary case distinction following the feminine marker. Such a discontinuous interaction of number and case over the feminine marker is not attested. Interaction of number and case is attested only in forms in which gender is part of the contraction of number and case, as in (8). The dependency in (8) is not discontinuous, but rather extends over the three linearly adjacent features number, gender, and case. Number does not covary with case discontinuously. Last, the discontinuous features gender and declension also fail to covary.

These considerations suggest that covariation among features obtains only locally. This generalization is expressed in (12).

- (12) Locality Criterion: when an element A requires, excludes, or effects the form of a distinct element B, then A and B are adjacent.

There are certain apparent exceptions to the locality criterion. They are the subject of the following section.

## 2.2 Nonlinear covariation

The generalization that emerges from the preceding section is that a feature may covary with an adjacent feature but not with a non-adjacent feature. However, there are several exceptions to this generalization. As (1c and e) demonstrate, the definite article and the declension particle are in complementary distribution in a set of forms, namely the singular common nouns. These forms evidence covariation between definiteness and declension in the form of mutual exclusivity. This covariation obtains over intervening material including the stem, number, gender, and case. It is nonlinear.

Case does not covary with any noun phrase internal feature except declension, to which it is adjacent, as discussed in the previous section.

However, case does not vary freely, but rather it varies with the type of the external governor of the noun phrase. Case is genitive if the noun is governed by *inter alia* a preposition, accusative if it is governed by *inter alia* a verb, and nominative if it is governed by tense (possibly *inter alia*). A governor is, in principle, not contained within its governee. Case covaries with an external governor in spite of the morphologically embedded position of case between gender and declension, neither of which covary with the external governor. In (13), the case marker is separated from a leftward external governor by intervening material including definiteness, the stem, number, and gender.

- (13) a. maʃa ʔaalib-a-t-i-n  
with student-sg-fem-gen-decl  
"with a student"  
b. qaabal-a ʔaalib-a-t-a-n  
met-3/sg/masc student-sg-fem-acc-decl  
"He met a student."  
c. xaraʒ-at ʔaalib-a-t-u-n  
left-3/sg/fem student-sg-fem-nom-decl  
"A student left."

Covariation also obtains between the stem and the gender marker in the form of a lexical selectional restriction. The stem determines the form and content of the gender marker, since gender is a lexical property of the stem. This covariation obtains over the number marker, which linearly intervenes. The stem and gender marker therefore also covary nonlinearly.

The chart below summarizes the repertoire of nonlinear dependencies. Linear dependencies are not shown. A plus (+) indicates covariation between two features; a minus (-) indicates lack of covariation between two features. Recall that the Locality Criterion predicts only minuses in the chart below.

(14)	decl.	case	gender	number	stem
governor	-	+	-	-	-
definiteness	+	-	-	-	
stem	-	-	+		
number	-	-			
gender	-				

### 2.3 *Structural approach to local dependencies*

The analysis presented here borrows from the Minimalist Program (Chomsky 1995) that an utterance is a 'spell-out' of a set of features in a syntactic hierarchy. Features are spelled out into morphemes according to the hierarchical ordering that obtains at the point in the derivation at which they are spelled out. The spelling out of morphosyntactic features references the lexicon (Halle & Marantz 1993); terminal syntactic feature bundles are matched up with lexical entries which match in feature content. In short, at least some, if not all, lexical insertion is postsyntactic.

The present study also borrows from Baker (1988) and Kayne (1994) the idea that the mapping from syntactic structure to a linear ordering of lexical items is direct, in a substantive way. Kayne proposes that asymmetric syntactic relations are expressed in phonological form as linear precedence relations. If an element asymmetrically c-commands another element, then phonological material associated with the former linearly precedes phonological material associated with the latter in the spell out of the structure. Any postsyntactic operation which nonvacuously reorders elements of the spell out of a syntactic structure results in a violation of the directness axiom, since it yields an ordering of elements of the spell out which is not a direct mapping from relations in the syntactic structure. Any such directness axiom therefore entails at least that no structure permuting operations apply in the postsyntactic component, i.e., the syntax of an utterance is not hidden behind other than a transparent function from syntax to PF. The spell out component is transparent in that it cannot alter the categories of, or structural relations among, the elements it spells out.

The directness axiom orders features in a linear order on the basis of the syntactic structure, and the spell out component maps features or strings of adjacent features onto morphemes. A final methodological principle which plays an important role in the argumentation that follows is strict adherence to the Locality Criterion. While a principle of this form motivates the transformational approach to the description of syntactic structures broadly, the present study extends the notion of locality to morphological covariation within prosodic words in general. This extension is a consequence of the transparency of the syntax to PF

mapping in a grammar in which lexical insertion is postsyntactic. Syntax does not see prosodic words, since they enter the derivation postsyntactically. Since features are manipulated only by syntactic operations, the only operations that manipulate features do not have access to information about their prosodic grouping. There is no syntactic partition between NP internal features and NP external features. The principles of syntax, such as the locality restriction on covariation, apply everywhere.

The Locality Criterion is observed directly in the repertoire of linear covariation discussed in section 2.1. As discussed in section 2.2, however, some elements covary which are not adjacent in the ordering in (5). The present study adopts the transformational approach to discrepancies between the locality restriction on covariation and instances of nonlocal covariation. According to the transformational approach, an utterance is associated with representations in which the elements which covary superficially nonlocally are local, and one or more functions relate the set of such representations (Chomsky 1957).

### 2.4 *Representations of the noun phrase*

Following the line of reasoning delineated above, the nonlinear dependencies described in the chart in (14) indicate that one or more functions relate a representation of the ordering in (5) with a representation in which case and the external governor are local, in which the definite article and the declension are local, and in which the stem and the gender marker are local.

The generalization in the X-bar theoretic tradition that syntactic structures are headed by lexical elements at D-structure suggests that the nonfinal surface position of the stem is derived. Since the stem is not local to the gender marker in its surface position, the stem movement operation is felicitously analyzed as the operation that separates the stem from a position local to the gender feature, i.e., gender is local to the stem at D-structure. Since the stem is phrase final, gender precedes.

(15) . . . gender > stem

Since the function from D-structure to S-structure creates at least one instance of nonadjacency between covarying elements, analytical parsimony and absence of counterevidence motivate the proposal that the mapping from D-structure to S-structure creates all three instances of nonlinear covariation observed at S-structure. Elements which covary nonlocally at S-structure are local at D-structure. Additional arguments will be brought in section 3.1 against an LF checking analysis of the dependencies under consideration here.

Since the case assigning governor is external to the noun phrase, case is the highest element within the noun phrase when it is local to the governor. Any highestmost element other than case will violate the adjacency relation between case and the external governor. The D-structure of noun phrases may therefore be further fleshed out as in (16), where V stands for a case assigning governor (e.g., tense or a verb).

(16) V > case . . . gender > stem

According to the line of reasoning followed here, the definite article and the declension particle, which are local at D-structure, occupy positions between case and gender. The remaining feature number also occupies a position between case and gender. An analysis in which case and declension and number and gender are base generated in their surface order is felicitous in not requiring any structure permuting operation to generate the S-structure ordering of these features. These considerations fully specify the D-structure ordering of features, and, in light of absence of counterevidence, it is adopted here. Case precedes declension at D-structure as at S-structure. Number precedes gender at D-structure as at S-structure. Definiteness occupies the remaining available position, that between declension and gender.

(17) V > case > declension > definiteness > number > gender > stem

The syntactic structure in (18) expresses the adjacency relations in (17) in structural terms.

(18) [ CaseP [ DeclP [ DP [ NumP [ GenP [ NP ]]]]]]

Note that the structure in (18) is coherent with respect to the partitioning of types of elements. The case particle and the declension together form the word-final domain of case declension in the noun phrase. Definiteness and number both restrict the extension of the kind denoted by the stem and together form the domain of quantification. Gender and the noun stem, the former a lexical property of the latter, together form the lexical domain of the noun phrase.

Given a logically coherent D-structure that conforms to the Locality Criterion, the function that relates it to the corresponding S-structure is considered to consist of the smallest set of transformations that generates the related S-structure while conforming to general constraints on movement. The present work does not pursue any rationale for the logical discontinuities observed in natural language surface forms.

The smallest set of transformations that generates the order of features in (5) from the structure in (18) is that illustrated in (19). (19a) is the D-structure shown in (18). Movement of NP to NumP in (19b) derives the surface order stem-number-gender. Movement of DP to CaseP in (19c) derives the complete surface order displayed in (5).

- (19) a. [ CaseP [ DeclP [ DP [ NumP [ GenP [ NP ]]]]]]  
 b. [ CaseP [ DeclP [ DP [ [ NP ]<sub>i</sub> [ NumP [ GenP [ t<sub>i</sub> ]]]]]]  
 c. [ [ DP [ [ NP ]<sub>i</sub> [ NumP [ GenP [ t<sub>i</sub> ]]]]] ] [ CaseP [ DeclP [ t<sub>j</sub> ]]]]

The two transformations illustrated above derive the logically disjoint surface structures exhibited in (1) from the structure in (19a) which is logically coherent with respect to both the Locality Criterion in (12) as well as the organizational logic of the structure, diagrammed in (20).

(20) [ case domain [ quantificational domain [ lexical domain ]]]

This analysis of the derivation of the surface ordering of features in noun phrases departs from the trend in syntactic characterizations of the structure of noun phrases toward the exclusive use of head movement. A detailed argument against the head movement approach





projections. Secondly, gender and the head noun are not local; they are separated by an intermediate projection. Gender and the lexical head covary, as do case and its external selector.

The confounding complication is the additional provision that the nonlinearly covarying elements are local in particular at D-structure. In (24b),  $N^0$  is contained in at least one segment of  $Gen^0$ . Nonetheless, the two nodes are still separated by a segment of  $Num^0$ . The notion that head movement makes  $Num^0$  and  $Gen^0$  local in the structure in (24b) entails that intervening segments are not relevant within an  $X^0$  category. However, this idea poses the locality problem anew. The notion of underlying form is a moot concept if covariation can obtain across intervening segments in a syntactic structure within which all projections can be related by successive applications of head movement. If there are no bounds on locality within  $X^0$ , then there are no bounds on covariation within  $X^0$ , and there is no explanation for the many gaps in the paradigm of potential dependencies illustrated in (14) which form the empirical basis for the postulation of (18).

### 3.1.2 *On the rejection of the Mirror Principle*

The second possible approach to saving the head movement analysis of Arabic noun phrases, while retaining the structure in (18), is the abandonment of the Mirror Principle. Head movement fails to derive the ordering in (5) from the structure in (18) only under the assumption that the surface ordering must reflect the derivational composition of the form. The disharmony between the Locality Criterion and the ordering in (5) disappears under the assumption that morphemes are ordered with respect to a host by a mechanism which does not obey constraints on syntactic transformations.

However, in addition to the conflict with the directness axiom, which represents a methodological basis of the present study (see section 2.3), the decoupling of morphology from syntax results in a system which either overgenerates or contains redundant sets of rules. Given a postsyntactic head ordering component, the ordering of features in (5) can be generated by head movement of the lowest to the highest head within any ordering of the categories in (18). And given some ordering of the categories in (18), any ordering of the features in (5) can be generated by head movement of the lowest to

the highest head. The reduction of the generative power of this system through the postulation of independent constraints within the postsyntactic ordering component results in a grammar with two distinct sets of ordering rules, one syntactic and one postsyntactic, each with a distinct set of constraints.

The replication of sets of ordering rules and the complementary replication of sets of constraints on ordering rules which the delinking of syntax and morphology results in represents a significant theoretical defeat. The redundancy is not warranted for the sake of the head movement analysis of Arabic noun phrases insofar as an analysis of Arabic noun phrases is available which does not require a distinction between syntactic and postsyntactic ordering rules.

Head movement is the mechanism by which adjectives and nouns become local in Cinque's treatment of Romance noun phrases, and follows a tradition of head movement analyses of nominal syntax in both Romance (see also Longobardi 1994) and Arabic (Fassi Fehri 1993; Ouhalla 1988). However, the important point that elements within noun phrases interact syntactically does not entail head movement. For example, Longobardi's detailed demonstration that proper names interact with determiners at S-structure in Italian and that this interaction is a result of syntactic locality of the two types of elements at S-structure, shows that movement applies in Italian noun phrases, but it does not exclude in principle any particular type of movement.

In light of this tradition, the final point directed here against the head movement analysis is that, in addition to the fact that abandoning either the structure in (18) or the Mirror Principle leads to an unwarranted radical augmentation of the generative power of the theory of grammar, the notion of locality on which the head movement analysis is based overgenerates in and of itself.

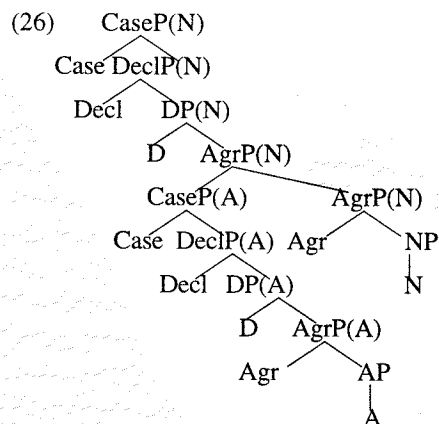
### 3.1.3 *On the syntactic transmission of features*

As (21) shows, adjectives not only agree with the nouns they modify, they display agreement morphology in the same morpho-syntactic template as nouns. (21a and b) isolate number morphology to the direct right of the stem. (21a and c) isolate gender morphology to the direct right of the number morpheme. (21e and f) isolate case to the direct right of the gender morpheme. (21d and e) isolate

definiteness word-initially and the declension *n* word-finally. Agreement morphology on adjectives appears in the surface ordering illustrated in (5), just as in nouns. (21) therefore suggests that adjectives are housed in the same syntactic substructure as nouns, (25) at D-structure, identical to (18) except that it is headed by an adjective.

(25) [ CaseP [ DeclP [ DP [ NumP [ GenP [ AP ]]]]]]

In order to make the structures in (18) and (25) more compatible with standard approaches to agreement, let us assume that the phi features number and gender are conflated into a single Agr projection. Under this assumption, (26) represents an analysis in the spirit of Romance nominal syntax of the relation between noun phrases and associated adjective phrases within a head movement framework. The diagram in (26) maintains the structures in (18) and (25) and ignores the Mirror Principle, which, however, will not play a role in the argument that follows. The extended AP occupies the specifier position of the Agr projection within the extended NP. In accordance with the standard implementation of agreement via head movement, the features number and gender are base generated as properties of the head  $N^0$ , and are checked in AgrP(N) via N-movement to Agr<sup>0</sup>. Extended projections of the noun are marked '(N)'; extended projections of the adjective are marked '(A)'.



The proposal that AgrP(A) may covary with AgrP(N) in the configuration in (26) presupposes that the agreement relation may obtain over intermediate projections, in this case CaseP(A), DeclP(A), and DP(A). However, if the dependency may obtain over the syntactic positions for case, declension, and definiteness, then there is again no explanation for the failure of interaction between number and gender features and case, definiteness, and declension features. It is never the case that the form of the definite article, or the form of the case marker or the declension marker, varies with the features number or gender discontinuously, as illustrated in (14). This gap in the paradigm of morphological covariation remains mysterious if the syntax fails to partition number and gender from other features in a substantive way. The claim that CaseP(A), DeclP(A), and DP(A) may transmit number and gender features from AgrP(N) to AgrP(A) fails to partition these features syntactically.

An additional problem that (26) poses is that in Arabic the noun and adjective agree not only in the phi features instantiated in Agr, but also in the remaining features case, declension, and definiteness. According to the restrictive assumption that the adjective's position in [spec, AgrP(N)] makes the nodes in the extended adjective local only to the features in AgrP(N), the features in CaseP(N), DeclP(N) and DP(N) cannot covary with the corresponding features in the extended adjective. The features of CaseP(N), DeclP(N) and DP(N) must lower to AgrP(N) in order to be in the hierarchical relation with the extended adjective which mediates agreement, i.e., the spec-head relation.

The canonical solution to problems of this type in recent research in the Government Binding tradition is the extension of the checking theory. A more complete feature checking instantiation of the noun-adjective dependencies under discussion here than that discussed above involves the base generation of all of the noun phrase internal features case, declension, definiteness, number and gender, on  $N^0$  in its base position in NP. Each of these features is checked in its respective position in the syntactic structure for noun phrases via head movement of  $N^0$  to Case<sup>0</sup> via the intermediate projections. The initial step of N-movement places all the features of the noun phrase in AgrP(N), the projection which mediates noun-adjective agreement. The problem of transmission of features of the noun to the respective syntactic

positions of the features of the adjective can also be resolved by head movement of  $A^0$  to  $Case^0$  via the intermediate projections.

The circularity of this approach is hinted at by the fact that the position of the adjective is underspecified. Since all features are local via head movement to all heads within the extended noun phrase, the adjective can adjoin to any projection while remaining equally local to all features. In particular, this approach is circular because the D-structure position of a feature has no bearing, restrictive or otherwise, on the transformation which mediates agreement. Head movement moves all features through the licensing sites for all features, which begs the question of gaps in the distribution of features illustrated in (14) anew.

Further, this approach still fails to resolve the problem of intermediate nodes in agreement relations discussed above. Assuming that all features are generated in  $N^0$ , movement of  $N^0$  to  $Agr^0$  places the features base generated in  $N^0$  syntactically adjacent to  $Agr^0$ . However, movement of  $Agr^0$  to  $D^0$  does not place the features base generated in  $N^0$ , for example the D-feature, syntactically adjacent to  $D^0$ .  $Agr^0$  intervenes. Pursuing an excorporation solution has notably problematic results for the empirical coverage of the Head Movement Constraint (Travis 1984). The disadvantages of abandoning the adjacency restriction on syntactic dependencies are enumerated above. Further, percolation of the features of a head to the head to which it raises is tantamount to abandoning the adjacency restriction, as described in more detail below.

3.1.3.1 *Unity of structure permuting operations.* What has coalesced in the previous section is an argument against feature percolation in general, either in its canonical form or in the form of head movement. Feature percolation fails to partition syntactic structures into local, observed dependencies, and nonlocal, nonobserved hypothetical dependencies. The syntactic expression of a morphological dependency by percolation of features through unaffected nodes obviates a transformational account of any dependency by failing to exclude the repertoire of possible covariation.

Feature percolation creates redundancy in syntactic structures, which is the source of overgeneration. When, for example, the D-feature of a noun phrase percolates from  $N^0$  to  $D^0$  via  $Agr^0$  following

N-movement to  $Agr^0$  and Agr-movement to  $D^0$ , the D-feature is represented in all three nodes. Contrary to the spirit of the Minimalist Program, the multiplicity of representations of features increases the redundancy of the system. This redundancy correlatively increases the system's generative power, far beyond the repertoire of observed dependencies, allowing, in the present case for example, the expression of number and gender features in Agr to covary with the expression of definiteness, contrary to the observed lack of interaction, as described previously.

Not only are features themselves represented redundantly under feature percolation, feature percolation itself is redundant with another structure permuting operation, namely movement. Movement and feature percolation both have the same function. They move an element from one position in a syntactic structure to another position. Further, they do so subject to similar sets of constraints.

In a feature percolation analysis of agreement, features of a noun phrase instantiated in  $N^0$  may percolate to an agreeing head through intervening heads. However, there are locality constraints on feature percolation to which the very existence of overt constituent movement attests. For example, the fact that noun phrases must move to feature checking positions indicates that the features to be checked may not percolate out of the noun phrase. The S-structure position of subjects, for example, is distinct from the D-structure position, which is relatively low, i.e., below manner adverbials, as argued by Koopman & Sportiche (1991). Only a restriction on percolation out of the noun phrase prevents percolation of, e.g., case features of the noun phrase through the inflectional superstructure of the sentence into the S-structure subjective case licensing position, without subject movement, generating, for example, (27). According to the argument developed here against feature percolation, (27a), in which feature percolation has removed a set of features from a noun phrase, is analogous to (27b), in which movement has removed an element from a noun phrase.

- (27) a. \*Tomorrow will carefully John repair the faucet.  
 b. \*Who did Mary believe the rumor that John fired?

Both movement and feature percolation out of prepositional phrases are also impossible in many of the Germanic languages (though the constraint on movement is relaxed in English). Consider Standard German.

- (28) a. Auf welchem Tisch steht die Vase?  
on which table stands the vase  
"Which table is the vase on?"  
b. \*Welchem Tisch steht die Vase auf?  
which table stands the vase on  
c. \*Steht die Vase auf welchem Tisch?  
stands the vase on which table

(28b) shows that a *wh*-phrase may not move out of a prepositional phrase. The entire prepositional phrase must move to the clause-initial licensing position, as in (28a). (28c) shows that movement is obligatory, demonstrating that feature percolation may not carry a *wh*-feature out of a prepositional phrase into the clause initial *wh*-licensing position through intervening syntactic structure.

In general, movement and feature percolation are both structure permuting operations and are restricted by analogous constraints. They are redundant functions with redundant sets of constraints. The redundancy between feature percolation and movement is further highlighted by the absence of the movement operation in theories of grammar which make heavy use of feature percolation. For example, dependencies related by movement in the Government Binding tradition, e.g., the dependency between the thematic position of *wh*-phrases and their clause-initial surface position, are related by feature percolation in the Generalized Phrase Structure Grammar (GPSG) of Gazdar et al. (1985). GPSG makes no use of movement. What the form of frameworks such as GPSG shows is that feature percolation subsumes the movement phenomenology.

Since a grammar with feature percolation does not require movement, a grammar with both feature percolation and movement contains an overlap which again damages the spirit of the Minimalist approach to linguistic science.

Movement is preferable to feature percolation as a structure permuting function for the reasons described above. Feature percolation copies information redundantly throughout syntactic

structures, and in so doing, fails to provide a syntactic partition between observed and nonobserved dependencies. In particular, for the present purposes, it fails to provide a sufficiently minimal syntactic characterization of the dependencies in (14). The following generalization is therefore proposed to obtain in syntactic structures; it prohibits feature percolation.

- (29) Structural Uniqueness Criterion: a feature is represented in the node in which it is base generated and not in any other node.

### 3.2 Agreement as across the board movement

The structures in (18) and (25) are identical except for the difference in the content of the lexical head, which is discussed in section 3.2.1 below. In noun-adjective agreement configurations, the noun phrase and the adjective phrase are not only structurally identical, but they are identical in the values of the features instantiated in each syntactic head, as well.

The transformational tradition provides a mechanism which evaluates syntactic subtrees for identity, namely that which feeds across the board (ATB) extraction. According to Williams (1978), a sentence such as (30a) has the D-structure in (30b).

- (30) a. I wonder which politician John saw and Bill hit.  
b. I wonder [ John saw which politician ] and [ Bill hit which politician ]

*Wh*-extraction applies to *which politician* in both conjuncts. The two instances of *which politician* are unified at S-structure in a single instance in the *wh*-landing site. The primary condition on ATB is that the two extracted elements are identical. The operation of ATB therefore presupposes the operation of a grammatical mechanism that evaluates subtrees for identity. The subsequent operation of ATB unifies the identical elements not only morphologically, but also semantically. (30a), namely, is not synonymous with (31).

- (31) I wonder which politician John saw and which politician Bill hit.

Whereas (31) asks for the identity of two politicians, one of whom John saw and the other of whom Bill hit, (30a) asks for the identity of

only one politician, of whom it is both the case that John saw him/her and Bill hit him/her.

Though the form of ATB and semantic unification is controversial, the present study assumes that any formalism that relates *which politician* in (30a) to the theta grids of both predicates *see* and *hit* without imposing a multiplicity of denotations on *which politician* contains both (i) a mechanism that evaluates syntactic structures for identity, and (ii) a mechanism that unifies the structures syntactically and (perhaps as an entailment) semantically. Little more than these two mechanisms, which are required by (30a) and its interpretation *ipso facto*, are necessary to characterize agreement phenomena under the line of reasoning pursued here that features are instantiated structurally. Note that while ATB out of coordinate structures obeys the Coordinate Structure Constraint (CSC), a presupposition of the program introduced here, which is the extension of the ATB mechanism to coindexation broadly, including binding phenomena, is that ATB operates outside of coordinate structures independently of the CSC.

ATB operates only on identical elements. A noun phrase and an adjective phrase are identical when they contain the same set of features, and all features are structurally related in the identical syntactic hierarchy. However, noun phrases and adjective phrases differ in lexical content in principle. Noun phrases are headed by a noun, and adjective phrases by an adjective. This discrepancy is addressed below, followed by a formalization of the ATB approach to agreement.

### 3.2.1 Unification of lexical content

In the generative linguistic tradition, dependencies such as agreement are characterized as reflexes of structural relations. In the Minimalist Program, in particular, agreement is treated as a reflex of the spec-head configuration. A head agrees with the element in its specifier position, as illustrated in (32a), in which the indices indicate agreement. Certain semantic relations also obtain in the spec-head relation, for example external theta role assignment, illustrated in (32b), in which the indices indicate the theta relation. According to Kayne (class lectures 1996), all theta relations obtain in the spec-head configuration.

- (32) a. [ XP<sub>i</sub> [ Agr<sup>0</sup><sub>i</sub> ] ]  
 b. [ XP<sub>i</sub> [ V<sup>0</sup><sub>i</sub> ] ]

As discussed at length in section 3.1, (32a) does not suffice as a description of the agreement relation. Transmission of features from a lexical projection inside XP to agreeing elements outside AgrP via feature percolation obviates the configurational requirement. Crucially, the same criticism can be brought to bear on (32b). A lexical projection inside XP is separated from the verb to which it is theta related by at least XP. A locality requirement over the theta relation is postulated by Sportiche (1996) in connection with an analysis of phrase structure, motivated by reconstruction effects, in which determiners and nouns are separated at D-structure, the bare NP being generated local to the verb, as in (33). Movement relates the determiner and noun prior to S-structure.

- (33) [ . . . D<sup>0</sup> . . . [ NP<sub>i</sub> [ V<sup>0</sup><sub>i</sub> ] ] ]

A locality requirement over theta relations complicates the noun-adjective relation discussed here. Both nouns and adjectives are deeply embedded in inflectional structure at S-structure. No analysis of the type illustrated in (33) relates a noun and adjective syntactically local at D-structure to embedded positions in distinct subtrees at S-structure, on account of the requirement that antecedents c-command their traces. Again, a feature percolation approach to derived locality is militated against by all the considerations discussed in section 3.1.

The problem of the noun-adjective theta relation is therefore similar to the problem of the agreement relation between feature projections in the subtrees dominating the noun and adjective. The noun and the adjective are too deeply embedded in distinct structures to fulfill the Locality Criterion. This similarity suggests the extension of the ATB analysis of agreement to the semantic relation between agreeing nouns and adjectives.

Because such a solution requires an augmentation of the ATB mechanism, two additional reasons to pursue this approach are pointed out here. First, because traditionally both agreement and theta assignment are mediated by the same syntactic configuration, i.e., the spec-head relation, an approach other than ATB to theta assignment

would create a disparity in the present analysis between the syntactic mechanism underlying agreement and that underlying theta assignment. Such a disparity would represent a redundancy in the present system in light of the unity of these relations in, e.g., the Minimalist Program.

Second, agreement is a reflex of the semantic relation between the noun and the adjective. Adjectives do not agree with nouns they do not modify. Because agreement is a reflex of modification, a correct grammatical description of the agreement dependency is one in which the agreement dependency is subsumed by the operation that entails the semantic dependency. In the present proposal, both the lexical content and the feature content of noun phrases and adjective phrases are instantiated structurally. The complete structural instantiation of covarying elements makes a formulation of agreement possible that relates it to the structure of the modification relation. The mechanism that mediates the theta relation between NP and AP also mediates the agreement relation between each feature within the extended NP and the corresponding feature within the extended AP. The mechanism that mediates agreement in the framework being developed here is unification under ATB. The natural analysis of the entailment between adjective-noun modification and agreement is the extension of unification under ATB to the adjective-noun modification relation. In fact, as pointed out above, this dependency between semantic modification and agreement already obtains in the present analysis. Unification of a noun phrase and an adjective phrase each with root node CaseP, resulting in agreement via unification for case and all features dominated by CaseP, also results in unification of NP and AP *de facto*. The unresolved aspect of this conclusion is the issue of what it means for NP and AP to be unified.

On the basis of the preceding remarks, the proposal forwarded here is that unification of NP and AP means that the noun is interpreted as an argument of the adjective. The interaction of ATB, unification, agreement, and predication is made explicit below.

- (34) ATB Agreement Hypothesis: when two syntactic structures are subject to ATB, then, where F is a feature, N is a noun, and PRED is an adjective:
- (i) if F1 and F2 are corresponding nodes, then F1=F2
  - (ii) if N and PRED are corresponding nodes, then PRED(N).

### 3.2.2 Unification entails movement

As described previously, the ATB mechanism is composed minimally of a mechanism that evaluates syntactic structures for identity and a mechanism that unifies the structures syntactically and semantically. These mechanisms do not necessarily entail syntactic movement. However, asymmetries in the distribution of agreeing elements mirror constraints on movement.

- (35) a. John<sub>i</sub> said that he<sub>j</sub> left.  
 b. \*He<sub>j</sub> said that John<sub>i</sub> left.  
 c. \*John, Mary said (that) left.

Morphological agreement between *John* and *he* in (35a) is characterized in the present approach as ATB over *John* and *he*, resulting in syntactic and semantic unification of the two elements, hence agreement and hence the interpretation that John and he are the same person. As the contrast between (35a and b) shows, the order in which the two elements appear is relevant to the possibility of agreement and identity (i.e., coindexation). A constraint on movement to the effect that DP movement is clause bound (as in (35c), regardless of the appearance of the complementizer), whereas movement of pronominals is unbounded (at LF), generates the distinction in (35a and b), and reflects the generalization that pronominal binding is less sensitive to subjacency than DP movement. This relativization of constraints on movement to the categorial type of the target has a precedent in the Relativized Minimality framework (Rizzi 1990), in which locality for binding is relativized to a taxonomy of binding relations based on quantification properties qua licensing requirements of the bindee. While a great deal more needs to be said about paradigms such as (35), the suggestion made here is that (35) indicates that Principle C falls under independently observed constraints on movement of DPs, allowing the configuration in (36) only in case John is not related to a trace over a CP, i.e., only if John is related to the trace to which it is closest in its derived position.

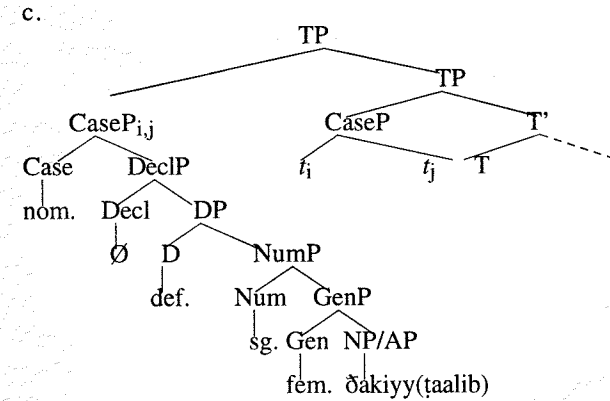
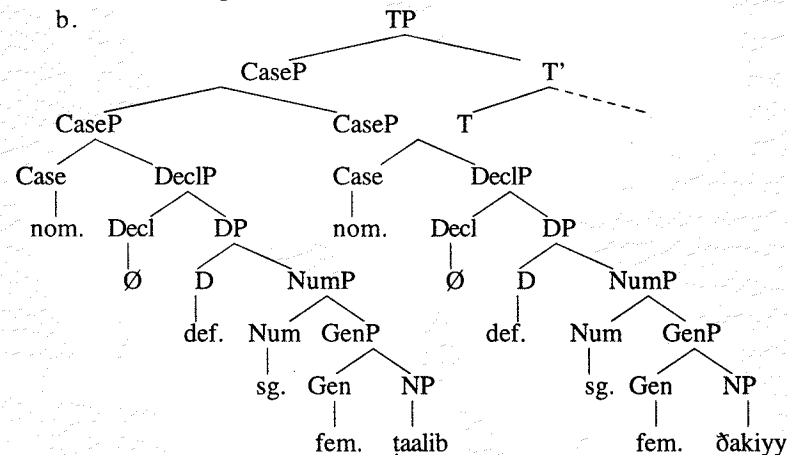
- (36) a. [[John<sub>i</sub>=he<sub>j</sub>] [ t<sub>i</sub> said [ that t<sub>j</sub> left ] ] ]  
 b. \*[[John<sub>i</sub>=he<sub>j</sub>] [ t<sub>j</sub> said [ that t<sub>i</sub> left ] ] ]

(36a) is a schematic LF representation of (35a). This formulation of the facts in (35) indicates that ATB as described in (34) entails movement. Agreeing elements undergo across the board movement in logical form, resulting in their syntactic and semantic unification in the landing site.

3.2.3 ATB agreement in Arabic

The movement analysis of the Across the Board Agreement Hypothesis for the Arabic noun-adjective agreement paradigm is illustrated below. The diagrams in this section and section 3.2.4 presuppose a simple phrase structure for Arabic for the purposes of illustration. However, the analysis is not dependent on this particular phrase structure. The ATB Agreement Hypothesis is compatible with any phrase structure in which formal constraints on movement can be formulated to restrict the operation of ATB, as exemplified in section 3.2.4. The application of ATB movement to the structure in (37b) results in the structure in (37c). Subjects appear in [spec,TP]; the value of CaseP is selected by tense. ATB adjoins the conjoined CasePs to TP.

- (37) a. al-*ṭaalib*-a-t-u                      al-*ḍakiyy*-a-t-u  
 def-student-sg-fem-nom              def-intelligent-sg-fem-nom  
 "the intelligent student"



Both CasePs are extracted from their base positions and are unified in a landing site c-commanding both traces. Unification of NP and AP results in the predicational structure *ḍakiy(ṭaalib)*, in which *ṭaalib* is interpreted as an argument of *ḍakiy*.

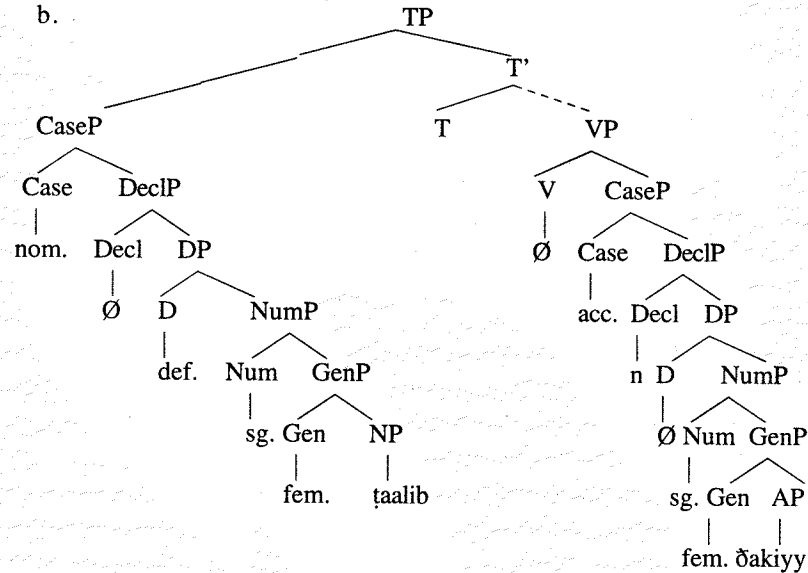
When an adjective forms the predicate of its clause, as in (38), agreement between the adjective and subject is reduced in comparison with noun phrase internal agreement. Predicate adjectives agree with subject nouns in number and gender, but not in case, declension, or definiteness. In (38), the subject bears nominative case, while the verb *kaana* ("was") assigns accusative case to the adjective. As the alternation (38a-b) shows, the adjective can vary in declension and definiteness independently of the subject.

- (38) a. *kaanat* al-*ṭaalib*-a-t-u                      *ḍakiyy*-a-t-a-n  
 was def-student-sg-fem-nom intelligent-sg-fem-acc-decl  
 "The student was intelligent."  
 b. *kaanat* al-*ṭaalib*-a-t-u                      al-*ḍakiyy*-a-t-a  
 was def-student-sg-fem-nom def-intelligent-sg-fem-acc  
 "The student was the intelligent one."

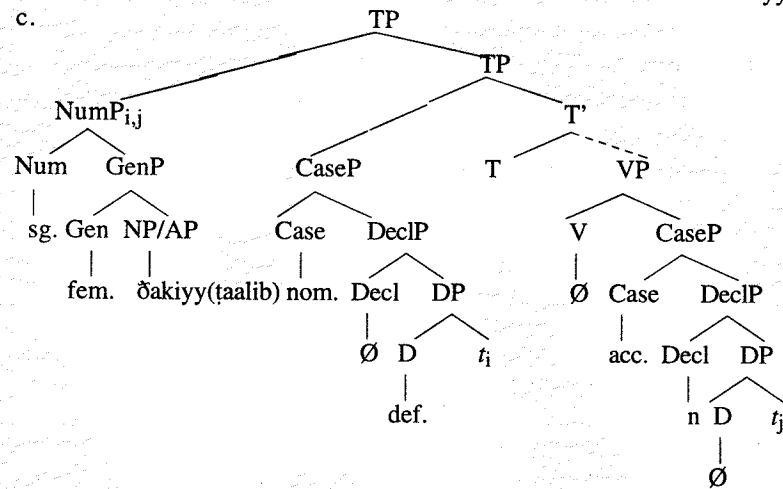
In the present proposal, the stem and the features number and gender constitute a syntactic subtree which excludes the features case, definiteness, and declension. Across the board movement on the subtrees with root node NumP housing the noun and adjective respectively yields the pattern in (38), illustrated in (39). VP in (39) is a nonovert accusative assigning operator bound by the main verb. The main verb is above the subject (see section 3.2.4).

- (39) a. kaanat al-taalib-a-t-u                      ḍakiyy-a-t-a-n  
 was def-student-sg-fem-nom intelligent-sg-fem-acc-decl  
 "The student was intelligent."

b.



c.



In (39c), the two subtrees with root node NumP, containing the subtrees GenP and NP and AP respectively, are unified in a single landing site  $c$ -commanding both traces. Unification results in the

equation of the nominal and adjectival features number and gender and the predication of the noun on the adjective, as formalized in (34).

### 3.2.4 Context for ATB

The phrase structure in (39) makes a formalization possible of the constraint on agreement to the effect that a subject and an adjective which form a sentence predicate do not agree in case, declension, or definiteness (other than coincidentally). Namely, VP is a barrier for DP and nodes higher than DP (DeclP and CaseP). NumP may move over VP but no constituent higher than NumP may move over VP. Another case of syntactic bounding on agreement is subject-verb agreement in Arabic. Verbs agree with preverbal subjects in number and gender. Verbs agree with immediately postverbal subjects in gender only. Postverbal subjects that are separated from the verb by intervening material may trigger gender agreement or may optionally fail to trigger agreement on the verb altogether.

- (40) a. al-taalib-aa-t-u                      xaṭab-na                      fii al-ṭiḏtimaaf-i  
 def-student-pl-fem-nom spoke-pl/fem in def-meeting/sg/masc-gen  
 "The students spoke at the meeting."  
 b. xaṭab-at                      al-taalib-aa-t-u                      fii al-ṭiḏtimaaf-i  
 spoke-sg/fem def-student-pl-fem-nom in def-meeting/sg/masc-gen  
 "The students spoke at the meeting."  
 c. xaṭab-a                      fii al-ṭiḏtimaaf-i                      al-taalib-aa-t-u  
 spoke-sg/masc in def-meeting/sg/masc-gen def-student-pl-fem-nom  
 "The students spoke at the meeting."

While person is expressed prefixally in the imperfect tense, the features number and gender appear suffixally, to the direct right of the verb stem, in all tenses.<sup>1</sup> This parallel to the surface ordering of noun stems and related phi feature morphology points in the direction

<sup>1</sup>Except plural in the first person imperfective, which is expressed prefixally. However, the claim that number and gender appear suffixally is crucial only for the third person, namely the form which agrees with full DPs, since I am claiming that structural isomorphy between subject and verb underlies agreement, and the suffixal aspect of number and gender in DP has already been established. The ordering of features within the first person pronouns—the elements with which first person verbs agree—has not been established, and possibly cannot be established, except to say that the hypothesis that isomorphy underlies agreement indicates that number is prefixal in the first person pronouns, since it is prefixal in the first person verbs. But complete suppletion hides any ordering.

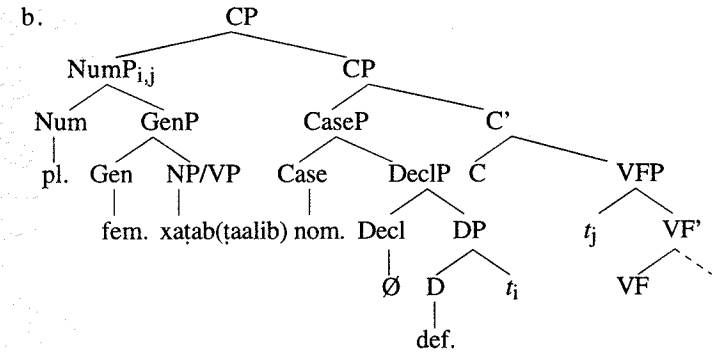
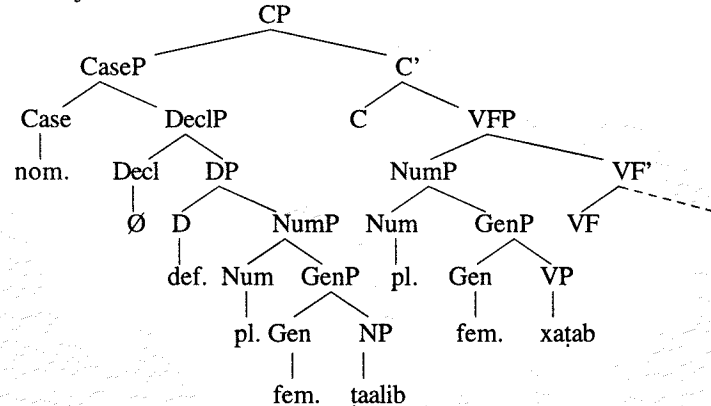


of a derivational parallelism between noun phrases and verb phrases along the lines of (19). In fact, in light of the fact that the Across the Board Agreement Hypothesis requires agreeing elements to be structurally isomorphic, the only verb phrase structure compatible with the line of reasoning pursued here is minimally that in (41). (41a) is the D-structure from which (41b) is derived by VP movement (cf. (19)).

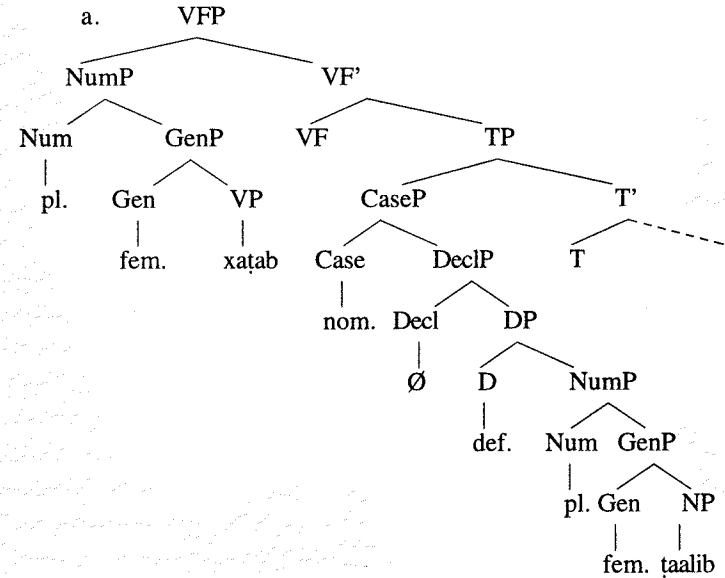
- (41) a. [ NumP [ GenP [ VP ]]]
- b. [ [ VP ]<sub>i</sub> [ NumP [ GenP [ t<sub>i</sub> ]]]]

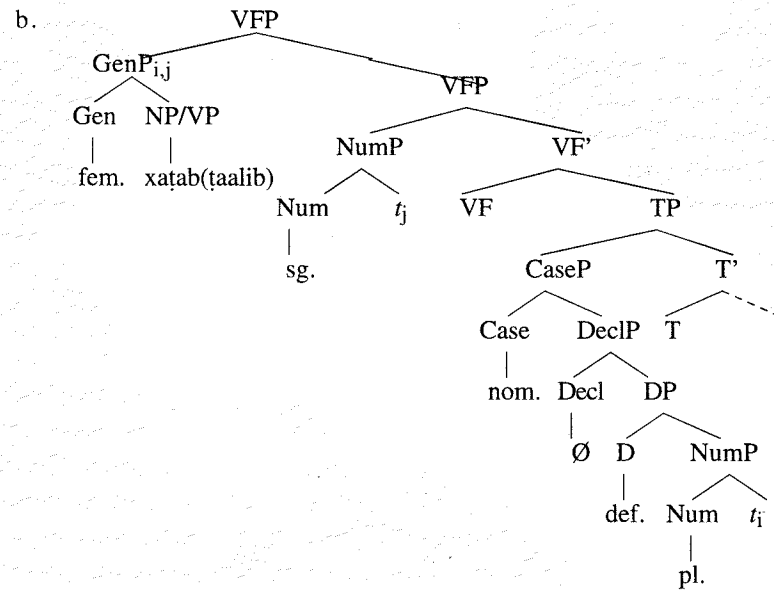
On the basis of (41), in the terms of the hypothesis presented here, (40a) represents an instance of ATB movement of subtree with root node NumP from the subject noun phrase and the verb phrase, diagrammed in (42). (40b) is an instance of ATB movement of the subtree with root node GenP from the subject noun phrase and the verb phrase, diagrammed in (43). (40c) is an instance of ATB movement of NP and VP from the subject noun phrase and the verb phrase respectively, illustrated in (44). I assume the preverbal position of the subject is [spec,CP]. The postverbal position of the subject is the case assigning position [spec,TP]. Verbs, which have now been analysed as full phrases rather than heads, occupy a specifier position between CP and TP, which I term the ‘verb field,’ a term borrowed from Germanic syntax, which is marked VFP (‘verb field phrase’) in the diagrams below.

(42) Preverbal subject: ATB over NumP

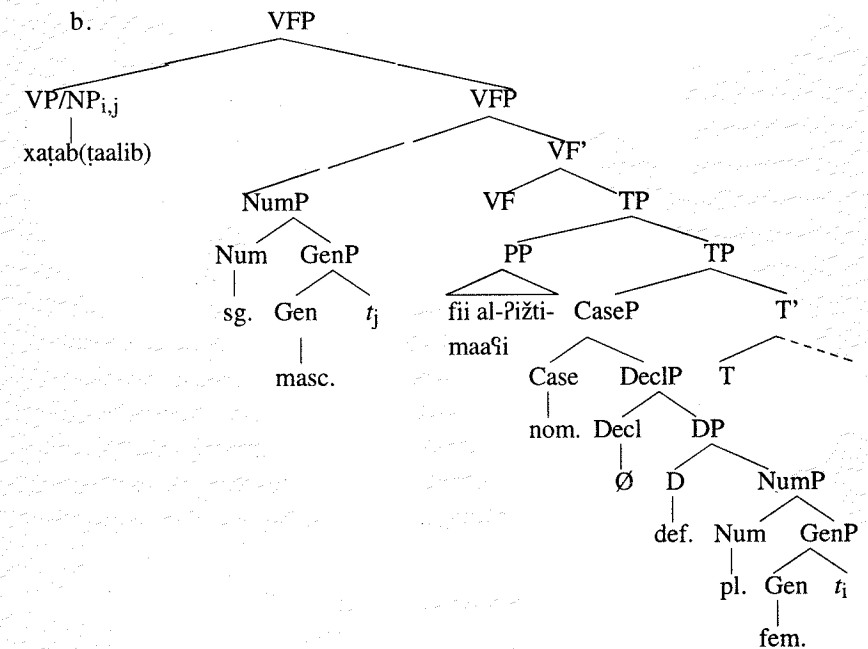
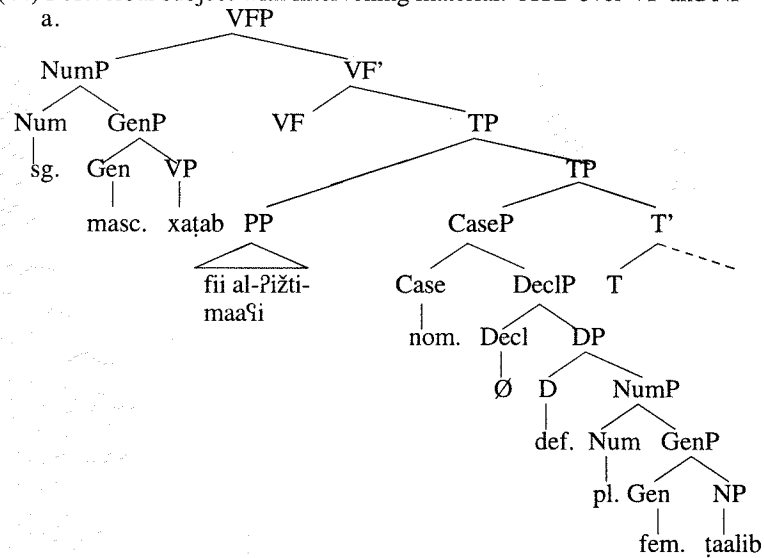


(43) Immediately postverbal subject: ATB over GenP





(44) Postverbal subject with intervening material: ATB over VP and NP



Again, a structural bound generates the distinction in completeness of verbal agreement between pre- and postverbal subjects. Namely, TP is a barrier for NumP and nodes higher than NumP.<sup>2</sup> GenP and NP may cross a node labeled TP, but NumP may not. ATB movement of a preverbal subject NumP and the verb NumP to a unified position adjoined to tense (42) carries neither NumP over Tense. ATB movement of a postverbal subject NumP and the verb NumP to a unified position adjoined to VFP would carry the subject NumP over TP. Hence, in this configuration, only GenP (including NP) moves. A complex TP formed by adjunction of adverbial material is a barrier for even GenP and nodes higher than GenP in dialects, particularly earlier Arabic, where agreement fails altogether with postverbal subjects not adjacent to the verb. I assume the optionality of agreement in modern Arabic is a carryover from earlier Arabic. Because complex TP is a barrier for GenP, ATB moves only NP and

<sup>2</sup>The fact that NumP of an accusative adjective which forms the predicate of a sentence agrees with a pre-auxiliary subject over TP points toward an 'escape hatch' for accusatives. As ever, constraints on extraction of accusatives are relaxed with respect to nominatives.

VP in (44), lest ATB of GenP move GenP of the subject over a complex TP.<sup>3</sup>

In this manner, structural barriers determine the extent of agreement among syntactic elements. It is crucial, however, that predicates and their arguments always undergo ATB when they are semantically related to each other, since ATB is the mechanism that derives the predication relation. If NP and VP failed to undergo ATB to derive the NP's 'argument of' relation to VP in any of the examples above, then no such interpretation would be available. This is the fundamental motivation for ATB in the contexts discussed here. ATB applies to derive the semantic relation between a noun and its predicate. More or less, agreement may obtain depending on the amount of inflectional structure that is 'pied-piped' along with the noun and predicate. In general, as much structure is pied-piped as barriers between agreeing elements allow, hence the paradigms in (38) and (40).

#### 4. Conclusion

This paper describes an analysis of agreement phenomena in the context of a purely structural analysis of feature morphology and strict adherence to the locality constraint on morphosyntactic covariation. While more needs to be said concerning constraints on movement operations that feed unification under ATB, the fact that ATB is an independent extant component of the theory of grammar in the transformational tradition makes the proposal forwarded here genuinely reductionist. The additional mechanism developed here, that ATB also mediates theta assignment, is a direct consequence of the line of reasoning that motivates the ATB analysis of agreement.

The Locality Criterion in its strictest form characterizes the widespread failure of covariation between nonlocal features. The analysis presented here develops an extension of locality in which an individual head in an inflectional structure is local to a parallel head in an isomorphic structure when both structures undergo ATB.

<sup>3</sup>As for constructions of the form *auxiliary-subject-main verb*. . . , in which the auxiliary displays reduced agreement with the subject, and the main verb displays full agreement, although an analysis could be formulated in terms of barriers to movement, such an analysis is more complex than a biclausal analysis in which the main verb agrees with a nonovert subject to its right.

Nonparallel structure is not affected, preserving the Locality Criterion in its strictest form. Structural parallelism between nouns, verbs, and adjectives is independently evident, as discussed in sections 3.1.3 and 3.2.4. The present analysis demonstrates that by virtue of ATB and the structural isomorphy requirement for agreeing elements, both independently substantiated properties of Arabic, the Locality Criterion need not be weakened in order to also subsume agreement between individual heads across potentially large intervening structures. Hence, agreement phenomena of several types are shown to be compatible with the Locality Criterion, the condition which motivates the transformational approach to grammatical dependencies in general, and the weakening of which, in the form of feature percolation or postsyntactic structure permuting operations, is contrary to the spirit of the generative enterprise.

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