

Alternate Agreement in Arabic

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Introduction

Arabic has rich agreement morphology which allows it to show agreement relations between various elements in the sentence. There are five morphosyntactic features involved in agreement in Arabic: number (singular, dual and plural), gender (feminine and masculine), person (1st, 2nd, and 3rd), case (nominative, accusative and genitive) and definiteness (definite and indefinite). The strongest agreement relation is that between a noun and adjective where four of the five agreement features are involved: number, gender, case and definiteness. Examples (1) through (5) show different type of agreement relationships.

- (1) هذا الرجل (noun – demonstrative pronoun: number, gender)
haḍā ar-raġulu¹
this.sg.masc the-man.sg.masc
'this man'
- (2) رأيت الرجلين الكريمين (noun – adjective: number, gender, case, definiteness)
ra'aitu ar-raġulaini al-karīmaini
I-saw the-man.dual.acc.def the-generous.dual.masc.acc.def
'I saw the two generous men.'
- (3) الطالبتان اللتان نجحتنا (noun – relative pronoun: number, gender, case)
aṭ-ṭālibatāni allatāni naġaḥatā
the-student.dual.fem.nom who.dual.fem.nom succeed.past.dual.fem.3
'The two students who succeeded'
- (4) الطالبات ذاكرن دروسهن (noun – pronoun: person, number, gender)
aṭ-ṭālibātu dākarna durūsa-hunna
the-student.pl.fem.3.nom study.past.pl.fem.3 lessons-their.pl.fem.3
'The students studied their lessons.'
- (5) الرجل كريم (subject – predicate: number, gender)
ar-raġulu karīmun
the-man.sg.masc generous.sg.masc
'The man is generous.'

Regarding verb–subject agreement, when subjects are in the pre-verbal position, verbs have full (rich) agreement as they are required to agree with their subjects in number, gender and person, as shown in the example in (6).

- (6) البنات ذهبن إلى الحديقة
al-banātu dāhabna 'ilā al-ḥadiqati
the-girl.pl.fem.3 go.past.pl.fem.3 to the-garden
'The girls went to the garden.'

¹ We follow the DIN 31635 standard for the transliteration of the Arabic alphabet.

Contrastively if subjects are in the post-verbal position, verbs show partial (weak or poor) agreement, as verbs agree with their subjects in gender and person only, as shown in the example in (7). Verbs take the default singular form whether subjects are singular, dual or plural.

- (7) ذهبت البنات إلى الحديقة
 dahabat al-banātu 'ilā al-ḥadīqati
 go.past.sg.fem.3 the-girl.pl.fem.3 to the-garden
 'The girls went to the garden.'

The feature of humanness plays an important rule in agreement in Arabic. With non-human plural nouns, verbs are invariably in the singular and feminine, as shown in (8).

- (8) القطط تشرب اللبن
 al-qīṭaṭu tašrabu al-labana
 the-cat.pl.fem.nom.3 drink.sg.fem.3 the-milk
 'The cats drink milk.'

Sometimes in subject–predicate constructions the morphosyntactic agreement is replaced by a semantic agreement. In the example in (9) the subject is plural and the predicate is singular, but they are semantically compatible.

- (9) هؤلاء هم السبب في هزيمتنا
 hā'ulā' i humu as-sababu fī hazīmati-nā
 These they the-reason in defeat-our
 'These people are the reason behind our defeat.'

Regarding the definition of agreement, Ryding (2005) states that agreement or concord is the feature compatibility between words in a phrase or clause. Agreement is formally defined by Corbett (2001) as “systematic covariance between a semantic or formal property of one element and a formal property of another.” Corbett (2001) used the terms “controller” to refer to the element which determines the agreement, “target” to refer to the element whose form is determined by agreement, and “domain” to refer to the syntactic environment in which agreement occurs.

Corbett (2001) maintained that the relationship in agreement is asymmetrical in general because the target cannot match all the features of the controller. Androutsopoulou (2001) provided a formal definition of the principle of asymmetric agreement as:

In an agreement relation between two elements α and β , where α is the head and β is the specifier, the set of agreeing features of β must be a subset of the set of agreeing features of α .

Alternate Agreement in Arabic Clauses

Platzack (2003) classified languages into “uniform agreement” languages and “alternate agreement” languages. He stated that Standard Arabic is a language with alternate agreement, where the verb shows full agreement in person, gender and

number when the subject is in front of it, but partial agreement (only person and gender) when the subject follows the verb.

Corbett (2001) pointed out that a common approach to dealing with agreement is unification, in which agreement is considered as a process of cumulating partial information from both the controller and the target. He gave the French example in (10).

- (10) Je suis content /contente
 I be.1.sg pleased.sg.masc/ pleased.sg.fem
 ‘I am pleased’ (man/woman taking)

According to Corbett we have two feature structures: one for the personal pronoun and the verb (11.a) and the second for the predicative adjective (11.b).

- (11.a) $\left[\begin{array}{l} \text{number: sg} \\ \text{person: 1} \end{array} \right]$

- (11.b) $\left[\begin{array}{l} \text{number: sg} \\ \text{gender: fem} \end{array} \right]$

Corbett (2001) considered that these feature structures are compatible and hence can be unified, giving the structure in (12):

- (12) $\left[\begin{array}{l} \text{number: sg} \\ \text{person: 1} \\ \text{gender: fem} \end{array} \right]$

However, we believe that unification will not be very efficient in accounting for agreement in Arabic. In the Arabic example in (13) the verb is singular and the subject is plural and the unification will fail in this case.

- (13) ذهب الأولاد إلى المدرسة
 dahaba al-'awlādu 'ilā al-madrasati
 go.past.sg.masc.3 the-boy.pl.masc.3 to the-school.
 ‘The boys went to school.’

A possible workaround might be to make the singular feature of the verb as a default non-obligatory feature.

$$\begin{array}{l} \text{ذهب } V \quad \{(\uparrow \text{NUM}) (\uparrow \text{NUM}) \sim = \text{sg} \\ \quad \quad \quad | (\uparrow \text{NUM}) = \text{sg} \} \end{array}$$

This solution will effectively work for (13), yet this will make the feature lose its constraining power, and there will be no way to account for the ungrammaticality of the sentence in (14), where the verb must agree in number with the plural pre-verbal subject. In this example the incompatibility between the subject and the verb will go

undetected. This shows that in Arabic agreement cannot be specified satisfactorily through unification.

- (14) * الأولاد ذهب إلى المدرسة
 * al-'awlādu dahaba 'ilā al-madrasati
 the-boy.pl.masc.3 go.past.sg.masc.3 to the-school.
 'The boys went to school.'

Arabic verb–subject agreement has a complex system of variability which cannot be modeled in terms of unification or constraints. Arabic is a language with alternate agreement. In VSO word order the verb agrees with the subject in gender and person, and is invariably in the singular, whether the subject is singular, dual or plural. In SVO word order the verb must agree with the subject NP in gender, number and person.

Within the LFG-XLE framework, Hoyt (2004) described a grammar for modelling the morphosyntax of verbal agreement in Modern Standard Arabic. Hoyt (2004) showed that the variability of subject–verb agreement in Arabic poses a problem for a unification-based approach. Therefore he proposed the projection of a semantic layer represented as s-structure which interacts with the f-structure to control the agreement features.

Here we propose that an additional layer is not necessary to represent the agreement features in Arabic and that they can be handled within the two basic representations: c-structures and f-structures. Agreement in Arabic is determined by word order and this is why we adopt a constructional approach to agreement. We think that agreement must be specified by the phrase structure rules. Initially, the agreement features of the verbs can be temporarily stored in an independent structure. Later the relationship between the subject and the verb is resolved through functional equations on the phrase structure according to the position of the subject to the verb, i.e. whether it precedes or follows the subject.

To show how this solution is implemented, let's first look at the two examples in (15) and (16) where the verb is singular in one instance and plural in the other.

- (15) لعب الأولاد
 la'iba al-'awlādu
 play.past.sg.masc the-boy.pl.masc.3
 'The boys played.'

- (16) الأولاد لعبوا
 al-'awlādu la'ibū
 the-boy.pl.masc play.past.pl.masc.3
 'The boys played.'

To start with, we make the lexical entry of the verb لعب la'iba 'play' not say anything about the subject, but rather store the agreement features in a temporary f-structure AGR. Within AGR, the verb specifies the values for number, gender and person.

لعب V (↑ PRED)='العِب'
 (↑ AGR NUM)=sg
 (↑ AGR GEND)=masc
 (↑ AGR PERS)=3

لعبوا V (↑ PRED)='العِب'
 (↑ AGR NUM)=pl
 (↑ AGR GEND)=masc
 (↑ AGR PERS)=3

Then, functional equations are inserted in the phrase structure rules to select which features are relevant in agreement according to the position of the subject in relation to the verb.

SV → NP V
 (↑ SUBJ)=↓ ↑=↓
 (↑ AGR GEND)=(↑ SUBJ GEND)
 (↑ AGR NUM)=(↑ SUBJ NUM)
 (↑ AGR PERS)=(↑ SUBJ PERS)

VS → V NP
 ↑=↓ (↑ SUBJ)=↓
 (↑ AGR NUM)=sg
 (↑ AGR GEND)=(↑ SUBJ GEND)
 (↑ AGR PERS)=(↑ SUBJ PERS)

According to the equations above, when the verb follows the subject it agrees with it in number, gender and person, while it agrees in gender and person only when it precedes it. This shows how agreement is resolved by storing the agreement features in a temporary reservoir and using phrase structure rules annotated with functional equations to distribute the agreement features. Figure 1 and Figure 2 show the c-structure and f-structure representations for the sentences in (15) and (16) above.

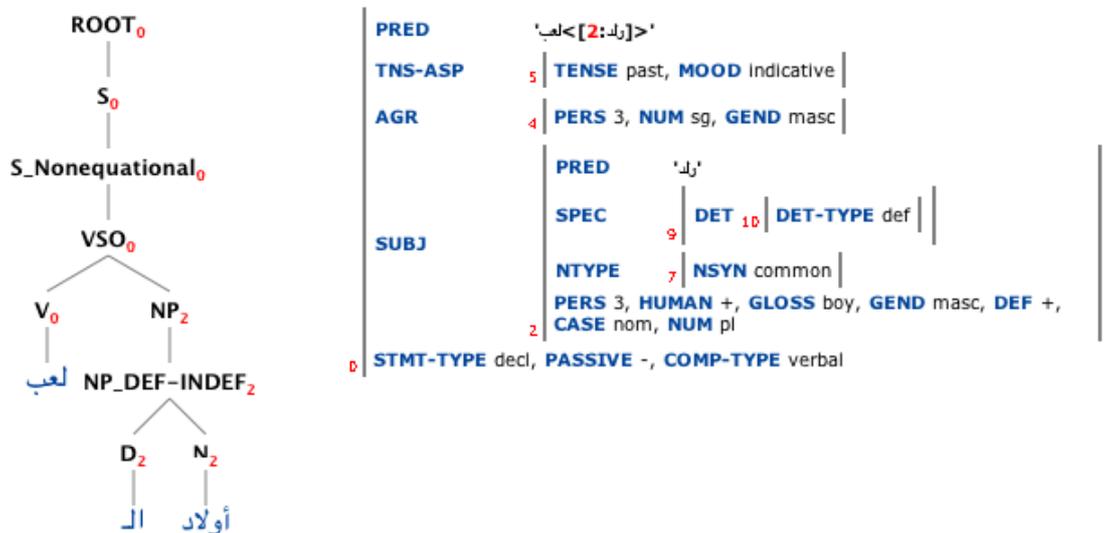


Figure 1. C-structure and f-structure of a VS sentence

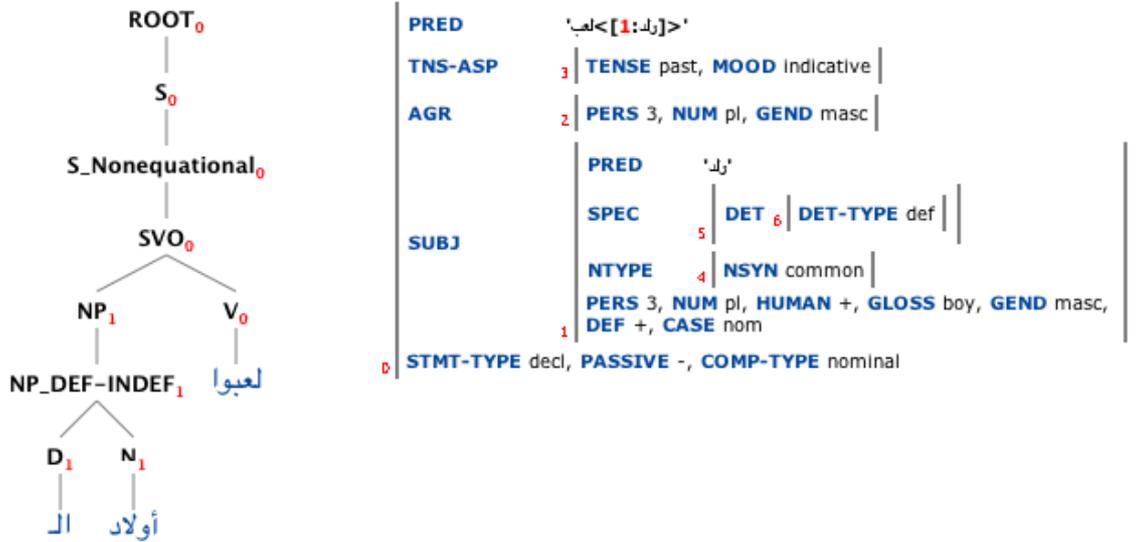


Figure 2. C-structure and f-structure of an SV sentence

Alternate Agreement in Coordination

There are two types of coordination: constituent and non-constituent coordination (Kaplan and Maxwell, 1995). In constituent coordination two phrases of the same category are coordinated, e.g. *John and Mary went to London*. In non-constituent coordination the coordinated elements are fragments of phrases, e.g. *John went to London and Mary to Paris*. Only constituent coordination is covered in our grammar until now.

In the LFG framework coordinated constituents are treated as sets. The phrase structure notation for creating a set function for the coordinated constituents is presented by Kaplan and Maxwell (1995) as in (17) which means that the two NPs in right hand side are members of the set NP in the left hand side.

$$(17) \quad S \rightarrow \begin{matrix} S & & \text{CONJ} & & S \\ \uparrow \in \downarrow & & & & \uparrow \in \downarrow \end{matrix}$$

For the coordinated sentences in (18), Figure 3 shows how the two sentences are represented as a set containing the f-structures that correspond to sentences.

- (18) ذهب الولد ونامت البنت
 dahaba al-waladu wa-nāmati al-bintu
 went the-boy and-slept the-girl
 'The boy went and the girl slept.'

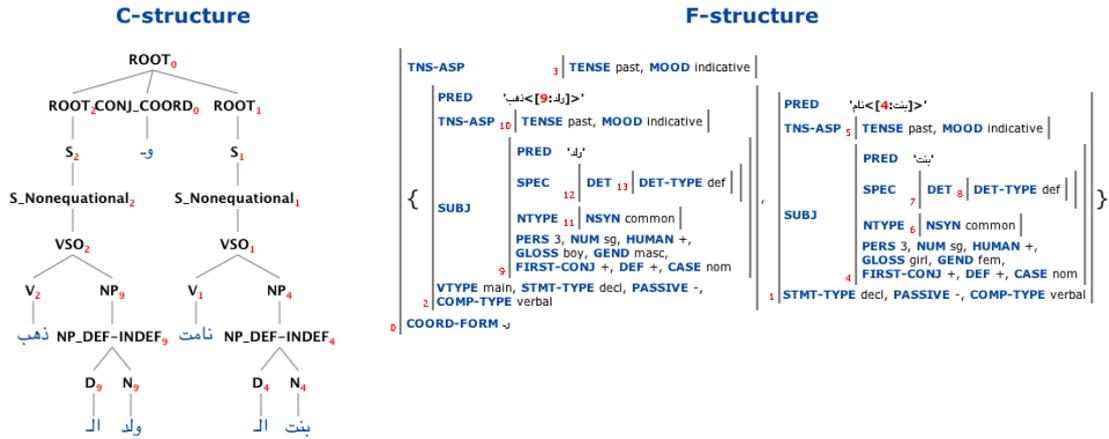


Figure 3. Constituent coordination represented as a set

Some features however are distributive and other features are not. In the Arabic noun phrases, the features of number, gender, person, and humanness are non-distributive and are controlled through special conditions.

In Arabic, if the subject is a coordinate NP occurs in the post-verbal position, the verb exhibits what is termed by many researchers, e.g. Sadler (2003) and Hoyt (2004), as “first conjunct agreement”, i.e. the verb agrees only with the first conjunct of a coordinate subject. Alternatively if the subject occurs in the pre-verbal position, verbs exhibit agreement with the whole set, after the features of the coordinate NP are resolved according to specific conditions.

The first conjunct agreement is handled in our grammar through the phrase structure rules, as shown in (19). The NP in the subject position which occurs in the post-verbal position is given a check feature of FIRST-CONJ which takes the value of ‘+’. In SVO word order this check feature is not used.

$$(19) \quad S \rightarrow V \quad NP$$

$$\quad \quad \quad \uparrow=\downarrow \quad (\uparrow \text{SUBJ})=\downarrow$$

$$\quad \quad \quad \quad \quad \quad (\downarrow \text{FIRST-CONJ})=+$$

$$(20) \quad S \rightarrow NP \quad V$$

$$\quad \quad \quad (\uparrow \text{SUBJ})=\downarrow \quad \quad \quad \uparrow=\downarrow$$

Then the NP coordination template checks for the feature “FIRST-CONJ”. If it is found the whole conjunction is given the same features for number, gender and person as the first conjunct. The example in (21) and the corresponding representation in Figure 4 show how first conjunct agreement is treated in our grammar.

- (21) ذهبت البنت والولد
dahabat al-bintu wa-al-waladu
went.fem.sg the-girl and-the-boy
‘The girl and the boy went.’

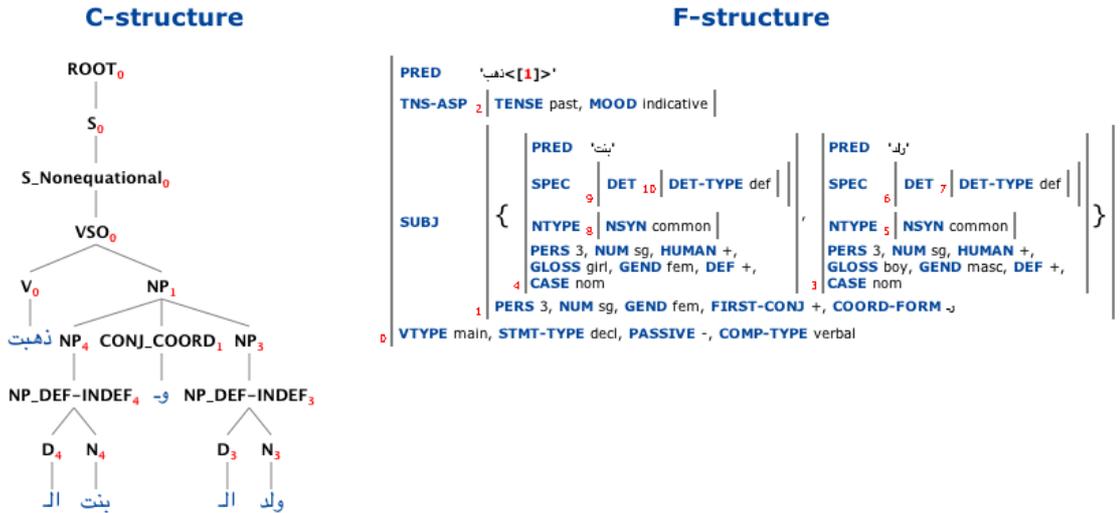


Figure 4. First conjunct agreement

If the agreement does not follow the first conjunct agreement condition, the resolution of the features in conjoined subjects follows these rules:

- Gender: The gender of the whole NP is masculine unless all conjuncts are feminine nouns,
- Person: The resolution of the person feature follows this priority order. The person of the whole conjunction is 1st if any NP is in the 1st person. The person of the whole conjunction is 2nd if any NP is in the 2nd person. Otherwise the person is 3rd.
- Number: the number of the whole NP will be plural unless there are only two conjuncts and both are singular, in which case the whole NP is dual.

The example in (٢٢) and the corresponding representation in Figure 5 show how the agreement features are resolved.

(٢٢) البنت والولد ذهبا
 al-bintu wa-al-waladu ḍahabā
 the-girl and-the-boy went.dual.masc
 'The girl and the boy went.'

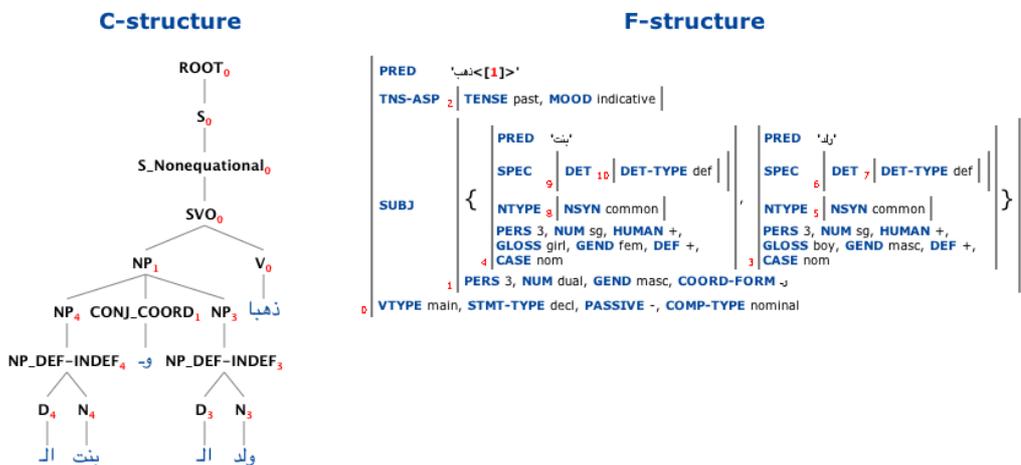


Figure 5. Resolution of the agreement features in conjoined NPs

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