

Coordination of Standard Arabic Subject Markers: Implementing the Agreement Asymmetries in the ACCG Framework

Ismail Biskri, Louisette Emirkanian, Adel Jebali

UQTR, UQAM, Concordia University

Ismail.biskri@uqtr.ca, emirkanian.louisette@uqam.ca, ajebali@alcor.concordia.ca

Abstract

In Standard Arabic, object markers and subject markers behave differently, although they share some properties. We are concerned here by their morphosyntactic status; whether they are arguments or agreement markers. The status of object markers is not an issue by itself, but the status of subject markers is one. The agreement asymmetries lead us to stipulate that, when subject markers are doubled by NPs whether these NPs are coordinated or not, they are agreement markers and not arguments. This analysis is implemented by means of an applicative combinatory categorial grammar (ACCG).

1. The Arabic Pronominal System

In standard Arabic, there are two sets of elements that can be qualified as pronominal forms: independent forms and conjunctive forms. These two sets differ in terms of their function. The independent forms, which we refer to as *independent pronouns*, are phonologically and morphologically independent proforms and replace nominal phrases.

Conjunctive forms, which will be referred to as *argument markers*, borrowed from Auger (1994), are prosodically deficient morphemes that encode the argument properties with which they are associated or that they replace. The two forms may change referents, refer to topics, or be classified according to their morphosyntactic properties, consistent with the definition of pronouns proposed by Bresnan (2001).

In (1) is an example of an independent pronoun “?iyyaaka” (you, accusative), in (2a), an argument marker, in this case the object marker “-ka” (you) and in (2b), a subject marker “-naa” (IMP):

- (1) ?iyyaaka n- a3bud -u
You(ACC) 1P- adore.IMP -Ind
"It is you that we adore" (Qur'an)
- (2) a. n- a3bud -u -ka
1P- adore.IMP -Ind -you
"We adore you"
- b. xaraj -naa
leave.PER -1P
"We leave."

2. Argument Markers

Argument markers make up a homogeneous group when compared to independent pronouns. Subject markers and object markers thus present certain distributional similarities to one another, one of which can be found in conjunctions. Argument markers, whether subject or object, cannot in fact subordinate one another, and must rather be repeated on their hosts, such as in the verbs of the following examples:

- (3) a. *ra?ay -tu -hu wa -haa
see.PER -1S -him and -her
- b. ra?ay -tu -hu wa ra?ay -tu -haa
see.PER -1S -him and see.PER -1S -her
"I saw him and I saw her."
- c. *ji? -tu wa -ta
come.PER -1S and -2MS
- d. ji? -tu wa ji? -ta
come.PER -1S and come.PER -2MS
"I came and you came."

From a purely phonological point of view, another resemblance may be observed since subject markers, just like object markers, cannot be stressed, focused, or otherwise emphasized, as pointed out by Bloch (1986) and Eloussfourri (1998). They are always pragmatically

neutral and only their independent equivalents may be stressed.

However, argument markers present several differences that allow them to be split into two distinct groups. Among these differences, there are several of particular importance for the hosts. Object markers may appear on several types of hosts (verbs, prepositions, nouns and functional heads) while subject markers have only one possible host: the verb. Furthermore, purely morphologically speaking, only subject markers are included in the morphological boundaries of their hosts while object markers are excluded and agglutinate to already morphologically well-formed words.

These resemblances and these differences lead us to question the morphosyntactic status of these markers: are they argument markers or agreement markers? In order to answer this question, it is necessary to observe the behaviour of these units in contexts where they co-occur with independent pronouns and noun phrases.

3. The Status of Argument Markers

Let us first clarify what we mean by agreement marker and argument marker. We define the agreement marker as an element devoid of a proper syntactic function. This element refers to another with which it shares certain grammatical features in a given configuration (Auger, 1994). The agreement marker is therefore usually part of a word (or a phrase) that itself satisfies a syntactic function.

We define a syntactic argument here as being a linguistic object selected by, and so complement of, another constituent.

There are several contexts that allow us to address the question of the morphosyntactic status of argument markers. The cases of interest are either those of doubling or dislocation. Even if the dislocation is tied in with the doubling in terms common features, it is distinguished by an intonational break (or pause) which places the dislocated element in a peripheral position that produces certain pragmatic effects, such as emphasis.

The following examples illustrate cases of dislocation and doubling. In (4a), the dislocation involves the object marker –hu (him) and, in this type of dislocation, the NP dislocated to the left is in the nominative. In (4b), the dislocation involves the subject marker –uu (3MP). As with the previous example, the NP dislocated to the left is in the nominative.

- (4) a. ?ar- rajul -u ra?ay -tu -hu
 the- man -NOM see.PER -1S -him
 "The man, I saw him."
 b. ?ar- rijaal -u jaa? -uu
 the- men -NOM come.PER -3MP
 "The men, they came."

Example (5a) illustrates doubling of the subject marker –at (3FS) by an NP while example (5b) illustrates the impossibility of doubling of an object marker, here –hu (him).

- (5) a. jaa? -at ?al- banaat -u
 come.PER -3F the- girls -NOM
 "The girls came."
 b. *ra?ay -tu -hu ?al- walad -a
 see.PER -1S -him the- boy -ACC

Observe that only subject markers may be doubled by NPs, and (5b) with the object marker is ungrammatical. In the case of the object marker, only the dislocated form is possible (4a). Moreover, and this is particularly interesting, the doubling in the case of the subject marker has an effect on the agreement. As can be seen in (5a), the agreement is only made in terms of gender. It is therefore a case of impoverished agreement. The dislocation links these two types of units since the agreement is made in gender and number (rich agreement) (in (4a) and (4b)), as much for subject markers as for the object markers.

Bresnan and Mchombo (1986) distinguish two types of agreement: grammatical agreement and anaphoric agreement. In grammatical agreement between an NP and a subject marker, the NP is the argument of the verb while the marker redundantly expresses the person, the number and the gender of this NP. In anaphoric agreement, on the other hand, the marker is an incorporated pronominal argument and the co-referential NP is therefore not an argument; it functions as a focus or topic of the proposition or of the discursive structure. The authors provide several tests to distinguish between these two types of agreement, such as locality, the status (peripheral vs central) of the NP co-indexed with the marker, and the membership of the language under study to a given type.

These tests, particularly that of locality (grammatical agreement is always local)¹ lead us to conclude that object markers are arguments since they are never doubled and the only agreement relations they exhibit are of the anaphoric type and non-local by definition (the same definition as for dislocation). Where subject markers are concerned, these tests lead us to conclude that they present a functional ambiguity: depending on the context, they may be agreement markers or arguments. It was therefore warranted to take a closer look at the data to decide if it was a case of grammatical agreement or anaphoric agreement. It was consequently appropriate to examine the conjoined structures that introduce, in a certain way, an extra level of agreement.

¹ See (Jebali, 2009) for application of these tests and the empirical details.

4. Coordination

Our objective was not to account for coordinate structures as such. We were interested rather in the asymmetries of the agreement.

Take the schema VSm NP and NP². Theoretically, it is possible that the agreement be made in gender and number with the sum of the values of the conjuncts. This is what we find in the case of the dislocation in (6) for example³:

(6) *jaa? -aa, ?al- bint -u wa l- walad*
 -u
 come.PER -3MD, the- girl -NOM and the- boy
 -NOM

“They came, the girl and the boy.”

This corresponds with what we find in the case of a dislocation without coordination (4b), where the agreement is made in both gender and number.

Another possibility would be for the agreement to be impoverished (as we found in the case of non-coordinated reduplication), but still agreeing in terms of gender with the sum of the conjuncts.

(7) **jaa? -a ?al- banaat -u wa l- ?awlaad*
 -u
 come.PER -3M the- girls -NOM and the- boys
 -NOM

The Standard Arabic data, with regards to the type of doubling of interest here, place us before a particular agreement. Indeed, on the one hand, while the first conjunct is an NP, the agreement is not made with sum of the values of the two conjuncts, but only with the first conjunct; on the other hand, this agreement with the first conjunct is impoverished (gender agreement only, just as in contexts without coordination). If Standard Arabic and the dialects of Arabic’s data⁴ differ in terms of agreement in gender and number, the fact that in a coordinate structure, agreement is only made with the first conjunct should be found in the two varieties (Aoun et al., 1994, 1999).

The following example illustrates this particular behaviour. Here, the subject marker *-at* (3F) attached to the verb *xaraj* (to go out) agrees only in gender with the first conjunct *al-banaatu* (the girls) remaining in the singular form, therefore not agreeing with the sum of the values of the two conjuncts (two plurals, one of which being masculine should have given an agreement with the plural masculine, carrying out a calculation of the

features), as was the case with the dislocated structures in (6).

(8) *xaraj -at al- banaat -u wa al- ?awlaad*
 -u
 leave.PER -3F the- girls -NOM and the- boys
 -NOM
 “The girls and the boys left.”

Moreover, when the first conjunct is an independent pronoun, the agreement made with it is rich (gender and number), illustrated in the following example:

(9) *xaraj -na hunna wa al- ?awlaad*
 -u
 leave.PER -3FP they(FP-NOM) and the- boys
 -NOM
 “They (FP) left, they (FP) and the boys.”

With regards to the difference between independent pronouns and an NP, we may call on what has been proposed by several authors, such as Harbert and Bahloul (1992) and, with certain nuances, Bouchard (2002): pronouns inherently encode number while nouns acquire this feature in context. It is therefore not surprising that the pronoun, when it is the first conjunct, entails an agreement in gender and number, while the NP entails an impoverished agreement, only in gender.

Other work, namely Aoun et al. (1994, 1999), addresses the question by stipulating that coordination in Arabic is phrasal. It is thus proposed that the structure is VSm NP [and NP], which would explain how the agreement is only made with the first agreement. However, these authors examined this question by stressing contemporary Arabic dialects (especially Moroccan Arabic and Lebanese Arabic), which limits the extension of their analysis to Standard Arabic. Moreover, they do not establish the differences between doubling and dislocation (especially with independent pronouns)⁵.

The data on coordinate structures, whatever the analysis adopted to account for coordination in Arabic, show us that subject markers enter into the same type of impoverished agreement relationship in the case of doubling as the postposed nominal, be it a single element or two coordinated elements.

In light of the tests proposed by Bresnan and Mchombo (1986) to account for the anaphoric agreement/grammatical agreement opposition on the one hand, and on the other hand, the behaviour of subject markers in a

² V: verb, Sm: subject marker.

³ As we can see, the marker is dual masculine, since in Standard Arabic the masculine overrides the feminine.

⁴ In the non-coordinated cases, as in (5a), in Arabic dialects, the marker would be in plural.

⁵ We hope to address this question in future work.

Category N^s_{3sm} typifies a noun acting as subject of 3rd person masculine singular. N^o_{1sm} typifies a noun acting as object of 1st person singular masculine.

The categorial analysis of the statement (3.a) fails when we apply coordination. Indeed, the object markers -hu and

*ra?ay	-tu	-hu	wa	-haa
-----	-----	-----	-----	-----
$(S/N^s)/N^o$	$(S/N^o)((S/N^s_{1sm})/N^o)$	$S/(S/N^o_{3sm})$	$(X/X)/X$	$S/(S/N^o_{3sf})$
----- fails				

The repetition of the verb ra?ay in (3.b) is necessary for coordination to be possible. Coordination is applied, in this case, to two sentences.

ra?ay	-tu	-hu	wa	ra?ay	-tu	-haa
-----	-----	-----	-----	-----	-----	-----
$(S/N^s)/N^o$	$(S/N^o)((S/N^s_{1sm})/N^o)$	$S/(S/N^o_{3sm})$	$(X/X)/X$	$(S/N^s)/N^o$	$(S/N^o)((S/N^s_{1sm})/N^o)$	$S/(S/N^o_{3sf})$
-----<				----->		
(S/N^o)						
----->						
S						
				-----<		
				(S/N^o)		
				----->		
				S		
				-----<		
				$(X/X)/X$		
				S		

The categorial analysis of the statement (3.c) fails when we apply coordination to subject markers -tu and -ta. These are, indeed, associated with different respective categories that denote that -tu refers to a subject of the 1st person while -ta refers to a subject of the 2nd person.

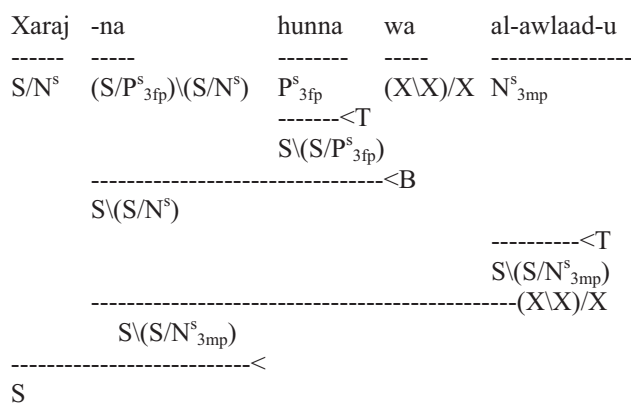
As for (3.b), the repetition of the verb ji? in (3.d) is necessary for coordination to be possible. Coordination is applied to two sentences. This applies to both expressions' sentence patterns.

*ji?	-tu	wa	-ta		Xaraj	-at	al-banaat-u	wa	al-awlaad-u
-----	-----	-----	-----		-----	-----	-----	-----	-----
S/N ^s	S\ (S/N ^s _{1sm})	(X\X)/X	S\ (S/N ^s _{2sm})		S/N ^s	(S/N ^s _{3f})\ (S/N ^s)	N ^s _{3fp}	(X\X)/X	N ^s _{3mp}
-----fails							-----<T		
							S\ (S/N ^s _{3fp})		
							-----<B		
							S\ (S/N ^s)		
									-----<T
ji?	-tu	wa	ji?	-ta	S\ (S/N ^s _{3mp})				
-----	-----	-----	-----	-----	-----				
S/N ^s	S\ (S/N ^s _{1sm})	(X\X)/X	S/N ^s	S\ (S/N ^s _{2sm})	(X\X)/X				
-----<					-----				
S					S\ (S/N ^s _{3mp})				
					-----<				
					S				
					-----<				
					(X\X)/X				
					S				

-haa are of different categories. The first marker refers to an object of masculine gender while the second refers to an object of feminine gender.

In the case of Example (8) -at is considered as an operator which operates on the verb xaraj in order to construct a complex operator whose operand is a subject of the 3rd person and of feminine gender.

In the case of the example (9) -na is considered as an operator which operates on the verb xaraj in order to construct a complex operator whose operand is a subject-pronoun of feminine gender and of the 3rd plural person.



6. Conclusion

We have shown that the behavior of argument markers changes according to whether they appear in a dislocation or a doubling configuration. In the first case, we observe a rich agreement whether we be in the presence of a subject or an object marker. In the second case, on the one hand, the doubling is only possible with subject markers and, on the other hand, the resulting agreement is impoverished. Thus we are in presence of a type of grammatical and non-anaphoric agreement, and the subject markers in this case are agreement markers, whether the NPs are coordinated or not. An implementation by means of the applicative combinatory categorial grammar has been done. We have proved that in the general framework of categorial grammars it is possible to give an account for the analysis of argument markers in Arabic. We believe that the analysis of Arabic cannot be done without an account for the morphological phenomena. While only a few attempts integrate morphology to categorial analysis and were strongly criticized, our implementation does this and our results show that we are able to conceptualize the information relating to gender, number and person in categorial types. We have now to decide on which structure to adopt for coordination (phrasal or not) and consider if, as Aoun et al. (1994, 1999) have proposed, it can explain the agreement with the first conjunct when the NPs are coordinated.

References

ANOUN, H. (2006). "Towards a logical analysis of nominal sentences in standard Arabic", ESSLLI '06.
AOUN J., BENMAMOUN E., SPORTICHE D. (1994). "Agreement, Word Order, and Conjugation in Some Varieties of Arabic". *Linguistic Inquiry*, vol. 25, no 2, pp. 195–220.
AOUN J., BENMAMOUN E., SPORTICHE D. (1999). "Further Remarks on First Conjunct Agreement". *Linguistic Inquiry*, vol. 30, no 4, pp. 669–681.

AUGER, J. (1994). *Pronominal Clitics in Québec Colloquial French : A Morphological Analysis*. PhD dissertation, University of Pennsylvania, Philadelphia.
BAHLOUL M., HARBERT W. (1992). « Agreement Asymmetries in Arabic ». In « The Eleventh West Coast Conference on Formal Linguistics », vol. 11, pp. 15–31.
BALDRIDGE J., KRUIJFF G.J. (2003). *Multi-Modal Combinatory Categorial Grammar*. *EACL 2003 Proceedings*.
BISKRI I., DESCLÈS J.P. (2006). Coordination de Catégories Différentes en Français. *Faits de Langue* No 28.
BLOCH, A. (1986). *Studies in Arabic Syntax and Semantics*. Wiesbaden : O. Harrasowitz.
BOUCHARD, D. (2002). *Adjectives, Number and Interfaces : Why languages vary ?* North-Holland: Elsevier.
BOZSAHIN, C. (2002). The Combinatory Morphemic Lexicon. *Computational Linguistics*, 28(2):145–186.
BRESNAN, J. (2001). "The Emergence of the Unmarked Pronoun". In Geraldine Legendre, Jane Grimshaw et Sten Vikner (éditeurs), "Optimality-theoretic Syntax", Massachusetts : MIT Press, pp. 113–142.
BRESNAN J., MCHOMBO S.A. (1987). "Topic, Pronoun and Agreement in Chichewa". *Language*, vol. 63, no 4, pp. 741–782.
CURRY B.H., FEYS, R. (1958). *Combinatory Logic Vol. I*. Amsterdam: North-Holland.
DE GROOTE, P., PODOGALLA, S. (2004). On the expressive power of Abstract Categorial Grammars: Representing context-free formalisms. In *Journal of Logic and Information*.
DESCLÈS J.P. (1996). Cognitive and Applicative Grammar : an Overview. C. Martin Vide, ed. *Lenguajes Naturales y Lenguajes Formales XII*, 29–60.
ELOUSSFOURRI, E. (1998). *Les pronoms personnels de l'arabe : syntaxe interne et externe*. PhD dissertation, Université Paris VIII.
ENGELMORE, R., and Morgan, A. eds. 1986. *Blackboard Systems*. Reading, Mass.: Addison-Wesley.
JEBALI, A. (2009). *La modélisation des marqueurs d'Arguments de l'arabe standard dans le cadre des grammaires à base de contraintes*. PhD dissertation. Université du Québec à Montréal, Canada.
KUBOTA, Y., (2007), A Multimodal Combinatory Categorial Grammar analysis of –te form complementation. *Colloque de syntaxe et sémantique*. Paris.
SHAUMYAN S.K. (1998). Two Paradigms of Linguistics : The Semiotic Versus Non-Semiotic Paradigm. *Web Journal of Formal, Computational and Cognitive Linguistics*.
STEEDMAN M. (2000). *The Syntactic Process*. MIT Press/Bradford Books.