

Abstract

Much discussion of the comparative correlative construction exemplified by *The more I read, the more I understand* has been concerned with how much cross-linguistic variation there is in this area. Culicover and Jackendoff (1999) suggest that there is considerable variation, but Den Dikken (2005) suggests with data from a variety of languages that the variation is quite limited. Modern Standard Arabic has a comparative correlative construction which is quite different from English and the other languages that Den Dikken considers, suggesting that there is more variation in this domain than he assumes. However, it is not difficult to provide an analysis of the construction and other related constructions within the HPSG framework.

1. Introduction

Since Culicover and Jackendoff (1999), the comparative correlative (CC) construction, exemplified by (1), has been an important focus of syntactic research.

- (1) The more I read, the more I understand.

A central issue has been how much cross-linguistic variation there is in this area. This is important because the more variation we find, the greater is the challenge for the Chomskyan view that grammatical systems are the result of setting a relatively small number of parameters. Culicover and Jackendoff suggest that languages vary significantly and that they are ‘forced to “cobble together” some kind of mechanism to express’ the CC meaning (1999: 569). In a reply to Culicover and Jackendoff, Den Dikken (2005) shows that a number of languages have constructions which are broadly similar to the English construction. Among the examples he cites are the following:

- (2) a. Naskol'ko luchshe mashina, nastol'ko ona.
by-how-much better car-NOM by-that-much it-F.NOM
dorozhe.
more.expensive
(Russian)
'The better the car, the more expensive it is.'

† This paper draws in various ways on the first author’s MA dissertation, Alqurashi (2008). We are grateful to the reviewers and audience at HPSG21 in Buffalo for their helpful comments and discussion and to Ewa Jaworska for editorial assistance. We alone are responsible for what appears here.

- b. Minél többet olvasol, annál többet
 what-ADESS more-ACC you.read that-ADESS more-ACC
 megértesz. (Hungarian)
 VM-you.understand
 'The more you read, the more you understand.'
- c. Xedii targan max, (bol) tödii
 how-much fat meat TOPIC that-much
 amttai. (Khalkha Mongolian)
 delicious
 'The fatter a piece of meat is, the more delicious it is.'

He argues that the CC constructions of various languages have essentially the same structure and are rather like the Hindi relative-correlative construction, exemplified by (3).

- (3) jo larRkii khaRii hai vo lambii hai. (Hindi)
 REL girl standing is DEM tall is
 'The girl that is standing is tall.'

He proposes that both the relative-correlative construction and the CC construction consist of a relative clause – essentially a free relative – adjoined to a following main clause.

Abeillé and Borsley (2008) note that broadly similar constructions may differ in important ways. They develop this point through a consideration of the French CC construction, where they show that the first clause does not resemble a free relative in any significant way and that for some speakers it is not even a subordinate clause because the two clauses are on a par, as in a coordinate structure.¹

In this paper, we will show that Modern Standard Arabic (MSA) has a CC construction, which provides further evidence that there is more cross-linguistic variation in this domain than Den Dikken assumes. We will show, however, that it is not difficult to develop a detailed analysis within the Head-driven Phrase Structure Grammar (HPSG) framework, building on the ideas of Borsley (2004, 2011).

Before we can proceed, we must ask what counts as a CC construction. It is only if we have an answer to this question that we can discuss the viability of Den Dikken's position. A CC construction is not just any construction which can express the CC meaning. In English, the CC meaning can be expressed by the *if-then* and *as-so* constructions. Thus, the following

¹ Both clauses of the English CC construction are rather like what Huddleston and Pullum (2002: 761-5, 985-91) call the exhaustive conditional construction, exemplified by (i):

(i) however much I read

This looks like a free relative. However, Huddleston and Pullum argue that exhaustive conditionals are in fact interrogatives.

have more or less the same meaning as (1):

- (4) a. If you read more, then you understand more.
- b. As you read more, so you understand more.

These constructions, however, can also express other meanings, as the following illustrate:

- (5) a. If you read this, then you will understand.
- b. As you read this, so you will understand.

What we need, then, is not just a construction which can express the CC meaning but a construction which can only express this meaning. It is entirely possible that some languages do not have such a construction. We will argue, however, that MSA has a CC construction, but one which is very different from the type that Den Dikken focuses on.

The paper is organized as follows. In section 2, we show that MSA has a CC construction which is quite different from those that Den Dikken discusses but is essentially a specialized version of a fairly ordinary combination of an adjunct cause and a main clause. Then in section 3, we show that MSA has a number of other special constructions which also have related examples in which an adjunct clause combines with an ordinary main clause. In section 4, we develop a fairly detailed analysis of the data within HPSG. Finally, in section 5, we conclude the paper.

2. The MSA construction

Like English, MSA can express the CC meaning with constructions which can also express other meanings. However, as we will see, it also has a construction which can only express the CC meaning. Hence it has a CC construction.

As one might expect, MSA can express the CC meaning with *ʔin* ‘if’, as in the following:

- (6) [*ʔin* *taqraʔ* *ʔakθar*] [*tafhm* *ʔakθar*]
 if read.IMPF.2.M.SG more understand IMPF.2.M.SG more
 ‘If you read more, you understand more.’

It can also express the CC meaning with other conditional particles such as *kullamā* ‘whenever’.

- (7) [kullamā qaraʔta ʔakθar] [tafham
whenever read-PERF.2.M.SG more understand-IMP.2.M.SG
ʔakθar]
more
'Whenever you read more, you understand more.'

Not surprisingly, both *ʔin* and *kullamā* can also express very different meanings, as the following illustrate:

- (8) [ʔin taqraʔ haðaa l-kitab]
if read-IMP.2.M.SG this DEF-book-ACC
[fa-sa-tafhm ʔal-maqsood]
will-understand IMP.2.M.SG DEF-idea
'If you read this book, you will understand.'
- (9) [kullamā qaraʔta haðaa l-kitab]
whenever read-PERF.2.M.SG this DEF-book-ACC
[tafham ʔal-maqsood]
understand-IMP.2.M.SG DEF-idea
'Whenever you read this book, you understand the idea.'

ʔin can introduce an imperfective clause, as in (6) and (8) above, or a perfective clause, as in (10):

- (10) [ʔin qraʔta ʔakθar] [fahimta ʔakθar]
if read-PERF.2.M.SG more understand PERF.2.M.SG more
'If you read more, you understood more.'

It also allows both a verb-initial clause, as in (6) and (8), and a subject-initial clause, as in (11):

- (11) [ʔin Zaid-un yaqraʔ ʔakθar]
if Zaid-NOM read-IMP.3.M.SG more
[yafhm ʔakθar]
understand IMP.3.M.SG more
'If Zaid reads more, he understands more.'

In contrast, *kullamā* only introduces clauses which are verb-initial and perfective, hence the ungrammaticality of the following:

- (12) *[kullamā taqraʔ ʔakθar]
whenever read-IMP.2.M.SG more
[tafham ʔakθar]
understand-IMP.2.M.SG more
'Whenever you read more, you understand more.'

- (13) *[*kullamā* Zaid-un yaqraʔ ʔakθar]
 whenever Zaid-NOM read.IMPF.3.M.SG more
 [yaʔhm ʔakθar]
 understand IMPF.3.M.SG more
 ‘Whenever Zaid reads more, he understands more.’

The main clause which it modifies may be verb-initial or subject-initial and may be perfective or imperfective, as we will show below.

If MSA only had the kinds of example that we have highlighted above, we could conclude that it does not have a CC construction. However, instead of (7), the following is possible:

- (14) [*kullamā* qaraʔta ʔakθar] [*kullamā*
 whenever read.PERF.2.M.SG more whenever
 faʔhmta ʔakθar]
 understand.PERF.2.M.SG more
 ‘Whenever you read more, you understood more.’
 ‘The more you read, the more you understood.’

Here, *kullamā* appears not only in the first clause but in the second clause as well. We might translate this in the same way as (7), but it seems equally appropriate to translate it with a CC sentence. It is not possible to have *kullamā* in the second clause with other sorts of meanings. Thus, (15) is not possible as an alternative to (9).

- (15) *[*kullamā* qaraʔta haðaa l-kitab]
 whenever read.PERF.2.M.SG this DEF-book-ACC
 [*kullamā* faʔhmta ʔal-maqsood]
 whenever understand.PERF.2.M.SG DEF-idea
 ‘Whenever you read this book, you understood the idea.’

Hence, the double *kullamā* construction can only express the CC meaning. Therefore, it is a CC construction. Unlike the English construction and the other constructions discussed by Den Dikken (2005), it does not have a fronted comparative constituent in either clause. Thus, it is very different from these constructions.

The single *kullamā* construction seems to be a fairly ordinary combination of an adjunct cause and a main clause. As we might expect, the clauses may appear in either order. Thus, (16) is an alternative to (7).

- (16) [tafham ʔakθar] [kullamā qaraʔta
understand.IMPF.2.M.SG more whenever read-PERF.2.M.SG
ʔakθar]
more
‘You understand more, whenever you read more.’

As we might also expect, the main clause is not required to be imperfective or to be verb-initial, as the following show:

- (17) [kullamā qaraʔta ʔakθar] [fahimta
whenever read.PERF.2.M.SG more understand.PERF.2.M.SG
ʔakθar]
more
‘Whenever you read more, you understood more.’
- (18) [kullamaa qaraʔa Zaid-un ʔakθar] [Amr-un
whenever read.PERF.3.M.SG Zaid-NOM more Amr-NOM
yafhmu ʔakθar]
understand.IMPF.3.M.SG more
‘Whenever Zaid reads more, Amr understands more.’

We turn now to the double *kullamā* construction, or the CC-construction, as we will call it from now on. There are a number of points to note. Firstly, neither clause of the construction allows an imperfective verb. Thus, both of the following are ungrammatical:

- (19) a. *[kullamā qaraʔta ʔakθar] [kullamā
whenever read.PERF.2.M.SG more whenever
tafham ʔakθar]
understand.IMPF.2.M.SG more
- b. *[kullamā taqaraʔ ʔakθar] [kullamā
whenever read.IMPF.2.M.SG more whenever
fahimta ʔakθar]
understand.PERF.2.M.SG more

Secondly, neither clause can appear without the other:

- (20) a. *kullamā qaraʔta ʔakθar.
whenever read.PERF.2.M.SG more
- b. *kullamā fahimta ʔakθar.
whenever understand.PERF.2.M.SG more

Thirdly, the two clauses have a fixed order. Thus, (21) differs in meaning from (12):

- (21) [kullamā fahimta ʔakθar] [kullamā
 whenever understand.PERF.2.M.SG more whenever
 qara'ta ʔakθar]
 read-PERF.2.M.SG more
 'The more you understand, the more you read.'

Given that the two clauses have the same form, this is not really surprising.

A final point to note is that while the two clauses of this construction must have a comparative interpretation, they need not contain a comparative word. Thus, as well as examples like (7), we have examples like the following:

- (22) [kullamā zaada hajmu-hu] [kullamā
 whenever increase.PERF.3SGM size-its whenever
 zaada siʕru-hu]
 increase PERF.3SGM price-its
 'The more its size increases, the more its price increases.'

This is rather like the main clause in what McCawley (1988) calls the reversed CC construction. The following is a typical example:

- (23) I understand more, the more I read.

Here, the second clause, which we assume is an adjunct, looks just like the two clauses of the English CC-construction. The first clause, which we assume is a main clause, has an in-situ comparative word. However, as McCawley notes, it is also possible to have main clauses with no comparative word but with a comparative interpretation. (24) illustrates:

- (24) My knowledge increases, the more I read.

We assume that the two clauses of the MSA CC-construction are subject to the same constraint as the main clause of this construction

It seems, then, that MSA has a number of ways of expressing the CC meaning. Some involve constructions which can also express other meanings, but one involving two clauses introduced by *kullamā* can only express the CC meaning. This, then, is a CC construction and one that is very different from the constructions that are the focus of Den Dikken (2005).

3. Other constructions

The MSA CC construction is a specialized construction, but, as we have seen, it is related to a fairly ordinary main clause + adjunct clause structure. This is quite like the situation in English, where the reversed CC

construction, exemplified by (23) and (24) above, is a fairly ordinary main clause + adjunct clause structure (Borsley 2004, 2011). In this section, we will show that the MSA CC construction is one of a number of specialized constructions, each of which is related to an ordinary main clause + adjunct clause structure. Again this is rather like English. Following Borsley (2004, 2011), we will call the specialized constructions correlative clauses.

In English a correlative clause which is rather like the CC construction is the *if-then* construction, illustrated in (4a) above. MSA has two constructions which resemble the *if-then* construction. These are what we will call the *ʔiðaa-fa* construction, exemplified by (25), and the *law-la* construction, exemplified by (26).

- (25) [ʔiðaa qaraʔta ʔakθar]
 if read-PERF.2.M.SG more
 [fa-sa-tafhamu ʔakθar]
 then-will-understand.IMPF.2.M.SG more
 ‘If you read more, then you will understand more.’
- (26) [law qaraʔta ʔakθar] [la-fahimta
 if read-PERF.2.M.SG more then-understand.PERF.2.M.SG
 ʔakθar]
 more
 ‘If you read more, then you will understand more.’

MSA has at least two further correlative clauses. The first, which we will call the *bimaa-ʔiðann* construction, is exemplified by (27).

- (27) [bimaa ʔannka taqraʔu ʔakθar] [ʔiðann
 as/since COMP.2.M.SG read-IMPF.2.M.SG more so
 sa-tafhamu ʔakθar]
 ill-understand.IMPF.2.M.SG more
 ‘As/since you read more, so you will understand more.’

This is rather like the English *as-so* construction, illustrated in (4b). Note that *bimaa* is followed by another complementizer. We assume this means that it takes a CP complement. The second, which we will call the *biqadri-maa-biqadri-maa* construction, is exemplified by (28).

- (28) [biqadri-maa taqraʔ] [biqadri-maa
 as-much-as read-IMPF.2.M.SG as-much-as
 tafham]
 understand.IMPF.2.M.SG
 ‘As much as you read, so much you understand.’

In all four constructions, neither clause can appear without the other:

- (29) a. *ʔiðaa qaraʔta ʔakθar.
if read-PERF.2.M.SG more
b. *fa-sa-tafhamu ʔakθar
then-will-understand.IMPF.2.M.SG more
- (30) a. *law qaraʔta ʔakθar.
if read-PERF.2.M.SG more
b. *la-fahimta ʔakθar.
then-understand.PERF.2.M.SG more
- (31) a. *bimaa ʔannka taqraʔu ʔakθar.
as/since COMP.2.M.SG read-IMPF.2.M.SG more
b. *ʔiðann sa-tafhamu ʔakθar.
so will-understand.IMPF.2.M.SG more
- (32) a. *biqadri-maa taqraʔ.
as-much-as read-IMPF.2.M.SG
b. *biqadri-maa tafham.
as-much-as understand.IMPF.2.M.SG

In all four, the order of the clauses is fixed. Thus, (33)–(35) are ungrammatical, and (36) differs in meaning from (28).

- (33) *[fa-sa-tafhamu ʔakθar] [ʔiðaa
then-will-understand.IMPF.2.M.SG more if
qaraʔta ʔakθar]
read-PERF.2.M.SG more
- (34) *[la-fahimta ʔakθar] [law
then-understand.PERF.2.M.SG more if
qaraʔta ʔakθar]
read-PERF.2.M.SG more
- (35) *[[ʔiðann sa-tafhamu ʔakθar] [bimaa
so will-understand.IMPF.2.M.SG more as/since
ʔannaka taqraʔu ʔakθar]
COMP.2.M.SG read-IMPF.2.M.SG more
- (36) [biqadri-maa tafham] [biqadri-maa
as-much-as understand.IMPF.2.M.SG as-much-as
taqraʔ]
read-IMPF.2.M.SG
'As much as you understand, so much you read.'

Like the CC construction, all four constructions have related examples where an adjunct clause with some distinctive form modifies an ordinary main clause:

- (37) [ʔiðaa qaraʔta ʔakθar] [sa-tafhamu
if read-PERF.2.M.SG more will-understand.IMPF.2.M.SG
ʔakθar]
more
'If you read more, you will understand more.'
- (38) [law qaraʔta ʔakθar] [tafhamu
if read-PERF.2.M.SG more understand.IMPF.2.M.SG
ʔakθar]
more
'If you read more, you will understand more.'
- (39) [bimaa ʔannaka taqraʔu ʔakθar]
as/since COMP 2.M.SG read-IMPF.2.M.SG more
[sa-tafhamu ʔakθar]
will-understand.IMPF.2.M.SG more
'As/since you read more, you will understand more.'
- (40) [biqadri-maa taqraʔ] [tafhamu]
as much as read-IMPF.2.M.SG understand.IMPF.2.M.SG
'As much as you read, you understand.'

With these examples the two clauses can appear in either order:

- (41) [sa-tafhamu ʔakθar] [ʔiðaa qaraʔta
will-understand.IMPF.2.M.SG more if read-PERF.2.M.SG
ʔakθar]
more
'You will understand more if you read more books.'
- (42) [tafhamu ʔakθar] [law qaraʔta ʔakθar].
understand.IMPF.2.M.SG more if read-PERF.2.M.SG more
'You understand more if you read more.'
- (43) [sa-tafhamu ʔakθar] [bimaa ʔannaka
will-understand.IMPF.2.M.SG more as/since COMP 2.M.SG
taqraʔu ʔakθar]
read-IMPF.2.M.SG more
'You will understand more as/since you read more.'
- (44) [tafhamu] [biqadri-maa taqraʔ].
understand.IMPF.2.M.SG as-much-as read-IMPF.2.M.SG
'You understand as much as you read.'

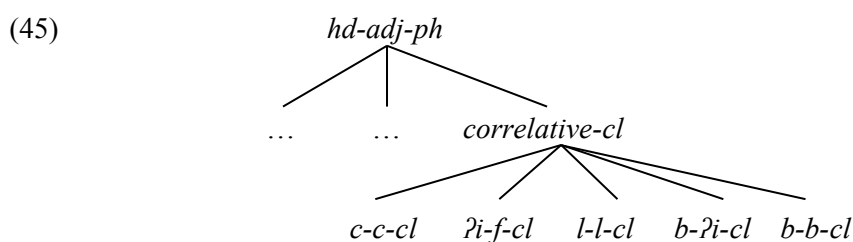
It seems, then, that the CC construction is one of a number of special constructions, which we call correlative clauses. In each case, the component clauses have a distinctive form, appear in a fixed order, and neither can appear without the other. Also in each case, we have related examples in which an adjunct clause combines with an ordinary main clause. Thus, we have the following situation:

Correlative clause	Main clause + adjunct clause
CC construction	Main clause + <i>kullamã</i> -clause
<i>?iðaa-fa</i> construction	Main clause + <i>?iðaa</i> -clause
<i>bimaa-?iðann</i> construction	Main clause + <i>bimaa</i> -clause
<i>biqadri-maa-biqadri-maa</i> construction	Main clause + <i>biqadri ma</i> -clause

4. Analyses

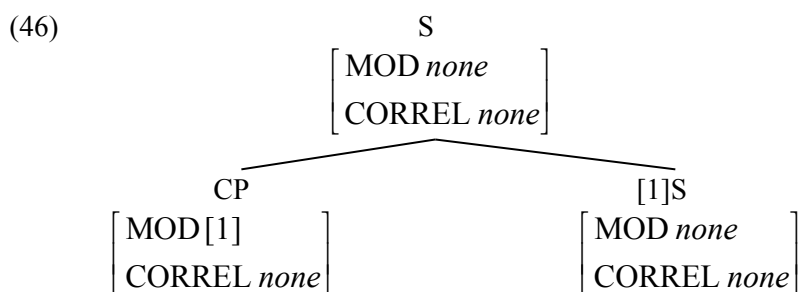
We will now develop a fairly detailed analysis of the data within HPSG, adopting essentially the version of HPSG outlined in Ginzburg and Sag (2000).

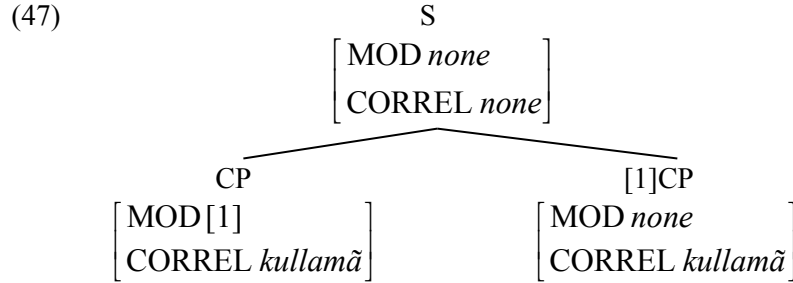
Following Borsley (2004, 2011), we assume that correlative clauses are special head-adjunct-phrases, where the head has a special feature specification reflected in its distinctive form, as a result of which it cannot appear without the adjunct. We assume the following system of types:



We also assume that *kullamã* and the other clause-initial elements in correlative clauses are complementizers and that they are identified by a feature CORREL(ATIVE). All other words will be [CORREL *none*], including *kullamã* in the single *kullamã* construction.

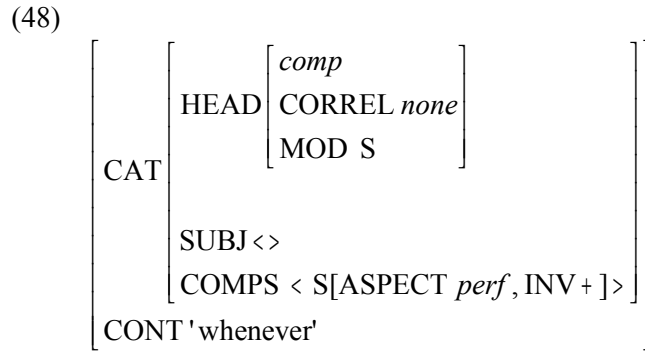
Given these assumptions, ordinary combinations of an adjunct clause and a main clause involve a CP modifying an S, as in (46), and correlative clauses involve a CP modifying a CP, and structures like (47).





The single *kullamã* construction can be analyzed in essentially the same way as other combinations of an adjunct clause and a main clause. The CC construction is a more complex matter, but we will show that it is not too difficult to provide an analysis within HPSG. We will also outline analyses for the other correlative clauses.

For *kullamã* in the single *kullamã* construction, we propose the following syntactic and semantic properties (where we use [INV +] to identify verb-initial clauses and indicate the meaning informally with ‘whenever’):²



For head-adjunct-phrases, we assume the fairly standard constraint in (49).

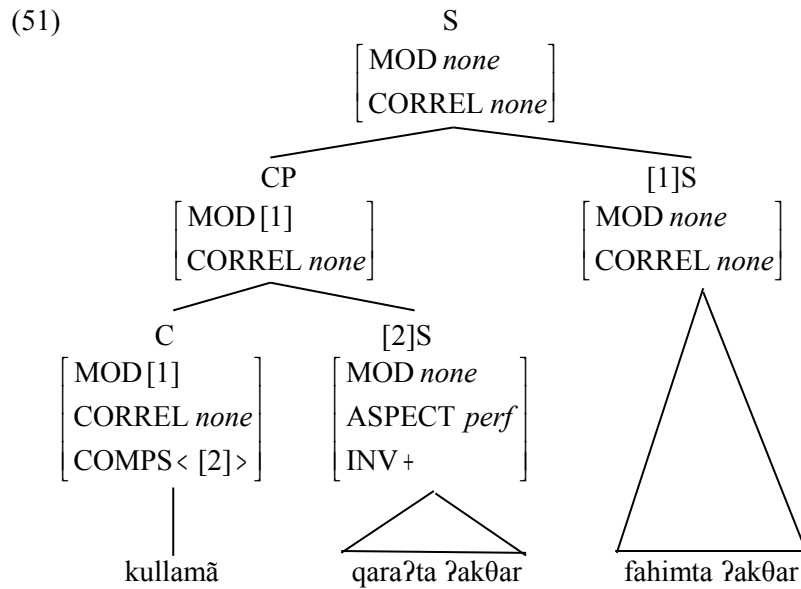
$$(49) \text{ } hd\text{-}adj\text{-}ph \rightarrow \left[\begin{array}{l} \text{DTRS} \langle [1][\text{SS}[2]], [\text{HEAD}[\text{MOD}[2]]] \rangle \\ \text{HD - DTR } [1] \end{array} \right]$$

We also assume Ginzburg and Sag’s Generalized Head Feature Principle (GHFP), which we can formulate as follows:

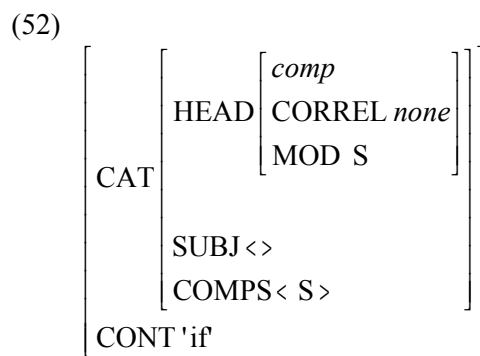
$$(50) \text{ } hd\text{-}ph \rightarrow \left[\begin{array}{l} \text{SYNSEM } /[1] \\ \text{HD - DTR } [\text{SYNSEM } /[1]] \end{array} \right]$$

² All complementizers will be [HEAD *comp*] and [SUBJ $\langle \rangle$], so this information doesn’t need to be included in the description of any specific complementizer.

This is a default statement, as indicated by the slash notation. It requires a headed phrase and its head–daughter to have the same syntactic and semantic properties unless some other constraint requires a difference. In the case of ordinary head–adjunct–phrases, it ensures that the phrase has the same category as its head. Given this machinery, (7) will have an analysis which we can represent as follows:



The other main clause + adjunct clause structures will have similar analyses. They just need appropriate syntactic and semantic properties. For *?in* we can propose the following:



This is like (48) except that it has a different CONTENT value and no restrictions are placed on the type of S that can appear as its complement. It will give a structure much like (51) for (6). The examples in (37)–(40) will

have similar structures.

We turn now to the rather more challenging CC construction. We will first introduce the necessary constraints and then provide syntactic and semantic properties for the two instances of *kullamã*. For correlative clauses, we assume the following constraints :

$$(53) \text{ correlative-cl} \rightarrow \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} v \\ \text{MOD } none \end{array} \right] \\ \text{CORREL } none \end{array} \right]$$

$$(54) \text{ correlative-cl} \rightarrow \left[\begin{array}{c} \text{PHON}[1] \oplus [2] \\ \text{DTRS} < [\text{PHON}[2]], [\text{PHON}[1]] > \end{array} \right]$$

The first overrides the GHFP and requires correlative clauses to be verbal, to be [MOD *none*], and to be [CORREL *none*]. (It may be that the last of these stipulations is unnecessary since it is probable that all head–adjunct–phrases are [CORREL *none*].) The second requires the first member of the daughters list, which given (49) is the head, to be second in the phonology. It accounts for the fact that all correlative clauses have a fixed order. For c-c-clauses, we propose the following constraint:

$$(55) \text{ c-c-cl} \rightarrow [\text{DTRS} < [\text{CORREL } kullamã], [\text{CORREL } kullamã]] >]$$

This ensures that the two daughters in a c-c-clause are [CORREL *kullamã*].

We now need syntactic and semantic properties for the two instances of *kullamã* that appear in the CC construction. Unlike the *kullamã* of the single *kullamã* construction, both must be [CORREL *kullamã*]. They also need to ensure that their complement has an implicit comparison interpretation. They will differ, however, in two ways. In the adjunct clause, *kullamã* must be [MOD CP], whereas in the main clause it must be [MOD *none*]. We will also assume that *kullamã* in the adjunct clause has the same ‘whenever’ interpretation as *kullamã* in the single *kullamã* construction, whereas *kullamã* in the main clause is meaningless, having the same interpretation as its complement. This will ensure that the CC construction has essentially the same interpretation as the single *kullamã* construction. It seems, then, that we need the following syntactic and semantic properties, where we represent the fact that the complement must be comparative with the informal CONT value ‘comparative’:

(56)

$$\left[\begin{array}{c} \text{CAT} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{comp} \\ \text{CORREL } kullam\tilde{a} \\ \text{MOD CP} \end{array} \right] \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle \text{S}[\text{ASPECT } perf, \text{INV} +, \text{CONT 'comparative'}] \rangle \\ \text{CONT 'whenever'} \end{array} \right] \end{array} \right]$$

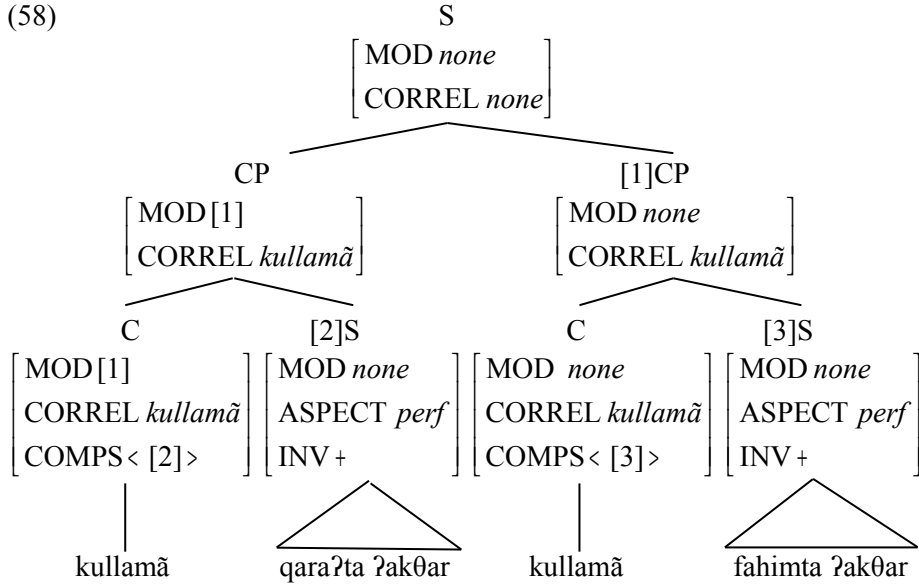
(57)

$$\left[\begin{array}{c} \text{CAT} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{comp} \\ \text{CORREL } kullam\tilde{a} \\ \text{MOD none} \end{array} \right] \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle \text{S}[\text{ASPECT } perf, \text{INV} +, \text{CONT [1] 'comparative'}] \rangle \\ \text{CONT [1]} \end{array} \right] \end{array} \right]$$

Both are [CORREL *kullamã*], and both select a complement which is perfective and verb-initial and has an implicit comparative interpretation. They differ in that the first is [MOD CP] whereas the second is [MOD *none*], and the first has the same CONTENT value as *kullamã* in the single *kullamã* construction whereas the second has the same CONTENT value as its complement and hence is meaningless.

With the constraints and lexical properties set out above, we have the following structure for the CC construction in (14):

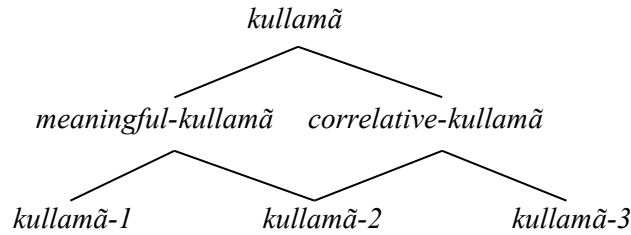
(58)



We now have analyses for both the single *kullamã* construction and the CC-construction. But we need to say more about *kullamã*. We have three separate sets of properties, (48), (56), and (57). They differ in important ways, but they also show some important similarities. All three are complementizers selecting a clausal complement which is perfective and verb-initial. The descriptions in (48), (56) have the same CONTENT value, and (56) and (57) have the same value for CORREL and require their complement to have an implicit comparison interpretation. We can capture these similarities with a system of lexical types.

We propose the following system, where *kullamã-1* is *kullamã* in the single *kullamã* construction, *kullamã-2* is first *kullamã* in a c-c-clause, and *kullamã-2* is second *kullamã* in a c-c-clause:

(59)



These are subject to the following constraints:

$$(60) \text{ kullamã} \rightarrow \left[\begin{array}{l} \text{PHON } kullamã \\ \text{SS|LOC|CAT} \left[\begin{array}{l} \text{HEAD } comp \\ \text{SUBJ } < > \\ \text{COMPS } < \text{S[ASPECT } perf, INV +]> \end{array} \right] \end{array} \right]$$

$$(61) \text{ meaningful-kullamã} \rightarrow [\text{SS|LOC}[\text{CONT 'whenever'}]]$$

$$(62) \text{ correlative-kullamã} \rightarrow$$

$$\left[\text{SS|LOC} \left[\text{CAT} \left[\begin{array}{l} \text{HEAD}[\text{CORREL } kullamã] \\ \text{COMPS } < [\text{CONT}[1]'imp - comp']> \end{array} \right] \right] \right]$$

$$(63) \text{ kullamã-1} \rightarrow \left[\text{SS|LOC} \left[\text{CAT} \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{CORREL } none \\ \text{MOD S} \end{array} \right] \\ > \end{array} \right] \right] \right]$$

$$(64) \text{ kullamã-2} \rightarrow [\text{SS|LOC}[\text{CAT}[\text{HEAD}[\text{MOD CP}]>]]$$

$$(65) \text{ kullamã-3} \rightarrow \left[\text{SS|LOC} \left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD}[\text{MOD } none] \\ \text{COMPS } < [\text{CONT}[1]]> \end{array} \right] \\ \text{CONT}[1] \end{array} \right] \right]$$

The description in (48) combines the properties in (60), (61) and (63). The description in (56) combines those in (60), (61), (62) and (64). Finally, the description in (57) combines the properties in (60), (62) and (65). With this system of types and constraints, we capture the similarities among the three elements.

We turn now to the other correlative clauses highlighted in section 3. It is not difficult to extend the approach developed above to accommodate them. First we need the following constraints on the relevant phrase types to ensure that the right complementizers appear:

$$(66) \text{ } \textit{?i-f-cl} \rightarrow [\text{DTRS } <[\text{CORREL } fa], [\text{CORREL } \textit{?i}\delta aa]>]$$

$$(67) \text{ } \textit{l-l-cl} \rightarrow [\text{DTRS } <[\text{CORREL } la], [\text{CORREL } law]>]$$

$$(68) \text{ } \textit{b-?i-cl} \rightarrow [\text{DTRS } <[\text{CORREL } \textit{?i}\delta ann], [\text{CORREL } bimaa]>]$$

$$(69) \quad b-b-cl \rightarrow [DTRS <[CORREL \textit{biqadri-maa}, \\ [CORREL \textit{biqadri-maa}]>]$$

Then we need lexical descriptions for the complementizers. In the case of *bimaa* and *?iðann*, we propose the following (ignoring semantics):³

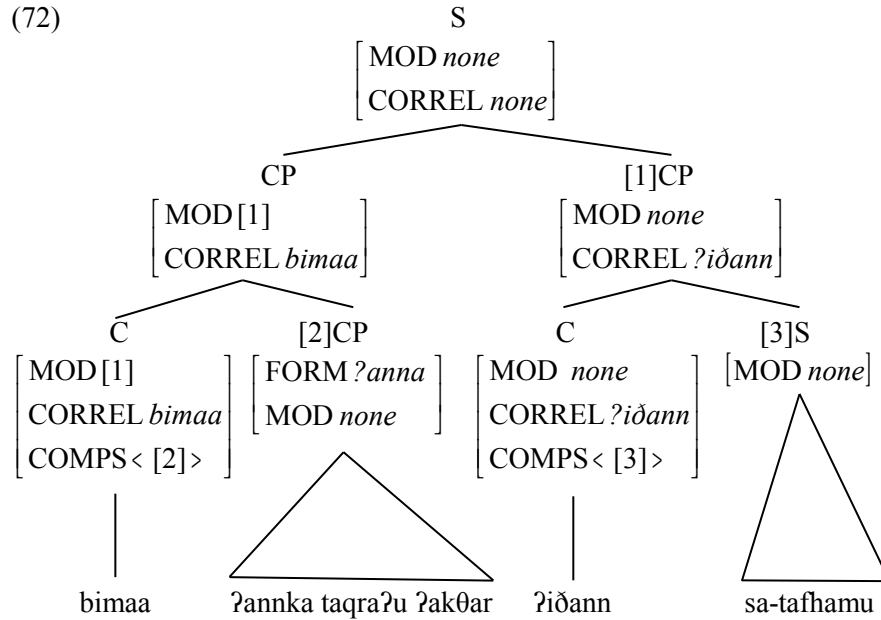
$$(70) \quad \left[\begin{array}{c} \text{PHON } \textit{bimaa} \\ \\ \text{SYNSEM} | \text{LOCAL} \end{array} \left[\text{CAT} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \textit{comp} \\ \text{CORREL } \textit{bimaa} \\ \text{MOD CP} \end{array} \right] \\ \\ \text{SUBJ } <> \\ \text{COMPS } < \text{CP}[\text{FORM } ?\textit{anna}]> \end{array} \right] \right] \right]$$

$$(71) \quad \left[\begin{array}{c} \text{PHON } ?\textit{iðann} \\ \\ \text{SYNSEM} | \text{LOCAL} \end{array} \left[\text{CAT} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \textit{comp} \\ \text{CORREL } ?\textit{iðann} \\ \text{MOD none} \end{array} \right] \\ \\ \text{SUBJ } <> \\ \text{COMPS } < \text{S } > \end{array} \right] \right] \right]$$

These give the following structure for the *bimaa*-*?iðann* construction in (27):

³ *?iðann* allows both a verb-initial and a subject-initial complement but requires its complement to be future tense. We ignore this in (71).

(72)



Apart from the fact that *bimaa* takes a CP complement, this is very similar to the representation for the CC construction in (58). The other correlative clauses will have similar structures.

5. Conclusion

We have argued in this paper that MSA has a CC construction which is very different from the English CC construction and the other CC constructions discussed in Den Dikken (2005). We have shown that both the rather unusual CC construction of MSA and the various related constructions are unproblematic for HPSG and we have outlined detailed analyses, drawing on the approach to such constructions developed in Borsley (2004, 2011).

There is one final point that we should make here. Although we have emphasized that the MSA CC construction is quite different from those which Den Dikken focused on, we do not want to suggest that anything goes in this area. We have shown that the MSA CC construction is quite similar to a number of other MSA correlative clauses. In English and other languages, the CC construction seems to be a rather specialized correlative clause. In MSA, it is rather ordinary example of such a clause. However, the fact remains that we have evidence here that there is more variation in this area than Den Dikken (2005) assumed, and hence an important challenge for the view that grammatical systems are the result of setting a relatively small number of parameters.

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