

CONSTRUCTIONS, FUNCTIONAL HEADS, AND COMPARATIVE CORRELATIVES¹

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1. Introduction

In this paper I will discuss two theoretical concepts and one area of syntax. The concepts are CONSTRUCTIONS, which play a central role in some frameworks but are rejected in others, and FUNCTIONAL HEADS, which appear to be the main alternative to constructions. The area of syntax is what is generally called the COMPARATIVE CORRELATIVE or comparative conditional (CC) construction although of course whether this is anything more than a convenient label is a matter for debate. I will consider what sort of account of this area the two approaches can provide. I will argue that the first is the more promising.

The paper is organized as follows. In section 2, I outline the main current views of constructions and explain how functional heads might be seen as an alternative. In section 3, I introduce the CC construction, highlighting its idiosyncratic properties and the properties it shares with certain other constructions. In section 4, I present a construction-based analysis of the data. In section 5, I consider what a functional head-based analysis would involve. Finally, in section 6, I summarize and conclude the paper.

2. Background

Informal discussions of syntax often talk about constructions even if the author does not regard them as a necessary theoretical concept. Thus, to take one striking example, the term is used over a hundred times in Den Dikken's (2005) paper on the CC construction, a paper which emphatically rejects the idea that constructions are real. There are two very different views about the status of constructions in the literature. On the one hand, for a variety of work, beginning perhaps with Fillmore *et al.* (1988), they play a central role in syntactic analyses. Particularly important here is the Head-driven Phrase Structure Grammar (HPSG) framework, as it has developed since the mid-1990s (see especially Sag 1997, forthcoming; and Ginzburg and Sag 2000). In contrast, Chomsky has long claimed that constructions do not exist. For example, Chomsky (1995: 6) asserts that there are 'no grammatical constructions of the traditional sort within or across languages'. Thus, it may be convenient to speak of constructions, but on the Chomskyan view they are not required in a formal analysis.

¹ This paper is partly based on joint work with Anne Abeillé, represented especially in Abeillé and Borsley (2008). An earlier version of the paper was presented at the meeting of the Linguistics Association of Great Britain at the University of Edinburgh in September 2009. I am grateful to the audience there and at CSSP 2009 for their comments. I am also grateful to an anonymous referee for a number of interesting comments. Any bad bits are my responsibility.

The objection to constructions is not normally spelled out in any detail. However, the idea seems to be that they miss generalizations because constructions share properties with other constructions. In a brief discussion of the issue, Rizzi (2004: 328) suggests that there are ‘more elementary computational elements’. This is undoubtedly right. It has been clear, for example, since Ross (1967) and especially Chomsky (1977), that the various unbounded dependency constructions share properties such as being subject to island constraints. However, the fact that there are families of constructions with shared properties is well understood in construction-based work, and as we will see below, it is not difficult to capture the similarities between constructions within a construction-based approach. Thus, the fact that constructions share properties with other constructions is no objection to such an approach.

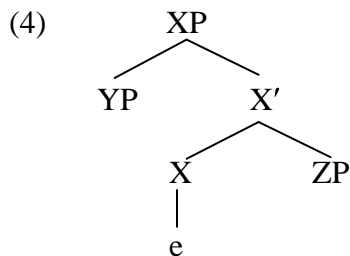
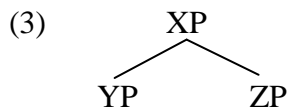
Rizzi goes on to assert that constructions are ‘mere conglomerates of such finer ingredients’ (2004: 328). He seems to be suggesting that all the properties of any construction are shared with some other construction and hence that constructions do not have any distinctive properties. On the face of it, however, constructions often have such properties. Consider, for example, non-finite relative clauses. Unlike finite relative clauses, they only allow a PP filler. Thus, whereas both versions of (1) are fine, only the second version of (2) is grammatical:

(1) someone $\left\{ \begin{array}{l} \text{who I rely on} \\ \text{on whom I rely} \end{array} \right\}$

(2) someone $\left\{ \begin{array}{l} * \text{who to rely on} \\ \text{on whom to rely} \end{array} \right\}$

Such idiosyncrasies look like a problem for the view that there are no constructions.

Given idiosyncrasies like these, how might the position that there are no constructions be maintained? An uncharitable answer would be: by ignoring the data. It is certainly true that a lot of work which rejects constructions ignores a lot of data. Culicover and Jackendoff (2005: 535) note that ‘much of the fine detail of traditional constructions has ceased to garner attention’, and various people have said similar things. A more charitable answer would be: with phonologically empty functional heads. Instead of assuming structures like (3), one can assume structures like (4).



Then instead of stipulating that XP has YP as its first daughter and ZP as its second daughter, one can stipulate that X has YP as its specifier and ZP as its complement. This is the alternative to constructions which has been assumed within Principles and Parameters Theory and Minimalism.

It seems, then, that constructions and functional heads provide two rather different approaches to syntactic phenomena. It clearly makes sense to try to see which approach works best. Any construction might provide a suitable testing ground. One could look at relative clauses, where a detailed construction-based analysis is available in Sag (1997), or *wh*-interrogatives, where Ginzburg and Sag (2000) provide a comprehensive construction-based account. In the following pages I will look at the comparative correlative construction, exemplified by (5), and consider what the two approaches can say about it.

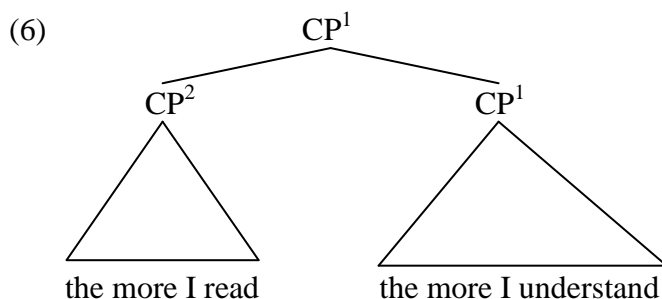
(5) The more I read, the more I understand.

I will outline the properties of the construction in the next section.

3. The comparative correlative (CC) construction

The CC construction was first highlighted within syntactic theory in Ross (1967), and it has received quite a lot of attention since the publication of Culicover and Jackendoff (1999).

Culicover and Jackendoff argue that it is a special construction, which ‘does not conform to the general patterns of X-bar theory’ (1999: 567). They discuss its properties, but they do not provide an explicit analysis. In a response, den Dikken (2005) rejects their position, commenting that ‘[t]he idea here is emphatically not that the comparative correlative is a “construction” with a fixed template; rather, the comparative correlative has a number of lexical ingredients, in language after language, that incontrovertibly lead to projection of a structure like (30) in syntax’ (516). His (30) is a structure in which the first clause is adjoined to the second, i.e. the structure in (6).



Adjunction is presumably a feature of X-bar theory. Hence, this structure conforms to ‘the general patterns of X-bar theory’. However, as discussed in Abeillé and Borsley (2008), den Dikken does not explain how the lexical ingredients lead to the projection of such a structure or how the various idiosyncrasies of the construction highlighted by

Culicover and Jackendoff might be handled. Thus, he has not shown that it is not a special construction.

The CC construction consists of a pair of finite clauses, each with an initial constituent containing *the* and a comparative word of some kind. In other words, it has the following form:

(7) [[*the* comparative ...] ...] [[*the* comparative ...] ...]

I will call the clauses *the*-clauses and the initial constituents *the*-phrases. Ross (1967) and Culicover and Jackendoff (1999) show that *the*-clauses are filler-gap constructions rather like *wh*-interrogatives and *wh*-relatives. However, the construction has some unusual properties, which pose an important challenge for theories of syntax.

Firstly, as noted by Culicover and Jackendoff (1999: 546), the *the*-phrase may be followed by the complementizer *that*:

(8) The more that I read, the more that I understand.

This contrasts with the situation in *wh*-interrogatives and *wh*-relatives, as the following illustrate:

- (9) a. I wonder how much (*that) he reads.
b. the books which (*that) he reads

Secondly, the construction allows the omission of a copula under certain circumstances (Culicover and Jackendoff 1999: 554). This is possible if: (i) its complement is fronted, (ii) it is the main verb of the clause, (iii) *that* is not present, and (iv) the subject has a non-specific interpretation. All four conditions are met in (10), but (11a) violates the first, (11b) and (11c) violate the second, (11d) violates the third, and (11e) violates the fourth.

- (10) The more intelligent the students, the better the marks.
(11) a. *The more intelligent the students, the more marks given.
b. *The more intelligent the students, the better the marks will.
c. *The more intelligent the students, the better it seems the marks.
d. *The more intelligent that the students, the better that the marks.
e. *The more intelligent they, the more pleased we.

It is not normally possible to omit the copula even if it is a main verb and its complement is fronted, as the following show:

- (12) a. *The students very intelligent.
b. *How intelligent the students?
c. *I wonder how intelligent the students.

Thirdly, the *the*-phrase may not contain a pied piped preposition (Culicover and Jackendoff 1999: 559). Thus, while (13a) is fine, (13b) is ungrammatical.

- (13) a. The more people I talk to, ...
 b. *To the more people I talk, ...

This is unlike the situation in *wh*-interrogatives and *wh*-relative clauses, as the following show:

- (14) a. How many people did Kim talk to?
 b. To how many people did Kim talk?
 (15) a. the people Kim talked to
 b. the people to whom Kim talked

Finally, it seems that the first clause is a rather unusual kind of adjunct clause. Culicover and Jackendoff (1999: 549–550) show that there is a variety of evidence that the second clause is a main clause. For example, it is possible to have a tag question reflecting the second clause but not one reflecting the first clause.

- (16) a. The more we eat, the angrier you get, don't you?
 b. *The more we eat, the angrier you get, don't we?

Similarly, in the right context, the verb in the second clause may have subjunctive morphology, but this is not possible with the verb in the first clause.

- (17) $\left\{ \begin{array}{l} \text{It is imperative that} \\ \text{I demand that} \end{array} \right\} \left\{ \begin{array}{l} \text{the more John eats, the more he pay.} \\ \text{*the more John eat, the more he pays.} \end{array} \right\}$

Culicover and Jackendoff also note (1999: 559) that subject–auxiliary inversion is possible in the second clause but not in the first clause. Thus, (18a) seems acceptable, but not (18b):

- (18) a. ?The more Bill smokes, the more does Susan hate him.
 b. *The more does Bill smoke, the more Susan hates him.

Given that subject–auxiliary inversion does not normally occur in subordinate clauses but occurs in various types of main clause, this provides further evidence that the second clause is a main clause. It seems that the first clause is a subordinate clause, and since it is not the complement of some lexical head, it is presumably an adjunct. However, it is obligatory and confined to initial position. Thus, (19a) is ungrammatical and (19b) has a meaning different from (5).

- (19) a. *The more I read.
 b. The more I understand, the more I read.

This is unlike the situation with a typical adjunct clause, e.g. a *when*-clause, which is optional and can appear in initial or final position, as the following show:

- (20) a. I understand more.
 b. When I read more, I understand more.
 c. I understand more when I read more.

Although the construction is an unusual one, it is not unique. Both the construction as a whole and the component *the*-clauses are similar in certain ways to certain other constructions and clauses.

Looking first at *the*-clauses, we have already indicated that they are filler-gap constructions like *wh*-interrogatives and *wh*-relatives. Like other filler-gap constructions, they are subject to island constraints, as Ross (1967) observed. More specifically, *the*-clauses resemble what Huddleston and Pullum (2002: 14.6) call exhaustive conditionals.² The latter also allow copula omission, as the following illustrates:

- (21) However good the students (are), ...

It seems, then, that copula-omission is a feature of two English constructions.³

Turning to the construction as a whole, we can note that it is similar in certain ways to the *if-then* construction, highlighted by McCawley (1988), and the *as-so* construction, highlighted by den Dikken (2003). The following illustrate:

- (22) a. If I read more, then I understand more.
 b. As I read more, so I understand more.

Here, as in the CC construction, the second clause has a distinctive form and cannot easily appear on its own. The following are only possible if the context provides an interpretation for *then* and *so*, and *so* at least seems to be a different element here.

- (23) a. ?Then I understand more.
 b. ?So I understand more.

² Huddleston and Pullum argue that these clauses, which look rather like free relatives, are in fact a type of interrogative. (See also Rawlins 2008.) In Abeillé and Borsley (2008) we referred to them as adjunct free relatives. I now think this was a mistake.

³ An anonymous referee suggests that a further similarity between *the*-clauses and exhaustive conditionals is that both allow multiple occurrences of key phrase types. He/she cites the following examples:

- (i) The more people drive at higher speeds on narrower roads, the more accidents you are going to get.
 (ii) Whichever book you buy in whichever store, you always end up paying too much.

Notice, however, that whereas (ii) contains two *wh-ever* phrases, (i) contains just a single *the*-phrase and the in-situ comparative phrases lack *the*. Thus, there is an important difference here. Notice also that the possibility of multiple *wh-ever* phrases in exhaustive conditionals is unsurprising if they are a type of interrogative, as Huddleston and Pullum and Rawlins argue.

As in the CC construction, the order of clauses is fixed in the *if-then* and the *as-so* constructions. The following have a different interpretation from the examples in (22) and, again, are only possible if the context provides an interpretation for *then* and *so*.

- (24) a. ?Then I understand more if I read more.
 b. ?So I understand more as I read more.

The CC construction, the *if-then* construction, and the *as-so* construction all have related simpler constructions, as the following illustrate:

- (25) a. I understand more the more I read.
 b. I understand more if I read more.
 c. I understand more as I read more.

(25a) is an example of what McCawley (1988) calls the reversed CC construction. All three examples seem to involve a main clause followed by an adjunct clause, which, like standard adjunct clauses, is optional, as (26) shows:

- (26) I understand more.

Unlike the other examples, (25a) requires the main clause to have a comparative interpretation.⁴ It also does not allow the fronting of the adjunct clause, unlike the examples in (25b, c).

- (27) a. *The more I read, I understand more.
 b. If I read more, I understand more.
 c. As I read more, I understand more.

Otherwise, however, the reversed CC construction seems to be a fairly standard main clause + adjunct clause structure.

Thus, both the construction and its component clauses have distinctive properties and also properties that they share with other constructions and clauses. A satisfactory analysis must capture both the distinctive properties and the shared properties.

4. A construction-based analysis

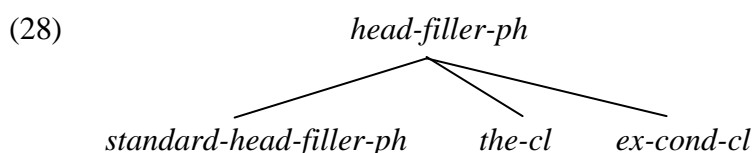
In this section, I will present a construction-based analysis of the CC construction within the version of HPSG developed in Ginzburg and Sag (2000). This will be similar although not identical to that presented in Borsley (2004).

⁴ It need not contain a comparative word. As noted by McCawley (1988), examples like the following are fine:

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

Before we proceed we can note that an unstructured set of constructions, each with a stipulated set of properties, would make no distinction between the idiosyncratic properties of a construction and the properties it shares with other constructions, and generalizations would be missed. This is essentially Rizzi's objection to a construction-based approach. However, much construction-based work, including work in HPSG, assumes a hierarchical classification of constructions. This allows the two sorts of properties to be distinguished and the generalizations to be captured.

An analysis needs an appropriate set of hierarchically classified constructions (or phrase types) and constraints on them. I will look first at *the*-clauses and then consider the CC construction as a whole. *The*-clauses and exhaustive conditionals can be analysed as two non-standard types of head–filler phrase, giving the following hierarchy of phrase types:



Wh-relatives, *wh*-interrogatives and other filler–gap constructions will be subtypes of *standard-head-filler-ph*. The type *head-filler-ph* will be subject to the following constraint:

(29) *head-filler-ph* \rightarrow $\left[\begin{array}{l} \text{SLASH } \{ \} \\ \text{DTRS } \langle [\text{LOC } [1]], [2][\text{SLASH } \{[1]\}] \rangle \\ \text{HD - DTR } [2] \end{array} \right]$

This requires a head–filler phrase to be SLASH { } and to have a head daughter and a non-head daughter whose LOCAL value is the local feature structure within the value of SLASH on the head daughter. This captures the properties which all head–filler phrases, both standard and non-standard, share, and in particular ensures that filler and gap match. The type *standard-head-filler-ph* will be subject to the following constraint, which requires it to be verbal and to be [NULL–].

(30) *standard-head-filler-ph* \rightarrow $\left[\begin{array}{l} \text{HEAD } v \\ \text{NULL } - \end{array} \right]$

This constraint rules out standard head–filler phrases headed by a complementizer and with a missing copula, and thus accounts for the ungrammaticality of the following:

- (31) a. *I wonder [who that I saw].
 b. *I wonder [how good the students].

The type *the-cl* will be subject to the constraint in (32).

$$(32) \quad \textit{the-cl} \rightarrow \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{VFORM } \textit{fin} \\ \text{MOD 'S[imp - comp]'} \end{array} \right] \\ \text{CORREL } \textit{the} \end{array} \right]$$

This requires a *the*-clause to be finite, unlike, for example, *wh*-interrogatives and *wh*-relatives. It also requires it to modify a clause with an implicit comparative interpretation, which I represent informally as ‘S[imp-comp]’. Finally, it requires it to be [CORREL *the*]. I assume that [CORREL *the*] is realized as a degree word *the*, which can only appear as a specifier of a comparative adjective.⁵ I also assume that CORREL is an EDGE feature in the sense of Miller (1992). As such, it will be realized on the leftmost constituent of the expression it is associated with, ruling out a pied-piped preposition as in (13b) above. Since *the*-clauses are not standard head–filler phrases, they are not required to be verbal, and hence may be headed by a complementizer, and may be [NULL +], and hence have a missing copula. Thus, (8) and (10), repeated here as (33), are allowed:

- (33) a. The more that I read, the more that I understand.
 b. The more intelligent the students, the better the marks.

How exactly should missing copula examples be analysed? An obvious approach is to assume that [NULL +] picks out a phonologically null finite copula with the following properties:

$$(34) \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{v} \\ \text{VFORM } \textit{fin} \\ \text{NULL +} \end{array} \right] \\ \text{SUBJ } \langle [1]\text{NP['F']} \rangle \\ \text{COMPS } \diamond \\ \text{SLASH } \{ \text{XP}[\text{SUBJ } \langle [1] \rangle] \} \end{array} \right]$$

‘F’ here stands for whatever restrictions need to be placed on the subject, the COMPS feature ensures that this form does not have an in-situ complement, and the SLASH feature ensures that it has a fronted complement. Within this approach, (11a) is out because it has an in-situ complement, and (11b) is out because it is a non-finite form of the copula that is missing. (11c) and (11d) will be out if only the head of a head–filler phrase can be [NULL +]. Finally, (11c) is excluded by ‘F’.

⁵ Henk van Riemsdijk suggested to me that the appearance of *the* could be explained if *the more I read* has essentially the same structure as ‘the extent to which I read’. The problem with this suggestion is that English is very unusual in having the definite article in its CC construction. Most languages have other pre-comparative words or no pre-comparative words at all. See den Dikken (2005) for a variety of examples.

Turning to the type *ex-cond-cl* we can propose a constraint requiring it to be finite and verbal, to modify a clause, and to have a first daughter which is a WH-EVER expression as follows:⁶

$$(35) \textit{ex-cond-cl} \rightarrow \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \nu \\ \text{VFORM } \textit{fin} \\ \text{MOD S} \end{array} \right] \\ \text{DTRS} < [\text{WH-EVER } \square], [\square] > \end{array} \right]$$

This constraint rules out an exhaustive conditional headed by a complementizer, as in (36).⁷

(36) *However good that the students are, ...

Since exhaustive conditionals are not standard head–filler phrases, they may be [NULL +] and hence have a missing copula, as in (37).

(37) However good the students, ...

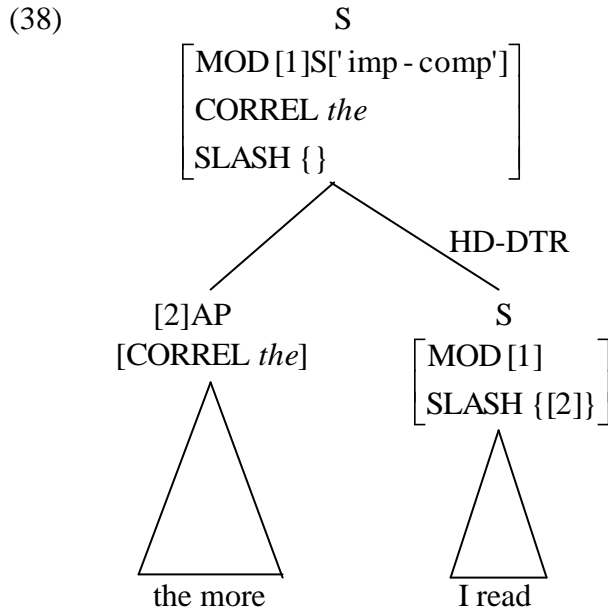
Within this analysis, the first clause in (5) will have the structure in (38), where ‘S’ is an abbreviation for [HEAD ν , SUBJ $\langle \rangle$, COMPS $\langle \rangle$]:

⁶ The analysis needs to be extended in some way to accommodate a second type of exhaustive conditional.

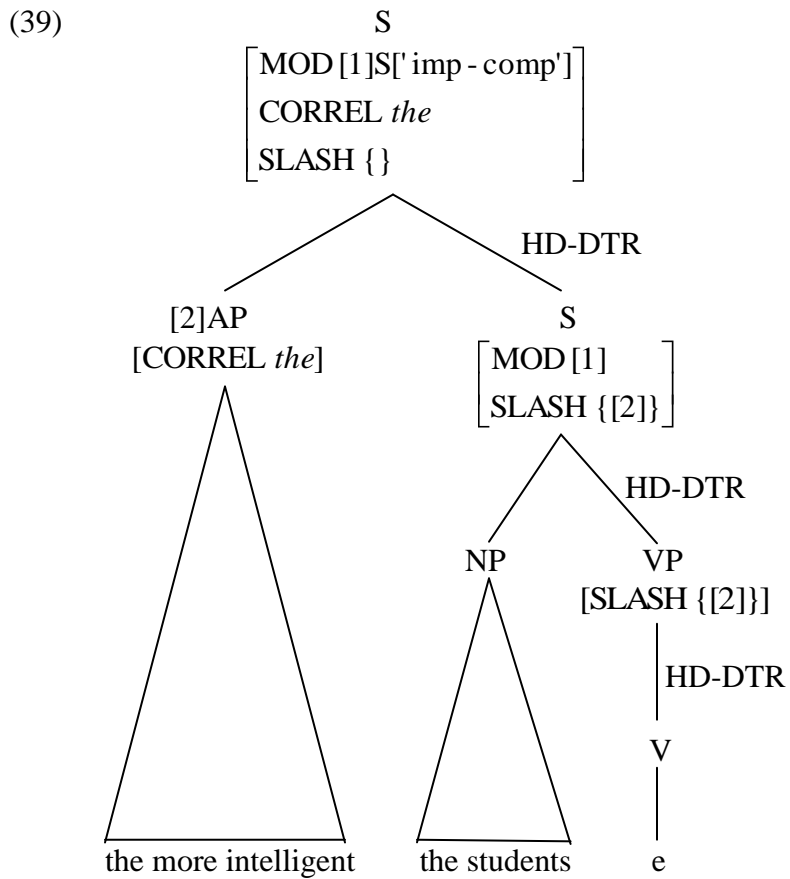
(i) $\left. \begin{array}{l} \text{No matter} \\ \text{Irrespective of} \\ \text{Regardless of} \end{array} \right\} \text{ how good the students (are), ...}$

I will not consider how this might be done.

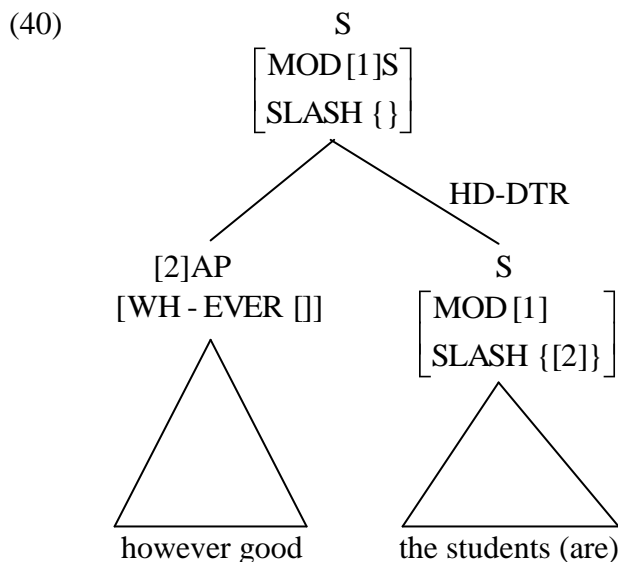
⁷ If such examples are acceptable for some speakers, they will have a simpler constraint, without ν in the value of HEAD.



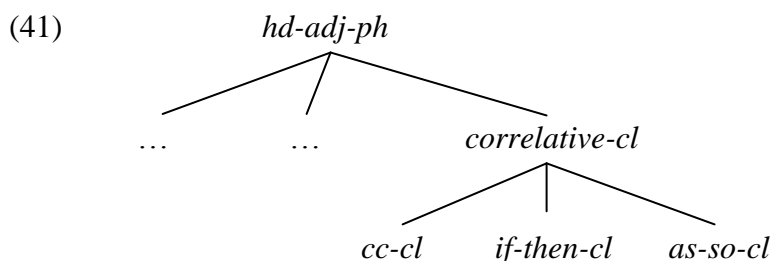
The second clause will have the same structure. The first clause in (10) will have the structure in (39):



Again, the second clause will have the same structure. The exhaustive conditional in (21) will have the following structure:



We can turn now to the construction as a whole. The CC, *as-so*, and *if-then* constructions can be analysed as subtypes of correlative clause, the latter being a non-standard type of head–adjunct phrase, giving the following hierarchy of phrase types:



Other types of head–adjunct phrases will be VP + adverb structures, adjective + nominal structures and noun + relative structures. The type *hd-adj-ph* will be subject to a constraint requiring the head daughter to have the syntactic and semantic properties in the MOD value of the non-head daughter as follows:

$$(42) \text{hd-adj-ph} \rightarrow \left[\begin{array}{l} \text{DTRS} < [1][\text{SS} [2]], [\text{HEAD} [\text{MOD} [2]]] > \\ \text{HD - DTR} [1] \end{array} \right]$$

In most head–adjunct phrases the phrase and its head will have the same category. This will follow from the Generalized Head Feature Principle of Ginzburg and Sag (2000: 33), which we can formulate as follows:

$$(43) \text{hd-ph} \rightarrow \left[\begin{array}{l} \text{SYNSEM} / [1] \\ \text{HD - DTR} [\text{SYNSEM} / [1]] \end{array} \right]$$

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 correlative clauses, the clause and its head will not have the same category. The head will be [CORREL *the*], [CORREL *then*], or [CORREL *so*], but the clause must be [CORREL *none*] to rule out an example like the following, in which a CC construction is the head of another CC construction:

(44) *The more I think [the more I read, the more I understand].

It may be that head–adjunct phrases should be required to be [CORREL *none*], but I will just impose this restriction on correlative clauses. I suggest the following constraint:

$$(45) \textit{correlative-cl} \rightarrow \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} v \\ \text{MOD } \textit{none} \end{array} \right] \\ \text{CORREL } \textit{none} \end{array} \right]$$

This requires correlative clauses to be verbal, to be [MOD *none*], and to be [CORREL *none*]. The first restriction ensures that the construction is verbal even when the main clause is headed by a complementizer, as in (8), repeated here as (46).

(46) The more that I read, the more that I understand.

The second restriction is necessary in the case of the CC construction, where the head will be [MOD ‘S[imp-comp]’]. It prevents the construction from being a modifier, ruling out an example like (47).

(47) *I know more, [the more I read, the more I understand].

The role of the third restriction has just been discussed.

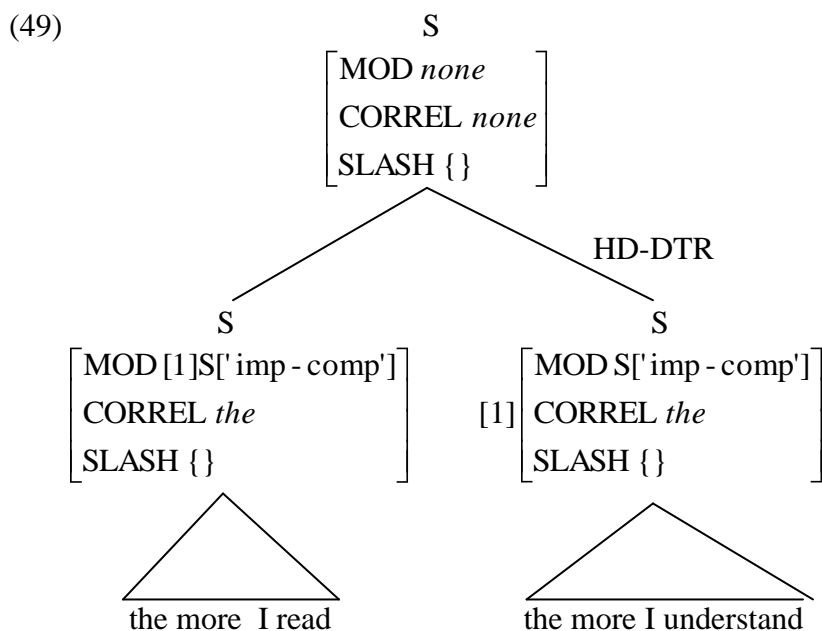
Of course we also need to accommodate the distinctive properties of the three subtypes of correlative clause. We can do this with the following constraints:

$$(48) \begin{array}{l} \text{a. } \textit{cc-cl} \rightarrow \left[\text{DTRS } \langle [\text{CORREL } \textit{the}], \left[\begin{array}{l} \text{CORREL } \textit{the} \\ \text{INV } - \end{array} \right] \rangle \right] \\ \text{b. } \textit{if-then-cl} \rightarrow [\text{DTRS } \langle [\text{CORREL } \textit{then}], [\text{CORREL } \textit{if}] \rangle] \\ \text{c. } \textit{as-so-cl} \rightarrow [\text{DTRS } \langle [\text{CORREL } \textit{so}], [\text{CORREL } \textit{as}] \rangle] \end{array}$$

Notice that the first member of the DTRS list is the head. This follows from the fact that correlative clauses are head–adjunct structures, subject to the constraint in (42). The [INV–] specification on the second daughter in (48a) ensures that there is no inversion in

the first clause of the CC construction. The absence of any value for INV on the first daughter means that inversion is possible.⁸

Within this approach, (5) will have the following structure:



Here the first clause is an adjunct modifying the second clause, which is a head. Although it is a head, the construction has different values for MOD and CORREL, as required by (45). The *as-so* and *if-then* constructions will have similar structures.

Here, then, we have a fairly detailed construction-based analysis of the English CC construction, one which captures both the idiosyncratic properties of the construction and the properties it shares with other constructions. As far as I am aware, it does not miss any generalizations.⁹

5. A functional head-based approach

We can now consider what the functional head-based approach to the CC construction might look like. As far as I am aware, there are no functional head-based analyses in the literature, only certain sketches, which need to be fleshed out. As emphasized in Abeillé and Borsley (2008), a sketch is all that den Dikken (2005) provides. As in the previous

⁸ The second daughter in (48c) should also be [INV-]. However, this is probably not required for the second daughter in (48b) given examples like the following:

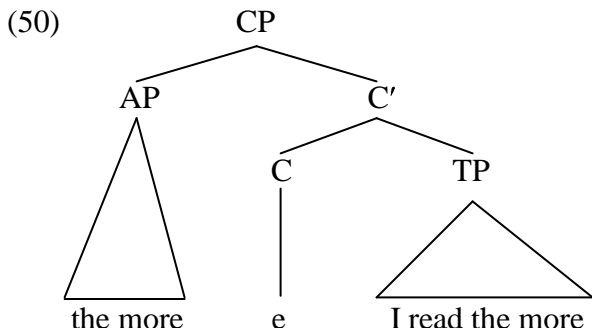
- (i) Had I been there, then I would have seen you.

We can analyse this as an example of the *if-then* construction if we do not require the second daughter to be [INV-] and if we allow certain finite auxiliaries to be [CORREL *if*].

⁹ An important limitation of this approach is that it says nothing about meanings. For an HPSG analysis of the CC construction which incorporates a semantic analysis see Sag (forthcoming).

section, I will first look at the clauses that make up the construction and then consider the construction as a whole.

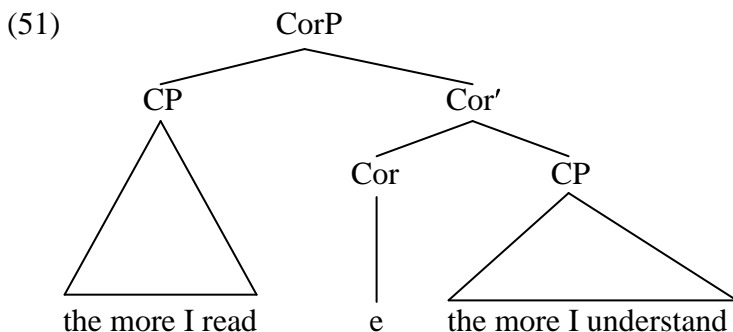
Within the functional head-based approach *the*-clauses will have something like the following structure:



The two clauses of the CC construction will have somewhat different complementizers, one heading an adjunct and not attracting an auxiliary, the other not heading an adjunct and optionally attracting an auxiliary. Both complementizers may be realized as *that*. Both must also allow TP to be headed by a phonologically null form of the copula whose complement is obligatorily fronted. However, they must only allow this if they are phonologically null. It is not really clear how this approach could exclude a pied piped preposition.

Within this approach, exhaustive conditionals will require another complementizer. This will always be phonologically empty but like the two complementizers for *the*-clauses will allow TP to be headed by a phonologically null form of the copula.

What about the construction as a whole? As noted earlier, den Dikken (2005) proposes that the first clause is adjoined to the second. However, this analysis does not explain why the first clause is obligatory. The obvious alternative is an analysis in which the first clause is the specifier and the second the complement of an empty functional head. If we call this Cor(relative), we will have the following structure:



The *if-then* and *as-so* constructions will require further empty functional heads selecting an appropriate specifier and complement. *If* and *as* can probably be analysed as complementizers heading the clauses they introduce. However, *then* and *so* would probably be analysed as specifiers. If so, *then*- and *so*-clauses will involve further phonologically empty complementizers.

Thus, whereas a construction-based approach needs a variety of phrase types to handle the data, a functional head-based approach needs a variety of mainly empty functional heads. These elements need to take the right sort of specifier and complement, to either head an adjunct or not, and to either attract an auxiliary or not. The following table spells out these properties:

Functional head	Form	Specifier	Complement	Adjunct-heading	Aux-attraction
<i>C(the-main)</i>	<i>(that)</i>	<i>the-phrase</i>	finite TP with copula omission	No	Optional
<i>C(the-subord)</i>	<i>(that)</i>	<i>the-phrase</i>	finite TP with copula omission	Yes	No
<i>C(ex-cond)</i>	e	<i>wh-ever-phrase</i>	finite TP with copula omission	Yes	No
<i>Cor(CC)</i>	e	subordinate <i>the-CP</i>	main <i>the-CP</i>	No	No
<i>Cor(if-then)</i>	e	<i>if-CP</i>	<i>then-CP</i>	No	No
<i>Cor(as-so)</i>	e	<i>as-CP</i>	<i>so-CP</i>	No	No
<i>C(if)</i>	<i>if</i>	No	finite TP	Yes	No
<i>C(then)</i>	e	<i>then</i>	finite TP	No	No
<i>C(as)</i>	<i>as</i>	No	finite TP	Yes	No
<i>C(so)</i>	e	<i>so</i>	finite TP	No	No

Table 1. The properties of functional heads.

A real analysis would need to provide lexical entries for these elements which encode these properties. However, it is not really clear what form these entries should take.¹⁰ There don't seem to be any generally accepted positions within Minimalism on how these properties should be handled. It seems to be generally assumed that specifiers of functional categories are filled by movement, but at least in the case of movement to SpecCP there are different positions in Chomsky's writings. In Chomsky (2000), C and the moved constituent undergo Agree and movement to SpecCP is triggered by an EPP feature on C. In Chomsky (2008), Agree is not involved here, and movement is triggered by what Chomsky calls an Edge Feature (which is something quite different from Miller's EDGE features). Complement selection seems to have had little attention within Minimalism. As for adjuncts, one view, developed in Cinque (1999), is that they are the specifiers of functional heads, but of course there are various ways in which this idea might be implemented. Movement of an auxiliary to C is often said to be triggered by the affixal nature of the head to which movement occurs, but it is not really clear what this means other than that the head triggers head-movement.

Given appropriate lexical entries, it should be possible to get most of the facts right. However, there is a rather obvious problem. An unstructured set of functional heads

¹⁰ While the properties of lexical elements, especially empty functional heads, are central for Minimalism, lexical entries are almost never provided. As Newmeyer (2003: 95, fn. 9) notes, 'in no framework ever proposed by Chomsky has the lexicon been as important as it is in the MP [Minimalist Program]. Yet in no framework proposed by Chomsky have the properties of the lexicon been as poorly investigated'.

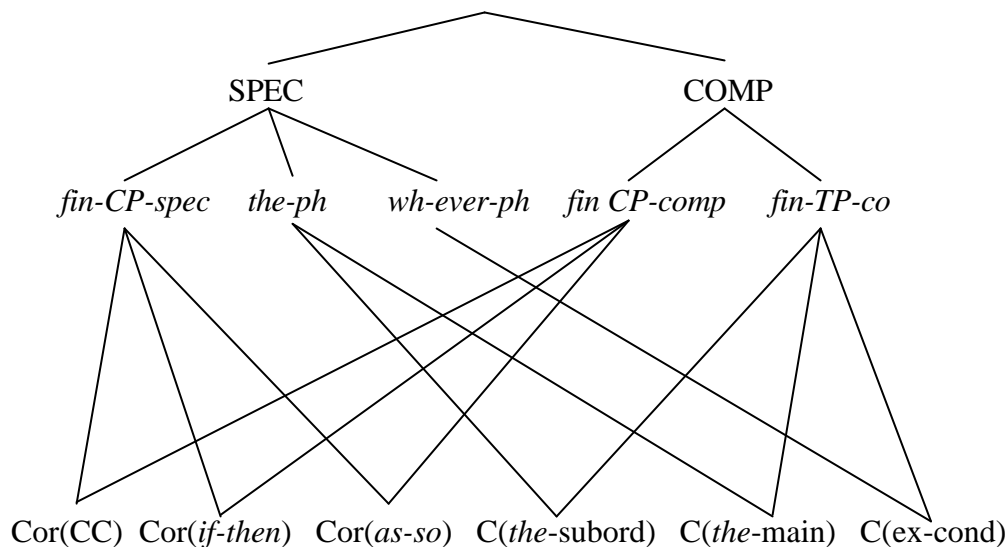
makes no distinction between properties shared by some or all elements and properties restricted to a single element, and thus misses generalizations. Here are the main similarities:

- (52) a. $C(\textit{the-main})$, $C(\textit{the-subord})$, and $C(\textit{ex-cond})$ have the same complement.
 b. $C(\textit{the-main})$ and $C(\textit{the-subord})$ have the same specifier.
 c. $F(\textit{CC})$, $F(\textit{if-then})$, and $F(\textit{as-so})$ are similar in taking CP as specifier and complement.
 d. $C(\textit{the-subord})$, $C(\textit{if})$, and $C(\textit{as})$ are similar in modifying a clause.

Thus, an unstructured set of functional heads has exactly the same problem as an unstructured set of constructions. It is somewhat surprising that this point has been missed by advocates of functional head-based approaches. This is probably a reflection of the fact that they do not develop detailed analyses.

The obvious response to this problem is to introduce some structure, more precisely to introduce a hierarchical classification of functional heads. Such a classification has been assumed in HPSG since Pollard and Sag (1987) to allow properties that are shared between different words to be spelled out just once. I will not try to work out a complete classification, but I will sketch a partial classification. In (53), I classify six of the functional heads postulated above on the basis of their specifier and complement selection properties. These are independent dimensions of classification identified by upper-case letters, as is standard in HPSG. It may well be that other dimensions would be appropriate for adjunct-heading and auxiliary-attracting properties.

(53)



These types will be associated with features as follows:

Type	Features
<i>fin-CP-spec</i>	features that ensure that a head has a finite CP as a specifier
<i>the-ph</i>	features that ensure that a head has a <i>the</i> -phrase as a specifier
<i>wh-ever-ph</i>	features that ensure that a head has a <i>wh-ever</i> -phrase as a specifier
<i>fin-CP-comp</i>	features that ensure that a head takes a finite CP as a complement
<i>fin-TP-co</i>	features that ensure that a head takes a finite TP allowing copula omission as a complement

Table 2. Types and features for functional heads.

If fully developed, this approach should be able to distinguish between properties shared by some or all elements and properties restricted to a single element, and thus not miss any generalizations. It looks, then, as if it may be possible to develop a functional head-based approach which both gets the facts right and does not miss any generalizations.

How does this approach compare with the construction-based approach presented in the last section? An anonymous referee suggests that the choice between the two approaches is ‘mainly a matter of taste’. Using LGB as an abbreviation for *Lectures on Government and Binding* (Chomsky 1981), he/she concedes that ‘[t]he desire to establish sweeping principles that go well beyond specific constructions in specific languages is often so dominant in LGB/minimalist thinking that analytical details often end up being neglected’ but goes on to suggest that ‘the construction-based approach ... tends to get bogged down in idiosyncrasies, at the expense of trying to establish truly overarching principles of the type that LGB-style work has been relatively successful in discovering’. He/she doesn’t explain in what sense construction-based work is ‘bogged down in idiosyncrasies’. Is Sag (1997) bogged down in the idiosyncrasies of English relative clauses? Is Ginzburg and Sag (2000) bogged down in the idiosyncrasies of English interrogatives? Is the analysis presented in section 4 bogged down in the idiosyncrasies of the CC construction? Such charges would only be justified if the attention to idiosyncrasies that is a feature of these analyses led them to miss important generalizations. I don’t see any reason to think that this is the case. Moreover, it is not clear to me that there are any ‘truly overarching principles’ that have been missed in construction-based work. Hence, I don’t think the choice between the two approaches is just a matter of taste with one preferable if one is interested in general principles and the other preferable if one is interested in idiosyncrasies.

One point to emphasize about the two approaches is that we are not in a position to make a real comparison. We have a fairly detailed construction-based analysis but just a sketch of a functional head-based analysis (though a rather more detailed sketch than den Dikken 2005 provides). The latter needs to be developed more fully. I leave this task to those who favour such an approach.

Although it is not easy to compare the two approaches, we can say certain things about the relation between them. One point we can make is that there are important similarities. One might say that the functional head-based approach mimics the construction-based approach. Another point we can make is that there is no reason to think that the functional head-based approach is any less stipulative than the construction-based approach. It involves different sorts of stipulation, but there is no reason to think

that it requires any fewer stipulations. There is also no reason to think that the functional head-based approach is more explanatory than the construction-based approach, as is suggested by Chomsky's remark that Minimalism 'encourages us to distinguish genuine explanations from "engineering solutions"' (Chomsky 2000: 93).

The similarities between the two approaches might lead someone to suggest that they are notational variants. I think this would be wrong. One approach involves a classification of phrases, while the other involves a classification of mainly phonologically empty lexical elements. The former unquestionably exist, but there is room for debate about the existence of the latter where they are phonologically empty. Arguably an approach involving a classification of elements which undoubtedly exist is preferable other things being equal to one involving a classification of elements whose existence is debatable.

There is a rather different argument which suggests that a construction-based approach is preferable. As Culicover and Jackendoff (2005: chapter 1) point out, canonical idioms such as (54) and constructional idioms such as (55) suggest that linguistic knowledge includes phrases with full and partial lexical content.

(54) Kim kick the bucket.

(55) Elmer hobbled/laughed/joked his way to the bank.

This makes it hard to see what objection there could be to allowing phrases with no specific lexical content as a further component of linguistic knowledge. But this is what canonical constructions are.

Thus, while a real comparison between a construction-based approach to CCs and a functional head-approach requires the fuller development of the latter, there are certain things that we can say about the relation between the two approaches and one is that there seem to be reasons for favouring the former.

6. Concluding remarks

In this paper, I have investigated the relation between two rather different approaches to syntax: the construction-based approach developed especially within HPSG and the functional head-based approach assumed within Principles and Parameters Theory and Minimalism. I have looked in particular how the two approaches might handle the CC construction. I have come to a number of conclusions. In particular I have suggested that there are reasons for preferring a construction-based approach.

As emphasized in the previous section a comparison of the two approaches is hampered by the fact that there are no detailed functional head-based analyses of the CC construction and it is only possible to spell out in fairly general terms what form such an analysis should take. This is not an isolated situation. Consider, for example, English relative clauses, where a detailed construction-based analysis is available in Sag (1997) but where there is no comparable functional head-based analysis, or consider English *wh*-interrogatives, analysed in terms of constructions in Ginzburg and Sag (2000) but never analysed in the same sort of detail in terms of functional heads. Ginzburg and Sag (2000: 1) remark that '[o]nly when comprehensive grammar fragments are commonplace will it

become possible to meaningfully compare available frameworks for grammatical description'. It is hard to see how anyone could disagree with this. However, at present there seem to be no real functional head-based grammar fragments. If none are forthcoming, some may draw some negative conclusions about functional head-based approaches.

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