

On the Lexical Property of Coordinators

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Abstract

Coordinate structures behave quite differently from the other syntactic unites. For example, any category can be present on their both sides, and the categories need to be the same. I propose that these unique behaviors should be ascribed to the lexical property of coordinators. The lexical property is that they have two (pairs of) unspecified slots about categorial values in the Formal Feature Matrix. This property also accounts for the Coordinate Structure Constraint (CSC) effect proposed in Ross (1967). This analysis makes it possible to eliminate CSC.

Keywords: formal feature, inconsistency, Full Interpretation, Coordinate Structure Constraint, multiple Spell-Out

1. Introduction

It is not too much to say that the history of the generative grammar is the struggle to reduce the tension between descriptive adequacy and explanatory adequacy. We have been trying to find out the way of explaining the most data with the fewest principles. It seems to me, however, that the Minimalist Program proposed in Chomsky (1995) has completely shifted the interest from seeking for descriptive adequacy to seeking for explanatory adequacy. This shift will open a new approach to knowledge of language but there seem to be several phenomena left behind. I regard coordinate structures (CSs) as one of those examples.

CSs can be found in every language. They are very primitive and universal in this sense. However, their syntactic behaviors are so mysterious, in other words, their behaviors are difficult to be fitted into linguistic theories, that there has not yet emerged a promising theory incorporating them since Ross (1967) proposed Coordinate Structure Constraint (CSC). Especially, as Postal (1998:183,fn.6) points out, "in the generative literature of the past twenty-five years closely linked to Chomsky's work, the CSC tends to go unmentioned."

There are at least two aspects of the problems concerning CSs. One is about the

structure of CSs, and the other is about their islandhood. They are closely related, though. The flat structure suggested in Riemsdijk and Williams (1986:21) is one of the major alternatives and their island hood is accounted for by the A-over-A principle.

(1) [[NP] and [NP]]

However, the structure (1) is hard to accept because it has no endocentric binary structure, which has been widely assumed since late 80s in Chomskyan literatures. The hierarchical structure (2), which is proposed in Larson (1990) is as follows:

(2) [[NP] [and [NP]]]

The structure (2) is fitted into the above standard assumption and the asymmetries between the two NPs can be accounted for in terms of "c-command," without "linear order." However, the reason why neither NP can be extracted is not mentioned at all.

It seems to me that the above dilemma is one of the reasons why CSs tend to go unmentioned in Chomskyan literatures. The aim of this paper is to show that there is a possibility that we keep the assumption that every phrase structure, including CSs, is endocentric and the islandhood of CSs can be deduced from their lexical property.

The organization of this paper is as follows: In section 2, I present several strange behaviors of CSs. Based on the observations in section 2, I propose a new approach to CSs in section 3. In section 4 I examine how the new approach sheds light on the CSC effect in a quite different way from CSC. Section 5 is devoted to the summary.

2. Mysterious Behaviors of Coordinate Structures

In this paper I assume that the structure of CSs is the endocentric binary one suggested in Larson (1990).¹

(3) [[specifier] [and [complement]]]²

If this is true, CSs show very strange behaviors. First, they have no restriction on the type of the specifier and the complement, unlike the other categories. For example,

¹ See Mukaiyama (1995) for a motivation of the flat structure of CSs

² In this paper I call and, or, and but "coordinator."

Noun, in general, takes NP or a determiner as the specifier and PP as the complement.³

- (4) a. [John]'s mother
- b. [the] picture
- c. pictures [of Megu]

Similarly, Preposition takes NP as the complement and Verb takes NPs as the specifier and the complement. However, coordinators can take any kind of category as the specifier and the complement. Look at the following examples.

- (5) a. I love [John and Mary].
- b. This is his [first and best] novel.
- c. They [loved but hated] each other in those days.
- d. He stole into the castle [silently but quickly].
- e. I feed fine [in front of many people or behind the curtain].
- f. [I will go there] but [he won't].
- g. I told him [that I loved him] but [that I wanted to kill him].

In (5a) the coordinator takes NPs as the specifier and the complement and in (5b) Adjectives, in (5c) Verbs, in (5d) Adverbs, in (5e) PPs, in (5f) Sentences, and in (5g) COMPs. This unrestrictedness on the specifier and the complement can not be found in any other category at all.⁴

Second, basically, the specifier and the complement of CSs must be the same category. We can not observe this property in the other categories, either.

- (6) a. *[John and handsome]
- b. *[young and child]
- c. *[rather and in the pool]
- d. *[Mary and silently]
- e. *[love and inconsistent]

The above examples are judged as ungrammatical instantly even without any context. On the other hand, let us take a look at (7).

³ I do not assume the DP analysis. The point here is not what structure NP has, but that there is a certain selectional restriction on the specifier and the complement.

⁴ Note, incidentally, that coordinators can in principle take the infinite number of elements as the specifier(s) and the complement(s).

- (7) a. [CDs and records]
 b. [examines and records]

The lexical item *records* is ambiguous about the categorial status. It may be a noun or a verb. Once the word is connected with a noun, however, the categorial status is felt to be determined rigidly to be a noun, as in (7a). The same argument is applied to (7b). We come to recognize *records* in (7b) as a verb. This also indicates that the specifier and the complement of CSs must not be different in their categorial status. Of course, this property is one of the reasons which reads us to feel these constructions to be "coordinate structure."

Third, CSs differ from the other categories in that the head does not seem to project. For example, NPs never change their categorial status whatever category they may take as the specifier and the complement.

- (8) a. John was fond of [_{NP} the [_N picture]].
 b. John was fond of [_{NP} the [_N picture] [_{PP} of Megu]].
 c. John had [_{NP} many [_N pictures]] [_{PP} of Megu]].

The categorial status of the maximal projection depends on that of the head as the above examples show. However, in CSs the specifier and the complement appear to be in charge of the whole category.

- (9) a. I love [John and Mary].
 b. This is his [first and best] novel.
 c. He stole into the castle [silently but quickly].
 d. I feel fine [in front of many people or behind the curtain].

In (9a) the categorial status of the specifier and the complement is NP, so we feel the whole projection is NP. In fact, we can replace *John and Mary* with *them*, the categorial status of which is NP. This property is so unique that we can never find this in any other category. The above examples undermine the status of coordinators as an "ordinary" head. The coordinator *and* behaves as if it were only a coordinator, which means that it just connects one element to the other equally, since it is not up to the categorial status of the whole projection.

Fourth, coordinators are also different from the other heads in that they always need the specifier and the complement at the same time. Compare examples in (10) with those in (11).

- (10) a. I have many pictures of Megu.
- b. I have the picture.
- c. I have pictures of Megu.
- d. I have pictures.
- (11) a. I love John and Mary.
- b. *I love John and.
- c. *I love and Mary.
- d. *I love and.

In (10) every sentence is grammatical regardless of the presence or the absence of the specifier and the complement. In (11), however, if either of them is not present, the sentence becomes ungrammatical.

To summarize, we have seen several strange behaviors of CSs. First, they can take a variety of categories as the specifier and the complement, in other words, there seems no restriction of the type of the specifier and the complement. Second, they need the same type of category for the specifier and the complement. Third, the categorial status of the maximal projection is not dependent of the head. On the contrary, the specifier and the complement are responsible for that. Fourth, they need the specifier and the complement at the same time. If either of them does not appear, the phrase is marked as ungrammatical.

In the following section, I propose a new approach to CSs, which lead us to find a unified way of dealing with the above strange behaviors of CSs.

3. Coordinators as Having No Categorial Features

In the framework of the Minimalist Program a lexical item is considered to be a bundle of phi-features. There are at least three types of matrices; the phonological feature matrix (PFM), the semantic feature matrix (SFM) and the formal feature matrix (FFM) (Uriagereka (1999:250)). In FFM we can find features specifying the categorial values. Typically, they are [+N, +V], [+N, -V], [-N, +V], [-N, -V] and so on. Suppose that coordinators are specified as [0, 0], putting it differently, unspecified. Let us consider what happens when *and* is selected from the numeration and then merges with, say, N. Chomsky (1955:244) suggests that the label of the two constituents a and b is one or the other of a, b. Thus if *and*, which has no categorial values, merges with N, then the categorial status of the merged element is none or N. If the whole category becomes [+N, -V], then we have no problem. The derivation proceeds without any difficulty to the next stage. However, when it happens that the whole category becomes [0, 0], the derivation will crash, because C,g,k never qualifies

as a syntactic object an item with no categorial specification. Perhaps this condition can follow from Full Interpretation.⁵ This assumption accounts for the first and the third strange behaviors of CSs. The first one is that they have no selectional restriction on the specifier and the complement. Since coordinators themselves have no categorial values, it is natural that their whole status must depend on other elements. Thus they can merge with any category. In other words, they can take any category as the specifier and the complement. The third strange behavior is that the head does not seem to be responsible for the whole categorial status. This is also evident because coordinators, which has no intrinsic categorial values, must be dependent on other elements.

Now let us look at another lexical property of CSs. Suppose that they have a little larger space to fill in concerning categorial specification than other "ordinary" heads. "Ordinary" heads have already had their intrinsic categorial values, whereas coordinators have no such values. Suppose, then, that they have one more slot to fill in as insurance. If this is true, coordinators have the following FFM.

- (12) a. and [... [0, 0] [0, 0] ...]
 cf. book [... [+N, -V] ...]

This lexical property of CSs accounts for why coordinators must have the specifier and the complement at the same time, since if either of them are absent, unspecified slots remains all through the derivation, which leads to crash the derivation. Furthermore, it follows that coordinators need the same type of category for the specifier and the complement. Imagine that the specifier is N and the complement is A. The FFM of this phrase is as follows:

- (13) [... [+N, -V] [+N, +V] ...]

This matrix can not be interpreted, since the value [*V] is inconsistent with the value [-V]. The matrix can be interpreted only when the categorial values are consistent.⁶

Now let us see how we can rule in the grammatical phrases and the rule out the

⁵ To be more precise, this condition may be called something different from Full Interpretation: C,g,k can not see anything that has no proper qualification.

⁶ Considering the infinite number of the specifiers and the complement of CSs, the matrix format may be as follows:

[... [0, 0] [0, 0] [-, -] [-, -] ...]

Alternatively, after the third element, they are "stamped" on the previous matrix.

ungrammatical ones.

- (14) a. I love John and Mary.
 b. *I love John and.
 c. *I love and Mary.
 d. *I love and.
 e. *John and handsome

(14a) is grammatical, because the FFM of *and* is [... [+N, -V] [+N, -V] ...]. There are neither unspecified nor inconsistent categorial values. (14b, c) are ungrammatical, since the FFM is [... [+N, -V] [0, 0] ...] or [... [0, 0] [+N, +V] ...]. This causes the derivation to crash, because it includes unspecified categorial values. (14d) is also ungrammatical, since the selectional restriction of the verb is not satisfied. This demonstrates, on the other hand, that coordinator *and* has no intrinsic categorial values. (14e) is ungrammatical, since the FFM is not interpreted because of the inconsistency of the categorial values; [... [+N, -V] [+N, +V] ...].

To summarize, if we consider the FFM of coordinators to be [... [0, 0] [0, 0] ...], all the strange behaviors mentioned in section 2 can be accounted for naturally.

4. Implications for Coordinate Structure Constraint

In the previous section, I have shown that the strange behaviors of CSs can be accounted for if we assume that the FFM of coordinators are [... [0, 0] [0, 0] ...]. In this section I examine how this analysis affects the position of CSC in the grammar.

CSC is proposed in Ross (1967).

- (15) In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjuncts.

(Ross (1986:99))

The above constraint correctly predicts the following data.

- (16) a. *Who did you see John and?
 b. *Who did you see and Mary?
 (17) a. *Which guitar does Keith play and sing madrigals?
 b. *Which madrigals does Keith play the guitar and sing?

(Roberts (1997:188))

Now look at the following examples.

- (18) a. What does Jack write and edit? (Napoli (1993:409))
 b. What theory did Tom attack and then Jane defend?
 (McCawley (1988:263))

If we apply CSC to (18) as it is, it is expected to be ungrammatical, which is contrary to the fact. In order to maintain CSC and prevent (18) from becoming ungrammatical, the concept of the across-the board application is introduced.

I propose here a quite different analysis of the above phenomena, dispensing with CSC and the across-the-board convention. First look carefully at the following data.

- (19) a. *I love John and. (=14b))
 b. *I love and Mary. (=14c))
 (20) a. *Who did you see John and?
 b. *Who did you see and Mary?

(19) and (20) are very similar. Rather, they are as like as two peas, except that in (19) either of the specifier or the complement is absent from the very beginning, whereas in (20) either is absent by "wh-movement". They are ungrammatical, because the lexical property of *and* is not satisfied, for some reason. Next take a look at (21).

- (21) Who saw John and who? (Huang (1995:156))

(21) is grammatical in contrast to (20a). This clearly shows that both the specifier and the complement of CSs must be present *in situ* at Spell-Out but that the features of them can be attracted at LF, that is, after Spell-Out. In a nutshell, in (19) the lexical property of *and* is not satisfied from the very beginning, which means that unspecified features remain and the derivation crashes. In (20) the lexical property may have been satisfied in a sense but untimely.

If this is true, why are (18) grammatical? The answer is that the lexical property of the coordinator is satisfied. Both the specifier and the complement are filled with the same type of elements like [-affirmative].⁷

⁷ Here I assume the following "underlying" structure tentatively.

- (i) What does Jack write and what does Jack edit?
 (ii) Which theory did Tom attack and (then) which theory did Jane defend?

Then, why are (17a, b) ungrammatical? The lexical property of the coordinator in (17) should be satisfied on a par with (18). Now look at (17) with great care. In (17a) the specifier has [- affirmative], whereas the complement has [+ affirmative] and in (17b) *vice versa*. Now remember how we rule out (14e),

- (14) e. John and handsome

It is ungrammatical because of the inconsistency of features. The same reasoning applies to (17). The type of the specifier is different from that of the complement. There are examples in Ross (1967) which show the above point more clearly.

- (22) a. Where did you go and who ate what?
 b. What exploded when and who was hurt?
 c. How long did this fit of generosity last and who gave what to whom?
 (Ross (1985:117))

In the above examples, the same types of the specifier and the complement are connected and they are all grammatical. On the other hand, it is expected that if different types are connected, then the sentences are ruled out. Examples in (23) make it clear that the prediction is true.

- (23) a. *I saw you there and who ate what?
 b. *What exploded when and I warned you it would?
 c. *Who gave what to whom and I'm sickened at this sentiment.
 (*ibid.*)

(17a, b) are ungrammatical for the same reason of (23)

However, here is a crucial example to show that it is not sufficient to specify only [+/- affirmative].

- (24) *What are you eating or did you play chess? (*ibid.*)

Both the specifier and the complement of CSs are [-affirmative]. We need some modification of the features in question. Suppose that coordinators are sensitive to whether or not both the specifier and the complement are filled with something lexical.⁸

⁸ I have not yet found out the right name of this feature. So I call it "something lexical" for the present for the sake of convenience.

This condition is met in the former part of (24), because the specifier of the COMP is occupied with *what*, whereas it is violated in the latter part of (24), since *did* is in the head position. This modification clearly distinguishes between (22a-c) and (24). On the other hand, this modification is insensitive to the difference between *John* and *who* in (21). Both the specifier and the complement are lexically filled. Probably this is because a lexical item needs only categorial features in order to determine the whole categorial status, whereas a sentence, or in this case CP, can be distinguished by whether its specifier is lexically filled or not, since it has no features corresponding to [+/-N, +/-V].

Finally, I mention that a multiple Spell-Out strategy suggested in Uriagereka (1999) is presupposed. It is necessary for coordinators to see what the specifier type and the complement type are in order to determine the whole categorial status. Every time a coordinator merges with another element, Spell-Out happens.

(25) Where did John and you go and who ate what?

Thus in (25) the first Spell-Out happens when *John* and *and you* merge and the later Spell-Out occurs when the whole sentence is built.

To summarize, I have shown that the CSC effect and the across-the-board application convention are accounted for in a unified way if we assume that, in addition to a multiple Spell-Out strategy, both the specifier and the complement of CSs need to be lexically filled.

5. Concluding Remarks

In this paper I have argued that if we consider the FFM of coordinators to be [... [0, 0] [0, 0] ...], their strange behaviors can be accounted for straightforwardly. Furthermore, we can account for the CSC effect and the data which are treated as exceptions by the application of the across-the-board rule in a unified way. The CSC effect is reduced not to the island that nothing can not be extracted out the island, but to the inconsistency of the features of the specifier and the complement when they are connected.

References

- Chomsky Noam (1995) *The Minimalist Program*, MIT Press, Cambridge, MA.
 Huang, C.-T. James (1995) "Logical Form," *Government and Binding Theory and the Minimalist Program*, ed. by Gert Webelhuth, 125-175, Blackwell, Oxford.

- Larson, Richard (1990) "Double Objects Revisited: Reply to Jackendoff," *Linguistic Inquiry* 21, 589-632.
- McCawley, James, D. (1988) *The Syntactic Phenomena of English*, Vol.2, University of Chicago Press, Chicago.
- Mukaiyama, Mamoru (1995) "A Note on Coordinate Structures," In A Festschrift for Professor Kinsuke Hasegawa, Kenkyusha, Tokyo.
- Napoli, Donna, J. (1993) *Syntax*, Oxford University Press, New York.
- Postal, Paul, M. (1998) *Three Investigations of Extractions*, MIT Press, Cambridge, MA.
- Riemsdijk, Henk van, and Edwin Williams (1986) *Introduction to the Theory of Grammar*, MIT Press, Cambridge, MA.
- Roberts, Ian (1997) *Comparative Syntax*, Arnold, London.
- Ross, John Robert (1967) *Constraints on Variables in Syntax*, Doctoral Dissertation, MIT. [Published as *Infinite Syntax!*, Ablex, N.J., 1986]
- Uriagereka, Juan (1999) *Rhyme and Reason: An Introduction to Minimalist Syntax*, MIT Press, Cambridge, MA.