

# A Series of Inquiries into Ungrammaticality: No.5

— “Both Bill sang and Mary danced.” —\*

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## 1. Introduction

In English *both* has so far been analyzed as a coordinator which precedes the first conjunct when *both* occurs in coordinate structures: *both* is assumed to be a conjunction in Kayne (1994), Zwart (1995) and Borseley (1996), and a coordinator in Sag et al. (1985) and Moltmann (1992). However, if *both* is taken to be a conjunction or coordinator, the following difference in acceptability between (1) and (2) might be attributed to the categorial types which *both* modifies.

- (1)a. Both [ Bill ]and [ Mary ] sang.
- b. Bill both [ sang] and [ danced ].
- c. This book is both [ stimulating ] and [ useful ].
- (2) \*Both [ Bill sang ] and [ Mary danced ].

In (2) *both* occurs with TP conjuncts, yielding unacceptability, as pointed out in Quirk et al. (1985). Given that *both* is a conjunction or coordinator, it follows that attachment of *both* to the coordinate structure is sensitive to the categorial types of coordination. In other words, *both* precedes maximal projections such as DP, VP, AP, PP, etc. while it cannot precede a TP. This generalization, however, is not plausible, in that *both* precedes TP conjuncts in the embedded contexts, as shown in the following:

- (3)a. This is the book which both I sold and she bought.
- b. I hope that both Bill will sing and Mary will dance.
- c. Did you believe that both Bill sang and Mary danced?

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\* I would like to thank Mark Volpe for his comments and suggestions. Any errors, of course, are my own.

Then, a question arises. Why is (2) unacceptable? This paper is an attempt to answer this question, focusing on the categorial status of *both* in coordinate structures, within the minimalist program.

## 2. *Both* as conjunction

In English *both* has so far been assumed to be a conjunction or a coordinator in the literature (Kayne 1994, Zwart 1995, Borseley 1996; Sag et al. 1985, Moltmann 1992), based on two distribution facts. First, *both* occurs in coordinate constructions with just two conjuncts, but not with more than two conjuncts. Then, Borseley (1996) assumes *both* to be a coordination-introducing particle, i. e., a specialized conjunction. Second, *both* is similar to coordinators introducing coordination in other languages, as pointed out in Neijt (1979). Coordinators like *both* in English, *en* in Dutch and *både* in Norwegian refer to, and emphasize, ‘two-ness’: they intensify individual conjuncts, as in the following:

- (4)a. both John and Bob
- b. en Jan en Bob
- c. Hun liker både [ å gå og å sykle ]  
        She likes both to walk and to cycle  
        ‘She likes both walking and cycling.’ (Johannessen 1998)

However, the assumption that *both* is a conjunction or coordinator, as argued in Baltin (1995), Bobaljik (1995, 1998), Johannessen (1998) and others, is not plausible. First, if *both* is taken to be a conjunction or coordinator, the following difference in acceptability between (5) and (6) cannot be accounted for, given that the same elements are coordinated in (5) and (6).

- (5)a. This book is both [ very stimulating ] and [ very useful ].
- b. \*This book is very both [ stimulating ] and [ useful ].
- (6)a. This book is [ very stimulating ] and [ very useful ].
- b. This book is very [ stimulating ] and [ useful ].

Second, when *both* cooccurs with DP conjuncts, it can float, unlike other conjunctions like *and* or *or*, as in the following:

- (7)a. Both [ Bill and Jenny ] are linguists.
- b. [ Bill and Jenny ] both are linguists.
- c. [ Bill and Jenny ] are both linguists.

If *both* is assumed to be a conjunction, it is not clear why only *both*, but not other conjunctions, can float.

Third, as pointed out in Johannessen (1998), *both* always occupies the initial position in the coordinate constructions, and it doesn't conjoin anything like the ordinary conjunction *and*.

- (8) \*Bill both Jenny are linguists.

Fourth, *both* cooccurs with various categorial types of conjuncts, but, as pointed out in Quirk et al. 1985, it doesn't cooccur with TP nor CP conjuncts, as follows:

- (9)a. \*Both Bill sang and Mary danced.
- b. \*Both who sang and who danced?

Let us notice such a condition is restricted to root clauses. In the embedded contexts, *both* can cooccur with TP or CP, which will be discussed in the next section. Therefore, it is not plausible that *both* is a conjunction or coordinator.

### 3. *Both* as adverb

In the previous section we pointed out that in the root clauses *both* doesn't cooccur with TP nor CP whereas in the embedded clauses it can cooccur with TP or CP, as shown in the following:

- (10)a. This is the book which both [ I sold and she bought ].
- b. This is the book both [ which I sold and which she bought ].
- c. Did you believe that both [ Bill sang and Mary danced ]?
- d. Did you believe both [ that Bill sang and that Mary danced ]?

The examples in (10) show that in the embedded clauses *both* can cooccur with CP or TP conjuncts. Before considering this descriptive generalization, let us consider

Neijt's(1979) and Bayer's(1996) observations. They claim that *both* can adjoin to maximal projections only, as shown in the following examples:

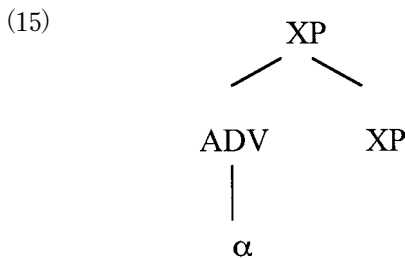
- (11)a. This book is both [ very stimulating and very useful ].  
b. She is both [ going to college ] and [ holding a part-time job ].  
(12)a. \*This book is very both [ stimulating and useful ].  
b. \*She both [ is going to college ] and [ is holding a part-time job ].

Bayer(1996) claims that the difference in acceptability between (11) and (12) can be accounted for on the assumptions that *both* is regarded as a focus particle and that focus particles are not allowed to attach to non-maximal projections. Let us consider other focus particles.

Hoeksema&Zwarts (1991) points out that focus adverbs such as *only*, *even*, *just*, etc. do not attach to all categorial types. The following examples suggest that *only* and *even* have the same syntactic behavior as *both* with respect to modifying elements:

- (13)a. This book is only [ very interesting ].  
b. This book is so easy that even [ a child ] can read it.  
(14)a. \*This book is very only [ interesting ].  
b. \*This book is so easy that an even [ child ] can read it.

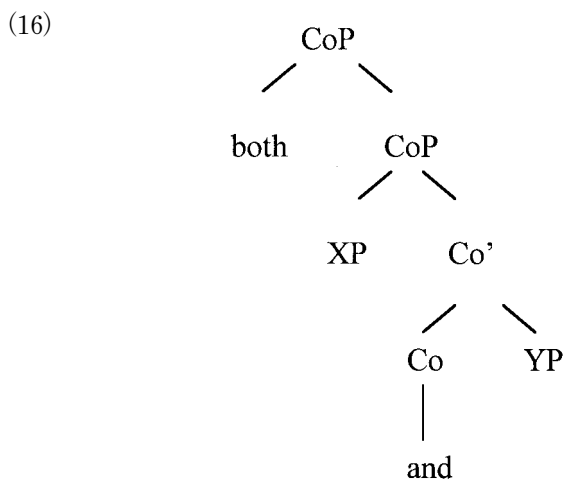
Focus adverbs can modify maximal projections. To say that an adverb *a* modifies some maximal projection XP is to say that *a* takes XP as its target, as illustrated below:<sup>1</sup>



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<sup>1</sup> For details, see Kubo (1993).

Let us notice that *both*, unlike other focus adverbs such as *only*, *even*, *just*, etc, has a selectional property for the target XP. Where *both* occurs in coordinate structures, it requires two conjuncts. Then, following Baltin (1995), Bobaljik (1995, 1998), Johannessen (1998) and others, we assume that *both* is an adverb, and that following Johannessen (1998), the coordinating conjunction projects a functional projection ‘CoP’, as is illustrated below:



However, given that *both* is a focus adverb and that coordinate constructions have the above structure, it is not clear why in the root clauses *both* cannot cooccur with maximal projections such as CP nor TP. Then, Johannessen (1998) makes an attempt to explain why in the root clauses *both* cannot cooccur with CP conjuncts.

Johannessen (1998) points out that *both* behaves like an adverb rather than a conjunction with respect to word order when *both* occurs with CP conjuncts, providing the following Norwegian examples, which are taken from Johannessen (1998):

- (17) a. Per gikk til jobben, og Marit tok trikken til skolen.  
 Peter walked to the work and Mary took the tram to the school  
 ‘Peter walked to work, and Mary went by tram to school.’
- b. Både gikk Per til jobben, og Marit tok trikken til  
 both walked Peter to the work and Mary took the tram to  
 skolen.  
 the school  
 ‘It is both the case that Peter walked to work, and that Mary went  
 by tram to school.’

- c. \*Både Per gikk til jobben, og Marit tok trikken til skolen.
- d. \*Både gikk Per til jobben og tok Marit trikken til skolen.

According to Johannessen (1998), the difference in acceptability in (17) suggests that 'både' triggers subject-verb inversion in the first conjunct, but not in the second conjunct, just as if an adverb or a PP triggers the Verb-Second (usually abbreviated V2) phenomenon in the Germanic languages. In the Germanic languages, finite verbs in root clauses are subject to a constraint which restricts them to the second position, i. e., the V2 phenomenon, as shown in the following contrast:

- (18)a. Gestern kaufte Hans den Buch.  
Yesterday bought Hans the book  
'Yesterday Hans bought the book.'
- b. \*Gestern Hans den Buch kaufte.  
Yesterday Hans the book bought  
'Yesterday Hans bought the book.'

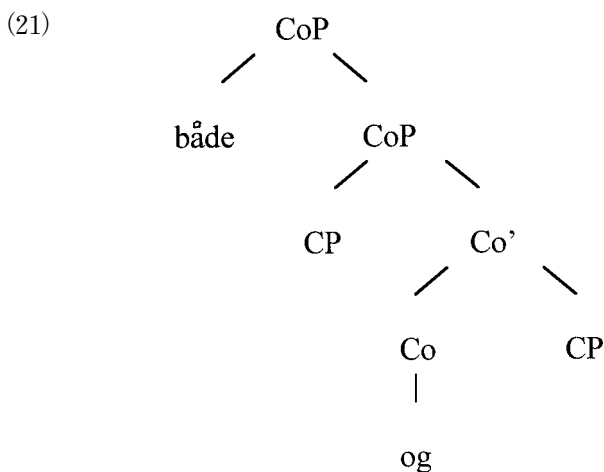
The V2 phenomenon is found in all root clauses. In the embedded contexts, however, the V2 phenomenon is subject to the presence of an overt complementizer. Let us consider the following:

- (19)a. Ich glaube [ daß [ Hans krank gewesen ist ] ]  
I believe that Hans sick been is  
'I believe that Hans has been sick.' (Webelhuth 1992)
- b. \*Ich glaube [ daß [ Hans ist krank gewesen ] ]  
I believe that Hans is sick been  
'I believe that Hans has been sick.' (ibid.)
- (20)a. Ich glaube [ Hans ist krank gewesen ]  
I believe Hans is sick been (ibid.)
- b. \*Ich glaube [ Hans krank gewesen ist ] ]  
I believe Hans sick been is (ibid.)

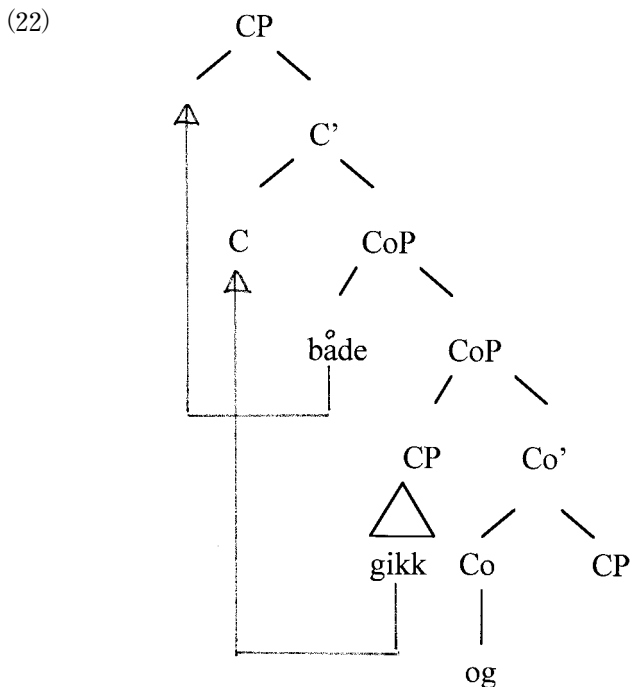
As shown in the contrast between (19a) and (19b), where the overt complementizer *daß* is present in German, the embedded clause does not exhibit the V2 effect. However, where the overt complementizer is missing, the V2 effect is observed in

embedded clauses, as shown in the contrast between (20a) and (20b).

Standard assumptions about the V2 effect treat this operation as involving movement of T to C. Besten (1983) assumes that the V2 inversion involves movement of the inflected verb to the head of CP. Thus, it provides an account for why in the embedded contexts the inflected verb is in complementary distribution with complementizers in the Germanic languages. Then, let us recall that in Norwegian ‘både’ triggers the V2 effect in the root clauses in (17). The subject-verb inversion might be accounted for on the assumptions that the initial element ‘både’ is in the specifier position of CP and that the inflected verb ‘gikk’ is in the head of CP. Johannessen’s (1998) explanation, however, is inconsistent with the CoP structure (16). Johannessen (1998) claims that the examples in (17) are all involved in coordination of CP conjuncts, as shown in the following structure:



Given that the V2 effect is involved in movement of T to C, it then follows that *både* moves to the specifier position of CP and the inflected verb *gikk* moves to the head of CP in the following structure:



In (22) movement of the inflected verb is an extraction of the element contained in the first conjunct out of that conjunct, which is ruled out by the so-called “Coordinate Structure Constraint” proposed in Ross (1967). It then follows that (17b) is wrongly predicted to be unacceptable. Therefore, Johannessen’s (1998) account is not plausible.

#### 4. *Both* checking

In this section we will consider the descriptive generalization about the syntactic behavior of *both* which we have seen: in the root clauses *both* doesn’t cooccur with either TP or CP whereas in the embedded clauses it can cooccur with TP or CP.

In most languages the conjoined subjects trigger plural agreement with the verb, and the number feature of the conjoined DPs can be determined by the sum of the number of the conjoined DPs. For example, in Slovene, as pointed out in Corbett (1983), DPs are classified by number into three groups: singular, dual and plural. If two singular DPs are conjoined, they trigger dual number agreement with the verb. If more than two singular DPs are conjoined, or if one of the conjoined DPs has a



dual or plural number, then the predicate has a plural form.<sup>2</sup> In other words, when *both* has a DP target, it has a selectional property for the target as well.

- (23) a. Both the girls have left.  
b. The girls both have left.  
c. The girls have both left.
- (24) a. \*Both the girl have/has left.  
b. \*The girl both have/has left.  
c. \*The girl has both left.

As the above examples show, when *both* has a target DP, it requires the duality of its target.

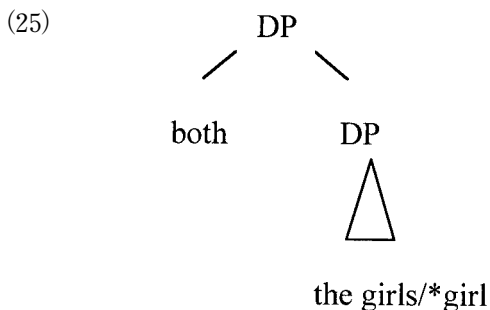
The minimalist program in Chomsky (1995) makes use of the mechanism of feature checking. Features include  $\Phi$ -features like person, number or gender, Case features, and categorial features. Feature checking is undergone when the item having the feature to be checked, i.e., an uninterpretable feature, is in the checking domain of the item having the corresponding checking feature, i.e., an interpretable feature.<sup>3</sup> Uninterpretable features must be checked and deleted at LF. Then uninterpretable features which remain unchecked and undeleted at LF cause the derivation to crash.

Therefore we assume that *both* bears a number feature ‘plural’ that is uninterpretable, which must be checked by a checker which has the interpretable number feature ‘plural’. Let us recall the contrast between (23a) and (24a).

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<sup>2</sup> However, when the predicate precedes the conjoined DP subject, as noted in Corbett (1983), Comrie&Corbett (1993), Munn (1993), Wilder (1997), Johannessen (1998), and Progovac (1998), agreement in person, and gender with the nearest conjunct is much more common in some languages like Czech, German, Palestinian Arabic, Swahili and so on. We will not pursue this problem here.

<sup>3</sup> According to Chomsky (1995), the checking domain of a head  $\alpha$  is the set of nodes contained in  $\text{Max}(\alpha)$  that are distinct from and do not contain  $\alpha$ .



In (25) the interpretable number feature of the DP ‘the girls’ can check the uninterpretable number feature of *both* in the checking domain whereas in the case of ‘the girl’, the number features of the checker and the checkee cause a mismatch, which yields the unchecked uninterpretable feature, causing the derivation to crash.

Let us turn to *both* in coordinate structures. Given that CoP is a functional category, it then follows that when the whole CoP enters into the checking relation, the CoP must bear a categorial feature or  $\Phi$ -features (person, number and gender) of its conjuncts. Therefore, the features of the conjuncts are required to percolate up to the CoP.<sup>4</sup>

Let us notice that *both* can only adjoin to CoP headed by *and*, *either* to *or*, and *neither* to *nor*. Thus, *both*, *either*, and *neither* have a sectional property for the head of the target XP. This fact suggests that *both* and *and* must enter into the checking relation within the CoP. When the conjunct is a DP, the features of the DPs percolate up to the whole CoP. Then, the uninterpretable number feature of *both* is checked against the interpretable number feature of CoP based on sisterhood relation, causing the former feature to delete, just like number feature checking in (23) and (24).

However, a problem arises. When the conjunct is a maximal projection except for DP, how is the uninterpretable number feature of *both* checked? The maximal projections except for DP has no inherent number feature. Then, we tentatively assume that the head of CoP, *and*, gets an interpretable number feature by checking against each conjunct in the specifier and complement positions, and that the uninterpretable number feature of *both* is checked against the interpretable number feature of *and*, causing the derivation to converge.

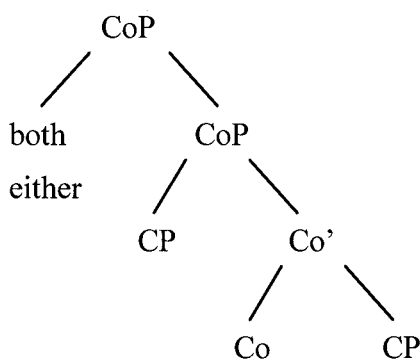
Let us turn to *both* of CoP in the root clauses. When each conjunct is a CP, *both* cannot attach to it, just like *either*.

<sup>4</sup> We will not pursue the concrete mechanism of the percolation. For details, see Poole (2002).

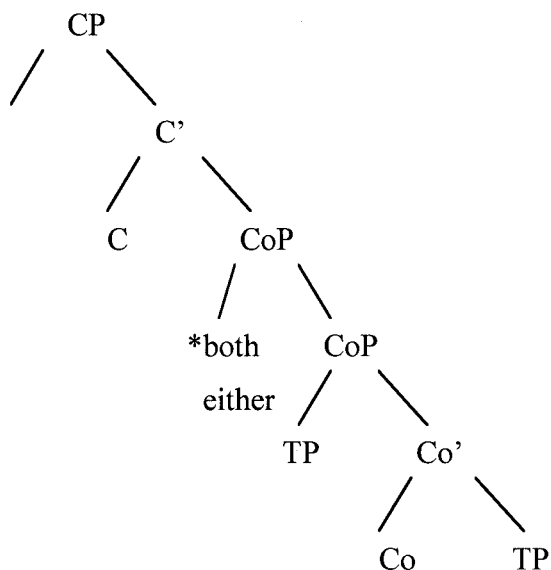
- (26) a. \*Either [ who sang or who danced ]?  
 b. \*Either [ John sang or who danced ]?  
 c. \*Either [ who sang or John danced ].

The examples in (26) suggest that when each CP conjunct is a different clause type, *both* and *either* cannot attach to them. In the minimalist program, the formal features of the functional category C determine clause type. Declarative clauses have the declarative force and interrogative clauses the feature Q in the head of CP.

(27) a.



b.



Let us suppose that in (26) CPs are conjoined as in (27a). The head Co enters into checking relation with each CP conjunct with respect to categorial feature. In order to rule out (27a), however, the head of each CP conjunct must be visible for the

checking operation, which causes the checking mechanism to become complicated. This complication is inconsistent with economy considerations in the minimalist program in Chomsky (1995, 1998, 1999).

On the other hand, when each conjunct of the CoP is a TP, *both* and *either* have different syntactic behaviors. Only *either* cooccurs with TP conjuncts as below:

(28) Either [ John will sing and Mary will dance ].

It then follows that whether focus adverbs such as *both* or *either* cooccur with TP conjuncts can be regarded as an idiosyncratic property. Given that *both* cannot cooccur with TP conjuncts as in (27b), unlike *either*, it then follows that the feature checking of *both* is visible for the categorial type of CoP. We will leave open how *both* in (27b) is ruled out by the checking mechanism.

## 5. Concluding Remarks

We have seen that the ungrammaticality of the sequences ‘Both Bill sang and Mary danced’ can be attributed to the idiosyncratic property of *both*, and that the distribution of *both* can be accounted for by the mechanism of feature checking within CoP.

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