

ELLIPSIS AND THE STRUCTURE OF DISCOURSE

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Abstract

Many authors have suggested that ellipsis and other processes of reduction require a certain similarity or parallelism between the reduced clause and some antecedent clause in discourse. We claim that discourse structure constrains the way in which ellipsis satisfies a parallelism constraint: the parallelism match must involve two clauses that are related by local c-command in the discourse tree.

1 Introduction

Many authors have suggested that ellipsis and other processes of reduction require a certain similarity or parallelism between the reduced clause and some antecedent clause in discourse. It has also frequently been proposed that discourse structure is relevant to interpretation of ellipsis and related constructions. In this paper, we combine these two claims, and propose that the parallelism requirement is strongly constrained by discourse structure. Our point of departure is the following two background claims:

- **Matching Condition on Ellipsis Resolution:** Ellipsis resolution requires that a *matching* relation holds between a containing clause E and some antecedent clause A. (Dalrymple *et al.*, 1991; Rooth, 1992)
- **Discourse Structure:** Clauses in a discourse are structured according to discourse relations; ellipsis resolution (and other anaphora resolution) occurs as a side-effect of establishing discourse relations. (Hobbs, 1979; Asher, 1993; Prust *et al.*, 1994; Kehler, 2000; Asher *et al.*, 2001; Webber *et al.*, 2001)

The central claim of this paper is the following:

- **Discourse Condition on Ellipsis Resolution:** Clause A can be antecedent for ellipsis in clause E iff A locally c-commands E in discourse tree.¹

In what follows, we show that this claim makes a variety of correct predictions concerning the interpretation of ellipsis, both in terms of the selection of the antecedent for an ellipsis occurrence, and in terms of the possible readings for ellipsis given a particular antecedent.

¹We define local c-command as follows: A locally c-commands E iff A c-commands E and there is no C c-commanding E that appears between A and E. We also assume that the clause E containing the ellipsis does not contain the antecedent clause A.

In section 2, we examine our background claims concerning ellipsis resolution and discourse structure in somewhat more detail. In section 3, we examine the issue of antecedent selection for ellipsis occurrences. Using both sluicing and VPE, we show how our claim successfully rules out potential antecedents, relying crucially on discourse structure. Next, in section 4, we examine the issue of possible readings for ellipsis occurrences, focusing on two versions of the “many-clause” puzzle in VPE. We show that our claim rules out readings that are incorrectly permitted by theories that do not refer to discourse structure. In section 5 we examine some potential problems and complications with the approach: in particular, it might appear that our claim is excessively restrictive. While the approach does place much stronger constraints than previous approaches, we show that it is not quite as restrictive as one might think, since the matching may often be performed at different levels. Furthermore, we examine cases in which the matching process must be sensitive to implicit material.

2 Background

2.1 Ellipsis Resolution as Matching

(Rooth, 1992) argues that ellipsis involves a matching relation that is not restricted to the minimal clause containing the ellipsis. (See also (Tancredi, 1992; Fiengo and May, 1994; Schwarzschild, 1999) among many others). In this paper, we will assume Rooth’s (1992) formalization of this idea, which he applies to ellipsis (complete phonological reduction) as well as to deaccenting (a milder form of phonological reduction).

Rooth first defines the focus value of an expression P , roughly as given in (1): the focus value of P is the set of expressions that result from replacing every focused element e (and any pronoun bound by e) in P with some element of the same semantic type as e .²

$$(1) \quad F(P) = \{P' \mid \exists x. P' = P[e/x]\}, e \text{ focused in } P.$$

Rooth’s matching requirement states the following:

- (2) **Matching Condition:**
Ellipsis (E) requires that there be some phrase P containing E and some antecedent phrase ANT in the discourse, such that $[[ANT]]$ is or contextually implies a member of $F(P)$.

To see just two examples, (3) illustrates how this constraint is met through direct membership, whereas (4) shows that matching also obtains when ANT implies a member of $F(P)$. (Capitals indicate focal stress and italics mark deaccented material.)

- (3) Susan arrived late last night, and **KAREN** did, too.
[Susan arrived late last night]_{S1} ∈ F([KAREN did arrive late last night]_{S2})

²More accurately, the focus value of an expression P is the set of denotations construed as follows (Rooth 1985):

- (1) a. If α is a non-focused lexical item, then $F(\alpha) = \{\alpha\}$.
b. If α is a focused lexical item, then $F(\alpha) = D_\sigma$, where σ is the type of α .
c. If the node α has the daughters β and γ (order irrelevant), and there are types σ and τ such that $\langle \sigma, \tau \rangle$ is the type of β and σ is the type of γ , then $F(\alpha) = \{x \in D_\tau : \exists y, z [y \in F(\beta) \wedge z \in F(\gamma) \wedge x = y(z)]\}$

- (4) People convinced John to play the lottery, and then SUE *decided to* as well.
 [People convinced John to play the lottery]_{S1} implies [John decided to play the lottery].
 [John decided to play the lottery] ∈ F([SUE decided to play the lottery]_{S2})

Rooth and other authors propose that an extra identity condition applies to ellipsis but not to deaccenting: the elided constituent itself E' has to find an antecedent ANT' in the discourse to which it is identical (syntactically identical, as in (Rooth, 1992; Fiengo and May, 1994), or semantically identical, as in (Hardt, 1993; Jacobson, 1992); see also (Merchant, 2001) for a variant of the semantic identity approach.) We will not be concerned with this extra condition in the present paper.

2.2 Discourse Relations: Background

There is an extensive literature concerning the structure arising from clausal discourse relations (Hobbs, 1979; Mann and Thompson, 1986; Asher, 1993; Marcu, 2000; Webber *et al.*, 2001). While there is still controversy concerning the proper inventory of discourse relations, and the class of possible resulting structures, much progress has been made, and there is substantial agreement concerning standard relations such as the following:

- **Temporal:** A before/after B
- **Cause-Effect/Subordination:** A because B
A although B
- **Parallel:** A and B too
- **Contrast:** A but not B
- **Constructions:** if A then B

We will restrict ourselves to relatively uncontroversial structures where relations such as the above are explicitly signalled with discourse particles. We will also follow the fairly standard view that discourse relations (both explicit and implicit) give rise to a tree structure (Asher, 1993; Prust *et al.*, 1994). See also (Webber *et al.*, 2001) for a more nuanced examination of the tree structure assumption.

3 Selection of Antecedent

Our claim is that discourse structure guides the application of the parallelism requirement generated by ellipsis. This makes straightforward predictions concerning the selection of antecedent: we examine these predictions, first using examples of sluicing, and next using examples of VP ellipsis.

3.1 Sluicing

Ross (1969) coined the term "Sluicing" to refer to the ellipsis of IP in an interrogative clause, as exemplified in (5)-(6). Chung et al (1995) noted that the expression in the ANT clause corresponding to the sluiced *wh*-phrase is often an indefinite, explicit in (5) and implicit in (6). Let us call this corresponding expression the "correlate".

- (5) John called somebody. I wonder who.
 (6) John ate. But it's unclear what.

(Romero, 1998) gives a Matching Condition account of the relation between a sluiced *wh*-phrase and the shape of its correlate. She exploits the fact that sluiced *wh*-phrases –like remnants of ellipsis in general– bear focus stress, and she defines a set of alternatives of a focused *wh*-Determiner that includes an existential option. The result is, roughly, that S1 matches S2 in e.g. (6) as follows:

- (7) [John ate]_{S1}. But it's unclear [WHAT (he ate)]_{S2}.
 [∃ x: John ate x]_{S1} ∈ F([WHAT x: he ate x]_{S2})

Furthermore, (Romero, 1998) argues that uttering a sentence like *John ate* implies that the speaker has some propositional attitude towards the proposition expressed. That is, uttering *John ate* implies *I believe / I know / It is clear that John ate*. Once this is taken into account, matching obtains between S1 and S3, that is, between two direct sisters in the discourse tree:³

- (10) [John ate]_{S1}. But [it's unclear [WHAT (he ate)]_{S2}]_{S3}.
 [∃ x: John ate x]_{S1} implies [It is clear that ∃ x: John ate x], and
 [It is clear that ∃ x: John ate x] ∈ F([It is UNCLEAR WHAT x: he ate x]_{S3})

For the sake of simplicity, we will ignore these propositional attitudes in the next examples. We will concentrate on finding an ANT for the sluiced interrogative, assuming that, once it is found, the necessary propositional attitude will be implied by the context.

Let us now turn to the following example, which Chung et al (1995) observe is ill-formed:

- (11) *[Agnes arrived after [John ate] _{S3}]_{S1}, but [it's unclear what]_{S2}. (Agnes arrived after John ate)

Chung *et al.* claim that unacceptability results from an island constraint, as with the overt counterpart:

- (12) *It's unclear **what** (Agnes arrived after John ate **t**)

However, Chung *et al.* do not consider the possibility of the following reading:

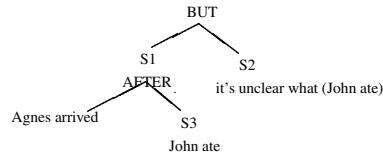
- (13) *[Agnes arrived after [John ate] _{S3}]_{S1}, but [it's unclear what]_{S2}. (John ate) ate)

Nothing in Chung *et al.*'s theory (or other theories of ellipsis) rules this out. In the present account, (13) is ungrammatical because no matching antecedent is found that is in the right discourse relation, since:

- i S3 matches S2, but S3 does not c-command S2 in the discourse tree, and
- ii S1 c-commands S2 in the discourse tree, but S1 and S2 do not match. Ie., [Agnes arrived after John ate]_{S1} ∉ F[WHAT x: John ate x]_{S2}

³Romero's actual focus value for S2, given in (8), includes an existential interrogative (with *whether*) rather than an existential declarative (with *that*). Thus, the corresponding matching is done as is (9) rather than as in the simplified version given in the text. This difference is immaterial to the argument in the present paper.

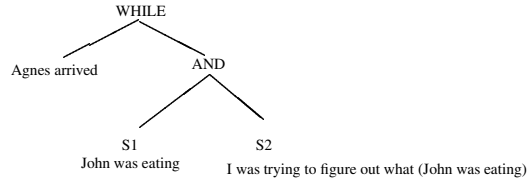
- (8) F(WHAT John ate) =
 {what x: John ate x, how many x: John ate x, whether ∃ x: John ate x }
 (9) [John ate]_{S1}. But [it's unclear [WHAT (he ate)]_{S2}]_{S3}.
 [∃ x: John ate x]_{S1} implies [It is clear whether (or not) ∃ x: John ate x], and
 [It is clear whether (or not) ∃ x: John ate x] ∈ F([It is UNCLEAR WHAT x: he ate x]_{S3})



Example (13)

If we change the discourse structure, as in (14), the example becomes acceptable.

- (14) Agnes arrived while [[John was eating]_{S1} and [I was trying to figure out what]_{S2}].



Example (14)

The sentence is grammatical because the Matching Condition and the Discourse Condition are now both met. S1 matches S2 in (14), as sketched in (15). And, given that S1 is sister to S2, S1 is permitted as antecedent to the sluice by the Discourse Condition.

- (15) $S1 \in F(S2)$, i.e.,
 $[\exists x: \text{John was eating } x] \in F(\text{I was trying to figure out}) \text{ WHAT } x: \text{John was eating } x]$

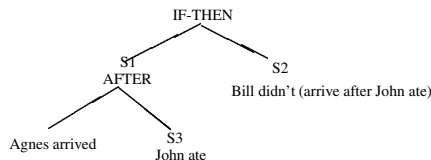
3.2 VP Ellipsis

We have seen that discourse structure correctly rules out potential antecedents for sluicing. Here, we will see that the same is true of VP ellipsis. In (16), S2 is not allowed to take S3 as its matching ANT because there is not c-command. Ellipsis must be resolved to the VP in S1:

- (16) [Agnes arrived after [John ate.] _{S3}]_{S1} (But) [Bill didn't *(eat)/ (arrive after John ate)]_{S2}.

The same discourse configuration obtains if, instead of being juxtaposed, the larger clauses S1 and S2 are placed in an *if-then* discourse structure. Given the resulting discourse tree under (17), only S1 is a possible ANT for S2 according to the Discourse Condition.⁴

- (17) If [Agnes arrived after [John ate] _{S3}]_{S1} then [Bill didn't *(eat)/ (arrive after John ate)]_{S2}.

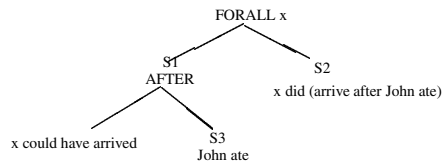


We analyze Antecedent Contained Deletion (ACD) sentences like (18) in a similar fashion. That is, even though relatives clauses -like *if*-clauses- are syntactically embedded within the matrix

⁴See subsection (5.4) for an elaboration on (17) involving symmetric focus.

CP projected by S2, the discourse relation is established between the relative clause IP and a matrix IP node excluding the relative clause. The resulting discourse tree is given below. Again, sisterhood determines that the ellipsis should be resolved to *arrive after John ate*.

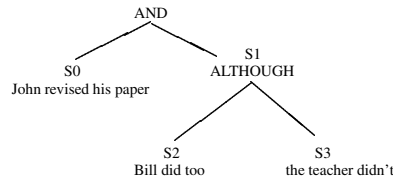
- (18) Everyone who [could have arrived after John ate]_{S1} [did (arrive after J ate)]/*(ate)]_{S2}



4 Possible Readings: The Many-Clause Puzzle

We turn now to a well-known type of example, dubbed the “many-clause puzzle” by (Fiengo and May, 1994), and originally due to (Dahl, 1974).

- (19) John revised his paper, and Bill did too, although the teacher didn't.
 (20) [John revised his paper]_{S0}, and
 [[Bill did (revise his paper)]_{S2} too, although
 [the teacher didn't (revise his paper)]_{S3}]_{S1}.



Note that there are two ellipsis clauses, *S2* and *S3*. As noted by Dahl, there are three possible readings. First, there is the across the board strict reading, where John, Bill and the teacher all revised John's paper. Second, there is the across the board sloppy reading, where John, Bill and the teacher all revised their own paper. Third, there is a mixed reading, in which Bill revised Bill's paper (sloppy), although the teacher revised Bill's paper (strict). Other mixed readings are not possible. Thus of five potential readings, displayed below, only 1-3 are permitted.

Readings: 1. JJJ 2. JBT 3. JBB 4. *JJT 5. *JBJ

Below, we show how readings 1-3 are correctly permitted in our approach, whereas readings 4-5 are ruled out:

1. (JJJ) All strict: $S_0 \in F(S_2), S_2 \in F(S_3)$. $F(S_2) = F(S_3) = \{x \text{ revised John's paper}\}$
2. (JBT) All sloppy: $S_0 \in F(S_2), S_2 \in F(S_3)$. $F(S_2) = F(S_3) = \{x \text{ revised } x\text{'s paper}\}$
3. (JBB) Sloppy/Strict:
 $[\text{John revised John's paper}]_{S_0} \in F([\text{BILL revised Bill's paper}]_{S_2}) = \{x \text{ revised } x\text{'s paper}\}$
 $[\text{Bill revised Bill's paper}]_{S_2} \in F([\text{the TEACHER revised Bill's paper}]_{S_3}) = \{x \text{ revised Bill's paper}\}$

4. *(JJT)

$[John\ revised\ John's\ paper]_{S0} \in F([BILL\ revised\ John's\ paper]_{S2}) = \{x\ revised\ John's\ paper\}$

$[Bill\ revised\ John's\ paper]_{S2} \notin F([the\ TEACHER\ revised\ teacher's\ paper]_{S3}) = \{x\ revised\ x's\ paper\}$

5. *(JBJ)

$[John\ revised\ John's\ paper]_{S0} \in F([BILL\ revised\ Bill's\ paper]_{S2}) = \{x\ revised\ x's\ paper\}$

$[Bill\ revised\ Bill's\ paper]_{S2} \notin F([the\ TEACHER\ revised\ John's\ paper]_{S3}) = \{x\ revised\ John's\ paper\}$

It is pointed out by (Fiengo and May, 1994) that Reading 5 (JBJ) is incorrectly permitted by the approach of (Dalrymple *et al.*, 1991), since it allows that matching to relate the clause S3 with clause S1. The same criticism applies to Rooth's matching approach, as we see below:

$[John\ revised\ John's\ paper]_{S1} \in F([BILL\ revised\ Bill's\ paper]_{S2}) = \{x\ revised\ x's\ paper\}$

$[John\ revised\ John's\ paper]_{S1} \in F([the\ TEACHER\ revised\ John's\ paper]_{S3}) = \{x\ revised\ John's\ paper\}$

This shows clearly that discourse relations play a crucial role in constraining available readings. Here, we don't allow $match(S3, S0)$ because S0 does not locally c-command S3, given that a closer c-commander of S3 -namely, S2-appears between S0 and S3.

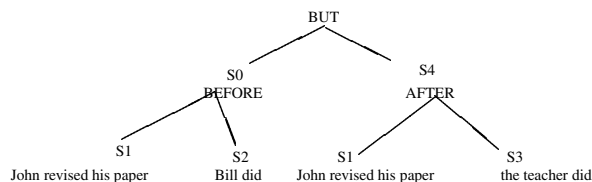
4.1 A Variant of the Many-Clause Puzzle

We turn now to a variant of the Many-Clause Puzzle, which further illustrates the interaction of discourse structure with the selection of available readings.

(21) John revised his paper before Bill did, but after the teacher did.

(22) $[[John\ revised\ his\ paper]_{S1}\ before\ [Bill\ did\ (revise\ his\ paper)]_{S2}]_{S0},\ but\ [after\ [the\ teacher\ did\ (revise\ his\ paper)]_{S3}]_{S4}.$

Note that here, clause S1 and S2 are related by BEFORE, and S1 and S3 are related by AFTER, as shown in Figure 2.



Because of the difference in discourse structure, only Readings 1 and 2 are possible here:

Readings: 1. JJJ 2. JBT 3. *JBB 4. *JJT 5. *JBJ

1. (JJJ) All strict: $S1 \in F(S2), S1 \in F(S3) F(S2) = F(S3) = \{x\ revised\ John's\ paper\}$

2. (JBT) All sloppy: $S1 \in F(S2), S1 \in F(S3) F(S2) = F(S3) = \{x\ revised\ x's\ paper\}$

3. *(JBB):

$[\text{John revised John's paper}]_{S1} \in F([\text{BILL revised Bill's paper}]_{S2}) = \{x \text{ revised } x\text{'s paper}\}$

$[\text{John revised John's paper}]_{S1} \notin F([\text{the TEACHER revised Bill's paper}]_{S3}) = \{x \text{ revised Bill's paper}\}$

4. *(JJT):

$[\text{John revised John's paper}]_{S1} \in F([\text{BILL revised John's paper}]_{S2}) = \{x \text{ revised John's paper}\}$

$[\text{John revised John's paper}]_{S1} \in F([\text{the TEACHER revised teacher's paper}]_{S3}) = \{x \text{ revised } x\text{'s paper}\}$

$[[\text{John revised John's paper}]_{S1} \text{ before } ([\text{BILL revised John's paper}]_{S2})_{S0} \notin F([\text{John revised John's paper}]_{S1} \text{ after } [\text{the TEACHER revised teacher's paper}]_{S3})_{S4}] = \{\text{John revised John's paper after } x \text{ revised } x\text{'s paper}\}$

5. *(JBJ):

$[\text{John revised John's paper}]_{S1} \in F([\text{BILL revised Bill's paper}]_{S2}) = \{x \text{ revised } x\text{'s paper}\}$

$[\text{John revised John's paper}]_{S1} \notin F([\text{the TEACHER revised John's paper}]_{S3}) = \{x \text{ revised John's paper}\}$

$[[\text{John revised John's paper}]_{S1} \text{ before } ([\text{BILL revised Bill's paper}]_{S2})_{S0} \notin F([\text{John revised John's paper}]_{S1} \text{ after } [\text{the TEACHER revised John's paper}]_{S3})_{S4}] = \{\text{John revised John's paper after } x \text{ revised John's paper}\}$

Reading 3 is ruled out because S3 and S1 do not match.⁵ Note that readings 4 and 5 are ruled out because S₀ and S₄ do not match. They are required to match because of the contrast relation between *before* and *after*, not because of ellipsis.

5 Potential Problems and Complications

Our account is based on a simple claim about the interaction of discourse structure with ellipsis resolution. Here we examine some cases that seem, *prima facie*, to challenge our account. In general, we will see that these potential problems can in fact be solved by appealing to independent issues of semantic interpretation, or by flexibility that is indeed already present in our account. We begin by observing that certain examples that appear to lack local c-command in fact involve Matching -with the required local c-command- at a higher clause level. Next,

⁵Strictly speaking, it is not entirely clear that our approach rules out reading 3. We have shown above that reading 3 causes matching between S3 and S1 to fail. However, we must consider whether the parallelism requirement generated in S3 can be satisfied by matching S4 and S0. Intuitively, this would not appear possible, since S0 contains S1, the antecedent for the ellipsis in S3, and this is not permitted by our condition (see 1). However, one might instead claim that S2 is the antecedent for S3. Then we could not rule out matching between S4 and S0 to satisfy S3's parallelism requirement, and this matching would wrongly allow for Reading 3. It is clear that this alternative matching conflicts with the spirit of our approach – although match succeeds between S0 and S4, there is a clear sense in which they are not parallel, since S1 would be the antecedent for S2 within S0 but ..S1 would not be a parallel antecedent for S3 within S4. It is therefore necessary to specify some further condition to our definition of Match, which we have given following Rooth's original definition, simply in terms of semantic denotations. Many authors have suggested that a more structural view of parallelism matching is required (for example, (Fox, 2000) describes a method in which corresponding links are structurally compared). We leave the precise statement of this further condition to future work.

we look at cases which involve implicit material, independently required for the interpretation of modal operators. Once this implicit material is taken into account, Matching obtains in the predicted discourse configuration. Next we examine cases where some simple inferences are required to produce the correct Matching. The appeal to inference has always been part of the matching approach, independently of the new Discourse Condition. Finally, we look at a difficult case of symmetric focus in which the prediction of our account might appear to be violated. Here the judgements are unclear, and there appears to be a clash between the requirements of our claim and requirements of other focused expressions.

5.1 Matching at Different Levels

The c-command constraint sharply limits possible interpretations for ellipsis, in a way that might at first glance appear excessively restrictive. For example, one might think that embedded antecedents are never possible, since they cannot c-command the ellipsis site. It is important to realize however, that the matching can often take place at many levels. Recall that the Matching Condition simply requires matching between some antecedent constituent ANT and *some* constituent E containing the ellipsis; in particular, we do not require that the *minimal* containing clauses match. We will see that, in all of the following cases, apparent matching between clauses without local c-command is due to matching clauses at a higher level that are in the appropriate c-command relation.

We start with the set of examples (23)-(25). (23) is like the examples from the section 3.2. The relative clause S1 and the main clause S2 are discourse sisters in a *ForAll* structure. Hence matching can apply between them and the ellipsis is resolved to S1's VP.

- (23) Everyone who [wanted to leave before he ate salmon]_{S1} [did *(eat salmon) / (leave before he ate salmon)]_{S2}

But what about (24)? Despite the fact that the two embedded clauses S3 and S4 in (24) are not discourse sisters, ellipsis resolution can select the embedded VP in S3. We propose that here matching is performed not between S3 and S4, but between the two matrix clauses S1 and S2, which are discourse sisters. This can be seen by comparing (24) with (25). (25) shows that, if we change the second matrix sentence so that the matrix sentences S1 and S2 do not match, the embedded VP *eat salmon* is not an available antecedent anymore.

- (24) [The man who [ate salmon]_{S3} left this evening]_{S1}. [The man who [didn't(eat salmon)]_{S4}, left this afternoon.]_{S2}
 (25) [The man who ate salmon left this evening]_{S1}, and [John did too (leave this evening)/*(eat salmon).]_{S2}

A second type of example, which involves questions, is given in (26). Here the local c-commander S2 does not provide the antecedent for the VP ellipsis site. But, again, our c-command constraint is not violated, since matching can be done between the question S1 and the entire sentence S4, which stand in the Question/Answer discourse relation:

- (26) [Did the students answer the survey?]_{S1}
 [[Everyone who [received the forms]_{S2} [did]_{S3} (answer the survey)]_{S4}

In this sense, matching in (26) obtains exactly at the same level as in (27), between a question and its sister answer. The only difference is that, while (27) provides a complete answer, (26) only gives a partial one. Following Groenendijk-Stokhof (1984), a partial answer eliminates some equivalence class in the partition (of possible exhaustive answers) induced by the question,

but it does not eliminate all but one. (Or, in terms of (Büring, 1997), S4 in (26) answers some subquestion of the relevant question, but leaves some other subquestions unanswered.)

- (27) [Did the students answer the survey?]_{S1}
 Yes, [they did (answer the survey)]_{S4}

5.2 Implicit Material

Here, we examine cases involving implicit material. We argue that our account must have access to this implicit material. Consider example (28). Here, S1 seems to match S2 and resolve the VPE with it, despite the lack of local c-command between them:

- (28) [If it rains, [John will come home]_{S1}]_{S0}. [Peter might (come home)]_{S2}, too.

However, note that modals always carry some restrictor set *C* of possible worlds. This set is at least partly determined contextually, and it can be further restricted with an explicit *if*-clause (Kratzer 1979, Fintel 1994). In (28), the restrictor set is specified by the *if*-clause for S0 and contextually determined for S2. But note that the restrictor of *might* in S2 is understood as being $\{w' : \textit{it rains in } w'\}$. That is, semantically, the higher clauses S0 and S2 match. And, since S0 is the local c-commander of S2, matching occurs with the appropriate discourse relation.

- (29) [If it rains, [John will come home]_{S1}]_{S0}. [If $C_{\{w' : \textit{it rains in } w'\}}$, [Peter might (come home)]_{S3}]_{S2}, too.

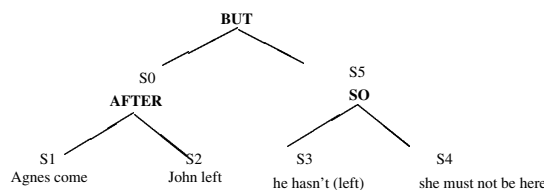
Matching is also done at the top level in the following variant, where not only the subjects but the content of the restrictor sets contrast with each other:

- (30) [If it rains, [John might come home]_{S1}]_{S0}. [[Peter will (come home)]_{S3} no matter what]_{S2}.

5.3 Inferencing

In Rooth's original exposition of the Matching account of VPE (Rooth, 1992), he argued that Matching must have access to inferred antecedents. The following example (due to an anonymous reviewer) appears to violate our account, but in fact simply illustrates the interaction of inference with matching.

- (31) [[Agnes said she would come]_{S1} after [John left]_{S2}]_{S0}.
 But [[he hasn't]_{S3}, so [she must not be here yet]_{S4}]_{S5}.



Again, the minimal clause containing the ellipsis, S3, appears to match the embedded S2. This matching is prohibited by our discourse condition. Can we find a matching ANT sentence at a higher level? In other words, do the sisters S0 and S5 match? We argue that, if we allow for some simple inferences and some straightforward implicational bridging in the Matching Condition, the answer is yes. The relevant steps are the following.

First, S2 and S3 match semantically.

Second, *Agnes hasn't come* generally implies *Agnes isn't here*.

Third, the entire S0 *Agnes said she would come after John left* implies S0' *If John hasn't left, Agnes must (according to Agnes' forecast) not have come yet*. Using the implication from the previous step, we obtain S0'' *If John hasn't left, Agnes must not be here yet*. Now, does the implied S0'' *If John hasn't left, Agnes must not be here yet* match S5 *John hasn't left, so Agnes isn't here yet*? We think it does. The two sentences express the same consequence relation between two propositions. The only difference is that we have *if-then* in S0'' (*if-then* only states this consequence relation) and we have *polarity(or assertion)-so* in S5 (roughly, *polarity-so* expresses the consequence relation *and* states the value of the two propositions in the actual world). Hence, taking the relation *polarity-so* to contrast with the relation *if-then*, S0'' (and thus S0) matches S5.

Let us look at a similar example, given in (32). S1 and S3 seem to match despite the fact that S1 is not S3's discourse sister:

- (32) [If [Agnes visited Venice]_{S1} , [she'd ride in a gondola.]_{S2}]_{S0}
Unfortunately, [she never did (visit Venice)]_{S3}

Notice that, in general, S1 is not a good matching source for S3 in this configuration. In (33)-(34), focus on *Peter* requires a sentence containing it to find a matching antecedent, no matter whether we have ellipsis or deaccenting. Matching the non-sisters S1 and S3 in (33) does not fulfill this goal, and thus the discourse is ill-formed.

- (33) # [If [Agnes visited Venice]_{S1} , [she'd ride in a gondola.]_{S2}]_{S0}
[PETER never *visited Venice* / did (visit Venice)]_{S3}, either.

But, if we add a *so*-clause as in (34), the discourse is judged felicitous:

- (34) [If [Agnes visited Venice]_{S1} , [she'd ride in a gondola.]_{S2}]_{S0}
[[PETER never visit Venice / did (visit Venice),]_{S3} either, so [he hasn't ridden in a gondola]_{S4} either.]_{S5}

This suggests that the felicitous matching compares S0 and the lengthened S5, and not S1 and S3. We propose that matching is done at the top level again after the speakers execute the appropriate inferences, made salient by the adverb *unfortunately*. That is, (32) is felicitous as far as it is roughly understood as in (35)

- (35) [If [Agnes visited Venice]_{S1} , [she'd ride in a gondola.]_{S2}]_{S0}
[[She never did (visit Venice)]_{S3} so [unfortunately she has never ridden in a gondola]_{S3}]_{S4}

5.4 Symmetric Focus

Before concluding this paper, we would like to consider one more case, this time involving symmetric focus. Recall that example (17), repeated below, is ungrammatical under ellipsis resolution to *eat*. But what happens if we add focus on *John*, as in (37)?

- (36) If [Agnes arrived after [John ate] _{S3}]_{S1} then [Bill didn't]_{S2}. *(eat)/ (arrive after John ate)
(37) If [Agnes arrived after [JOHN ate] _{S3}]_{S1} then [BILL didn't]_{S2}. %(eat)/ %(arrive after John ate)

Judgements are unclear for (37). The ellipsis resolution to *eat* is marginal for some speakers, while others judge it acceptable. In the lack of more conclusive empirical data, we will speculate on how each of the two judgments could be derived.

Let us first assume this ellipsis resolution is marginal. We can derive this marginality from the fact that, under any possible resolution, there is a clash between matching and c-command. On the one hand, the focus on JOHN requires that ellipsis is resolved as *eat* (this way, the phrase [JOHN ate] contrasts with [BILL didn't eat]). But this leads to a violation of the local c-command discourse condition, since S3 is not c-command to S2. On the other hand, if ellipsis is resolved as *arrive after John ate* and c-command obtains, then the phrase [JOHN ate] is not matched, and, hence, it is infelicitous. Hence, the accenting in (37) may be marginal under any ellipsis resolution because there is no winning resolution candidate. Instead, on either resolution of the ellipsis, we obtain a violation.

Let us now assume the judgment, shared by some speakers, that the resolution to *eat* is acceptable. Should we allow S3 and S2 to match, and consider that symmetric focus overrides the discourse c-command requirement? The answer is no, since we need c-command to correctly rule out the following minimal variant:

(38) [Agnes arrived after [JOHN ate,] _{S3}]_{S1} but [BILL didn't]_{S2}. *(eat)

We propose that, for those speakers for whom the sentence is acceptable, the ellipsis resolution *eat* does not come from matching S2 with the non-c-commanding S3. Instead, both the focus on JOHN and BILL and the ellipsis *eat* are licensed by matching them with a previous implicit or explicit question *Who ate?* that acts as the sister of the entire answer S4:

(39) Q: [Who ate?]_{S0}
 A: [[If Agnes arrived after [JOHN ate / did (eat),] _{S3}]_{S1} then [BILL didn't (eat)]_{S2}]_{S4}

The sentence (39A) is a felicitous relevant answer to the question in (39 Q): it does not answer the question in full, but it gives an entailment relation between facts concerning the two possible answers *John ate* and *Bill ate*. The question/answer pair in (39) is reminiscent of example (41), from (Büring, 2000). Büring notes that, even though (41 A) is not a total or partial answer to (41 Q) in Groenendijk-Stokhof's definition,⁶

it should count as a felicitous answer, since it at least shifts the probability towards one of the equivalence classes:

(41) Q: Will you come to the party?
 A: Presumably.

In a comparable way, our example (39) at least states a relation involving some of the equivalence classes. Büring envisions a new definition of felicitous relevant answer that uses Kratzer's (1981) idea of ordering a set of propositions (e.g. the propositions in the question's partition)

⁶Technically, (39 A) and (41 A) are not partial answers to (39 Q) and (41 Q) respectively under Groenendijk-Stokhof's (1984), since they do not eliminate any of the equivalence classes induced by their question. For example, (39 A) does not eliminate any of the following possible equivalence class defining propositions:

(40) John ate and nobody else did
 Bill ate and nobody else did
 John and Bill ate and nobody else did.
 Pat ate and nobody else did.
etc.

using another set of propositions (the ordering source). A response that adds a proposition to the ordering source counts, then, as a felicitous answer.

Note that, in this same question/answer context, (38) is judged as an odd (partial) answer, as witnessed in (42), maybe because it provides irrelevant information about the timing of one of the answers (i.e., that John ate before Agnes arrived is irrelevant). This supports the idea that the symmetric focus is licensed when the entire S4 is be understood as an answer to the question *Who ate?*, and not by matching S3 and S2 without c-command.

- (42) Q: [Who ate?]_{S0}
A: [[Agnes arrived after [JOHN ate / did (eat),] _{S3}]_{S1} but [BILL didn't (eat)]_{S2}]_{S4}.

6 Conclusions

Our basic claim is that discourse structure constrains the way in which ellipsis satisfies a parallelism constraint, and we have proposed a very simple way to capture this: the parallelism match must involve two clauses that are related by local c-command. We have shown how this simple claim successfully captures facts about the selection of antecedent for ellipsis, and about the determination of possible readings with a given antecedent. We have also shown how our claim interacts with inferred antecedents, and implicit semantic material.

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