Coherence Relations, Ellipsis, and Contrastive Topics[1]

Petra Hendriks
Centre for Language and Cognition Groningen, University of Groningen
(P.Hendriks@let.rug.nl)

1. The puzzle

A highly pervasive phenomenon in natural languages is ellipsis. It is commonly believed that the presence of ellipsis is one of the main reasons why natural language is as ambiguous as it is. If lexical material is left unpronounced, a hearer must rely on other parts of the sentence, on contextual information and on intonation to recover the unpronounced material. Because there may be different options within the sentence for recovery of unpronounced material, elliptical sentences can be ambiguous. Also, the context in which the sentence appears can differ, which may lead to different readings. Finally, the sentence may be compatible with different patterns of intonation. Because intonation can have truth-conditional effects, this may also increase the number of readings of a sentence.

In a number of cases, however, ellipsis decreases rather than increases the number of readings of a sentence. Consider the following sentences from Levin and Prince (1986):

(1) Sue became upset and Nan became downright angry.
(2) Sue became upset and Nan Ø downright angry.

Sentence (1) has two readings, a symmetric and an asymmetric reading. According to the symmetric reading, the two events expressed by the two conjuncts are understood as independent. According to the other reading, the asymmetric reading, the first event is interpreted as the cause of the second event. In contrast to (1), the gapped sentence in (2) only has the symmetric reading.

[1] I would like to thank Gerlof Bouma, Jennifer Spenader, Niina Zhang, Jan-Wouter Zwart, the audience of the PIONIER Workshop on Contrast in Discourse, April 2003, in Nijmegen, the audience of the TABU-dag, June 2003, in Groningen, and two reviewers for this journal for their comments. I gratefully acknowledge the Netherlands Organisation for Scientific Research, NWO (grants no. 051.02.070 and 015.001.103).

The availability of the symmetric and asymmetric reading can most easily be detected by embedding the sentence in a context which favors a symmetric or asymmetric reading. The following examples are again taken from Levin & Prince (1986):

(3) Sue and Nan had worked long and hard for Carter. When Reagan was declared the winner, Sue became upset and Nan became/ Ø downright angry.

(4) Susan's histrionics in public have always gotten on Nan's nerves, but it's getting worse. Yesterday, when she couldn't have her daily Egg McMuffin because they were all out, Sue became upset and Nan became/# Ø downright angry.

The context in (3) favors a symmetric reading. Both the ungapped sentence in (1) and the gapped sentence in (2) are possible in this context. In the context in (4), favoring an asymmetric reading, however, the gapped version is infelicitous. This shows that an asymmetric reading is not available for the gapped version of the sentence. The central question of this paper is why gapping decreases the number of readings of an ambiguous sentence.

Section 2 discusses Kehler's solution to this problem. As is shown in section 3, Kehler's analysis solves a number of well-known problems for both syntactic and semantic approaches to ellipsis. Section 4 discusses several problems with Kehler's analysis. An alternative solution is proposed in section 5. Here, it is argued that the presence of symmetric and asymmetric readings depends on the way the topic is constructed. Section 6 presents a brief sketch of an optimization approach to coherence resolution. Sections 7 and 8, finally, are concerned with subject deletion in Dutch. The properties of this type of ellipsis are shown to be predicted by the proposed analysis.

2. Coherence relations and ellipsis

Kehler (1996, 2000, 2002) offers an explanation for the question why gapping sometimes decreases the number of readings of a sentence. His explanation is based on the interaction between ellipsis and the inference processes that underlie the establishment of coherence relations in discourse. Following ideas first articulated by David Hume some 250 years ago, Kehler distinguishes three general classes of coherence relations between utterances: (a) Cause-Effect relations, (b) Contiguity relations and (c) Resemblance relations.

A Cause-Effect relation requires that a path of implication be identified between the propositions denoted by the utterances. In the case of a Cause-Effect relation like the one expressed in (5a), if the proposition *p* is inferred from the first conjunct and the proposition *q* is

inferred from the second conjunct, the presupposition that should be satisfied is $p \rightarrow q$. In (5a), p corresponds to the meaning of *Bill was about to be impeached*, q corresponds to the meaning of *Bill called his lawyer*, and the presupposition to be satisfied is *if X is about to be impeached, then it plausibly follows that X will call his lawyer*. This is a prototypical case of a Cause-Effect relation termed Result. Note that coherence relations do not require the presence of an overt conjunction. In (6a), the same coherence relation would hold if no overt conjunction were present. Other Cause-Effect relations are Explanation (presupposing $q \rightarrow p$), Violated Expectation (presupposing $p \rightarrow \neg q$) and Denial of Preventer (presupposing $q \rightarrow \neg p$).

Cause-Effect Relations:

(5) a. Bill was about to be impeached, and he called his lawyer. (Result)

b. Bill called his lawyer, because he was about to be impeached. (Explanation)

c. Bill was about to be impeached, but he didn't call his lawyer. (Violated Expectation)

d. Bill didn't call his lawyer, even though he was about to be impeached. (Denial of Preventer)

The second class of relations is Contiguity, in which the sole relation is Narration:

Contiguity Relations:

(6) Ken Starr convened his grand jury this morning, and Vernon Jordan was called to testify. (Narration)

Narration allows a speaker to express a sequence of events centered around some common theme. A Narration relation requires that the events described by the passage display forward movement in time. Although Kehler points out that temporal progression is not enough to give rise to a Narration relation, he does not present a detailed analysis of this coherence relation.

The third class of coherence relation Kehler distinguishes is Resemblance. According to Kehler, establishing a passage as coherent by way of a Resemblance relation is fundamentally different from establishing a Cause-Effect relation or a Contiguity relation. Resemblance requires that commonalities and contrasts among parallel entities and properties in the two clauses be recognized.

Resemblance Relations:

(7) a. Bill likes to play golf, and Al enjoys surfing the net. (Parallel)

b. John supports Clinton, but Mary opposes him. (Contrast)

c. John voted for Clinton, but Mary voted for Dole. (Contrast)

In the case of the relation Parallel, coherence results from inferring a common relation, along with common properties of the parallel entities. In (7a), the common relation is participation in a recreational activity. The common property of the parallel entities *Bill* and *Al* is that they are democratic politicians. The relation Contrast, illustrated in (7b), requires that the relations between parallel entities (*John* and *Mary*, and *Clinton* and *him*) are contrasted. In (7b), these contrasted relations are *support* and *oppose*. In the second version of the Contrast relation illustrated in (7c), a property of an entity in the first clause (*vote for Clinton*) stands in a contrast relation to a property of the parallel entity in the second clause (*vote for Dole*).[2]

Crucial for Kehler's explanation of the disappearance of the asymmetric reading for the gapped sentence in (2) is the different way in which these coherence relations are established. Establishing a Resemblance relation requires access to the semantics of the constituents in the conjuncts (i.e., the common or contrasted relations and the parallel entities). Establishing a Cause-Effect relation or Contiguity relation, on the other hand, requires access only to the clause-level semantics (i.e., the propositions *p* and *q*). According to Kehler (1996: p. 229), because "elided information in the syntax of the target is recovered in just those cases in which the coherence resolution mechanism needs to access the semantics of syntactic nodes within the elided material", the missing verb can be recovered only when a Resemblance relation is operative. So Kehler's explanation for the unavailability of an asymmetric (i.e., Cause-Effect relation) reading for (2) is based on the view that the gapped verb is not recoverable under this reading.

3. Syntactic reconstruction versus anaphora resolution

By making a distinction between Cause-Effect relations and Contiguity relations, on the one hand, and Resemblance relations, on the other hand, Kehler is able to account for a number of well-known problems for both syntactic and semantic approaches to ellipsis. Ellipsis in Cause-

[2] In addition to these three types of Resemblance relations, Kehler (1996) also distinguishes the Resemblance relations of Exemplification, Generalization and Elaboration. The exact types of coherence relations will not be relevant for the present discussion though.

Effect relations and Contiguity relations tends to accord with semantic approaches to ellipsis (such as, e.g., Dalrymple et al., 1991). In these constructions, syntactic mismatches are allowed between the elided phrase and its antecedent. For example, in (8) (cited in Dalrymple, 1991) the antecedent clause is passivized, whereas the elided phrase sits in an active clause.

(8) In March, four fireworks manufacturers asked that the decision be reversed, and on Monday the ICC did. [did = reverse the decision]

Similarly, the antecedent may be a noun whereas the elided phrase is a verb phrase, but only if the coherence relation is a Cause-Effect relation or a Contiguity relation. Syntactic reconstruction approaches yield the wrong predictions for these constructions.

In contrast, ellipsis in Resemblance relations tends to accord with syntactic approaches to ellipsis (such as, e.g., Lappin, 1996). Unlike the acceptable cases of voice alternation with Cause-Effect relations, similar examples in Resemblance relations are unacceptable:

(9) #This problem was looked into by John, and Bob did too. [did = look into the problem]

Also, Condition A and C effects and subjacency effects are correctly predicted for ellipsis in Resemblance relations. This supports a syntactic reconstruction approach to ellipsis.

Kehler explains this difference by positing that ellipsis in Resemblance relations and in Cause-Effect relations is resolved in a totally different way. Ellipsis in Resemblance relations is resolved through syntactic reconstruction. For this reason, Resemblance relations require parallelism between the two conjuncts. In contrast, Cause-Effect relations and Contiguity relations do not require parallelism between the two conjuncts because ellipsis in these relations is not resolved through syntactic reconstruction but rather through a process of anaphora resolution. This distinction allows Kehler to explain the different conditions on ellipsis in these constructions.

4. Determining the correct coherence relation

Although Kehler's distinction provides a nice explanation for the observed problems with syntactic and semantic approaches to ellipsis, there are at least four problems with his explanation. First of all, as Kehler himself already acknowledges, "[...] no robust mechanical procedure currently exists for reliably determining the correct [coherence] relations for arbitrary

examples" (Kehler, 2000: p. 545). The best we can do to get an indication of the coherence relation, according to Kehler, is by applying tests using conjunctions and other indicator words. If two clauses are conjoined by *and*, they can express various coherence relations. If the sentence can be paraphrased with *and similarly* or *and ... too*, the relation is a Resemblance relation. If the sentence can be paraphrased with *and therefore* or *and as a result*, this signals a Cause-Effect relation. And if the sentence can be paraphrased with *and then*, this might signal a Contiguity relation, although often not to the exclusion of other relations. Unfortunately, many coordinate constructions occur without words that explicitly indicate the intended coherence relation. Moreover, sentences (1) and (2), which both have a symmetric Resemblance reading, do not even allow for the presence of *and ... too*. Also, indicator words for different coherence relations can appear in the same sentence. In (10), for example, *as a result* indicates a Cause-Effect relation, whereas *too* indicates a Resemblance relation.

(10) Sue became upset, and as a result Nan became upset too.

A second problem with Kehler's explanation is the observation that the Cause-Effect reading also seems to disappear in cases where no ellipsis is involved. Recall that Kehler explains the unavailability of a Cause-Effect reading for the gapped sentence in (2) through the unrecoverability of the gapped verb under this reading. However, compare (2) to (11):

(11) SUE became UPSET and NAN became DOWNRIGHT ANGRY.

If all constituents but the finite verbs are pronounced with contrastive accent, the asymmetric reading seems to disappear, or at least becomes highly marginal. Moreover, if this sentence is embedded in a context which favors an asymmetric reading, such as in (4), the result is infelicitous. However, no ellipsis has taken place in (11), so recoverability cannot be at stake here. But if the disappearance of the Cause-Effect relation cannot be explained as a failure to recover missing material in this example, it might not be the correct explanation for the missing reading of the gapped sentence in (2) either.

A third problem concerns the status of indicators of coherence relations, in particular *too*. It is unclear why a presupposition trigger such as *too* should indicate a Resemblance relation. Whereas combinations such as *and similary* or *and therefore* might be analyzed as complex conjunctions marked in the lexicon as expressing a certain coherence relation, no such solution is

possible for *too* because *too* does not occur adjacent to the conjunction *and*. Therefore, the status of *too* as an indicator of a Resemblance relation remains unexplained under Kehler's analysis.

A final problem with Kehler's explanation concerns the mutual dependency that appears to be present among the processes of coherence resolution and anaphora resolution. To be able to infer commonalities and contrasts among two clauses, and, consequently, to establish the coherence relation between these clauses, one has to resolve all ellipsis. But, as Kehler argues, ellipsis resolution is dependent on the type of coherence relation.

This mutual dependency can be dealt with in a framework in which resolution processes take place simultaneously, such as Optimality Theory (OT, cf. Prince & Smolensky, 1993). In OT, a grammar consists of a set of constraints which are applied to possible output representations simultaneously. Because these constraints are hierarchically ranked according to strength, OT provides a formal mechanism for resolving conflicts between constraints. A lower ranked constraint can be violated, but only in order to satisfy a higher ranked constraint. Beaver (to appear), reformulating concepts from Centering Theory (Grosz, Joshi & Weinstein, 1995), shows that it is possible to account for pronoun resolution and topicality in an OT framework. De Hoop and de Swart (2000) present an OT account of temporal relations using insights from Segmented Discourse Representation Theory (SDRT, cf. Asher, 1993; Asher & Lascarides, 1998). The remainder of this paper will be compatible with an OT perspective on interpretation.

5. Contrastive topics

Let us recapitulate the discussion so far. As we saw, the conjunction *and* is compatible with different types of coherence relations. If the finite verb of the second conjunct is removed through gapping, however, only the Resemblance relation remains. In the previous section, I argued that Kehler's explanation for the disappearance of the Cause-Effect reading cannot be correct. The question that remains to be answered is why this reading disappears in the context of gapping. In this section, it will be argued that the Cause-Effect reading disappears as a result of the Resemblance relation being more prominent. The Resemblance relation becomes more prominent because the coordinate construction can be interpreted as containing a contrastive topic.

Let us look again at the contexts favoring a symmetric or asymmetric reading in (3) and (4). These contexts differ in what they are about. The context in (3) appears to be about the pair of individuals Sue and Nan. The context in (4), on the other hand, appears to be about Sue. In other words, the two contexts differ with respect to their topic. As a result, the two subjects in the

second sentence in (3) are interpreted as contrastive topics, whereas the two subjects in the second sentence in (4) are not.

According to Krifka (1999), contrastive topics are topics. That is, they can be analyzed as the entities a predication is about. But, in addition, contrastive topics are contrastive. This means that they come with alternatives. Assuming that a sentence is an answer to some implicit question, the function of a contrastive topic is to indicate that the answer is a partial one. Krifka gives the following definition:

(12) $[...T_F...C_F...]$ is a true contrastive answer to Q iff:

a. $[...T...C_F...]$ is a partial congruent answer to Q;

b. there are alternatives T', T''... to T and alternatives C', C''... to C such that $[...T...C_F...] \wedge [...T'...C'_F...] \wedge [...T''...C''_F...] \wedge$ ... entails a true proposition in Q.

The contrastive topic, T_F (focus within the topic), is usually marked by secondary, rising accent. The focus of the comment, C_F, which is the focus that identifies the alternatives in answers that correspond to the variation introduced by the question, is often characterized by a falling accent. In the context of the question *What did Peter and Pia eat?*, the answer *Péter ate pàsta* is a partial answer. An alternative answer would be *Pía ate pàsta*. So *Péter* and *Pía* are contrastive topics. In both answers, *pàsta* is the comment focus providing the answer to the question.

In (3), the two conjuncts of the second sentence can also be interpreted as partial answers to the same implicit question, namely to the question *What happened to Sue and Nan when Reagan was declared the winner?* Therefore, *Sue* and *Nan* are contrastive topics. Such an implicit question for which both conjuncts are partial answers cannot be formulated for the second sentence in (4).[3] In Cause-Effect relations and Contiguity relations, the second conjunct builds on the first conjunct. As a consequence, the topic may shift between the conjuncts. In Resemblance relations, on the other hand, each conjunct is independently related to the previous discourse.

Under the assumption that Resemblance relations and Cause-Effect relations differ with respect to the way the topic is constructed, we would expect other differences to arise. For example, the interpretation of pronouns following Resemblance relations and Cause-Effect

[3] The notion of topic and how it is constructed also forms the basis for a major distinction between discourse relations in SDRT, namely between coordinators and subordinators (Gómez Txurruka, 2003). However, the distinction in SDRT does not fully correspond to the distinction between Resemblance relations, on the one hand, and Cause-Effect relations and Contiguity relations, on the other hand.

relations are expected to differ. Pronouns prefer to refer to the topic. If the topic is contrastive and hence is provided by the subjects from both conjuncts of a coordinate construction, we would expect a pronoun following this coordinate construction to preferably refer to the group of entities denoted by the conjunction of the two subjects. On the other hand, if the topic is provided by the subject of a single conjunct, we would expect a pronoun to preferably refer to this subject. These expectations are borne out by the following examples:

(13) The men and the women had worked long and hard for Carter. When Reagan was declared the winner, the men became upset and the women Ø downright angry. They wanted to leave immediately.

(14) The men's histrionics in public have always gotten on the women's nerves, but it's getting worse. Yesterday, when they couldn't have their daily Egg McMuffin because they were all out, the men became upset and the women became downright angry. They wanted to leave immediately.

Indeed, the preferred interpretation of *they* in (13) is that it refers to the group of men and women. On the other hand, the preferred interpretion of *they* in (14) seems to be that it refers to just the women. These observations suggest that the differences between Resemblance relations and Cause-Effect relations result from the different way in which the topic is established in these constructions. In Resemblance relations, both conjuncts contribute to the topic in an equal manner. In Cause-Effect relations, each conjunct contributes to the topic independently of the other conjunct. Hence, a topic shift is possible here.

The assumption that the conjuncts in a Resemblance relation require a contrastive topic is supported by a number of other facts as well. First, contrastive topics are usually marked by pitch accent. We already saw in (11) that the asymmetric Cause-Effect reading becomes highly marginal if the subjects are pronounced with pitch accent, even in the presence of a context favoring an asymmetric interpretation. Because gapping requires the remnants to bear contrastive stress, this explains why gapping has the same effect on the interpretation of the coherence relation as stressing the subjects. That is, it explains why the gapped sentence (2) only has a symmetric reading. Sentence (1), in contrast, is compatible with the construction of the topic both as a contrastive topic and as a non-contrastive topic. Hence, this sentence is ambiguous in the absence of further, disambiguating, context.

Secondly, the symmetric reading disappears if the subject of the second conjunct in the passage in (3) is replaced by the pronoun *she*. In that case, this pronoun must be interpreted as

refering back to the subject of the first conjunct. Because the two subjects are now anaphorically related, they cannot be interpreted contrastively. Hence, the coherence relation expressed by the second sentence cannot be a Resemblance relation.[4]

A third argument in favor of the assumption that Resemblance relations are characterized by the presence of contrastive topics is Krifka's (1999) conclusion that stressed postposed additive focus particles associate with a contrastive topic. Here we have an explanation for why *too* is an indicator of a Resemblance relation. Recall that Kehler has to stipulate that the presence of *too* marks a Resemblance relation. However, *too* is an additive focus particle and as such requires association with the contrastive topic of the clause in which it occurs. Because Resemblance relations require the topic to be contrastive, this explains why the presence of *too* signals a Resemblance relation. Independent but related evidence for the assumption that the two conjuncts in a Resemblance relation both contribute to the topic comes from an investigation by Sæbø (this issue) of the role of the additive particles *too* and *again*. To account for the fact that an additive particle is sometimes necessary to yield an incoherent passage coherent, Sæbø argues that the topic of a sentence with *too* or *again* must be the sum of the associate of the particle and its alternative. In coordinate constructions, the alternative is always provided by the other conjunct. Hence, the topic of coordinate constructions with *too* and *again* must be constructed on the basis of both conjuncts.

Because the three characteristics discussed here do not hold for Cause-Effect relations, Cause-Effect relations must involve a non-contrastive topic. In sections 7 and 8, additional evidence is provided for the assumption that the relevant distinction between Resemblance relations and Cause-Effect relations concerns the construction of the topic. First, however, I will present a brief sketch of how an OT account of coherence resolution might look like.

6. An optimization approach to coherence resolution

[4] One of the reviewers pointed out that there are cases of Resemblance that do not seem to involve contrastive topics:

(i) Susan supports Paul, and she likes him, too.

But note that the additive particle is obligatory here. The verb *likes*, with which the additive particle associates, is a contrastive focus rather than a contrastive topic. Contrastive focus must be distinguished from normal sentence focus and is due to, e.g., focus-sensitive operators. As Sæbø (this issue) points out, a topic and a focus will amount to basically the same as regards contrast, both presupposing a set of alternatives. Therefore, the two conjuncts of sentence (i) are felicitous answers to the same implicit question *What is Susan's relation to Paul?*

Lascarides and Asher (1993) show that when there is a conflict between a narrative interpretation and a causal interpretation, the causal interpretation takes precedence over the narrative interpretation. They explain this by the laws of non-monotonic logic. Conflict between defeasible rules is resolvable in non-monotonic logic if one is more specific than the other. Because their Causal Law is more specific than their discourse relation of Narration, the Causal Law wins. In an OT framework, the same effect can be obtained by assuming that the constraint favoring a causal interpretation is stronger than the constraint favoring a narrative interpretation. As a first approximation, let us formulate these constraints as follows:

(15) *Cause-Effect*(α,β). The event described in α must stand in a causal relation to the event described in β.

(16) *Contiguity*(α,β). The event described in α must stand in a temporal relation to the event described in β.

Note that these constraints are formulated as general as possible. There is no need to formulate one of the constraints as more specific than the other, since OT resolves conflicts between constraints through the hierarchical ordering of the constraints. If the constraint *Cause-Effect*(α,β) is stronger than the constraint *Contiguity*(α,β), we expect conflicts to be resolved in favor of *Cause-Effect*(α,β). Alternatively, if there is no conflict between these two constraints and if there is no information available which is in conflict with either of these constraints, the result is a passage which is predicted to have a causal as well as a narrative reading.

Given these two constraints, how should the constraint with respect to the relation of Resemblance be formulated? Asher (1993) defines the discourse relations Parallel and Contrast as scalar relations. A Parallel or Contrast relation may be stronger or weaker depending on the plausibility with which parallel or contrasting nodes can be identified. In this respect, Asher's discourse relations Parallel and Contrast differ from the other discourse relations he introduces, which are not scalar. Under Ashers proposal, a maximization constraint for Parallel and Contrast relations requires that we maximize the strength of the parallelism or contrast and so pick the maximally strong Parallel or Contrast relation. However, a problem with such a scalar notion of Parallel is that two clauses can always be said to be parallel, albeit in a minimal way. Unless one has some independent and mechanical way of identifying the coherence relation of Parallel (and as we already saw earlier, indicator words such as *too* do not offer such a mechanical way of identifying this relation, because they need not be present or can be in conflict with other

information), a scalar definition of the coherence relation Parallel will not help us to explain the difference in interpretation between the sentences in (1) and (2).

In OT, constraints cannot be formulated in a scalar way. An OT constraint is either satisfied or not, but cannot be merely satisfied to a certain degree. Avoiding any reference to the scalar property of parallelism, we could formulate the constraint on Resemblance as follows:

(17) *Resemblance*(α,β). The event described in an α which contains a contrastive topic must not stand in any type of coherence relation to the event described in a β which contains its alternative.

Recall from our discussion of Levin and Prince's examples (1) and (2) that a symmetric reading is the only reading remaining after gapping. Now if the constraint *Resemblance*(α,β) is stronger than the other two constraints, causal and narrative readings are predicted to disappear just in case the two clauses can be interpreted as expressing contrastive topics. Thus it is predicted that the gapped sentence (2) only has one reading. Note that if we had formulated *Resemblance*(α,β) as a positive constraint requiring parallelism, we would incorrectly have predicted the gapped sentence (2) to be as ambiguous as its non-gapped counterpart (1). The three constraints also account for the ambiguity of the non-gapped sentence (1). This ambiguity results from an ambiguity with respect to the topic. If the topic can be interpreted as constrastive, the constraint *Resemblance*(α,β) is operative. In this case, no causal or narrative interpretation is possible. Alternatively, if the topic cannot be, or is preferably not, interpreted as contrastive, the clauses may stand in a causal or temporal relation to one another. Whether the topic is interpreted as contrastive or not depends on the linguistic context.

If the constraint *Resemblance*(α,β) is operative, the events described in two successive clauses α and β are predicted to not stand in any coherence relation to each other. However, this does not mean that the two clauses α and β are not anchored to the discourse. Although α and β are not related to each other, they bear the same coherence relation to the clause preceding α and β and to the clause following α and β. In this sense, α and β independently link the preceding discourse to the following discourse.

Under the formulation in (17), *Resemblance*(α,β) is in fact not a coherence relation itself but rather the absence of any coherence relation. Parallelism between constituents is thus considered to be an epiphenomenon. That is, there need not be any coherence relation Parallel which explicitly requires parallelism between entities, properties or relations expressed by two

clauses. Parallelism between two clauses under the proposed formulation of Resemblance follows from the fact that the two clauses contain contrastive topics. Because the two contrastive topics indicate that the two clauses are partial answers to the same implicit question (cf. Krifka, 1999), this results in the two clauses being in some sense parallel. Consequently, this view on parallelism might account for the scalar nature of this property.

7. SGF-coordination

In this section, more evidence is provided that Resemblance relations should be distinguished from Cause-Effect relations and Contiguity relations on the basis of the way they construct the topic. This evidence comes from so-called SGF-coordination in Dutch and German. SGF-coordination is a phenomenon which has been widely discussed in the syntactic literature but which has never really received a satisfactory treatment. I will show that a proper analysis of this phenomenon also has to take into account semantic and pragmatic factors.

According to Kehler (1996, 2000, 2002), elliptical processes such as gapping must be distinguished from anaphoric processes such as VP-ellipsis and pronominal reference. Anaphoric processes may be cataphoric when embedded, and they may access referents from other clauses than the most immediate one. This is not possible for elliptical processes. In Kehler's analysis, elliptical processes are analyzed as involving syntactic reconstruction, which requires parallelism between the elided phrase and the antecedent phrase. Anaphoric processes, on the other hand, are analyzed as involving anaphoric resolution, which does not require any parallelism. The distinction between ellipsis and anaphora thus is a crucial one for Kehler's explanation of the readings of the sentences in (1) and (2).

Now let us turn to the process of subject deletion in Dutch and German, first discussed by Höhle (1983). Höhle observed that it is sometimes possible in German to delete the subject of the second conjunct from what appears to be a sentence-internal position. He termed this phenomenon 'subject gap in fronted/finite clause coordination' or 'SGF-coordination'. This type of coordination is also possible in Dutch:

(18) Zwijgend zit je aan tafel en kijkt uit het raam.
silently sit you at table and look out the window
"Silently you sit at the table and look out of the window"

Besides the subject gap in the second conjunct, this construction is characterized by a fronted constituent in the first conjunct. As a result of this fronting, the subject of the first conjunct follows rather than precedes the finite verb. SGF-coordination forms a major challenge for the syntactic analysis of coordination. It does not seem possible to analyze this construction using the standard mechanisms for coordination. An analysis of this construction as involving symmetric coordination of like categories seems impossible because the first conjunct is a complete clause, whereas the second conjunct still requires a subject. Because the subject of the first conjunct appears inside the first conjunct, it is not clear how the meaning of the subject distributes over both conjuncts. In general, only peripheral material can distribute over all conjuncts. Proposed solutions to this problem involve resorting to asymmetric coordination (e.g., Wunderlich, 1988; Heycock and Kroch, 1994) or introducing certain non-word order preserving mechanisms into the grammar (e.g., Steedman, 1990; Kathol, 1999). Sturm (1995a,b) convincingly shows that the subject gap in the second conjunct in SGF-coordination must be located to the left of the verb. One of his arguments is the observation that the verb in the second conjunct has the morphology of a non-inverted verb (e.g., *kijkt* rather than *kijk* in (18)), which requires the subject to the left. Another argument is the fact that no fronted element can appear to the left of the verb.

As the following sentences show, SGF-coordination cannot be cataphoric (19), and only a referent from the immediate clause can serve as the antecedent (20):

(19) *Als Ø zwijgend aan tafel zit, dan kijk je uit het raam.
if silently at table sit, then look you out the window

(20) *Zwijgend zit je aan tafel. Het wordt donker en Ø kijkt uit het raam.
silently sit you at table. it becomes dark and look out the window

Given these properties, subject deletion in Dutch appears to be a process of ellipsis rather than anaphora, in Kehler's terms. Zwart (1996: p.265) points out another similarity between SFG-deletion and gapping. A gapped verb does not have to agree in number with its antecedent. Similarly, in SFG-deletion, the missing element does not have to be morphologically identical to it antecedent:

(21) Toen kwam er opeens een jager aan en Ø schoot het haasje dood. [Ø = die/*een jager]
then came there suddenly a hunter on and shot that-one/a hunter shot the hare dead
"Then suddenly a hunter arrived and he shot the hare"

This suggests that SGF-coordination and gapping are similar processes which should receive a similar treatment. However, in the next section I will show that, whereas gapping is only felicitous with Resemblance relations, SGF-coordination is only felicitous with Cause-Effect and Contiguity relations. This provides another argument against Kehler's explanation for the puzzle of the missing reading of (2), since Kehler assumes elided material to be recoverable only under a Resemblance relation. Moreover, I will show that the notion of topic plays a crucial role in SGF-constructions, thus yielding additional evidence for the view that the way in which coherence relations construct the topic restricts the types of ellipsis they can occur with.

8. Predictions of the analysis

Although it seems clear that in SGF-coordination a subject is omitted from the left of the verb in the second conjunct, the exact conditions under which the subject may be omitted are far from clear. According to van Zonneveld (1992), only entities that have been introduced in the context can serve as the subject in these constructions. In other words, only topics can serve as the subject here. For example, if the subject is the indefinite NP *niemand* ('noone'), or the indefinite NP *een man* ('a man') under a weak, non-referential reading, SGF-coordination is impossible: [5]

(22) *Zwijgend zit niemand/een man aan tafel en Ø kijkt uit het raam.
silently sit noone/some man at table and look out the window

The obvious explanation for the unacceptability of (22) is that indefinite NPs such as *noone* and *some man* do not like to serve as the topic. In fact, all acceptable cases of SGF-coordination presented by Sturm (1995a,b) and van Zonneveld (1992, 1996) involve definite subjects. This suggests that subject deletion in SGF-coordination is in fact topic deletion. [6] There is a clear contrast between (22) and (23), which contains a definite NP:

[5] In exceptional cases, indefinite NPs can appear as the subject of an SGF-construction. But this is only possible if the NP carries a strong reading. This is in accordance with the observation that indefinite NPs that are interpreted as specific or generic (i.e., carry a strong reading) can act as topics. For this reason, indefinite NPs such as *een man* ('some man'), *drie mannen* ('three men') and *veel mannen* ('many men') are impossible as the subject of an SGF-construction under a weak, non-referential, reading but can occur under a strong, referential, reading. Sentence (21) is acceptable because, in Dutch, a strong reading is possible (although not preferred) for the subject in an existential *er*-sentence (de Hoop, 1992).

[6] Kathol (1999: p. 318) claims that NPs such as *niemand* ('noone') are possible subjects in SGF-coordination in German. This then seems to be a difference between German and Dutch. Heycock

(23) Zwijgend zit de man/Jan aan tafel en Ø kijkt uit het raam.
silently sit the man/Jan at table and looks out the window

Because the gapping facts in Dutch are the same as in English (in particular, the asymmetric reading also disappears in the presence of gapping in Dutch), Kehler's explanation should carry over to Dutch. Specifically, if Kehler's explanation for the requirement on parallelism in Resemblance relations is correct, the coherence relation expressed in SGF-coordination must be a Resemblance relation, because ellipsis is resolved through syntactic reconstruction rather than through anaphora resolution. On the other hand, if the current hypothesis is correct that Resemblance relations are characterized by the way they construct the topic, namely as contrastive topics, SGF-coordination should not involve Resemblance relations. Because the topic of the second clause is deleted, the two clauses of the coordinate construction cannot involve contrastive topics.

Heycock and Kroch (1994: p. 273) point out that cases of SGF-coordination appear to be most acceptable when the actions referred to in the two conjuncts can be interpreted as occurring in sequence, although this observation does not play any role in their analysis. Sturm (1995a,b) also notes that acceptable cases of SGF-coordination require some sort of relation between the two conjuncts. In particular, Sturm claims that the second conjunct can be paraphrased as an infinitival purpose clause introduced by *om vervolgens* ('for consecutively'). To dispute this claim, van Zonneveld (1996) provides a number of well-formed examples from Dutch authors in which the second conjunct cannot be paraphrased by a purpose clause:

(24) Ineens ben ik moe en ga op het luik zitten.
suddenly am I tired and go on the hatch sit
'I suddenly get tired and go and sit down on the hatch'
(Franz Pointl, *De Aanraking*)

(25) Verder weet ik niets af van kunst, en kan dus niet zeggen of het een *Object* dan wel een *Piece* was.
furthermore know I nothing PRT of art, and can therefore not tell whether it an Object or a Piece was

---

and Kroch (1994) as well as Sturm (1995b) point out that German seems to be much more liberal with respect to these constructions than Dutch.

'Furthermore, I know nothing about art, and therefore I can't really say whether it was an Object or Piece'
(Gerard Reve, *Het Boek van Violet en Dood*)

If we take a closer look at these examples, they both seem to involve Cause-Effect relations. Previous examples, such as (18) and (21), involve Contiguity relations. Crucially, the acceptable examples provided by Sturm and van Zonneveld do not involve Resemblance relations. On the other hand, unacceptable cases of SGF-coordination do not seem to allow for a causal or narrative interpretation, as (26) (from Paardekooper, 1979) and (27) (from van Oirsouw, 1985) show:

(26) *Tegenwoordig maakt m'n buurman radio's en lapt schoenen.
nowadays repairs my neighbour radio's and cobbles shoes
(27) *Soms eet Jan vlees en drinkt bier.
sometimes eats Jan meat and drinks beer

So SGF-coordination is felicitous only if a Cause-Effect relation or Contiguity relation is operative. Of course, this does not yet provide us with a satisfactory analysis of SGF-coordination. As many authors have observed, this construction would be unproblematic if the subject of the first conjunct would occur in sentence-initial position. In this case, an analysis involving like categories would be possible, and the subject would distribute over both conjuncts:

(28) Je zit zwijgend aan tafel en kijkt uit het raam.
you sit silently at table and look out the window

The difference between this sentence and the problematic SGF-construction in (18) is that in the first conjunct of (18), the phrase *zwijgend* is moved to sentence-initial position. However, this type of movement yields a violation of the Coordinate Structure Constraint (CSC). The CSC requires movement in coordinate constructions to apply in an across-the-board manner (i.e., in all conjuncts simultaneously). But note that similar violations of the CSC have also been observed with wh-movement in English. Example (29) is taken from Kehler (1996), and example (30) from Carlson (1987):

(29) How much can you drink and still stay sober? (Violated Expectation)
(30) What did John go to the store and buy? (Narration)

As Kehler (1996) shows, violations of the CSC are possible if a Cause-Effect relation or Contiguity relation is operative, but not if a Resemblance relation is operative. Similarly, fronting in SGF-coordination is also only possible if a Cause-Effect relation or Contiguity relation is operative. Furthermore, Carlson (1987: p. 539) notes that sentences such as (30) only have a collective reading associated with it: they express a single event, in which John went to the store and bought something. This contrasts with the ambiguity of the corresponding declarative sentence, for which also a (less salient) distributive reading is available according to which there are two independent events, an event of going to the store and an event of buying something. As Frank (2002) observes, SGF-coordination also expresses a single, complex event or situation. This suggests that violations of the CSC by wh-movement and violations by SGF-coordination must receive a similar explanation. In fact, a non-across-the-board movement analysis of SGF-coordination in German was recently proposed by Johnson (2002). The results in this section support such an approach.

To sum, the above discussion provides us with another argument that the notion of topic, and the way the topic is constructed, is crucial in distinguishing Resemblance relations from Cause-Effect relations and Contiguity relations. Because SGF-constructions are characterized by topic deletion from the second conjunct, these constructions cannot involve contrastive topics. My analysis correctly predicts that SGF-constructions do not occur with Resemblance relations.

9. Conclusion

Ellipsis resolution processes are known to interact with the inference processes underlying the establishment of coherence relations in discourse. In this paper it was argued (contra Kehler, 1996, 2000, 2002) that the reason why certain ellipsis processes only cooccur with certain types of coherence relations does not lie in the (im)possibility to reconstruct the missing material. Rather, ellipsis processes differ in their relation to the topic. The way in which different coherence relations construct their topic (i.e., as a contrastive topic or as a non-contrastive topic) restricts the types of ellipsis they can occur with. This conclusion is supported by observed differences between gapping and subject deletion in Dutch SGF-constructions. A brief sketch was offered of an approach to coherence resolution within the framework of Optimality Theory. This sketch suggests that parallelism might be an epiphenomenon related to the construction of a contrastive topic, rather than the explicit effect of a particular coherence relation.

References

Asher, Nicholas (1993), *Reference to abstract objects in discourse*. Kluwer, Dordrecht.

Asher, Nicholas, & Alex Lascarides (1998), 'The Semantics and Pragmatics of Presupposition'. *Journal of Semantics* 15, 239-299.

Beaver, David (to appear), 'The Optimization of Discourse Anaphora'. To appear in *Linguistics and Philosopy*.

Carlson, Greg N. (1987), 'Same and Different: Some consequences for syntax and semantics'. *Linguistics and Philosophy* 10, 531-565.

Dalrymple, Mary (1991), 'Against Reconstruction in Ellipsis'. Technical Report SSL-91-114, Xerox.

Dalrymple, Mary, Stuart M. Shieber, & Fernando Pereira (1991), 'Ellipsis and Higher-Order Unification'. *Linguistics and Philosophy* 14, 399-452.

Frank, Anette (2002), 'A (discourse) functional analysis of asymmetric coordination'. In: M. Butt & T. H. King (eds.), *Proceedings of the LFG02 Conference*. CSLI Publications.

Gómez Txurruka, Isabel (2003), 'The natural language conjunction *and*'. *Linguistics and Philosophy* 26, 255-285.

Grosz, Barbara, Aravind Joshi, & Scott Weinstein (1995), 'Centering: A framework for modeling the local coherence of discourse'. *Computational Linguistics* 21:2, 203-225.

Heycock, Caroline, & Kroch, Anthony (1994), 'Verb movement and coordination in a dynamic theory of licensing'. *The Linguistic Review* 11, 257-283.

Höhle, Tilman (1983), *Subjektlücken in Koordinationen*. Unpublished manuscript, Tübingen.

Hoop, Helen de (1992), *Case Configuration and Noun Phrase Interpretation*. PhD Dissertation, University of Groningen.

Hoop, Helen de, & Henriëtte de Swart (2000), 'Temporal adjunct clauses in Optimality Theory'. *Rivista di Linguistica* 12.1, 107-127.

Johnson, Kyle (2002), 'Restoring exotic coordinations to normalcy'. *Linguistic Inquiry* 33.1, 97-156.

Kathol, Andreas (1999), 'Linearization vs. phrase structure in German coordination constructions, *Cognitive Linguistics* 10:4, 303-342.

Kehler, Andrew (1996), 'Coherence and the Coordinate Structure Constraint'. In *Proceedings of the 22nd Annual Meeting of the Berkeley Linguistics Society* (BLS 22), Berkeley, CA.

Kehler, Andrew (2000), 'Coherence and the Resolution of Ellipsis'. *Linguistics and Philosophy* 23.6, 533-575.

Kehler, Andrew (2002), *Coherence, Reference, and the Theory of Grammar*. CSLI Publications, Stanford, CA.

Krifka, Manfred (1999), 'Additive particles under stress'. In: *Proceedings of SALT 8, Cornell*, CLC Publications, 111-128.

Lappin, Shalom (1996), 'The Interpretation of Ellipsis'. In: S. Lappin (ed.), *Handbook of Contemporary Syntactic Theory*. Blackwell, 145-175.

Lascarides, Alex, & Nicholas Asher (1993), 'Temporal Interpretation, Discourse Relations and Common Sense Entailment'. *Linguistics and Philosophy* 16.5, 437-493.

Levin, Nancy S., & Ellen F. Prince (1986), 'Gapping and Causal Implicature'. *Papers in Linguistics* 19.3, 351-64.

Oirsouw, Robert van (1985), 'A linear approach to coordinate deletion'. *Linguistics* 23, 363-90.

Paardekooper, Piet (1979), *Beknopte ABN-syntaksis*. Eindhoven.

Prince, Alan, & Paul Smolensky (1993), *Optimality Theory: Constraint Interaction in Generative Grammar*. Technical Report #2, Center for Cognitive Science, Rutgers University.

Sæbø, Kjell Johan (this issue), 'Conversational Contrast and Conventional Parallel: Topic Implicatures and Additive Presuppositions'.

Steedman, Mark (1990), 'Gapping as constituent coordination'. *Linguistics and Philosophy* 13, 207-264.

Sturm, Arie (1995a), 'De wet van Paardekooper is niet voor één gat te vangen: over (voorwaartse) samentrekking en periferie'. *De Nieuwe Taalgids* 88.3, 193-222.

Sturm, Arie (1995b), 'SGF-coördinatie bij nader inzien: verklaring van de eigenschappen en ongehoorde mogelijkheden'. *De Nieuwe Taalgids* 88.4, 333-353.

Wunderlich, Dieter (1988), 'Some problems of coordination in German'. In: U. Reyle & C. Rohrer (eds.), *Natural Language Parsing and Linguistic Theories*, Dordrecht, 289-316.

Zonneveld, Ron van (1992), 'De wet van Paardekooper en het gat van Höhle: over SGF-coördinatie'. In: H. Bennis & J.W. de Vries (eds.), *De Binnenbouw van het Nederlands. Een bundel artikelen voor Piet Paardekooper*. Dordrecht: ICG Publications, 401-411.

Zonneveld, Ron van (1996), 'SGF-coordinatie en de continuatieve beknopte bijzin van doel'. *Tabu* 26.1, 41-51.

Zwart, Jan-Wouter (1996), *Morphosyntax of Verb Movement. A Minimalist Approach to the Syntax of Dutch*. Kluwer Academic Publishers.