

JAN RENKEMA\*

## HOW TO PROCEED WITH AMBIGUITY IN DISCOURSE RELATIONS? A PROPOSAL BASED ON CONNECTIVITY VARIABLES

This paper makes a contribution to the description of ambiguous discourse relations. The description is based on four variables in discourse connections: a. the status of the segments (nucleus and satellite), b. the anaphoric or cataphoric connection, c. the 'linking point', d. the 'anchor position'. This description model is illustrated with a specimen of discourse that has already been analysed in three different ways in Rhetorical Structure Theory. This contribution concludes with a proposal presenting some criteria on how to deal with ambiguous discourse relations.

*Keywords:* ambiguity, connectivity, discourse relations, Rhetorical Structure Theory, RTS.

\* University of Tilburg, J.Renkema@uvt.nl

## 1. Introduction

One of the central problems in discourse studies is how to describe the possible relationships between discourse segments (paragraphs, sentences or clauses). Given a particular sentence the possibilities for continuation seem overwhelming. Consider for example only some continuations of a simple sentence like ‘Mary went to the market’:

- (1a) Mary went to the market. What she bought were some special vegetables.
- (1b) Mary went to the market. For me, she could not find anything special.
- (1c) Mary went to the market. We have a whole afternoon for ourselves.
- (1d) Mary went to the market. She wanted to please her mother.
- (1e) Mary went to the market. You can get your prize at the desk.
- (1f) Mary went to the market. People are preparing for a hurricane.

In (1a) the relationship between the two sentences is a kind of elaboration, but in (1b) a contrast relation seems more plausible. In (1b) the segments have the same importance, but in (1c) with a possible cause-effect relation the second sentence seems more important. In (1d) there is a reason relation, but here the direction of interpretation goes from right to left: because Mary wanted to please her mother, she went to the market.

The first four examples contain connections that are rather easy to account for, but the linking in (1e) seems odd. However, if there is enough context, then one can link these sentences. Consider a situation where the first sentence is the last good answer in a quiz about Mary, leading to a prize which will be delivered at the desk. The last example (1f) is very odd. It is difficult to conceive a situation in which these sentences contain a relationship. But even in this case a connection can be made, for example a contrast relation in a situation in a village where Mary with her quiet behaviour is an exception in the rush and hurry before a hurricane.

Examples like these prompt analysts to think about questions such as: how many different discourse relationships exist or should be distinguished in the practise of discourse analysis? How can they be organised into a theoretically sound framework?

One of the best-known proposals to deal with these questions is the Rhetorical Structure Theory (RST) by Mann and Thompson (1988). A good overview with analyses and applications of this theory is given in Taboada and Mann (2006a) and Taboada and Mann (2006b). See also

www.sfu.ca.rst. In this theory some 30 relationships are used, divided across three categories of relations. There is a dichotomy between ‘subject matter relations’ referring to the content, for example an elaboration or condition, and ‘presentational relations’, referring to the intended effect on an addressee, for example a motivation relation which could cause that the reader is inclined to do something, or an evidence relation which is used to stimulate belief in a claim. This dichotomy more or less corresponds to the distinction between semantics and pragmatics. There is also a distinction between relationships in which one part is more important than the other and relationships containing two equally important segments. In RST each segment has the status of N for nucleus or S for satellite. The multinuclear relations have the structure N-N like the contrast relation in example (1b). The other relations have the structure N-S or S-N, like the elaboration in (1a) or the reason relation in (1d). Below is an overview of the RST taxonomy.

### (2) The RST set of discourse relations

#### *Subject matter relations Presentational relations Multinuclear relations*

Circumstance	Antithesis	Contrast
Condition	Background	Joint
Elaboration	Concession	List
Evaluation	Enablement	Multinuclear
Interpretation	Evidence	Restatement
Means	Justification	Sequence
Non-volitional cause	Motivation	
Non-volitional result	Preparation	
Otherwise	Restatement	
Summary	Purpose	
	Solutionhood	
	Volitional cause	
	Volitional result	

In RST the taxonomy is not fixed. The approach focuses on the practice of analyzing. Reduction is possible. And extension is feasible, but only to a certain degree ‘since there is a possible limit to how many relations (...) can be managed simultaneously by an analyst’ (Taboada & Mann, 2006a:16).

A fair discussion of this taxonomy and other versions of it would require several papers of this size (see for a summary of seven discussion topics Renkema 2004: 113-115). For the purpose of my approach it is sufficient to highlight only one topic. In the practise of analysing discourse it often happens that various labels seem to be (or are) applicable to the same combination of segments. Look again at the examples above. In (1a) one could argue that the relationship is not characterised properly with the subject matter relation 'elaboration'. This sequence can also be interpreted as being linked by the goal of Mary's going to the market. In that case the presentational relation 'purpose' could be defended. One can solve this problem by stating that in analyzing discourse relations two labels can be applicable if they belong to two different subsets. But in that case one has to specify under which conditions a twofold labelling is permitted. The labelling of discourse relations, however, is still more complicated. See for example (1c) with the possibility of a '(non-)volitional cause' in the context that Mary's going to the market gives two other people a whole afternoon for themselves. This relationship, however, can also be interpreted as a 'contrast': "Marry is doing some household activity, but we have a free afternoon." The contrast relation is multinuclear. So, in this case the status of the first segment is upgraded from a satellite to a nucleus. And even two possibilities is not the maximum. This relationship can also be labelled as a 'justification', since having a whole afternoon free needs a kind of argument for a person belonging to 'we'.

Mann and Thompson (1988) report that trained analysts could come to agreement about different analyses, but it is hard to see how that will work in the examples like the ones above. Remarkably, research on this topic is rarely found. Den Ouden et al. (1998) report an experiment with six trained analysts, and conclude that there was a high degree of consistency. This consistency, however, was mainly restricted to the structure: the division into paragraphs and the dependency between discourse segments (which could actually have been made without RST). There proved to be a big variety in RST labelling.

This paper focuses on the poly-interpretability or ambiguity of discourse relations and tries to give an insightful description of this phenomenon, focusing on certain aspects that are not dealt with in RST. Examples of ambiguity will be discussed in more detail in section 2. The four factors which should and have to play a role in describing connectivity are outlined in Section 3. An explanation as to why discourse relations can get different labels, based on a model with these four factors, is

presented in Section 4. Finally, a procedure to deal with this ambiguity will be proposed in Section 5. Illustrations will be given with several sets of easily confused relations. This proposal is based on an approach to complex sentences in 'good old grammars' from about a century ago, like those of the Dutch grammarian Den Hertog (1903/1904).

## 2. Some examples of ambiguous discourse relations

Why can links between sentences in some cases be labelled differently? For an answer to this question we need to analyze some examples in more detail. Take the following sequence:

- (3) Pete is the manager. You have to present him with this question.

Possible relations here are: reason, conclusion, justification and motivation. The reason relation (in RST a 'volitional cause') seems to be the most content-like, i.e. independent of the speaker and the addressee: "Because Pete ... you have to ...". In this relation the first sentence is hypothetically linked with the second one. The conclusion relation seems to be reasonable if both sentences have the same importance: "A, therefore B." In the relations justification and motivation the focus is more on the communication situation. With a justification the speaker seems to be more in front of the stage, in using the second sentence to underpin his first sentence. In the motivation relation the addressee is more envisaged; in this interpretation the first sentence is used as an inducement via the words 'have to' in the second sentence.

Which relation is at stake here? Or, can all four be justified? Anyway, different aspects of the two sentences seem to play a role in the labelling. The following scheme gives an overview (S stands for satellite and N for nucleus).

(3a)	reason	S → N	concerning content, 'ideational'
	conclusion	N → N	concerning content, 'ideational'
	justification	S → N	claim from the speaker
	motivation	S → N	appeal to the addressee

<sup>1</sup> In this paper the semantic and/or pragmatic character of the relation has not been dealt with. See Moore and Pollack (1992), Moser and Moore (1996) and Daamen (2005) for more on this topic. Here there is only reference to whether or not a discourse relation is rhetorical, i.e. discourse relations that could only be described by taking into account the intentions of the speaker.

Not only the fact that a sentence has S- or N-status, or the focus on speaker or addressee seems to play a role in labelling discourse relations, but the direction of interpretation is also important. The following example contains an N and an S:

- (4) Pete is depressed. His wife left him.

The relation between these two sentences could be labelled as cause or consequence. In the cause relation the direction of interpretation goes forward (cataphoric): S → N. In the consequence relation the direction of interpretation goes backward (anaphoric): N ← S.

Not only can definitions of discourse relations in RST<sup>2</sup> result in different labelling of the same sequence, but RST sometimes differs from other approaches. For example, the three approaches compared by Bateman and Rondhuis (1997), who give as an example the last two sentences from a speech by president Bush senior in the days before the Gulf War in 1991:

- (5) For five months we've sought peace and waited for the Iraqi leader to see sense. Whatever happens now there's only one man to blame – Saddam Hussein.

The relation between these two sentences is labelled differently in the three approaches which are compared in Bateman and Rondhuis' research.

- (5a) discourse relations in (3)
- |               |   |
|---------------|---|
| result        | Lascares and Asher (1991), Segmented Discourse, Representation Theory |
| conclusion    | Martin (1992), Conjunctive Relations                                  |
| justification | Mann and Thompson (1988) Rhetorical Structure Theory                  |

Here it seems that the S- or N-status of the first sentence is responsible for the difference between result and conclusion on the one hand (N → N) and justification on the other hand (S → N). The difference between result and conclusion or justification seems to be caused by the interpersonal factor, the focus on communication. A result relation seems more ideational, more focussed on content. A conclusion is an internal act of a speaker. In a justification the speaker uses the first sentence as an underpinning of his claim in the second one.

### 3. A description model for ambiguous discourse relations

Which factors play a role in ambiguous discourse relations? In order to answer this question it may be useful to explore the ways in which two segments – say two pieces of wood, two boxes etc. – can be connected.

- (6) variables in connectivity
- the status of the segments
  - the direction of linking
  - the 'fixing point'
  - the 'anchor position'

The four variables will be dealt with below.<sup>3</sup> Firstly, the status of segments. Not only can two segments X and Y be equivalent, but we can also connect a smaller or less important segment to a bigger or more important one. Secondly, the direction of linking. We can add X to Y, but we could also do it the other way round: Y to X. These two variables have been dealt with in the last section. In RST the status of the segments is described in the definitions of discourse relations, using the concepts nucleus (N) and satellite (S). The direction of linking is partly taken into account by the fact that an S before or after an N is connected to the N. The other two variables have up until now not been dealt with in discourse analysis. The variable 'fixing point' describes which part out of X or Y is used to make a connection with the preceding or following segment. And the variable 'anchor position' indicates with what part in the preceding or following segment the connection is made.

<sup>2</sup> See [www.sfu.ca.rst](http://www.sfu.ca.rst) for definitions of the discourse relations dealt with in this paper. In this paper 'reason' is used in stead of the RST term 'volitional cause'. The relation 'conclusion' is not listed in the RST approach. In this paper this relation is used in the sense: 'decision, opinion or judgement reached after consideration or deliberation'.

<sup>3</sup> There are other variables than the four mentioned here, for example the manner of linking: connectives or lexical cohesion, or a combination of both. Only the four variables which are needed to give a description of ambiguity are dealt with in this contribution.

These four variables could be applied as follows in a description of relating discourse segments, viz. in a description of connectivity.

(7) Four variables in connectivity

1. status - (a)symmetry

X-Y X-y X-Y X-y-z... X-y/Y-z

2. direction - ana/cataphoric

X ← Y X → Y x → Y X ← Y x ← Y x → y → z

3. phoric element - the locus

4. 'text base' - ante/postcedent

The linking status indicates whether it is symmetrical or asymmetrical, here represented with upper and lower case. It is important to note that there are more possibilities than accounted for in RST (N-N, N-S and S-N). A nucleus can also have two or more satellites: X-y-z etc. And a construction in which a satellite in a connection with an N functions as a nucleus in a consequent connection, X-y/Y-z, is also conceivable.

The direction of the linking can be anaphoric or cataphoric, but this direction is independent of the N- or S-status of the segment. And it can even be the case that a segment contains both anaphoric and cataphoric linkings, represented in  $x \leftarrow y \rightarrow z$ .

The locus refers to the phoric part of a segment. It describes which part of the segment is connected to the preceding or following segment. This can be one word, for example 'she' referring to 'Mary', but it can also be the segment as a whole. For example, "It is a bad cold" that could be linked to a preceding or following: "I am not going to work." The antecedent or postcedent indicates the part of a segment with which the connection is established. The next section explains how this description model can be applied in order to give an account of ambiguous discourse relations.

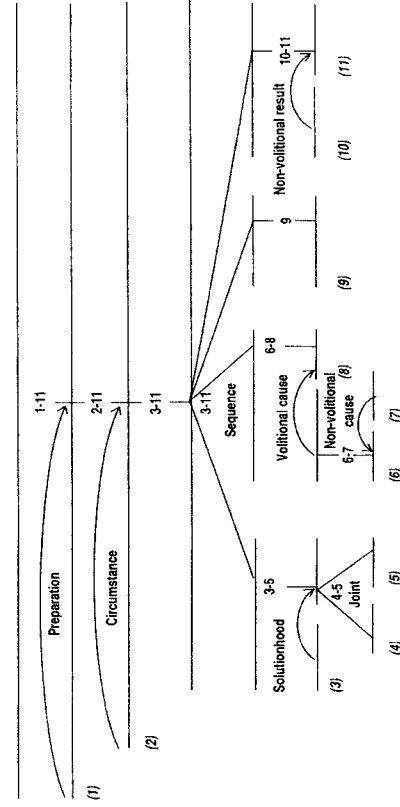
4. One text, different analyses

In the RST corpus there is one specimen of discourse that has three different analyses (see for more information [www.sfu.ca/rst](http://www.sfu.ca/rst)). It is a text about mother Theresa for Readers Digest (1986). The text is provided below. It is followed by a full analysis (9) and then another analysis of its last three sentences (10).

(8) the mother Theresa text

- (1) Mother Teresa often gives people unexpected advice. (2) When a group of Americans, many in the teaching profession, visited her in Calcutta, (3) they asked her for some advice to take home to their families. (4) "Smile at your wives," she told them. (5) "Smile at your husbands." (6) Thinking that perhaps the counsel was simplistic, (7) coming from an unmarried person, (8) one of them asked, "Are you married?" (9) "Yes," she replied, to their surprise, (10) "and I find it hard sometimes to smile at Jesus. (11) He can be very demanding."

(9) an RST analysis







- (16) a. If you are rich, you can give a lot of money to good causes.  
 b. Although he is rich, he does not give much money to good causes.  
 c. Although he is poor, he gives a lot of money to good causes.

Sentence (16a) contains a condition relation, in which a speaker or a listener is not envisaged.<sup>6</sup> One's expectations in reading both sentences (16b) and its opposite (16c) are not fulfilled. Within the causality relations the concession relation is the relation par excellence in which the speaker and listener are involved, with the speaker choosing a formulation in which the expectation of the listener is countered.

The three classification criteria provide a good basis for the procedure (outlined below) on how to deal with ambiguous discourse relations when analysing discourse. If it has been established that a sequence of segments can have more than one label, due to different assessments of the status of the segments (N or S) or the direction of interpretation or the locus or the ante/postcedent, then the procedure below can be followed based on the scheme in (15). The criteria can be seen as a classification based on the principle of enhancing informativity or 'richness of connectivity'.

The first classification criterion, i.e. first coordination then subordination can be read as follows: coordination usually gives less connectivity than subordination. After all, in subordination there is not just 'ordination' but also a linking of the segments in which their comparative importance is indicated.

The second classification criterion, i.e. first adnominal then adverbial also indicates that an addition to a nominal element ('the man who is walking there') seems to provide less information than the insertion of an adverbial element of time, place, cause etc.: "The man is walking there because he is looking for someone."

The third classification criterion - i.e. first content oriented, then communication oriented - also suggests that a discourse relation in which the speaker and/or writer is envisaged, provides more information about the meaning of a text than a content based relation.

How does this approach apply to the practice of discourse analysis? Below some examples of clusters of labels which often seem simultane-

<sup>6</sup> Of course, a condition relation can also acquire a communicative aspect, but that aspect is normally verbalized with a verb expressing the opinion of the speaker: "if you are rich, you have to give a lot of money to good causes."

ously applicable in RST analysis are presented. In these clusters the following strategy can be applied: choose the relation with the highest degree of connectivity.<sup>7</sup>

- (17) *sequence or cause?*

She had a baby in March and got married in April.

The relation can be labeled as post hoc, a temporal relation, but also as proper hoc, a causal relation. A temporal relation with N-N status is lower on the scale of informativity than a cause relation with S-N status. Hence the cause relation provides us a richer interpretation.

- (18) *cause or evidence?*

The neighbours are throwing a party. Otherwise the street wouldn't be crammed with cars.

The discourse relations cause (S-N) and evidence (N-S) do not only differ in direction of interpretation, but also in their degree of communication orientation. A cause is factual, but evidence can be described as a fact that is presented by the speaker to support his claim. Hence, an evidence relation is richer.

- (19) *sequence, cause or condition?*

Stir the powder slowly in the liquid. The mixture will become thick.

See (17) above for the difference between sequence and cause. The difference between cause and condition is that a condition is a, so to say, 'restricted cause', indicating that the cause has to be effectuated and that action is involved in order to get the result. Therefore the condition-relation is more precise and richer in connectivity.

- (20) *condition or motivation?*

Come home by 5.00. Then we can go to the shop before it closes.

<sup>7</sup> This proposal does not say that other procedures are impossible. An alternative procedure would be to choose the relation that has the biggest scope in locus and antecedent.



The difference between a condition (S-N) and a motivation (N-S) does not only lie in the direction of interpretation. A motivation relation is more communication oriented than a condition, as a motivation presupposes both a speaker with a goal, and an addressee who has to be motivated to do something. The addressee is more envisaged than in a condition relation in which the addressee 'only' has to do something in order to get the desired result. Therefore the motivation relation is to be preferred here as the richest form of connectivity.

With this approach I hope to have given some insight into the difficulties involved in ambiguous connectivity and to have provided a practical solution in analysing discourse. There is now longer any need to judge the possibility of more than one label per discourse relation as a weakness of RST or other discourse theories. If in analysing discourse relations more attention is given to cohesion analysis, in terms of locus and 'cedent', then the reason why a given relation between two segments is ambiguous can be rather easily explained.

In the practice of analysing discourse a choice from possible relations can be made on the basis of degree of connectivity. With this procedure the following statement of one of the leading researchers in RST (Taboada 2004:124): "Replication of the analyses is a thorny issue in RST." seems to no longer be of relevance. But a caveat should be made. The word 'seems' has been used deliberately in this context. The procedure for solving ambiguities presupposes a rationalized order of all current discourse relations based on the degree of connectivity. I hope this paper can be the beginning of this enterprise.

## References

- BATEMAN, J. & RONDHUIS, K.J. (1997). Coherence relations: Towards a general specification. *Discourse Processes* 24: 3-49.
- DAAMEN, E. (2005). Hoe eenduidig is samenhang in tekst? (How unambiguous are connections in discourse?) *Toegepaste Taalwetenschap in Artikelen* 73: 71-83.
- GROSZ, B. & SIDNER, C. (1986). Attention, intention and the structure of discourse. *Computational Linguistics* 12: 175-204.
- HERTOG, C.H. DEN (1903/1904). *Nederlandse Spraakkunst* (A Dutch Grammar) (dl. I, II en III), with an introduction by H. Hulshof, Amsterdam: Versluys (1973).
- HOVY, E. (1990). Parsimonious and profligate approaches to the question of discourse structure relations. Proceedings of the 5<sup>th</sup> International Workshop on Text Generation. Pittsburgh, PA: ACL: 57-62.

- LASCARIDES, A. & ASHER, N. (1991). Discourse relations and defeasible knowledge. Proceedings of the 29<sup>th</sup> Annual Meeting of the Association for Computational Linguistics. Morriston, NJ: Association for Computational Linguistics: 55-63.
- LOUWERSE, M.M. (2001). An analytic and cognitive parametrization of coherence relations. *Cognitive Linguistics* 12: 291-315.
- MANDLER, J.M. & JOHNSON, N.S. (1977). Remembrance of things parsed: Story structure and recall. *Cognitive Psychology* 9: 111-151.
- MANN, W.C. & THOMPSON, S.A. (1986). Relational propositions in discourse. *Discourse Processes* 9: 57-90.
- MANN, W.C. & THOMPSON, S.A. (1988). Rhetorical Structural Theory: Toward a functional theory of text organisation. *Text* 8: 243-281.
- MOORE, J. & POLLACK, M. (1992). A problem for RST: The need for multi-level discourse analysis. *Computational Linguistics* 18: 537-544.
- MOSER, M. & MOORE, J. (1996). Toward a synthesis of two accounts of discourse structure. *Computational Linguistics* 22: 409-420.
- OUDEM, H. DEN; WIJK, C. VAN; TERKEN, J. & NOORDMAN, L. (1998). Reliability of discourse structure annotation. *IPO Annual Progress Report* 33: 129-138.
- RENKEMA, J. (2004). Introduction to discourse studies, Amsterdam: Benjamins.
- TABOADA, M. (2004). Building coherence and cohesion: Task-oriented dialogue in English and Spanish, Amsterdam: Benjamins.
- TABOADA, M. & MANN, W.C. (2006a). Rhetorical Structure Theory: Looking back and moving ahead. *Discourse Studies* 8/3 (to appear).
- TABOADA, M. & MANN, W.C. (2006b). Applications of Rhetorical Structure Theory. *Discourse Studies* 8/4 (to appear).