



# Discourse markers as signals (or not) of rhetorical relations

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## Abstract

Ever since the formulation of Rhetorical Structure Theory (RST) by Mann and Thompson, researchers have debated about what is the ‘right’ number of relations. One proposal is based on the discourse markers (connectives) signalling the presence of a particular relationship. In this paper, I discuss the adequacy of such a proposal, in the light of two different corpus studies: a study of conversations, and a study of newspaper articles. The two corpora were analysed in terms of rhetorical relations, and later coded for external signals of those relations. The conclusion in both studies is that a high number of relations (between 60 and 70% of the total, on average) are not signalled. A comparison between the two corpora suggests that genre-specific factors may affect which relations are signalled, and which are not.

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## 1. Rhetorical relations and discourse markers

The analysis of discourse markers is part of the more general analysis of discourse coherence—how speakers and hearers jointly integrate forms, meaning, and actions to make overall sense out of what is said. (Schiffrin, 1987:49)

Coherence in discourse can be achieved by different means. Coherence relations—relations that hold together different parts of the discourse—are partly responsible for the perceived coherence of a text. More specifically, the recognition of coherence relations by the hearer or reader enables

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them to assign coherence to a text. Discourse markers guide the text receiver in the recognition of those relations.

The relations I am concerned with here are referred to as coherence relations, discourse relations, or rhetorical relations. They are paratactic or hypotactic relations that hold across two or more text spans. When building a text (just as when building a sentence), speakers choose among a set of alternatives that relate portions of the text (or sentence). The two parts of the text that have been thus linked can then enter, as a unit, into another relation, making the process recursive throughout the text.<sup>1</sup> Rhetorical relations have been proposed as an explanation for the construction of coherence in discourse. It is not clear how much speakers and hearers are aware of their presence (Sanders et al., 1993), but it is uncontroversial that hearers and readers process text incrementally, adding new information to a representation of the ongoing discourse (van Dijk and Kintsch, 1983; Hobbs, 1985; Meyer et al., 1980; Sanders, 1986; Sanders et al., 1993). Rhetorical relations are similar to what other researchers call discourse relations, or coherence relations. There are, however, differences between Rhetorical Structure Theory (RST) and other theories, mainly in that rhetorical relations place emphasis on the writer's intentions and the effect of the relation on the reader. (For a comparison of rhetorical relations to other approaches, see Taboada and Mann, in press-b.) For the present study, I will use the term 'rhetorical relations' and the framework of Rhetorical Structure Theory, as described in Mann and Thompson (1988). A brief introduction is presented in section 2.







review of recent research carried out within RST; in another paper (Taboada and Mann, in press-b), they examined some of the open issues within the theory.

choosing from a set of connectives. The authors found that categories of coherence relations were





Table 1  
Total figures and mean length of the conversations

	Total for the 30 conversations	Mean length
Turns	249	8.30
Units of analysis	784	26.13
Words	6804	225.93

performed an RST analysis of the conversations. Finally, I observed which discourse markers were used in each relation.

Before we move on to a discussion of the analysis proper, it needs to be pointed out that this study was slightly unusual in that it considered conversation, an area traditionally not covered by RST studies. The next section describes some of the challenges encountered in performing a rhetorical analysis of conversation.

#### 4.1. *Functional and hierarchical organization*

An RST analysis of a text presupposes that the text in question is functionally and hierarchically organized. On the one hand, the dialogues in the corpus were, likely, driven by functional purposes. Although not spontaneous, the dialogues were meant to be representative of a dialogue with a particular purpose, that of setting up an appointment. On the other hand, it is more difficult to postulate hierarchical organization in dialogue, given that speakers do not plan and rework their conversations. Some researchers believe that RST cannot be applied to conversation, whereas others have proposed modifications that would account for turn-taking phenomena (e.g., Daradoumis, 1996; Stent, 2000). It has been argued that even casual conversation carries a certain level of organization, encoded as knowledge of the particular script, frame, or genre being used (Aijmer, 1996; Dorval, 1990; Eggins and Slade, 1997; Paltridge, 1995; Stenström, 1994; Tsui, 1994). If that is the case, then RST can tell us something about the organization of conversation.

Considering functional and hierarchical organization, there are two different ways in which the analysis can proceed, according to two different points of view, that of the analyst and that of the participants. From the point of view of the analyst, the conversation is a product of the interaction of the two speakers, an autonomous piece of text. The analyst is an observer, and he or she is detached from the original context. In the participants' view, the conversation is a process to which both speakers contribute in their respective turns. Each turn is an independently created text; while representing a response to the overall context, it is nevertheless a text in itself.

The two points of view could lead to two different analyses. In the first analysis, each of the turns is examined in isolation, without the analyst relating them to each other. In the second analysis, the whole conversation is considered to be a text, and then studied as such. Elsewhere, I have performed both analyses, and compared the results (Taboada, 2004a). In this paper, I will concentrate on the first type of analysis, examining only one turn at a time. This involves a certain detachment from the original context and the original purpose of the conversations, but I believe it can provide insights into how each speaker contributes to the conversation. The discourse relations used and their markers are internal to the turn. It is worth mentioning here that very few signals of inter-turn relations were found.

The analysis proceeded as follows: I segmented the conversation into units; the segmentation was not changed later on as a result of the analysis. This was for several reasons, the most

important of which was that different types of analyses were performed on the corpus: in addition to performing the rhetorical analysis, I analysed cohesive relations and information structure (Taboada, 2004a). In order to compare the data across analyses, the units were made the same for

Table 2  
Rhetorical relations and markers in task-oriented dialogue

	Frequency	%	Discourse markers	%
Antithesis	1	0.17	0	-
Background	13	2.24	1	7.69
Circumstance	5	0.86	0	-
Concession	71	12.24	38	53.52
Contrast	9	1.55	2	22.22
Condition	66	11.38	33	50.00
Elaboration	166	28.62	2	1.20
Enablement	10	1.72	0	-
Evaluation	8	1.38	0	-
Interpretation	1	0.17	1	100
Joint	29	5.00	16	55.17
Justify	34	5.86	3	8.82
Motivation	3	0.52	0	-
Non-volitional cause	37	6.38	23	62.16
Non-volitional result	43	7.41	27	62.79
Otherwise	4	0.69	2	50.00
Purpose	10	1.72	9	90.00
Restatement	28	4.83	3	10.71
Sequence	7	1.21	4	57.14
Solutionhood	7	1.21	0	-
Summary	4	0.69	1	25.00
Volitional cause	7	1.21	1	14.29
Volitional result	17	2.93	14	82.35
	580	100	179	30.86

corresponding segment. It is often the case that the segments under discussion contain further relations, but those are ignored, as I consider only the relation under discussion.

- (8) [N] Maybe we should get, together some time, [S] and talk about this a little longer.
- (9) [N] Um when can we get together again, on our m-, [S] um to discuss our project.
- (10) [N] I think we are gonna have to work something out, [S] that we can extend the deadline somehow.

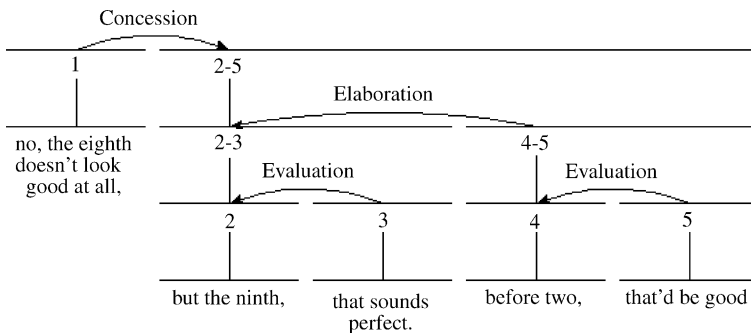


Fig. 3. Rhetorical relations in Example (7).

There are few safe correlations between relation and marker. The conjunction  $\text{for}$ , used to indicate Purpose, is also present in Elaboration, Joint, Non-Volitional Cause and Sequence.  $\text{if}$  is present in Background, Condition, Justify, Non-Volitional Cause, Non-Volitional Result,

object-attribute, elaboration-part-whole, elaboration-process-step, and elaboration-set-member. In fact, it has been argued that Elaboration is so diverse and difficult to define that it should not be considered a proper relation at all (Knott et al., 2001).

The text, as annotated with the corresponding relation, includes information on the nucleus

frequently marked (Concession, Circumstance, and Result), the overall level of signalling is 72.62%. In the group of less commonly marked relations (Background, Elaboration, and Summary), the percentage of marked relations overall drops to 13.32%.

Examining each relation more closely, we find distinct patterns of marking. In Concession relations, which are very frequently marked (90.35% of the time they appear), by far the most preferred signal is a conjunction: *and* appears 82 times of the 206 that Concession has a signal. [Table 4](#)

(17) [S] Delta problems are difficult, not impossible, to solve — [N] I am just not convinced that we are ready to solve them yet.

One last remark with regard to Concession relations has to do with the most frequent placement of the signal. The relations were coded, according to whether the signal was placed in

It is interesting to note that 16 of the relations were indicated with *temporal*, to indicate temporal succession, as seen in Example (20). Here, relations marked with *temporal* occur both in the satellite-nucleus order and in nucleus-satellite order, the latter being the most frequent.

- (20) [S] Following the impeachment conviction, [N] Dr. Benjamin Hooks, executive director of the National Association for the Advancement of Colored People, issued a restrained statement, warning that the Hastings case could set a “dangerous precedent,” but adding, “We must respect the considered judgment of the Senate.”

Non-finite forms of other verbs (*gerunds*, *participles*, *infinitives*) were also used in similar way. In most cases, background knowledge helps the reader understand the temporal relation expressed (*participles* may happen at the same time as another action, whereas something happens after something else *gerunds* happened). Similar instances occur with gerunds in prepositional phrases, as in Example (21), where the satellite is introduced by *while*, and with past participle non-finite clauses, as in Example (22), which exhibits another temporal relation (“after having been rated . . . , the issue will be sold”).

- (21) [N] Interest on the bonds will be treated as a preference item [S] in calculating the federal alternative minimum tax that may be imposed on certain investors.
- (22) [S] Rated single-A-1 by Moody’s Investors Service Inc. and single-A by Standard & Poor’s Corp., [N] the non-callable issue will be sold through underwriters led by Merrill Lynch Capital Markets.

Finally, in Example (23), I present a Circumstance relation that is not marked at all. The satellite in the example provides the framework for interpreting the nucleus.

- (23) [N] Imelda Marcos asks for dismissal, says she was kidnapped. The former first lady of the Philippines asked a federal court in Manhattan to dismiss an indictment against her, claiming among other things, that she was abducted from her homeland. [S] Mrs. Marcos and her late husband, former Philippines President Ferdinand Marcos, were charged with embezzling more than \$100 million from that country and then fraudulently concealing much of the money through purchases of prime real estate in Manhattan.

As for the placement of markers, they appear more often in the satellite portion of the relation (322 times, almost 90% of the signalled relations) than in the nucleus (a mere 36 relations had a nucleus marking).



Table 6  
Most frequent signals in the Result relation

	Times present	% of signalled relations (n = 78)
Because of	16	20.51
As a result of	14	17.95
Because	8	10.26
And	6	7.69
So	5	6.41
As a result	4	5.13
When	4	5.13
As	3	3.85
Since	2	2.56
Now	2	2.56
After	2	2.56
The result	1	1.28
So far	1	1.28
Now that	1	1.28
And so	1	1.28
Thus	1	1.28
But	1	1.28

- (24) [S] To answer the brokerage question, Kidder, in typical fashion, completed a task force study. [N] The result: Kidder will focus on rich individual investors and small companies, much closer to the clientele of Goldman, Sachs & Co. than serve the world firms like Merrill Lynch or Shearson Lehman Hutton Inc.

In Example (25), we are dealing with an unmarked relation. Though presented as unmarked, the relation does bear some resemblance to the Circumstance relations discussed above, where a non-finite clause is used as an underspecified representation of the meaning.

- (25) [S] Bowing to criticism, [N] Bear Stearns, Morgan Stanley and Oppenheimer joined PaineWebber in suspending stock-index arbitrage trading for their own accounts.

Marking in Result relations happens more frequently on the satellite (about 73% of the times).

We now turn to the discussion of those relations that were, from the outset, considered to be less frequently marked: Background, Elaboration, and Summary. As was to be expected (see Table 3), these relations were marked less frequently, to an overall level of about 13%.

In a Background relation, the satellite increases the reader's ability to comprehend the nucleus, unlike Elaboration, where the information is not considered necessary, only additional. It is also important to remember that Background is a presentational relation, whereas Elaboration is a subject matter relation.<sup>6</sup> Background is signalled 26.56% of the times it is present, or 51 signalled relations out of 192. The signalling devices are varied. Many of them are prepositional phrases indicating time:

<sup>6</sup> Subject matter relations (such as Cause, Purpose, Condition, Summary) relate the subject matter of two text spans. Presentational relations (such as Motivation, Antithesis, Background, Evidence) are used to facilitate presentation, usually to increase some inclination in the reader (desire, positive regard towards a statement, belief). See section 6 for a discussion of this classification in relation to signalling.

where X and Y indicate temporal expressions. Other signals include 't', 'and', and 't'.

One example of a temporal expression is presented in Example (26), where the satellite that provides the background information begins with 't'. Example (27) shows an interesting case of marking on the nucleus. The background information is presented first, but the conjunction 'and' seems to introduce the nucleus as related to that satellite.

- (26) [N] Financial Corp. said it agreed to buy the bonds after a representative of Ivan F. Boesky Corp. visited it in November 1983 and said Financial Corp. could improve its financial condition by purchasing the bonds. [S] Shortly before the visit, Mr. Boesky and Drexel representatives had met with Financial Corp. officials and had signed a letter of intent to acquire the 51% stake in the company. However, the agreement was cancelled in June 1984.
- (27) [S] Concern about the volatile U.S. stock market had faded in recent sessions, [N] and traders appeared content to let the dollar languish in a narrow range until tomorrow, when the preliminary report on third-quarter U.S. gross national product is released.

In many of the Background examples, tense seems to play a role, whether accompanied by a temporal expression or not. In Example (28), the background information (presented in the satellite) is not marked at all, but the tense of the verb in the nucleus, 'is', seems to introduce the nucleus as related to that satellite.

Elaboration had a level of marking at 9.79%, with signals such as conjunctions (and, but) and adverbials (therefore, as a result); quite often, the signals were simply punctuation marks, such as

elaboration on what has gone before. Knowledge of the newspaper genre leads us to think that an article, unless otherwise stated, proceeds in a series of elaborations.

- (32) [N1] American Pioneer Inc. said it agreed in principle to sell its American Pioneer Life Insurance Co. Subsidiary to Harcourt Brace Jovanovich Inc.'s HBJ Insurance Cos. for \$27 million. American Pioneer, parent of American Pioneer Savings Bank, said the sale will add capital and reduce the level of investments in subsidiaries for the thrift holding company. [S1] [N2] Recently, the boards of both the parent company and the thrift also voted to suspend dividends on preferred shares of both



actually relations?), the answers to the first two questions are not clear at this point. One proposal suggests that texts are expected to proceed in certain ways corresponding to their genre structure. For example, a newspaper article is expected to proceed by a series of elaborations, such that the title and the first few sentences capture most of the information, and the rest of the article provides further detail. This is how readers can interpret the relation between certain sections of the text as an elaboration relation.

As for the third question, existing research suggests a positive answer, namely, that unsignalled relations are indeed relations. [Marcu and Echihabi \(2002\)](#) carried out a study using in part the same newspaper corpus as the one discussed in the present paper, with the aim of detecting relations automatically. They reported that Contrast relations were signalled by a discourse marker in 26% of the cases where they appeared. Relations labelled as Explanation-Evidence were found to be signalled also around 26% of the time. This level of signalling is, obviously, a problem for an automatic system that purports to identify relations based on discourse markers, such as the one proposed by [Marcu \(2000a, 2000b\)](#). The innovation reported in [Marcu and Echihabi \(2002\)](#) is that these authors were successful in training an automatic classifier to recognize the relations that were not signalled by a discourse marker. The classifier was trained on examples of actual relations, versus examples of non-relations (random pairs of units, sometimes each taken from different documents), using lexical patterns. It learnt to distinguish relations that were not signalled by a discourse marker, increasing accuracy over a discourse-marker-based method by as much as 77%. Although we cannot claim that the automatic classifier is using the same cues that humans do, it is still remarkable that the classifier, compared to humans, detected more relations (out of the total set that human annotators had proposed).

In general, I would like to argue that unsignalled relations are rhetorical relations, but possibly of a different kind. Recall that what I term 'unsignalled relations' (discussv)T'.4(al).-2007 a re194209.3ecall uni

- (36) [N] For his sixth novel, Mr. Friedman tried to resuscitate the protagonist of his 1972 work, “About Harry Towns.” Harry is now a 57-year-old writer, whose continuing flirtation with drugs and marginal types in Hollywood and New York seems quaintly out-of-synch. Harry fondly remembers the “old” days of the early ’70s, when people like his friend Travis would take a psychiatrist on a date to analyze what Travis was doing wrong. “An L.A. solution,” explains Mr. Friedman. Line by line Mr. Friedman’s weary cynicism can be amusing, especially when he’s riffing on the Hollywood social scheme—the way people size each other up, immediately canceling the desperate ones who merely almost made it. Harry has avoided all that by living in a Long Island suburb with his wife, who’s so addicted to soap operas and mystery novels she barely seems to notice when her husband disappears for drug-seeking forays into Manhattan. [S] But it doesn’t take too many lines to figure Harry out. He’s a bore.

If it is the case, then, that in RST, relations can be generally classified into the two groups: presentational and subject-matter, we still have to account for the fact that the relations in one of the groups tend to be more (lexically or otherwise) signalled, whereas the relations in the other group occasionally are not signalled at all. The position taken in this paper is that whether signalled or not, the rhetorical relations occurring in either group are recognized as such by the recipients. Future work should explore how readers construct representations for relations that are not explicitly signalled.

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