Rhetorical Structure Theory:

A Theory of Text Organization

Reprinted from The Structure of Discourse

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ISI/RS-87-190
June 1987
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Rhetorical Structure Theory is a descriptive theory of a major aspect of the organization of natural text. It is a linguistically useful method for describing natural texts, characterizing their structure primarily in terms of relations that hold between parts of the text. This paper establishes a new definitional foundation for RST. Definitions are made more systematic and explicit, they introduce a new functional element, and incidentally reflect more experience in text analysis. Along with the definitions, the paper examines three claims and findings of RST: the predominance of nucleus/satellite structural patterns, the functional basis of hierarchy, and the communicative role of text structure.
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Rhetorical Structure Theory: A Theory of Text Organization

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Abstract

Rhetorical Structure Theory is a descriptive theory of a major aspect of the organization of natural text. It is a linguistically useful method for describing natural texts, characterizing their structure primarily in terms of relations that hold between parts of the text. This paper establishes a new definitional foundation for RST. Definitions are made more systematic and explicit, they introduce a new functional element, and incidentally reflect more experience in text analysis. Along with the definitions, the paper examines three claims and findings of RST: the predominance of nucleus/satellite structural patterns, the functional basis of hierarchy, and the communicative role of text structure.
Second, descriptive RST has been used as an analytical tool for a wide range of text types. [Noel 86], for example, shows how it can be used to characterize news broadcasts. [Fox 84] demonstrates how explanations of the choice between pronoun and full NP in expository English texts can be derived from the organizational structure revealed by RST.

Third, descriptive RST lays a foundation for studies in contrastive rhetoric. Cui's analysis of Mandarin and English essays [Cui 85] is an example.

Fourth, RST has proven to be useful in analyzing narrative discourse as well. [Kumpf 86] is a study of the interlanguage of Japanese and Spanish speakers. The author shows that RST is valuable in describing the grammatical and rhetorical properties of the narratives produced by these speakers.

Finally, RST provides a framework for investigating Relational Propositions, which are unstated but inferred propositions that arise from the text structure in the process of interpreting texts (see [Mann & Thompson 86b]). Since the coherence of a text depends in part on these Relational Propositions, RST has been useful in the study of text coherence.

In writing this paper, we presumed of the reader no prior familiarity with RST. The intended audience is linguists, computational linguists and others familiar with common linguistic terminology. Our method is to define the symbolic mechanisms of RST and then present their application along with natural examples. Those most interested in the consequences and content of actual analyses can skip Sections 2 and II and concentrate on the examples in Sections 3 and 6 through 10, since they illustrate the effects of the definitions.

2 Definitions for Relations, Schemas and Structures

This section defines the elements of RST independently of the particular languages and text types to which it has been applied. It defines RST's four kinds of defined objects:

1. Relations
2. Schemas
3. Schema Applications
4. Structures

Briefly, the relation definitions identify particular relationships that can hold between two portions of a text. Based on the relations, the schemas define patterns in which a particular span of text can be analyzed in terms of other spans. The schema
writer or readers. Since such judgments cannot be certain, they must be plausible judgments. In effect, every judgment of the completed analysis is of the form, "It is plausible to the analyst that ..." This is what it means for a proposition to hold as part of an analysis (see also [Crothers 79] for a similar view of the role of plausibility in analysis).

Similarly, all judgments of the reader's comprehension of the text are made on the basis of the text rather than the analyst's direct knowledge of the reader, and thus are from the writer's perspective. These, too, are plausibility judgments.

For example, the statement "Comprehending S and the incompatibility between N and S increases R's positive regard for N" appears in the definition of the Antithesis relation. A more explicit, but equivalent, statement would be: "It is plausible to the analyst that it is plausible to the writer that comprehending S and the incompatibility between N and S would increase R's positive regard for N." Eschewing obfuscatory verbosity of locutional rendering, the circumscriptional appellations are excised.

In judging the functions of text, the analyst sometimes must go beyond literal readings. For example, in analyzing unit 1 of the text presented in Section 1.6.2, ("we've been able to mine our own iron ore... all the materials we need"), the analyst must recognize that the unit is not simply about ability to mine ore, but about actual mining.

Note that since every definition has an Effect field, the analyst effectively provides a plausible reason the writer might have had for including each part of the whole text.

This is a more explicit form of definition than that used in previous papers. Though still based on judgments, necessarily, it provides a checklist of affirmations and thus makes it easy to identify the claims underlying a particular analysis.

2.3 Schemas

Schemas define the structural constituency arrangements of text. They are abstract patterns consisting of a small number of constituent text spans, a specification of the relations between them, and a specification of how certain spans (nuclei) are related to the whole collection. They are thus loosely analogous to grammar rules. With the conventions below, they determine the possible RST text structures.

RST is an abstract set of conventions. We can view the conventions as either independent or inclusive of particular relation definitions. The first view is more comprehensive, but the latter is more convenient; we use the latter. (The first view would be essential for a crosslinguistic or crosscultural comparative study in which relation definitions might differ.) This view gives rise to various versions of RST as text
Figure 1: Examples of the Five Schema Types

A structural analysis of a text is a set of schema applications such that the following constraints hold:

**completeness:** The set contains one schema application that contains a set of text spans that constitute the entire text.

**connectedness:** Except for the entire text as a text span, each text span in the analysis is either a minimal unit or a constituent of another schema application of the analysis.
Table 1: Organization of the Relation Definitions

Circumstance
Solutionhood
Elaboration
Background
Enablement and Motivation
    Enablement
    Motivation
Evidence and Justify
    Evidence
    Justify
Relations of Cause
    Volitional Cause
    Non-Volitional Cause
Volitional Result
Non-Volitional Result
Purpose

Antithesis and Concession
    Antithesis
    Concession
Condition and Otherwise
    Condition
    Otherwise
Interpretation and Evaluation
    Interpretation
    Evaluation
Restatement and Summary
    Restatement
    Summary
Other Relations
    Sequence
    Contrast

In the relation definition sections, here and in the appendix, each relation definition is accompanied by the analysis of a natural example of its occurrence. Many of these are analyses of whole texts or substantial extracts, going beyond illustrating the single relation being defined.

The four relation definitions below comprise two of the groups from Table 1. They illustrate a diverse range of textual effects, which one can identify, depending on one's technical orientation, as interpersonal or social effects, ideational or argumentation effects and textual or presentational effects.

3.1 Evidence and Justify

Evidence and Justify form a subgroup; both involve the reader's attitude toward the nucleus. An Evidence satellite is intended to increase the reader's belief in the nuclear material; a Justify satellite is intended to increase the reader's readiness to accept the writer's right to present the nuclear material.
Figure 2: RST diagram for "Tax Program" text

relation name: JUSTIFY
constraints on N: none
constraints on S: none
constraints on the N + S combination: R's comprehending S increases R's readiness to accept W's right to present N
the effect: R's readiness to accept W's right to present N is increased
locus of the effect: N

see the Common Cause text analyzed in detail in [Mann & Thompson 86b], [Mann & Thompson 85], and [Thompson & Mann 87].

3.2 Antithesis and Concession

These two relations in the Antithesis/Concession subgroup share the following property: The desired effect is to cause the reader to have positive regard for the nucleus. They differ in that Antithesis is a subtype of Contrast, as reflected in the definition, while Concession is not.

3.2.1 Antithesis

The contrast in positive regard, which is at the core of the Antithesis relation, is well illustrated by the first paragraph from an editorial in The Hartford Courant:
1. Farmington police had to help control traffic recently

2. when hundreds of people lined up to be among the first applying for jobs at the yet-to-open Marriott Hotel.

3. The hotel's help-wanted announcement - for 300 openings - was a rare opportunity for many unemployed.

4. The people waiting in line carried a message, a refutation, of claims that the jobless could be employed if only they showed enough moxie.

5. Every rule has exceptions,

6. but the tragic and too-common tableaux of hundreds or even thousands of people snake-lining up for any task with a paycheck illustrates a lack of jobs,

7. not laziness.

Figure 4 gives the RST diagram for this excerpt.

Units 6 - 7 in this excerpt illustrate the Antithesis relation. In unit 7, the editorial writer considers the thesis that unemployment can be explained in terms of laziness, but she clearly favors (i.e., has positive regard for) the proposition in unit 6: Unemployment has its roots in a lack of jobs.

3.2.2 Concession

One obvious way to signal a Concession relation is an although clause (but see [Thompson & Mann 86] for discussion of the form-function relationship with Concession). Here is a clear example in a Scientific American abstract:

Title: Dioxin

1. Concern that this material is harmful to health or the environment may be misplaced.

2. Although it is toxic to certain animals,

3. evidence is lacking that it has any serious long-term effect on human beings.

\[\text{We are not considering the title to be a unit of analysis; it is included to provide the antecedent for the pronominal demonstrative this in unit 1.}\]
**relation name:** CONCESSION

**constraints on N:** W has positive regard for the situation presented in N;

**constraints on S:** W is not claiming that the situation presented in S doesn’t hold;

**constraints on the N + S combination:**

W acknowledges a potential or apparent incompatibility between the situations presented in N and S; W regards the situations presented in N and S as compatible; recognizing the compatibility between the situations presented in N and S increases R’s positive regard for the situation presented in N.

**the effect:** R’s positive regard for the situation presented in N is increased.

**locus of the effect:** N and S

---

**Figure 5:** RST diagram for "Dioxin" text

17. Although Jim lists tennis, Chinese food, and travel to exotic locales among his favorite hobbies,

18. one can’t help but wonder at the unmentioned interests that help spark Jim’s creativity, leading him to concoct an unending stream of imaginative programs.
improves it. The opposite is true of converting canonical order to non-canonical, e.g., by putting a background satellite at the end.

**Table 2:** Canonical Orders of Spans for Some Relations

<table>
<thead>
<tr>
<th>Satellite Before Nucleus</th>
<th>Antithesis</th>
<th>Conditional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Background</td>
<td>Justify</td>
</tr>
<tr>
<td></td>
<td>Concessive</td>
<td>Solutionhood</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nucleus Before Satellite</th>
<th>Elaboration</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enablement</td>
<td>Restatement</td>
</tr>
<tr>
<td></td>
<td>Evidence</td>
<td></td>
</tr>
</tbody>
</table>

5 Distinctions Among Relations

Several people have suggested that we create a taxonomy of the relations in order to present the important differences among them. However, no single taxonomy seems suitable. Depending on one's interests, any of several features and dimensions of the relations could be made the basis for grouping them. The grouping of relations reflected in Table 1, in Section 3, reflects one such basis. Other bases could be time, writer and reader participation, and locus of effect.

An interesting two-way division is one based on a distinction between what we might call "subject matter" and "presentational" aspects of text structure. Thus, relations, such as **Volitional Cause**, express parts of the subject matter of the text. **Volitional Cause** relates two text spans if they are understood as causally related in the subject matter. Others, such as **Justify**, are used only to facilitate the presentation process itself. **Justify** relates two text spans only if one of them is deemed likely to increase the reader's acceptance of the other.

The following chart suggests possible names for this distinction, in addition to the labels Subject Matter/Presentational:

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>Presentational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic</td>
<td>Pragmatic (see [van Dijk 77:208] and [Ford 87])</td>
</tr>
<tr>
<td>Ideational</td>
<td></td>
</tr>
</tbody>
</table>

We can, then, divide the relations we have presented into these two groups. What determines the proper group for a given relation? The clearest indicator is the
This leads to the following observation about RST structural descriptions of texts:

For each relation and schema definition, the definition applies only if it is plausible to the analyst that the writer wanted to use the spanned portion of the text to achieve the Effect.

As a result, an RST analysis always constitutes a plausible account of what the writer wanted to achieve with each part of the text. An RST analysis is thus a functional account of the text as a whole.\(^9\)

This point is important in establishing just how our approach offers a functional account of text structure. RST provides an explicit plausible functional account of a text as a side effect of the analysis, precisely because the definitions are stated in terms of how the text produces an effect on the reader which the writer could reasonably have intended. In applying a relation definition, the analyst affirms the plausibility of each Effect.

The applicability of a relation definition never depends directly on the form of the text being analyzed; the definitions do not cite conjunctions, tense, or particular words. RST structures are, therefore, structures of functions rather than structures of forms.

7 Use and Consequences of RST

To this point, the paper has been devoted to defining and exemplifying the conventions, methods and mechanisms of RST. It has not presented research results, except as they represent a point in a development sequence, a sequence of successively more defensible conventions found increasingly useful in empirical descriptive work on natural texts.

Although the primary purpose of the paper is definitional, we can review some results of applying RST constructs to natural texts. But first, we should note that the definitional sections do not imply that texts will have RST structures. One could imagine that no texts with such structures exist; the fact that some texts have RST structures is thus a result.

Two groups of results are reviewed below, one from text analyses and the other from studies of relational properties.

\(^9\)Of course, it is not the whole functional account; many effects of a text do not depend on its RST structure.
propositions, even in cases where no morphosyntactic signal of the relation exists (as in Figures I-4 and 2.)

Take, for example, the text in Figure 2:

1. The program as published for calendar year 1980 really works.

2. In only a few minutes, I entered all the figures from my 1980 tax return

3. and got a result which agreed with my hand calculations to the penny.

People commonly recognize that the text conveys the idea that a result that agrees with hand calculations is evidence that the program works. The writer's use of the Evidence relation thus has the effect of asserting that one thing is evidence for another, a suitable basis for increasing the reader's belief.

The other relations, likewise, convey relational propositions, each representative of the relation definition. Relational propositions represent a new class of assertional effects. They are not invited inferences, Gricean implicatures or mere opportunistic inferences from available knowledge, all of which are quite avoidable. Relational propositions are as inevitable as text structure itself.

We find all the relational propositions essential to the coherence of the text. If they can somehow be neutralized, as by explicit contrary assertions, the coherence of the text is broken at the point of the missing relation; it becomes incoherent or takes on some alternate interpretation.

Since the relations need no signal in the text, neither do the relational propositions. Relational propositions are not compositional in the usual sense -- the communication effect arises from something other than the composition of interpretations of explicit parts. And they are about as numerous as independent clauses.

Relational propositions, therefore, challenge theories of language that equate the communication effect of a text with the "meanings" of its sentences and compose those meanings from the meanings of its syntactic structures and lexical items.

All of these aspects of relational propositions have been recognized in prior work. The new element in this paper is that relational propositions are seen as derived directly from the relation definition itself. In particular, the Effect field appears to be a sufficient basis for derivation of the relational proposition.

While the details need to be worked out, it seems clear that the relational
1. What if you’re having to clean floppy drive heads too often?

2. Ask for SYNCOM diskettes, with burnished Ectype coating and dust-absorbing jacket liners.

3. As your floppy drive writes or reads,

4. a Syncom diskette is working four ways

5. to keep loose particles and dust from causing soft errors, dropouts.

6. Cleaning agents on the burnished surface of the Ectype coating actually remove build-up from the head,

7. while lubricating it at the same time.

8. A carbon additive drains away static electricity

9. before it can attract dust or lint.

10. Strong binders hold the signal-carrying oxides tightly within the coating.

11A. And the non-woven jacket liner,

12. more than just wiping the surface,

11B. provides thousands of tiny pockets to keep what it collects.\textsuperscript{11}

13. To see which Syncom diskette will replace the ones you’re using now,

14. send for our free "Flexi-Finder" selection guide and the name of the supplier nearest you.

15. Syncom, Box 130, Mitchell, SD 57301. 800-843-9862; 605-996-8200.

The RST analysis of this text appears in Figure 7. We will not discuss each part.

\textsuperscript{11}Our analysis of this infinitival clause as part of unit 11, rather than as a separate unit, derives from the judgment that \textit{to keep what it collects} is an infinitival relative clause on the head noun \textit{pockets}, rather than a purpose clause for the predicate \textit{provides thousands of tiny pockets}; the pockets are intended to keep what the liner collects, not the liner itself. The alternative analysis, however, would not change our overall point.
Figure 7: RST diagram for "Syncom" text
**Figure 8:** Some Effects Statements for the Syncom Advertisement

**Solutionhood:**
The reader recognizes that the body of the text presents a solution to the problem of having to clean floppy disk heads too often.

**Motivation:**
The reader’s desire to ask for Syncom diskettes is increased.

**Enablement:**
The reader’s potential ability to effectively ask for Syncom diskettes is increased.

**Elaboration:**
The reader recognizes that when cleaning agents remove build-up, it is one of the four ways that the diskette is working to prevent errors.
comprehensible. But in presenting the "opportunity" for new writeups they also make acceptable the request for copy, the deadline and the gentle warning at the end. It is quite plausible that the writer wanted to justify the request and also make it comprehensible. It happens that these two dissimilar relations both hold, and so they exemplify simultaneity rather than ambiguity.

![Diagram]

**Figure 9:** Top of an RST diagram for "Update" Text

Differences in identification of relations are the most frequent type of simultaneity. Cases of simultaneous analyses with different structures also occur. In one such case, a letter to supervisors and employees, a single text had two analyses, one for each segment of the audience.

### 9.1.4 Differences Between Analysts

An analysis always involves three elements: the text, the structure and the analyst. An analysis is a statement that a particular analyst finds a certain collection of propositions plausible. Differences between analysts, based on genuine differences in their reactions to the text, are to be expected. Such differences occur, but we find them infrequent. More often we find that when two analysts' analyses differ, each will accept the structures that the other posits, and so they will come to agree that a particular ambiguity exists.
10 Nuclearity

10.1 What is nuclearity?

In the early development of RST, we noticed that texts could generally be described by breaking them down into pairs of spans; the various kinds of regular relationships between the members of the pair became the relations.

At the same time, we noted that the relations were mostly asymmetric. If A is evidence for B, then B is not evidence for A. In addition, there were regularities across relations in the way that the spans functioned for the text as a whole. In particular, if the asymmetries of the relations were arranged in a particular way, in effect into two "columns," each column had commonalities among the elements. We elaborated on these commonalities and formed them into our concepts of nucleus and satellite.

Three commonalities are noticeable.

1. Often, one member of the pair is incomprehensible independent of the other, a non-sequentur, but not vice versa. Without the nuclear claim, the evidence satellite is a non-sequentur, as is the background satellite without the nuclear span it illuminates.

2. Often, one member of the pair is more suitable for substitution than the other. An Evidence satellite can be replaced by entirely different evidence without much change to the apparent function of the text as a whole; replacement of a claim is much more drastic.

3. Often, one member of the pair is more essential to the writer's purpose than the other.\(^\text{12}\)

These asymmetries form a single pattern which is represented in the relations definitions by the assignment of the nucleus and satellite labels. In analyzing a text the identification of nuclei is thus generally a byproduct of recognition that a particular relation holds. (The only exceptions are in the cause cluster.)

10.2 Text Phenomena that Demonstrate Nuclearity

Several independent facts about text structure support the claim that English texts are structured in nucleus-satellite relations and, therefore, support a theory in which nuclearity is assumed to be a central organizing principle of text structure.

\(^{12}\text{This is always a matter of judgment, but often uncontroversial. People often strongly agree that a text with a particular satellite deleted would be more satisfactory (to the writer, as a substitute text) than a text with a corresponding nucleus deleted.}\)
2. Ask for SYNCOM diskettes, with burnished Ectype coating and dust-absorbing jacket liners

4. A Syncom diskette is working four ways

6. Cleaning agents on the burnished surface of the Ectype coating actually remove build-up from the head

8. A carbon additive drains away static electricity

10. Strong binders hold the signal-carrying oxides tightly within the coating

11. And the non-woven jacket liner ... provides thousands of tiny pockets to keep what it collects

14. send for our free "Flexi-finder" selection guide and the name of the supplier nearest you
3. As your floppy drive writes or reads,

4. a Syncom diskette is working four ways

5. to keep loose particles and dust from causing soft errors, dropouts.

6. Cleaning agents on the burnished surface of the Ectype coating actually remove build-up from the head,

7. while lubricating it at the same time.

8. A carbon additive drains away static electricity

9. before it can attract dust or lint.

10. Strong binders hold the signal-carrying oxides tightly within the coating.

11A. And the non-woven jacket liner,

12. more than just wiping the surface,

11B. provides thousands of tiny pockets to keep what it collects.

10.2.4 Hypotaxis

Nuclearity in text structure is a plausible communicative basis for the grammar of hypotactic clause combining, as has been argued in some detail in [Matthiessen & Thompson 86]. Grammars in many languages draw a distinction between hypotactic and main clauses because of the nucleus-satellite distinction in discourse.

10.3 Multi-nuclear Constructs

So far we have assumed that a theory in which relations with a single nucleus play a central role can account for text structure. We have acknowledged that multi-nuclear relations exist and have identified Sequence and Contrast as useful multi-nuclear relations.

However, nuclearity seems less relevant to other phenomena of text structure, which we will briefly mention in this subsection.
10.4 Functional Interpretation of Nuclearity

Description in terms of function has been involved in every part of this paper; this is clearest in the way relations are defined in terms of their effects. In taking up the functional interpretation of nuclearity, we extend the discussion to additional notions of function. In the case of the relational definitions, the particular effects included as definitional constraints were informally abstracted during the study of various texts, then stipulated as parts of the definitions. The stipulation was successful, in that it did not constrain the relation definitions so much that instances were not recognized in analyses.

In considering the functions of nuclearity, we take a comparable approach but cannot go as far. Particular texts suggest functions of nuclearity, through the elements of the nuclearity pattern and through the instantial patterns in which nuclearity occurs. We can describe these as hypotheses about the functions of nuclearity, but we do not have confirming experience with sufficient quantities of text to see how the hypotheses fare.

Still, it is useful to identify the hypotheses, however informally, as preparation for further study. In doing so we touch on issues that seem as much part of individual or social psychology as of linguistics. Although we use terms that are technical in those fields, our usage is vernacular.

The reality of nuclearity, as a phenomenon, now seems reasonably certain. Nuclearity, like all category judgments of linguistics, has its obscure and borderline cases, but grammaticization of nuclearity in hypotaxis confirms a strong pattern.

But why does nuclearity arise as a phenomenon? What is its function in communication?

In recognizing text structure, the reader adds structure to a linear string. Even though nucleus and satellite are usually adjacent spans, the writer can use nuclearity to assign them different roles.

If we see part of the function of communication as building memories, then we can see nuclearity as suggesting organizational details of those memories. If the text structure, even in part, represents the access patterns that are facilitated in memory, then nuclearity can be seen as a way to signal that the memory of a satellite can usefully be accessed through memory of the nucleus.

As for memory, so for the immediate function of nucleus and satellite in receiving the text: The satellite gains its significance through the nucleus, so the writer can indicate, by nuclearity, that the nucleus is more deserving of response, including attention, deliberation and reaction.
interclausal relations." He acknowledges [Grimes 75], [Beekman & Callow 74], and the earlier references they cite. However, instead of conceiving of these relations as predicates, he sees them as best described in terms of a propositional calculus.

[Beekman, et. al. 81] present a text analysis based on relationships between clauses and higher units. In their view, clauses and higher-level units group into clusters, with one, or sometimes more unit(s), forming the prominent HEAD. These clauses thus stand in a "HEAD-support" relationship. In some situations, no one clause is more prominent than the others. In this case, they are all HEADS and are said to stand in an "addition" relationship. HEAD-support and addition seem to parallel Grimes' hypotactic and paratactic predicates, respectively. (See Section 11.2 below).

The HEAD-support relation superficially resembles our nucleus-satellite relation. However, our nucleus-satellite distinction is functional and reflects differential goals on the part of the writer; for Beekman et al., the notion of "prominence" and the label HEAD appear to reflect grammatical marking.

[Crothers 79] is concerned with a systematic treatment of the inferential structure of short texts. Although this is more ambitious than the goal we have set for ourselves, Crothers' interest in inference leads him to the issue of "inferring connectives," i.e., interclausal relations that need not be signalled.

Winter, in a number of publications leading up to [Winter 82], and Hoey [Hoey 83] suggest that a productive way of analyzing discourse is to treat it as "the product of semantic relations holding between sentences or propositions" ([Hoey 83], p. 17). Winter's definition of "clause relation" makes it clear that these relations are not restricted to single clauses or sentences, but can include larger spans:

A clause relation is the cognitive process whereby we interpret the meaning of a sentence or group of sentences in the light of its adjoining sentences or groups of sentences. ([Hoey 83], p. 18)

[Hoey 83] discusses a number of clause relations with properties similar to those of our rhetorical relations, such as the Cause-Consequence relation and the Situation-Evaluation relation, though his set of relations has fewer members than ours.\(^{14}\)

Distinct from these clause relations, for Hoey, are what he calls "discourse patterns" which he defines as a "combination of relations organising (part of) a discourse" (p. 31). For detailed study, he chooses the "Problem-Solution" pattern, though he also discusses the "General-Particular" pattern.

\(^{14}\) Hoey also provides a valuable and comprehensive annotated bibliography of work within the Winter tradition and of research on "interclausal relations" and text analysis in general.
...the choices a speaker has available within the content system can be expressed by means of PROPOSITIONAL structure. Each proposition contains a PREDICATE, which expresses a semantic relation among ARGUMENTS, which may themselves be propositions...The predicates whose arguments involve role specifications directly are the ones I call LEXICAL; the one that underlies English eat is an example. Those whose arguments are related in other ways I call RHETORICAL; the one that underlies English because is an example.

For example, the sentence

he saved the day; he made three touchdowns (p. 213)

can be represented by the rhetorical proposition:

Z gives details for X,

where the rhetorical predicate is SPECIFICALLY, the argument $Z = \text{"he made three touchdowns"}$, and $X = \text{"he saved the day."}$ Rhetorical predicates can take anything from lexical items to large "semantic subtrees" as arguments.

From this characterization, it is clear that Grimes is discussing what we call rhetorical relations. In spite of such locutions as "the one [predicate] which underlies because," his examples show that he does not intend explicit structural elements to realize all rhetorical predicates. We have adopted some of his predicates into our work on RST; for example, the Elaboration relation is essentially Grimes' SPECIFICALLY.

One of the most interesting features of Grimes' presentation of rhetorical predicates is his distinction between "paratactic" and "hypotactic" relations:

PARATACTIC predicates dominate all their arguments in coordinate fashion. HYPOTACTIC predicates have as one of their arguments, the CENTER, a term with respect to which the proposition as a whole is subordinated to some other proposition by being added to it as an extra argument. (p. 209)

Thus in the example given above, argument $X$ ("he saved the day") is considered the CENTER of the hypotactic SPECIFICALLY predicate. Our distinction between nucleus-satellite and multi-nuclear rhetorical relations roughly corresponds to this distinction of Grimes.

One difference between Grimes' work and our own is that Grimes has not commented on the function of his rhetorical predicates, while we see the rhetorical relations functioning as implicit propositions in a text and capable of performing rhetorical acts, just as explicit propositions that appear as clauses perform them (see [Mann & Thompson 86b] for further discussion).
1. Accounting for discourse requires explicit accounts of the involvement of the speaker and hearer. Just analyzing text relative to the conventions of language is inadequate.

2. The structure of discourse reflects more than anything else the intentions and goals of speakers. Intention is generally hierarchic.

3. Attention and Intention are usefully regarded as independent interacting aspects of texts.\(^{15}\)

4. We take Grosz and Sidner to be saying that language form, language function and discourse structure are related in a loosely co-constraining way, not by anything resembling one-to-one mappings. Thus there are no structural features that are always signaled uniquely by particular forms. We agree.

One can criticize details, but it is important for us to recognize immediately that Grosz and Sidner have produced an account that captures several of the most significant aspects of text structure. (Like RST, it is far from being a complete account.)

Having affirmed our agreement on some basics, we note that RST and GSDT are very different in scope. GSDT attempts to cover intentional, attentional and "linguistic" phenomena.\(^{16}\) RST accounts primarily for what Grosz and Sidner would call intentional.\(^{17}\)

GSDT also attempts to cover dialogue, whereas RST in its present form does not. We intend to extend RST to dialogue; we do not expect that extension to change the way RST accounts for monologue.

There are some important differences in the ways that the two theories are specified.

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\(^{15}\)We see the Attention group as including many other functions in addition to the referential ones cited by Grosz and Sidner.

\(^{16}\)All of these phenomena are properly linguistic, and have been for decades [Havranek 32], [Danes 74], [Halliday 67], [Halliday 69], [Halliday 70]. Their term "linguistic" refers primarily to the study of utterance forms, including those aspects that realize (express) their intentional and attentional entities.

\(^{17}\)See [Mann 87a] for a discussion of attentional and other discourse phenomena outside of RST.
structural, are lexicalized as discourse structures and have characteristic "cue phrases"; concessives with although are one kind. And RST seems capable of providing a fuller account of the "cue phrases" than GSDT. For a fuller description of how these theories are related, and a discussion of the prospects for an inferential absorption of text relations into GSDT, see [Mann 87b], which is expected to be available in the fall of 1987.

Let us suggest the way to a more constructive synthesis. Grosz and Sidner posit goals or purposes for the major structures which they recognize. So does RST. Sometimes these goals coincide. For text analysis purposes one can take the union of the GSDT and RST accounts as an analytic hypothesis, one that can be internally reconciled and refined to produce an intentional and attentional analysis of a text.

11.4 Martin’s Conjunctive Relations

Taking Halliday and Hasan’s discussion of "conjunction" [Halliday & Hasan 76] as his starting point, Martin [Martin 83] proposes a detailed Systemic analysis of English conjunctive relations. For him, "CONJUNCTION is the semantic system whereby speakers relate clauses in terms of temporal sequence, consequence, comparison, and addition" (p. 1). He goes on to acknowledge that "these logical relations may or may not be made explicit" (p. 1).

Martin considers types of relations similar to those that underlie our rhetorical relations. As in our framework, Martin acknowledges relations among spans of text larger than single clauses. However, Martin’s treatment of these relations differs from ours in several respects.

1. Martin recognizes a set of relations restricted to those potentially realizable by an adverbial or phrasal signal for one of three types of clause-connecting patterns:
   a. nonsubordinating
   b. subordinating finite
   c. subordinating nonfinite

We think that rhetorical relations exist independently of any explicit signals; thus, that some types of rhetorical relations have no corresponding conjunctive signals.

2. As pointed out above, respect to the research on interclausal relations, our rhetorical relations are dynamic as communicative acts. They function to achieve certain goals for the writer. Martin’s conjunctive relations are static elements of a taxonomy in a semantic system.
Because of the nucleus-satellite distinction, RST is a descriptive basis for studying clause combining. And because text relations have particular assertional effects, RST provides a basis for studying coherence in discourse.

Thus, RST is a linguistically useful account of the nature of text, both because it describes such phenomena as nuclearity and hierarchy and because it is a viable descriptive starting point for a wide variety of studies.
1 - 2

\[\text{circumstance}\]

1

2

Figure I-1: RST diagram for "Visitors Fever" text

public radio program called "Meet the Announcers", shows that the Circumstance satellite need not take the form of a hypotactic clause; the Circumstance satellite unit 5 is an independent clause. Figure I-2 shows the structure.

1. P. M. has been with KUSC longer than any other staff member.

2. While attending Occidental College,

3. where he majored in philosophy,

4. he volunteered to work at the station as a classical music announcer.

5. That was in 1970.

Circumstance differs from Condition (see Section I.7) in that a Condition satellite presents an unrealized situation, while a Circumstance satellite does not. The definitions make this distinction explicit.

Notice that the definition does not rely on morphological or syntactic signals. Recognition of the relation always rests on functional and semantic judgments alone. We have found no reliable, unambiguous signals for any of the relations.

1.2 Solutionhood

Here is an example from a set of instructions on redistributing the filler in a sleeping bag:
1. One difficulty ... is with sleeping bags in which down and feather fillers are used as insulation.

2. This insulation has a tendency to slip towards the bottom.

3. You can redistribute the filler.

4. ... 11.

The rest of the text, not given here, details how to redistribute the filler. Units 3 - 11 clearly provide the solution to the problem presented in units 1 - 2. Figure I-3 shows the RST diagram of this text.

Figure I-3: RST diagram for "Sleeping Bag" text

In the definition of the solutionhood relation, the terms problem and solution are broader than one might expect. The scope of problem includes:

2. It is expected that some 250 linguists will attend from Asia, West Europe, East Europe including Russia, and the United States.

3. The conference will be concerned with the application of mathematical and computer techniques to the study of natural languages, the development of computer programs as tools for linguistic research, and the application of linguistics to the development of man-machine communication systems.

Given that the goal of the text is to notify readers of the conference, we take unit 1 as nuclear. The satellites, units 2 and 3 provide further detail about the conference mentioned in unit 1.

The RST analysis of this text is in Figure I-4.

![RST Diagram](image)

**Figure I-4:** RST diagram for "Conference" text

A full analysis of a text notes information on elaborations beyond the structure itself, namely the identity of the element of subject matter (which could be as extensive as the nucleus itself) being elaborated. So, for example, we note that the conference, rather than Sweden, is the element elaborated.

I.4 Background

The **Background** relation appears in the first two paragraphs of a notice in a UCLA personnel newsletter:
An example of Enablement appears in a squib from the magazine *Environmental Action*. It begins:

1. Training on jobs. A series of informative, inexpensive pamphlets and books on worker health discusses such topics as filing a compensation claim, ionizing radiation, asbestos, and several occupational diseases.

After a description of these materials, unit 6 gives the enabling information:

6. For a catalog and order form write WIOES, 2520 Milvia St., Berkeley, CA 95704.

Without specifying the intervening material, this text can be diagrammed as in Figure I-5:

![Diagram](image)

**Figure I-5**: RST diagram for "Training" text

### I.5.2 Motivation

Like Enablement, the Motivation relation is commonly found in texts evoking an action on the part of the reader; advertising text typically largely consists of motivating material. Here is a non-advertising example from an invitation that appeared on the electronic bulletin board at ISI:
I.6 The "Cause" Cluster: Cause, Result, and Purpose

Several relations involve notions of cause. In broadly defining these relations, it is hard to include both situations that are intended outcomes of some action and causation that does not involve intended outcomes, such as physical causation. Because of this difficulty, we have divided the relations into volitional and a non-volitional groups. Figure I-7 indicates some of the systematic variation in the definitions.

\[
\begin{array}{ccc}
\text{DIFFERENCES IN NUCLEARITY} \\
\hline
\text{DIFFERENCES} & \text{Volitional Cause} & \text{Volitional Result} \\
\text{IN} & \text{Non-Volitional Cause} & \text{Non-Volitional Result} \\
\text{VOLITION} & & \\
\end{array}
\]

Figure I-7: Differences Between Cause and Result Relations

The five relations considered in this subsection all involve causation. Relations in this cluster can, of course, be categorized in many ways (see, e.g., Longacre 83, Grimes 75). The distinctions among the five relations discussed below have proven to be the most useful for our purposes.

The nuclearity of the causing situation distinguishes Cause and Result relations. When the causing situation is the satellite, we refer to that relation as either Volitional Cause or Non-Volitional Cause; when the causing situation is nuclear and the caused situation is less central, we refer to that relation as either Volitional Result or Non-Volitional Result. Within each of the Cause and Result pairs, we can distinguish Volitional and Non-Volitional variants. Purpose is definitionally neutral, including both volitional and non-volitional cases.

Volitional cause involves the action of an agent, typically a person, who controls an action that yields the nuclear situation. It is performed because the agent prefers the outcome or possibly the action itself. Non-volitional cause is the residue -- consequentiality without a chosen outcome.

I.6.1 Volitional Cause

The following extract from a personal letter illustrates the Volitional Cause relation:

---

18See Section 10 for a discussion of discerning nuclearity.
relation name: NON-VOLITIONAL CAUSE
constraints on N: presents a situation that is not a volitional action
constraints on S: none
constraints on the N + S combination:
S presents a situation that, by means other than motivating a volitional action caused the situation presented in N; without the presentation of S, R might not know the particular cause of the situation; a presentation of N is more central than S to W's purposes in putting forth the N-S combination.

the effect: R recognizes the situation presented in S as a cause of the situation presented in N

locus of the effect: N and S
The Transfer of Technology to Underdeveloped Countries

1. The elimination of mass poverty is necessary to supply the motivation for fertility control in such countries.

2. Other countries should assist in this process,

3. not least because they have a moral obligation to do so.

Unit 3 presents the general moral obligation; unit 2 presents the obligation for assistance, which is deduced from the more general obligation. Figure I-10 shows the RST analysis of the abstract.

---

21 Again, we are not considering the title to be one of the units of analysis; it is included here to provide the antecedent for such in unit 1.
relation name: NON-VOLITIONAL RESULT
constraints on N: none
constraints on S: presents a situation that is not a volitional action
constraints on the N + S combination:
N presents a situation that caused the situation presented in S;
presentation of N is more central to W's purposes in putting forth the N-S combination than is the presentation of S.
the effect: R recognizes that the situation presented in N could have caused the situation presented in S
locus of the effect: N and S

In this extract, unit 1, which gives the information about the explosion, is nuclear and presents the cause of the injuries presented in units 2 - 3. The definition of Non-Volitional Result thus applies; the causing situation is nuclear and the caused situation is non-volitional.

Figure I-11 shows the analysis of this extract. Like Non-Volitional Cause, Non-Volitional Result includes deductive cases.

![Diagram](image)

**Figure I-11:** RST diagram for "Blast" text

I.6.5 Purpose

This extract, from the end of an advertisement for floppy diskettes, illustrates the Purpose relation.
Presumably, there is a competition among trees in certain forest environments to become as tall as possible so as to catch as much of the sun as possible for photosynthesis.

However, in all such examples that we have found or imagined, some purpose seems implied. That is, there is in the subject matter some tendency toward particular classes of outcomes or states, and the span that expresses purpose identifies those outcomes or states for which the tendency supposedly exists.

In the example just cited, the purpose clause implies a teleological perspective on anatomical attributes. From this perspective, trees are as they are because they are embedded in a framework in which organisms tend toward photosynthesis maximization.

I.7 Condition and Otherwise

These two relations share the property that realization of the situation in the nucleus has something to do with the realization of the situation in the satellite. The difference between the two is that with Condition, the realization of the nuclear situation depends on the positive realization of the satellite situation; with Otherwise, realization of the nuclear situation prevents realization of the satellite situation.

I.7.1 Condition

relation name: CONDITION
constraints on N: none
constraints on S: S presents a hypothetical, future, or otherwise unrealized situation (relative to the situational context of S)
constraints on the N + S combination:
Realization of the situation presented in N depends on realization of that presented in S
the effect: R recognizes how the realization of the situation presented in N depends on the realization of the situation presented in S
locus of the effect: N and S

The Condition relation has been grammaticized in English by the hypotactic conditional clause. However, as with all our relations, which are textual relations rather than grammatical, Condition need not be expressed with an if clause.

While it might not seem necessary to illustrate the Condition relation, we do so here to show that a Condition satellite can be signalled in many ways. This extract, which was diagrammed in Figure I-20 above, appeared as a notice in the UCLA Personnel News, a staff newsletter; a Condition satellite is italicized:
1. It's new brochure time,

2. and that means a chance for new project write-ups.

3A. Anyone

4. desiring to update their entry in this brochure

3B. should have their copy in by Dec. 1.

5. Otherwise the existing entry will be used.

Here, realization of the command in the nuclear unit 3, turning in the new write-ups, will prevent realization of the situation in unit 5, use of the existing entry. This extract is analyzed in Figure I-13.

Notice that our definition does not cover the following type of example:

If A, then B. Otherwise (i.e., if not A, then) C

Such examples no doubt exist, but not in our corpus; we will have nothing further to say about their treatment in a theory of text structure.

1.8 Interpretation and Evaluation

The Interpretation and Evaluation relations involve assessing nuclear material in terms of some frame of reference that is not part of the subject matter of the nucleus itself. The difference is that Evaluation relates the nuclear situation to a scale of positive regard on the part of the writer, while Interpretation relates the nuclear situation to any other frame of ideas.

1.8.1 Interpretation

The Interpretation relation appears in this extract from an economic analysis text:

1. Steep declines in capital spending commitments and building permits, along with a drop in the money stock pushed the leading composite down for the fifth time in the past 11 months to a level 0.5% below its high in May 1984.

2. Such a decline is highly unusual at this stage in an expansion;

Here, the satellite unit 2 relates the nuclear unit 1 to a framework of ideas that interprets the declines mentioned in unit 1 in terms of cycles of economic activity. Figure I-14 shows the RST analysis of this extract.
**relation name:** INTERPRETATION

**constraints on N:** none

**constraints on S:** none

**constraints on the N + S combination:**
S relates the situation presented in N to a framework of ideas not involved in N itself and not concerned with W's positive regard\(^\text{22}\)

**the effect:** R recognizes that S relates the situation presented in N to a framework of ideas not involved in the knowledge presented in N itself

**locus of the effect:** N and S

---

**Figure I-14:** RST diagram for "Declines" text

1. Features like our uniquely sealed jacket and protective hub ring make our discs last longer.

2. And a soft inner liner cleans the ultra-smooth disc surface while in use.

3. It all adds up to better performance and reliability.

Obvious to any member of our consumer culture is the evaluative contribution of unit 3: It assesses the knowledge presented in units 1 - 2 in terms of the writer's positive regard.

\(^{22}\)Excluding W's positive regard differentiates this from the Evaluation relation.
I.9.1 Restatement

relation name: RESTATEMENT
constraints on N: none
constraints on S: none
constraints on the $N + S$ combination:
   S restates N, where S and N are of comparable bulk
the effect: R recognizes S as a restatement of N
locus of the effect: N and S

A good example of Restatement appears in the advertisement for a car-cleaning business discussed in [Noel 86], p. 69. We will give only the first two units here. The first is, presumably, set apart from the rest of the text for the sake of capturing attention:

1. A WELL-GROOMED CAR REFLECTS ITS OWNER

2. The car you drive says a lot about you.

This relation can be schematically diagrammed as in Figure I-16.

![Figure I-16: RST diagram for "Well Groomed Car" text](image-url)
1.0 Other Relations

Among the relations which we have considered but have not formulated definitions for are Comparison, Presentational Sequence, Disjunction and Means. We have also decided against a relation Quote. Justification for this decision includes:

1. Passages that present who said what or attribute information to certain sources rarely relate to other text spans in such a way that relational propositions arise;

2. The function of such attribution is in the domain of evidentiality with respect to the attributed material and thus is reasonably considered not as a distinct entity, but as part of the proposition that contains the attributional passage.

Cf. [Noel 86] for a similar conclusion with respect to attributed material in BBC news broadcasts.

I.11 The Multi-Nuclear Relations Sequence, Contrast, and Joint

The last three relations -- Sequence, Contrast and Joint are non-nucleated.

I.11.1 Sequence

relation name: SEQUENCE
constraints on N: multi-nuclear
constraints on the combination of nuclei:
A succession relationship between the situations is presented in the nuclei 23
the effect: R recognizes the succession relationships among the nuclei.
locus of the effect: multiple nuclei

Recipes make good examples for the Sequence relation. This one is for "Orange Ambrosia" (the list of ingredients and their amounts is omitted):

23 Note that the definition does not cover presentational sequence, e.g., "First ... ; Second ..." See the discussion of presentational relations in Section 5.
relation name: CONTRAST
constraints on N: multi-nuclear
constraints on the combination of nuclei:
no more than two nuclei; the situations presented in these two nuclei are (a) comprehended as the same in many respects (b) comprehended as differing in a few respects and (c) compared with respect to one or more of these differences

the effect: R recognizes the comparability and the difference(s) yielded by the comparison is being made

locus of the effect: multiple nuclei

1. Animals heal,
2. but trees compartmentalize.
3. They endure a lifetime of injury and infection
4. by setting boundaries that resist the spread of the invading microorganisms.

Units 1 and 2 of this text clearly fit the definition of Contrast: Animals and trees are similar in being living organisms, but differ in many respects. Units 1 and 2 compare one of these differences, namely their reactions to injury and disease.

Figure I-19 shows the RST diagram for this text.

I.11.3 Joint

The Schema called JOINT has no corresponding relation. The schema is multinuclear, and no relation is claimed to hold between the nuclei. See the discussion in Section 2.3.

We illustrate the use of the JOINT schema with this notice from the UCLA Personnel News:
This text, from which two units of detail have been omitted, essentially issues two different exhortations, one to employees who might have undergone a change in marital or family status, the other to employees who might have forgotten their listed beneficiary. These two parts are unrelated, except that they appear in the same text by virtue of shared subject matter; that is, they have no rhetorical relation to each other. Thus, a JOINT schema, illustrated in Figure I-20, accounts for them.

Figure I-20: RST diagram for "Beneficiary" text

In this section we have presented the relations found most useful in the analyzing short expository texts in our corpus. We have defined each relation and endeavored to provide enough detail to enable others to apply RST to the analysis of other texts.
We use the new technical term positive regard to bring together under single definitions a number of very similar text relations. In the definition of the Antithesis relation, for example, it encompasses several ways of favoring one notion over another. In analyzing any one text span and decomposing it into parts, we apply a single primary notion of positive regard -- belief, approval, or desire -- depending on the analyst's perception of the writer's intent.

II.2.1 Situations and their Realization

"Situation" here is an explicit cover term that includes events, actions, and states, as well as various other elements of text subject matter. Situations can be either "realized" or "unrealized". Unrealized situations are imagined or have yet to exist. A realized situation is anything else, any other sort of subject matter. The important definitional consequences involve the unrealized situations.

II.2.2 Action

"Action" applies to text subject matter, and refers to activity on the part of some agent capable of volition. It appears in two definitional contexts: in Motivation and Enablement, to restrict the nuclei to things reasonably motivated or enabled, and in the Cause cluster, in distinguishing volitionals from the rest. Its scope includes acts of accepting offers, as well as refusing or avoiding acts.

References


