Introduction to RST
Rhetorical Structure Theory

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Preface

- The following is a set of slides from courses taught by Maite Taboada and Manfred Stede
- It is distributed as a starting point for anyone who wants to present an introduction to RST
- You are free to use and modify the slides, but we would appreciate an acknowledgement
- For any comments and suggestions, please contact Maite Taboada: mtaboada@sfu.ca
Rhetorical Structure Theory

• Created as part of a project on Natural Language Generation at the Information Sciences Institute (www.isi.edu)
• Central publication
• Recent overview
• For many more publications and applications, visit the bibliography on the RST web site
  ▪ http://www.sfu.ca/rst/
  ▪ http://www.sfu.ca/rst/05bibliographies/
Principles

- Coherent texts consist of minimal units, which are linked to each other, recursively, through rhetorical relations
  - Rhetorical relations also known, in other theories, as coherence or discourse relations
- Coherent texts do not show gaps or non-sequiturs
  - Therefore, there must be some relation holding among the different parts of the text
Components

- Units of discourse
  - Texts can be segmented into minimal units, or spans
- Nuclearity
  - Some spans are more central to the text’s purpose (nuclei), whereas others are secondary (satellites)
  - Based on hypotactic and paratactic relations in language
- Relations among spans
  - Spans are joined into discourse relations
- Hierarchy/recursion
  - Spans that are in a discourse relation may enter into new relations
Paratactic (coordinate)

• At the sub-sentential level (traditional coordinated clauses)
  ▪ Peel oranges, and slice crosswise.

• But also across sentences
  ▪ 1. Peel oranges, 2. and slice crosswise. 3. Arrange in a bowl 4. and sprinkle with rum and coconut. 5. Chill until ready to serve.
Hypotactic (subordinate)

- Sub-sentential Concession relation

- Concession across sentences
  - Nucleus (spans 2-3) made up of two spans in an Antithesis relation
Relations

- They hold between two non-overlapping text spans
- Most of the relations hold between a nucleus and a satellite, although there are also multi-nuclear relations
- A relation consists of:
  1. Constraints on the Nucleus,
  2. Constraints on the Satellite,
  3. Constraints on the combination of Nucleus and Satellite,
  4. The Effect.
Example: Evidence

- Constraints on the Nucleus
  - The reader may not believe N to a degree satisfactory to the writer
- Constraints on the Satellite
  - The reader believes S or will find it credible
- Constraints on the combination of N+S
  - The reader’s comprehending S increases their belief of N
- Effect (the intention of the writer)
  - The reader’s belief of N is increased

- Assuming a written text and readers and writers; extensions of RST to spoken language discussed later
- Definitions of most common relations are available from the RST web site (www.sfu.ca/rst)
Relation types

- Relations are of different types
  - Subject matter: they relate the content of the text spans
    - Cause, Purpose, Condition, Summary
  - Presentational: more rhetorical in nature. They are meant to achieve some effect on the reader
    - Motivation, Antithesis, Background, Evidence
Other possible classifications

- Relations that hold outside the text
  - Condition, Cause, Result
  - vs. those that are only internal to the text
    - Summary, Elaboration

- Relations frequently marked by a discourse marker
  - Concession (*although*, *however*); Condition (*if*, *in case*)
  - vs. relations that are rarely, or never, marked
    - Background, Restatement, Interpretation

- Preferred order of spans: nucleus before satellite
  - Elaboration – usually first the nucleus (material being elaborated on) and then satellite (extra information)
  - vs. satellite-nucleus
    - Concession – usually the satellite (*although*-type clause or span) before the nucleus
Relation names (in M&T 1988)

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Other classifications are possible, and longer and shorter lists have been proposed.
Schemas

- They specify how spans of text can co-occur, determining possible RST text structures
Graphical representation

- A **horizontal line** covers a span of text (possibly made up of further spans)
- A **vertical line** signals the nucleus or nuclei
- A **curve** represents a relation, and the direction of the arrow, the direction of satellite towards nucleus
How to do an RST analysis

1. Divide the text into units
   - Unit size may vary, depending on the goals of the analysis
   - Typically, units are clauses (but not complement clauses)
2. Examine each unit, and its neighbours. Is there a clear relation holding between them?
3. If yes, then mark that relation (e.g., Condition)
4. If not, the unit might be at the boundary of a higher-level relation. Look at relations holding between larger units (spans)
5. Continue until all the units in the text are accounted for
6. Remember, marking a relation involves satisfying all 4 fields (especially the Effect). The Effect is the plausible intention that the text creator had.
Some issues

- Problems in identifying relations
  - Judgments are plausibility judgments. Two analysts might differ in their analyses
- Definitions of units
  - Vary from researcher to researcher, depending on the level of granularity needed
- Relations inventory
  - Many available
  - Each researcher tends to create their own, but large ones tend to be unmanageable
- A theory purely of intentions
  - In contrast with Grosz and Sidner’s (1986), it does not relate structure of discourse to attentional state. On the other hand, it provides a much richer set of relations.
Applications

• Writing research
  ▪ How are coherent texts created
  ▪ RST as a training tool to write effective texts

• Natural Language Generation
  ▪ Input: communicative goals and semantic representation
  ▪ Output: text

• Rhetorical/discourse parsing
  ▪ Rendering of a text in terms of rhetorical relations
  ▪ Using signals, mostly discourse markers

• Corpus analysis
  ▪ Annotation of text with discourse relations (Carlson et al. 2002)
  ▪ Application to spoken language (Taboada 2004, and references in Taboada and Mann 2006)

• Relationship to other discourse phenomena
  ▪ Between nuclei and co-reference

• For more applications (up to 2005 or so):
Resources

- RST web page
  - www.sfu.ca/rst
- RST tool (for drawing diagrams)
  - http://www.wagsoft.com/RSTTool/
Selected references (see RST web site for full bibliographies)