

# Rhetorical theory in $\LaTeX$ with the `rst` package

Version dated February 17, 2003

David Reitter  
reitter@mle.media.mit.edu  
<http://www.reitter-it-media.de/>

## 1 Motivation

Drawing rhetorical analyses is no fun when you need to change and update diagrams as you refine your work, or, more importantly, if a lot of analyses are to be drawn. Previous solutions include O'Donnell's RSTTool application (O'Donnell, 2000), which can output (encapsulated) postscript graphics. However, these drawings are more suitable for reference than for use in publications. Besides, pdfTeX has a notorious problem with postscript-items in source files.

Voilà, there we go: This package enables us to typeset beautiful diagrams with no hassle. It is oriented towards the style of the diagrams shown in Mann & Thompson (1988) and subsequent works.

Further developments include a conversion tool to generate the `rst` format automatically from URML files.

Please refer to the last section for copyright and usage information.

## 2 Installation

The file `rst.sty` is almost all you need. The package uses three additional packages, `color`, which are usually installed in a well-equipped  $\TeX$ system such as `teTeX`. If not, download and install them:

- `color`<sup>1</sup>
- `ifthen`
- `calc`

Install `rst.sty` with the usual mechanisms of your  $\TeX$ distribution or simply put it in the same directory where you keep the document that makes use of the `rst` package.

---

<sup>1</sup>You can probably eliminate the need for the `color` package by removing the `usepackage{color}` command and uncommenting four `\providecommand` statements in the `rst.sty` file.

### 3 The rhetoricaltext environment

To give examples from a corpus, you can use the `rhetoricaltext` environment. Every environment is assigned its own identifier, counted as roman numeral.

In the environment, single *minimal discourse units* are specified with the `\unit` command. It takes two arguments: the first one is optional and specifies a label for this unit. This label may be used to refer to the unit later on. The second argument to `\unit` contains the text.

An additional command is `\source`, which takes one argument. This usually identifies the exact source of the sample, e.g. an identification number in the corpus used.

You may refer to any given unit from any part of your document using the `\refr` command. It takes one argument, which should be the label of a unit defined somewhere else in the text. You will need to compile the document twice to get rid of the `??` appearing in the output. This is the same mechanism as with other kinds of references in  $\text{\LaTeX}$ .

Here's an example:

In the following, `\refr{bush2}` is an embedded discourse unit.

```
\begin{rhetoricaltext}
\unit[bush1]{The Bush Administration,}
\unit[bush2]{trying to blunt growing demands from
Western Europe for a relaxation of controls on exports to the
Soviet bloc,}
\unit[bush3]{is questioning...}
\source{wsj$_{2326}$}
\footnote{Taken from the corpus described in \cite{carlson-corpus}.
Bracket annotation simplified.[...]}
\end{rhetoricaltext}
```

How do we treat the noncontiguous discourse unit formed of `\refr{bush1}`, `\refr{bush3}`?

In the following, 1B is an embedded discourse unit.

[The Bush Administration,]<sup>1A</sup> [trying to blunt growing demands from Western Europe for a relaxation of controls on exports to the Soviet bloc,]<sup>1B</sup> [is questioning...]<sup>1C</sup> (wsj<sub>2326</sub>)<sup>2</sup>

How do we treat the noncontiguous discourse unit formed of 1A, 1C?

---

<sup>2</sup>Taken from the corpus described in Carlson et al. (2001). Bracket annotation simplified. The other examples are made up. They are not intended to demonstrate any linguistic/rhetorical properties.

## 4 The `\rl` command

To mark a relation name such as EVIDENCE or JUSTIFY in your document, use the `\rl` command. It capitalizes and word given as argument and, in the current version, typesets it in small caps.

## 5 Rhetorical structure diagrams

The `rst` package provides three types of diagram elements via the commands `\dirrel`, `\multirel` and `\rstsegment`.

### 5.1 Terminal elements

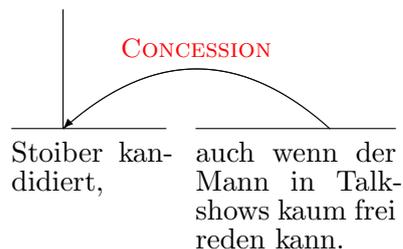
`\rstsegment` defines a terminal-level *minimal discourse unit*: it is meant to contain normal text. This is what it expects to be given as argument. While omitting this command and simply typing the text in an `\dirrel` argument might work sometimes, it could give unexpected (and not-so-nice) results.

### 5.2 Directed relations

`\dirrel` draws a schema diagram for one or more directed (nucleus-satellite) relations. There is always one designated nucleus per `\dirrel` schema.

This command always takes  $2n$  arguments. They should be thought of as pairs: The first argument always states a relation name, the second one contains the content of the span. Every argument pair given draws a span and a relation arrow to the nucleus argument of the schema. The nucleus is identified by leaving the relation name empty. Alternatively, you may specify `\nuc` if you think that's better to read. There may be up to four argument pairs.

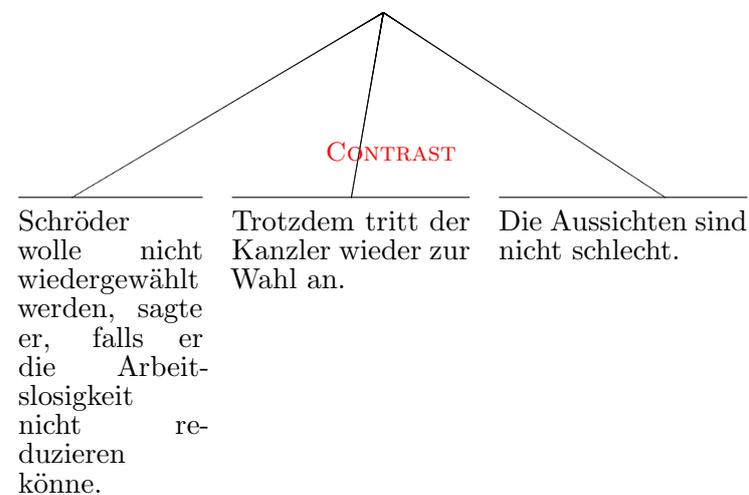
```
\dirrel{}  
{\rstsegment{Stoiber kandidiert,}}{Concession}  
{\rstsegment{auch wenn der Mann in Talkshows kaum frei reden kann.}}
```



### 5.3 Multinuclear relations

`multirel` draws a diagram for a multi-nuclear relation. It takes at least two arguments. The first argument is the relation name. All other arguments contain the contents of the spans that are connected by the relation.

```
\multirel{Contrast}
{\rstsegment{Schr\{o}der wolle nicht wiedergew\{a}hlt werden,
sagte er, falls er die Arbeitslosigkeit nicht reduzieren k\{o}nne.}}
{\rstsegment{Trotzdem tritt der Kanzler wieder zur Wahl an.}}
{\rstsegment{Die Aussichten sind nicht schlecht.}}
```



### 5.4 Configuration

The `rst` package knows a few configuration variables you may use to alter the appearance of the diagrams.

#### 5.4.1 Width control

The `\compressionWidth` value is the maximum width that a single span may have in any diagram. Set it to `0pt` to let not limit the width. Used on a per-diagram basis, it makes an excellent way of compression a diagram horizontally without making it look ugly. See the last example in section 6 to get an impression of what this parameter does.

```
\setlength{\compressionWidth}{0pt}
```

The `\terminalWidth` value is the maximum width that a single span may have in any diagram. Set it to `0pt` to let not limit the width.

```
\setlength{\terminalWidth}{100pt}
```

You may also alter the margins at the left and the right hand side of the tree with the `\rstmargin` value.

```
\setlength{\rstmargin}{3pt}
```

Finally, the following command sets the minimum space that's between spans in the `\rstmiddleskip` value.

```
\setlength{\rstmiddleskip}{1em}
```

### 5.4.2 Colors

`\renamebgcolor` contains the name of the background color of relation names. Depending on other packages used, white could avoid transparency. (This functionality is disabled in the `rst.sty` package by default to enable the use of `\raisebox` commands in relation names.) `\renamecolor` specifies the name of the text color of relation names.

```
\renewcommand{\renamebgcolor}{white}%           background color
\renewcommand{\renamecolor}{red}%               relation name color
```

Please note that these settings may or may not work, depending on your output format (Postscript or PDF). In my experiments, PDF worked generally better.

## 6 Complex structures - more examples

As you can see from the following examples, trees may be arbitrarily complex. In case the trees get too wide, reference numbers may be used in conjunction with the `rhetoricaltext` environment. Or, alternatively, you might want to consider choosing a more handy example, as readers tend to prefer smaller diagrams over unnecessarily complex ones...

**Note:** You may raise or lower the relation names in the diagrams with the `\raisebox` command in the relation name argument of directed relations. (See example below.)

**Note:** Position relation names vertically by adding space at the left or right hand side. Use either the `"\ "` syntax or an ordinary `\hspace` command. (See example below.)

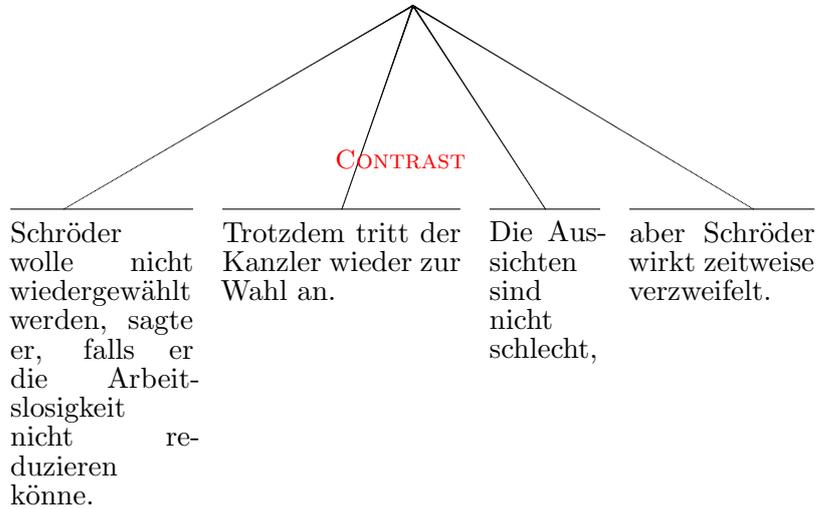
**Note:** If you do not want to give a relation name, just specify one space with a `\backslash (" \ ")` as shown below.

```
{\setlength{\terminalWidth}{90pt}
\multirel{Contrast\ \ \ \ }
{\rstsegment{Schr\ "{o}der wolle nicht wiedergew\ "{a}hlt werden,
```

```

        sagte er, falls er die Arbeitslosigkeit
        nicht reduzieren k\u{0}nne.}}
{\rstsegment{Trotzdem tritt der Kanzler wieder zur Wahl an.}}
{\rstsegment{Die Aussichten sind nicht schlecht.}}
{\rstsegment{aber Schr\u{0}der wirkt zeitweise verzweifelt.}}
}

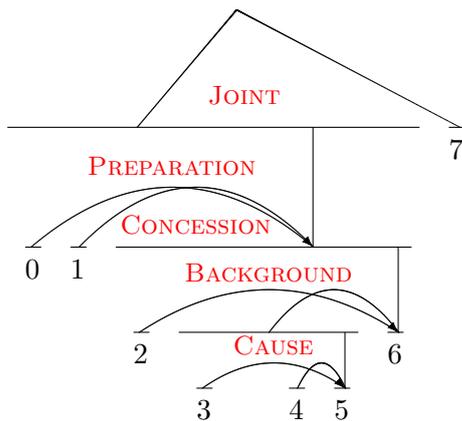
```



```

\multirel{Joint}{
\dirrel{Preparation}{\rstsegment{0}}
  {\raisebox{-2em}{Concession}}{\rstsegment{1}}
  {}{\dirrel{Background}{\rstsegment{2}}
    {\ }{\dirrel{Cause}{\rstsegment{3}}
      {\ }{\rstsegment{4}}
      {}{\rstsegment{5}}}}
    {}{\rstsegment{6}}}}
  {\rstsegment{7}}}}

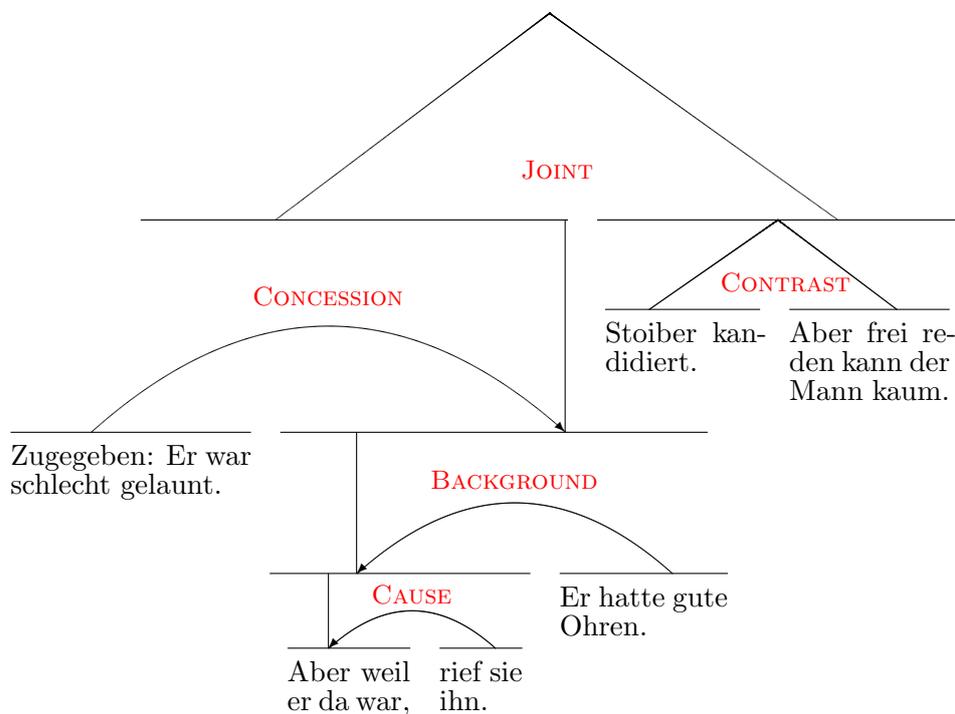
```



```

{\hspace{30pt}\setlength{\compressionWidth}{160pt}
\multirel{Joint}
  {\dirrel{Concession}
    {\rstsegment{Zugegeben: Er war schlecht gelaunt.}}
  {\dirrel
    {Background}{\dirrel{Cause}
      {\rstsegment{Aber weil er da war,}}
      {}{\rstsegment{rief sie ihn.}}}
    {}{\rstsegment{Er hatte gute Ohren.}}}
\multirel{Contrast}
  {\rstsegment{Stoiber kandidiert.}}
  {\rstsegment{Aber frei reden kann der Mann kaum.}}}
}

```



## 7 Conversion from URML

Underspecified Rhetorical Markup Language (Reitter & Stede, to appear 2003) is an XML-based format that encodes rhetorical annotations in a compact, yet easy to understand way. It is used to represent the Potsdam Corpus (Reitter, to appear 2003). Also, the English corpus presented in Carlson et al. (2001) can be encoded in URML.

Fully specified analyses can be translated to the TeX conforming format used with `rst`.

Simply call `urml2latex`. Usage:

```
urml2latex.perl [-i] urml-doc.xml [doc-id [analysis-id]]
```

The parameter `-i` instructs `urml2latex` to include the terminal segments (minimal discourse units) directly in the tree. The default is to insert them separately in a `rhetoricaltext` environment. If the `doc-id` is left out, all document identifiers in the URML document are shown. If the `analysis-id` is left out and there is more than one analysis in the document, the analyses are listed.

## 8 Known bugs

Drawing the diagrams is, unfortunately, slow. A solution to overcome this would be to use a faster machine.

The package can only draw up to four spans in one constituent, which is due to the limited number of arguments in  $\text{T}_{\text{E}}\text{X}/\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ .

The vertical line in compressed diagrams can be too far to the right, if the compression value is set too low. This will be improved in a later version. I recommend setting the compression value on a per-diagram basis.

The relation name drawn in multi-nuclear relations is often drawn over some lines. In a later version, I might find a way to put a white box behind the relation name. Sometimes, the Bezier curves of nucleus-satellite relations may also overlap, which is less favorable. This would be hard to change.

If the `\compressionWidth` length is set, the width of the diagram's bounding box may be too small, resulting in a diagram that appears too far left. This has proven to be too complicated to be fixed. Please accommodate manually using `\hspace`.

Please notify me in case you encounter any other problems.

## 9 History

Changes in version 1.3 (compared to version 1.0):

- horizontal spacing issues (at least) improved so that relation names can be drawn correctly. Still does not work well in some multi-satellite configurations.
- `rhetoricaltext` environment uses better label / reference mechanism now so  $\text{T}_{\text{E}}\text{X}$  won't run out of memory when working with large documents and many rhetoricaltexts. You always need to compile twice to get the refs right!
- `rhetoricaltext` environment does not use `\lineheight` any more. Margins before and after rhetoricaltexts may change.
- provide `\rl` command to format a relation name (capitalized) All relation names in diagrams are capitalized now

## 10 Copyright and Acknowledgements

Please feel free to use this package for your own purposes. If you prepare a publication with it that is not freely available via Internet, I would appreciate a copy of it. If you make extensive use of it, you may want to refer to this manual or the website. Do not redistribute the package itself, if any part of it is altered or left out. Of course, I welcome your suggestions and additions, and I will happily include helpful modifications in a new release.

I am grateful to Stephan Lehmké for providing his `naturalparbox.sty` from the TeXPower package (Lehmké, 2002).

## References

- Carlson, L., Marcu, D. & Okurowski, M. E. (2001). Building a discourse-tagged corpus in the framework of rhetorical structure theory, *Proceedings of the 2nd SIGDIAL workshop on discourse and dialogue, Eurospeech*, Aalborg, Denmark.
- Lehmké, S. (2002). TeXPower – Dynamic Online Presentations with LaTeX, <http://texpower.sourceforge.net/> as of 11/2002.
- Mann, W. C. & Thompson, S. A. (1988). Rhetorical Structure Theory: Towards a functional theory of text organization, *Text* 8(3): 243–281.
- O’Donnell, M. (2000). RSTTool 2.4 – a markup tool for Rhetorical Structure Theory, *Proceedings of the 1st International Natural Language Generation Conference*, Mitzpe Ramon, Israel.
- Reitter, D. (to appear 2003). Simple signals for complex rhetorics: On rhetorical analysis with rich-feature support vector models, *in Proceedings of the GLDV conference 2003*, St. Augustin, Germany: Gardez.
- Reitter, D. & Stede, M. (to appear 2003). Step by step: underspecified markup in incremental rhetorical analysis, *Proceedings of the 4th International Workshop on Linguistically Interpreted Corpora (LINC-03)*, *in: Proceedings of EACL 2003*, Budapest.