

Applying Rhetorical Structure Theory to Twitter Conversations

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Rhetorical Structure Theory (RST) (Mann and Thompson, 1988; Taboada and Mann, 2006) is one of the most widespread frameworks for ascribing coherence structures to monologue texts. While there have been a few attempts to also apply it to dialogue (e.g., Stent 2000), in general, experiences with using it for non-monologue exchanges are so far quite limited. In particular, the theoretical consequences of transferring an approach designed for monologue to a dialogue scenario are not clear yet. In our ongoing work, we are exploring ways of annotating rhetorical structures in Twitter multilogues: conversations that arise among users via the *reply-to* relation among tweets. We extracted this data from the one-month snapshot of German tweets by Scheffler (2014) and from topic-specific tweet collections discussing renewable energy. We are thus working on a linguistic mode that is typed yet shares many properties with spoken language. In this presentation, we discuss particular types of problems that we have encountered in the course of this attempt and offer some initial solutions.

The first problem concerns the *topological ordering* of discourse segments. RST imposes a strong constraint that only adjacent units of a text can be linked together via a rhetorical relation. It is, however, unclear how this adjacency rule should be applied to tree-like branching multilogues (resulting from multiple, independent replies to a tweet): should this constraint be lifted, or should the conversation structures be linearized. In our current annotation scheme, we require each tweet to have a single discourse tree (for capturing its internal coherence) and then allow this tree to be attached either to the reference tweet (the one which the given message replies to) or to one of its siblings in the tree (messages that have the same reference tweet). This follows from our empirical observation that *reply* is in the corpus not always used “canonically” but at the same time not completely arbitrarily.

Another important RST-rule imposes a *structural constraint* that the resulting coherence structure should necessarily be a tree (i.e. a loop-free graph with at most one parent per node). While this principle significantly simplifies the automatic analysis, it can fail to reflect real dependencies in cases when one message is simultaneously referencing two or more microblogs preceding it. (This point reflects the discussion that started with the claims of Wolf and Gibson (2005); see also

Vernant et al. 2013). A second variant of this problem arises when a tweet refers to particular spans within the reference tweet rather than addressing it as a whole. Based on our corpus observations so far, we decided to hold on to the tree restriction: Relating to tweet portions can usually be handled via the “strong nuclearity principle” (Marcu, 2000). The issue of multiple reference tweets would be fundamentally problematic for any linearization approach to multilogues, but in our data has occurred only rarely.

A third issue concerns the *taxonomy of discourse relations*. As is well known, RST differentiates between subject matter and presentational relations. The former group comprises connections whose goal is to merely reflect certain semantic links between the units of discourse, while the latter group deals with relations whose main purpose is to influence the reader’s dispositions. Similar to dealing with dialogue, we found that for multilogues a third group of relations is required: interactional relations that cover conversation management elements such as greetings, farewells, apologies, suggestions etc. Rather than starting from scratch for defining these, we decided to adopt a subset of a dialog act taxonomy (Bunt et al., 2010) and to re-cast these one-place predicates as two-place relations in our annotation manual.

Finally, RST obviously cannot be expected to be prepared for numerous *novel CMC phenomena* that do not easily fit into the established analysis paradigm. It is, for instance, unclear whether such Twitter-specific elements as @-mentions, hyperlinks, hashtags, and emoticons should form separate discourse units or rather be included in their adjacent text spans. In the former case, one also has to decide what the relations for these units should be and at what level of the discourse structure these units should be embedded. In our approach, we handle many of these cases via the criterion of syntactic embedding: When, for example, a hyperlink is structurally integrated into the utterance, it does not form a separate unit, but it does so when being given as add-on information.

In summary, most of these issues touch on the trade-off between the linguistic adequacy and the computational complexity of the annotation framework. Our goal is to strike a balance, but a number of critical aspects still remain to be worked out.

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