On Discourse relations, rhetorical relations and rhetoric

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Discourses are the collaborative activities of (human) agents who have purposes for communicating. Discourse structure includes the purposes of those agents, which I take, following [GroszSid86], to be formally expressible as intentions and beliefs.

While the theory of discourse structures has influenced how many computational linguists think about discourse processing, it does not preclude careful consideration of rhetorical function in discourses. Nor does it settle the question of how intentions are conveyed by particular utterances in particular genres of discourse.

In recent research I have been studying discourses that occur when people communicate about their collaboative activities. These people are collaborating not only to make the discourse happen, but to get something done together in the world. Following on the model of SharedPlans in [GroszSid90, GroszKra93], I have asked, how is it that agents use language to come to hold the beliefs and intentions specified by the SharedPlan model as necessary for successful collaboration? Using naturally occurring conversations of human agents collaborating, I have observed that their discourses cycle through a series of proposals, rejections, assents, counters, modifications and retractions.

To clarify this observation, I have devised an artificial language of negotiation [Sidner92] whose sentences are messages containing proposals of propositions, rejections of propositions, etc. The semantics of these messages is specified in terms of beliefs, especially mutual belief, and intentions that the discourse participants come to hold about the propositional content of the message. Along with the language is an "environment" for interpretation that keeps track of accepted, open and rejected proposals. Using this language I have created artificial conversations in which the beliefs

and intentions of the participants are fully evident. Such conversations have some of the richness of naturally occurring ones, though they lack such attentional devices of human discourse as cue phrases. They also contain more redundancy than human discourse; in the artificial language individual utterances can not serve several functions at once, as is very common in natural human discourse.

I maintain as a working hypothesis that the negotiation language can model naturally occuring discourses as cycles of negotiations. Under this hypothesis, the recognition that an utterance serves as a proposal as opposed to a counterproposal, for example, is determined not by the relation of the utterance to previous utterances. It is determined by recognition of beliefs and intentions conveyed by the utterance and by the current discourse state with respect to beliefs and intentions (e.g. which beliefs are not yet mutually believed, which are, and which cannot be because one discourse participants holds that the belief is false); these together indicate how the beliefs and intentions of the current utterance operate as proposals, counterproposals, rejections and the like. As a model of human discourse, the negotiation language provides a fine-grained model of the beliefs and intentions and relations among them that is conveyed in individual utterances. It does not eliminate the need for recognizing what role the particular beliefs and intentions conveyed play in the agents' plans, especially in their SharedPlans, and hence plan recognition is still critical. Recent work by Lochbaum [Lochbaum93] provides an outlook on plan recognition for collaborative activity.

The negotiation language might appear to be similar to relations in RST and other theories because terms such as proposing, counterproposing and rejection seem similar to, for example, Mann

and Thomson's evidence, antithesis and conces-
sion relations. The distinctions may be clari-
fied by first noting that the general term "dis-
course structure relations" is ambiguous. Re-
lations might be between utterances or utter-
ances and segments (i.e. elements of the linguis-
tic structure), between constructs of attentional
state or between those of the intentional struc-
ture [GroszSid86]. RST, Hobbs' theory and the
McKeown schemas [Manntho87, Hobbs79, McKe-
own85] are all relations among parts of linguistic
structure. The dominance and satisfaction prece-
dence of the Grosz and Sidner theory are rela-
tions among constructs of intentional structure.
In [Moorepar89] work, RST is used to organize
and enact the intentions of the speaker, as well as
to maintain a model of how portions of the *text*
are related to each other. Because the negotiation
language concerns relations among belief and in-
tentions, it is an example of relations among inten-
tional structure. Both this language and the use
of RST in Moore and Paris' work suggest that cer-
tain aspects of rhetorical relations are captured in
the beliefs and intentions conveyed in utterances
in combination with the state of the discourse.

The negotiation language viewpoint however
does not critically address the issue of rhetori-
cal function in part because it is not clear what
aspects of discourse behavior one wants to claim
must be addressed by rhetorical function. What is
the role of rhetorical function or rhetorical knowl-
edge in discourse? What aspects of discourse must
be accounted for by rhetorical function? While
rhetorical relations like those of RST have been
useful in the generation systems of McKeown and
the ISI systems, no one has claimed that the recog-
nition of these relations is essential for the inter-
pretation of discourse; many researchers do accept
the view, originally propounded by Austin, Searle
and Grice, that intentions and beliefs conveyed in
utterances are intended to be recognized.

Do rhetorical relations or other textual relations
concern rhetorical knowledge? Or are they mis-
named, so that the term linguistic structure rela-
tions is more apt? Rhetorical function concerns a
different aspect of communication than the recog-
nition of intention, namely the affective one. By
this I mean the role of an utterance in evoking in
the hearer or reader some change of state (includ-
ing an emotional one) that the hearer or reader
does not necessarily recognize; often affect is less
than successful if the hearer is aware of it. In
classical tradition, which extends back to Aris-

totle's view of rhetoric, rhetorical function con-
cerns the art of persuasion; in more recent times,
rhetoric is the art of social control and motivation
through communication. Hovy's Ph.D. [Hovy89]
work can be seen as an experiment in rhetorical
function. His PAULINE system can present an
event from several different points of view, de-
pending on, among other things, the goals for in-
fluencing hearer's opinions; Hovy's system is not
concerned with the hearer recognizing what is go-
ing on. Research by Cahn [Cahn90], addressesing
the automatic synthesis of utterances with affec-
tive mood (e.g. utterances that sound happy or
sad or angry), demonstrates that affect may be
carried at the most fine grained level of communi-
cation.

Both rhetorical theory and intentional theories
deal with a discourse participant coming to hold
a belief on the basis of utterances from another
participant. Modern rhetoric (especially in adver-
tising) concerns itself with causing the participant
to do something (such as buy a certain product),
a concern not entirely unakin to intending that
another perform an action [GroszKra93]. It is
only rhetorical theories that address the means
of achieving these ends by affect on the hearer,
either with or without the hearer recognizing it.

It is unclear to me whether Hobbs, McKeown or
Mann and Thompson intended their relations to
operate rhetorically in the sense described above.
If the relations were not so intended, then they
may continue to provide the kind of organizing
framework they have played in generation sys-
tems without having a parallel role in interpreta-
tion systems. And if they were not, then rhetori-
cal function is a matter computational linguistics
might still need to address. Because rhetorical
function is one of affect on the hearer, it may be
valuable to generation systems, which must plan
for the affect of utterances on discourse partici-
pants, the force of utterances in persuasive activ-
ity, and perhaps social aspects of discourse partic-
ipants. Rhetorical function may also be useful to
the interpretation of discourse. One might want
to consider how to build systems that are sen-
sitive to the affect of utterances (or perhaps not,
since it might be easier to have computational con-
versational partners that do not respond to such
matters). Rhetorical function does not yet seem
critical to many researchers in computational lin-
guistics, but a better understanding of its role in
discourse may clarify issues of this workshop.

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