A Goal-Based Grammar of Rhetoric

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1   An advocacy of rhetoric

In many applications in computational linguistics, such as machine translation, we want to understand why a writer has used language in a particular way, what specific effects she intended to convey, and which linguistic choices were made to achieve those goals. This idea, that a writer has specific communicative goals or intentions in mind when she composes text, goes back to the study of classical rhetoric, in which the rhetorical form of a writer's text was considered to reflect his thoughts and intentions. The rhetorical form was realized through the appropriate choice and organization of words and syntactic structures meant to "evoke the desired response" (Corbett 1971). Content and form were recognized as inseparable, and as exerting a reciprocal influence upon each other.

In our work, we have integrated the theory of classical rhetoric with contemporary work in knowledge representation to develop an approach to relating high-level intentions, through a hierarchy of increasingly detailed linguistic knowledge, to specific syntactic choices. We have constructed a multi-level grammar of rhetoric that ties rhetorical goals, such as formality and force, to syntactic choices, through the intermediary of stylistic goals such as clarity and concreteness.

When a writer sets out to produce a piece of text, he does so with a specific pragmatic goal, such as informing or persuading, in mind. In order to achieve this goal, he must make particular linguistic choices. The mechanism that we propose for achieving the desired pragmatic effect is the use of lower-level rhetorical goals. For example, if the writer wishes to be persuasive, he must present the argument in such a way as to make the reader receptive to his message. Thus, he might use a combination of the rhetorical goals of force and amity to convey both a sense of authority and a desire to communicate. He must then decide on the specific linguistic choices that will realize these rhetorical goals. Style is the medium that enables him to do this. In order to model formally the linguistic choices of a writer, we decompose complex rhetorical goals into simpler stylistic goals that can then be related to lexical, syntactic, and semantic choices.

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2 A multi-level grammar of rhetoric

Our grammar of rhetoric allows us to recognize, at the top level, how the overall structure of a text works to achieve a certain communicative goal, and, at the lower level, how the individual pieces of text fit together to produce subtle stylistic effects. Thus, through multiple levels of abstraction, we tie together rhetorical forms characteristic of high-level intentions and syntactic relationships associated with stylistically significant effects. Thus, we have four levels, the *pragmatic*, the *rhetorical*, the *stylistic*, and the *syntactic*.

In DiMarco and Hirst (1993), DiMarco *et al* (1992), Green (1992), and Hoyt (forthcoming), we describe the construction of a syntactic stylistic grammar that relates stylistic goals to abstract stylistic properties, and then relates these abstract properties to low-level syntax. The foundations of the grammar draw on the work of Halliday (1985) and Halliday and Hasan (1976); we consider the *primitive* stylistic effects of a sentence to be correlated with its underlying cohesive and hierarchical syntactic structure. We assign each type of sentence component a *primitive-element* classification on the basis of the nature of these fundamental structures.

We then compose these primitive stylistic elements into higher-level, *abstract stylistic properties*, or, *elements*. In DiMarco and Hirst (1993), we proposed a set of stylistic terms that made explicit these kinds of abstract properties. Here are three examples:

Heteropoise: A sentence in which one or more parenthetical components are syntactically 'detached' and dissimilar from the other components at the same level in the parse tree.

Centroschematic: A sentence with a central, dominant clause with one or more of the following optional features: complex phrasal subordination, initial dependent clauses, terminal dependent clauses.

Resolution: A shift in stylistic effect that occurs at the end of a sentence and is a move from a relative discord (an incongruity) to stylistic concord (normal usage).

Each abstract stylistic element is defined as a composition of primitive stylistic elements.

Next, the abstract stylistic elements are composed into stylistic goals. Stylistic goals, such as clarity and concreteness, are elusive qualities that were traditionally defined by stylists only by means of examples and informal rules. However, with our grammar, we can abstract from a plethora of low-level syntactic rules that stylists have used and can define formal rules for specific stylistic goals.

For example, the goal of concreteness is associated with heteropoise, a stylistic element that characterizes the kinds of cohesive (and non-cohesive) syntactic interruptions that create forms of stylistic emphasis. In the grammar, concreteness is defined as various forms of stylistic highlighting, either emphasis (heteropoise, dissolution) or deviation from established usage (discord).

An example of a concrete sentence that is a stylistic heteropoise, beginning with a canonical structure, but then emphatically interrupted, is this: *Your writing, if I may say so without offence, is immature.*

3 The level of rhetorical goals

In Makuta-Giluk (1991) and Makuta-Giluk and DiMarco (1993), we describe the development of a rhetorical grammar that is built upon our stylistic grammar and composes rhetorical goals from combinations of stylistic goals. Where goal-directed style accounts for the stylistic choices that will express a certain effect, goal-directed rhetoric considers the higher-level linguistic choices

associated with specific rhetorical effects that also express the communicative goals of a text. Thus, we have formalized some of the syntactic aspects of the rhetorical structure of texts.

There may be many reasons why an author writes a text and why she chooses to express it in a particular form. These reasons are *pragmatic goals* (*cf.* Hovy (1988)). Informing or persuading are examples of such goals. Once a writer commits herself to a specific pragmatic goal, she must determine appropriate content and linguistic realization. Both these issues involve a number of rhetorical options. A possible mechanism for achieving the desired pragmatic effect is using a set of *rhetorical goals*. Once the writer knows which rhetorical effects she wants in the text, she now needs to make the choices that realize these goals. We decompose complex rhetorical goals into simpler entities, the stylistic goals described above, such as simplicity or clarity. In Makuta-Giluk (1991) and Makuta-Giluk and DiMarco (1993), we pointed out that a stylistic goal can be used to realize more than one rhetorical goal, and a rhetorical goal can be achieved in several different ways. The author must choose a set of interrelated stylistic goals to realize her particular set of rhetorical goals. The stylistic goals taken separately do not determine the rhetorical effect of the text; it is their interplay that makes it possible to express a wide range of rhetorical goals. In our grammar, we have defined goals such as *force/ineffectiveness*, *formality/informality*, and *amity/distance*. For example, we define force to be characteristic of sentences that display one of the following combinations of stylistic goals:

force $\longrightarrow$

    directness *and* conciseness *and* concreteness

    dynamism *and* simplicity

An example of the first kind of forceful sentence is: *Frankly, my dear, I don't give a damn.*
    We associate *ineffectiveness*, the dual of force, with diffusive and garrulous communication:

ineffectiveness $\longrightarrow$

    complexity

    obscurity *and* verbosity

    obscurity *and* obliqueness

The following example of ineffectiveness is from a textbook of rhetoric: *The sequence of development is fortuitous and even implausible, for the treatment of rhetoric becomes more perfunctory as erudition in the works of rhetoricians increases, and rhetoric disappears abruptly when knowledge of it is at a maximum, particularly from the works of the authors who acknowledge the influence of Cicero and Quintilian.* We define other rhetorical goals in an analogous manner.

4 Multiple levels of rhetorical relations

The notion of multiple levels of rhetorical analysis is intrinsic to our formalization: communicative goals are represented at several levels of abstraction, and each level is composed of elements from the level below. We believe that this idea of stratified levels is applicable not only to syntactic aspects of rhetoric, but to lexical and semantic aspects as well, and have begun to apply our approach to studying how lexical choices realize particular intentional goals (DiMarco, Hirst, and Stede 1993).

Eventually, we see lexis, syntax, and semantics being represented by separate primitive-level representations that act together to determine the realization of communicative goals at the stylistic, rhetorical, and pragmatic levels; our formalism is therefore both stratified and branching. Thus, the ways in which intentional relations interact with ideational, or informational, relations (Moore and Pollack 1992) can be accounted for nicely by our model of rhetoric, which integrates the effects of lexis, syntax, and semantics on rhetorical structure within a single cohesive framework.

5 Conclusion

To construct a full computational theory of rhetoric, we will need to first develop complete formalizations of the lexical and semantic aspects of style, and then integrate these representations with our current syntactic grammar. The syntactic theory formalizes some significant aspects of style and rhetoric. While it has limitations, it does explain several aspects of the writing process and how intentional goals can be realized through several interrelated levels of rhetorical and stylistic goals.

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