

The Research Group *Interface Asymmetries*

is pleased to present

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Title: *Graded Constraints: Where Do They Fit?*

Date: FRIDAY, February 25, 2005

Time: 12:30 p.m.

Place: DS-6365
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Abstract

Deciding what to say and arranging that information, in a natural way, are two of the main challenges of building any dialogue or natural language generation system. Such systems require the seamless integration of a variety of information. Part of the problem of information arrangement, has been approached using a number of theoretical models including Rhetorical Structure Theory (RST, Mann 1984; Mann and Thompson 1986, 1988a, 1988b). In RST, text structure is defined in terms of *nuclei*, *satellites*, and various relations among them. The case study presented here shows how the prosodic weight of a discourse unit (DU, i.e., a nucleus or a satellite) influences sentential discourse structure, how we can use this information to improve the prediction of the order of DUs, and what implications this has for linguistic theory. We measure prosodic weight by the number of syllables, and define discourse structure based on RST. Analysis of a discourse-annotated corpus revealed an interesting interaction between the prosodic weight of the DUs and their order when the satellite bore certain relations to the nucleus. It was observed that the prosodically heavier DUs tended to come after the lighter ones—an observation that has been made before in theoretical linguistics. However, what is interesting is how the often conflicting constraints from discourse and prosody are resolved. Discourse constraints generally exhibit more strength than prosodic constraints, but as the difference between the lengths of DUs increases, we see a gradual strengthening of the prosodic constraint. A statistical model of the data for predicting the DU order resulted in a substantial increase in the accuracy of prediction compared to a baseline. Obviously, prosodic weight is not the sole determinant of DU order. Other constraints from other modules of grammar, such as, syntax, semantics, and information structure also play a role here with potentially conflicting requirements. Based on such observations, we argue for a soft-constraint satisfaction approach (e.g., Bistarelli 2001) to conflict resolution at interfaces. This approach, not only practical in terms of grammar engineering, leads to more informationally encapsulated and simpler, yet cognitively more accurate, grammatical modules.