

3. Syntactic coordination (inclusive of reduction phenomena such as gapping) should closely resemble the treatment of self-repair in spontaneous speech. (For example, the repair text can refer back to the reparandum text; this suggests that, during the computation of the repair text, the reparandum's structure is not destroyed. We hypothesize that reparandum and repair are "coordinated" in a way similar to the members of a conjunction).

We explained the workings of SG, compared it to lexicalized TAG and evaluated both in terms of the three demands.

The discussion and informal conversation revealed that the most important difference between SG and TAG resides in the fact that TAG uses only one level of syntactic representation, whereas SG distinguishes two levels: Functional (or F-) structures and Constituent (or C-) structures. Y. Schabes suggested informally that the mapping between C- and F-structures could be formalized in terms of S. Shieber's & Y. Schabes' **Synchronous TAG**. We added to this the suggestion that one might consider a system performing a double mapping: Between Semantic and F-structures, and between F- and C-structures, and that this, in turn, could considerably simplify the complexity of the (TAG-style) syntactic structures in the 'middle' layer. For instance, we suspect that only 'canonical' trees suffice (as in SG F-structure), and that their expansion to tree families is no longer needed: this work is replaced by the F-to-C-structure mapping. These ideas deserve further scrutiny.

Incremental Natural Language Generation with TAGs in the WIP Project

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In my talk, I argued that lexicalized Tree Adjoining Grammars with unification are useful for the incremental processing at the syntactic level of description. In order to motivate the need for incremental natural language generation in the WIP project I gave a short overview of the system to present the specific requirements upon its natural language generation component.

Incremental generation means the immediate verbalization of the parts of a step-wise computed message. It is psychologically evident that humans often start speaking before they know exactly what the whole contents of their utterance will be. Because the WIP system shall be usable in scenarios where information to be presented is continuously supplied by an application system and where such information must be simultaneously presented in a condensed way to assist human decision makers – there is a need for incremental presentation.

The syntax generation module's architecture was presented. Thereby it was argued that knowledge about local dominance relations should be separated from knowledge about linear precedence. Especially for languages with a relatively free word order – like German – one should avoid during incremental verbalization building up unnecessary syntactic paraphrases resulting from ordering variations in the input.

It was demonstrated how the three expansion operations that are needed during incremental generation – known from the literature as upward expansion, insertion, downward expansion – are realized for a lexicalized TAG with unification.

I argued that in contrast to the level of descriptions, where a verb directs the creation of an elementary structure including all its arguments, processing should consider parts of those structures to ensure incremental processing. The predicate called 'local completeness' for the lexical head can be used to enforce processing of parts. In contrast to De Smedt and Kempen, I argue that the linguistic module should demand missing information from the conceptualizer: Firstly, to ensure a fast utterance (instead of waiting or using defaults immediately), secondly, to ensure grammatically well-formed utterances.

Finally I presented a preliminary idea to handle phenomena caused by conceptual addition of input elements by using auxiliary trees as modifying filter for propagated information. This was possible because of our nonmonotonic unification operation (UTAG).

Implications of Tree Adjoining Grammar for

Natural Language Generation

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Modelling a cognitive process such as the production of utterances is in large part a problem of design. There is no direct evidence to which one can appeal for the representation of grammar in the mind or the mechanisms for selecting what is to be said or how it is to be organized. Instead one must adopt guiding frameworks and employ indirect evidence, especially aesthetic principles, from other disciplines. This paper considered such a case: adopting the TAG formalism for formulating grammars, as developed in mathematical and theoretical linguistics, to the processing model implemented in the natural language generation system, Mumble.

In our work, the TAG formalism is taken as given, and thus provides a means of reducing the degrees of design freedom within the rest of the generation process to just those possibilities that are consistent with TAGs. The greatest impact of the formalism comes from the fact that it provides only a single packaging for all linguistic information, the elementary tree. This means that the text planner's