is no information flow throughout the tree during the computation of the complete syntax tree.

Further discussion has to show whether there exists a clear difference regarding the practical usefulness of the two definitions especially for incremental computations.

Metarules in Tree Adjoining Grammars

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This talk discusses metarules as an extension to the TAG formalism. Metarules allow for a more compact representation of grammars, especially for natural languages. They also capture generalizations that can not be expressed in the original framework.

Metarules consist of an "input-pattern" and an "output-pattern". If a grammar rule matches the output-pattern (i.e. there is a substitution for the variables in the pattern that makes it equal to the grammar rule), the application of the metarule generates a new grammar rule (i.e. the output-pattern with its variables substituted according to the matching).

Other grammar formalisms like GPSG, HPSG, Categorial Grammars and Van Wijngarden Grammars have used metarules for compactification and generalizations. But they all encountered the problem of the generative power of metarules. If metarules are allowed to be applied recursively (and thereby produce infinite sets of grammar rules), the resulting formalism can generate every r.e. language.

This talk presents two different approaches to avoid this problem with metarules for TAGs. The first approach is a restriction of the form of metarules to one variable that can match only one subtree. For this definition it has been shown that it does not increase the generative power if such metarules apply recursively. The restricted form of metarules, however, is a drawback because it does not allow for a compact description of some generalizations. A second approach allows unrestricted patterns and variables for metarules, but restricts arbitrary recursive application of metarules. This is based on two properties of TAGs: 1) The adjoining operation already factors recursion in a compact way. 2) The extended domain of locality of an elementary tree has a bounded size. Property 1) rules out arbitrary recursive application and property 2) motivates a boundary on the size of elementary trees. The proposed definition allows the output of a metarule as a new elementary tree only if it is smaller than a given boundary (e.g. it contains at most one predicate-argument structure). This also rules out arbitrary recursive application of metarules. On the other hand the descriptive power of metarules can be enlarged to handle a large set of generalizations.