What is a natural syntactic model for frame-semantic composition?

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A semantics based on frames is compatible with most, if not all, of the contemporary mainstream grammar frameworks. In this talk, we want to ask what a natural syntax counterpart of frame-based semantics should look like. By "natural" we roughly mean sparse and transparent in terms of the syntax-semantics interface, and similar with respect to compositional aspects. Based on this, we will argue that grammar frameworks fall into two classes, EDL and LDL, whose distinction turns out to be fundamental and, in our view, more insightful than, e.g., the divide between lexical and phrasal grammar frameworks, which has received much attention recently (see Müller & Wechsler, 2014).

The leading question refers to the formal properties of frames. Given that frames are formalized as extended typed feature structures (Petersen, 1997; Kallmeyer & Osswald, 2013), there is neither an inherent (horizontal) ordering on the attributes of the same node, nor is there any trace of the distinction between arguments and modifiers. Accordingly frames are composed by unification, not by functional application. Hence Currying and λ-abstraction are completely absent, which are essential components of Montegovian semantics.

Regarding the lack of attribute ordering and functional application, we argue that the question in the title is to be answered: a syntactic model with an extended domain of locality (EDL). By EDL we understand the capability to immediately access arbitrarily distant parts of a sentence within one lexical entry or syntactic rule. It was first mentioned in the context of Tree-Adjoining Grammars (TAG, see e.g. Joshi et al. 1990), but it also applies to other, rather heterogeneous frameworks such as Role and Reference Grammar (RRG), Dependency Grammar, and certain flavors of Construction Grammar (CxG). In the talk we will mainly focus on LTAG and a recent adaption to frames in the line of Kallmeyer & Osswald (2013).

An LTAG consists of so-called elementary trees that may be combined using two operations, substitution and adjunction. To give a brief example, the elementary tree of *walked* and its frame-semantic companion are shown in Figure 1. The non-terminal leaf nodes in the elementary tree (anchored by *walked*) represent the syntactic arguments of the head, which are linked to the appropriate components of the frame representation by means of coindexation. The same is true for inner nodes of the elementary tree at which modifiers may attach. It is this coindexation which controls the parallel composition of elementary trees and of frame-semantic contributions. Note that there is no fixed derivational order regarding the syntactic arguments and modifiers; they may attach in any order.

As opposed to EDL, a predetermined derivational order is found in syntactic models that can be characterized as spanning over a Limited Domain of Locality (LDL), for example two adjacent constituents, which is the case in binarized CFG and related formalisms (HPSG, SBCG, MG, CCG). Within these models, the head combines with

its arguments and modifiers in a fixed order, e.g. first with the direct object and only after that with the subject. Dowty (1989) therefore dubs them *ordered argument systems*. One of the striking effects of fixed derivational orders is that it is difficult to see how to obtain partial analyses, e.g. for the subject and the head without the direct object. Another effect is the use of powerful mechanisms such as movement, type raising and valency merge to account for conflicting word orders and linear discontinuity. Both effects are considerably less marked in EDL approaches.

Fixed derivational orders result from list-like valency representations that are commonly attributed to the underlying denotation of the valency holder, represented by λ-terms, and to the so-called obliqueness hierarchy (Keenan & Comrie, 1977). The latter helps to explain a range of phenomena (see Müller, 2002, 9–10), among them the possible scope of depictive secondary predicates such as *naked* in (1):

(1) He walked to the football match naked.

In LDL approaches, the valency structure basically mediates between the semantics of the depictive and the semantics of its subject: depending on the phrase with which the depictive combines, it can only access the current members of the valency structure of the phrase (respectively of the phrase's head). Contrary to this, EDL approaches seem to favor a more transparent connection, thereby also making different empirical predictions. Concretely, in (1), the depictive *naked*, when attaching to the upper VP-node of the *walked* tree, can immediately access and modify any participant of the event. In the talk we will look at these and other issues of the distinction of EDL and LDL in detail.

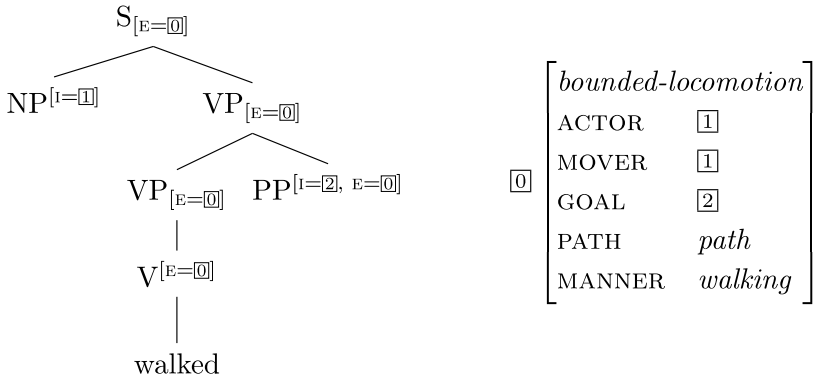

Figure 1: Elementary tree and frame-semantic representation for *walked.*

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