

Lexical Decomposition Approaches

- Lexical Decomposition theories claim that they offer the kind of elaborated semantics which thematic role theories of the sort we have seen so far do not;
- our starting point in lexical decomposition theories will be the study of **Aktionsarten** or **Lexical Aspect**;
- **Aktionsarten** categories are generally differentiated along the two dimensions of **temporal criteria** and **agency**.

Dowty 1979

- Dowty (1979) proposes a lexical aspect (Aktionsart) system with four temporal categories:
 1. states,
 2. activities,
 3. single changes of state, and
 4. complex changes of state
- all these four temporal categories are further distinguished into agentive/non-agentive predicates;
- according to Dowty (1979), the most important temporal criterion is the notion of temporal change, which differentiates states, which do not involve change, from the other three categories, namely the activities, which denote indefinite change of state, as well as the single changes of state, and the complex changes of state, which denote definite change;
- Dowty's activities and single/complex changes of state correspond to Vendler's activity and accomplishment predicates, respectively;
- examples of the former are the predicates *run* or *push a cart*, which lack definite criteria for completion; examples of the latter are *build a house* or *paint a chair*, which have such criteria

Dowty 1979 (cont.)

- the central idea of Dowty's theory is the following:
 - “...the different aspectual properties of the various kinds of verbs can be explained by postulating a single homogeneous class of predicates - stative predicates - plus three or four sentential operators and connectives” (Dowty (1979, p. 71)).
- two of Dowty's most important operators, which along with the connectives are treated as logical constants, are CAUSE, and BECOME;
- the CAUSE operator, which expresses the notion of **causation**, takes two propositions as arguments, and is used in order to define accomplishments;
- the BECOME operator takes a single state as its scope, and it is interpreted in such a way so that BECOME (p) is true at time t , if $\neg p$ is true just prior to t , and p is true just after t . The BECOME operator is introduced by accomplishment verbs, and the state p corresponds to the result state of the accomplishment;
- Dowty's proposal does not require that there be a unique translation of each linguistic expression into intensional logic, BUT only that there be at least one translation;

Dowty 1979 (cont.)

- in principle it is possible to adopt the mechanisms of Dowty's system and then proceed to define a linguistic level representing lexical decomposition. Two examples of research along those lines are the Role and Reference Grammar (RRG) developed by Foley and Van Valin (1984), and recent work by Bierwisch (1988).

Foley and van Valin 1984

- Foley and Van Valin, making use of Dowty's system, developed a theory of logical structures, where thematic roles are defined according to the position of a variable in these logical structures by means of a table of universal correspondences (Foley and Van Valin (1984, ff. 47));
- For example, a sentence like the following:
(29) The book is on the shelf.
has the logical structure **be-at'**(the book, the shelf);
- a table of universal correspondences between positions in logical structures and thematic roles indicates that *the book* is a Theme and *the shelf* is a locative;
- then a thematic hierarchy maps these thematic roles onto the so-called **Macro-Roles** ACTOR, and UNDERGOER, and these roles in turn are mapped onto the morphosyntax of the sentence;
- from this point of view, their theory should be viewed as lying somewhere in between the thematic role theories and the lexical decomposition approaches.

Bierwisch 1988

- Bierwisch's (1988) semantic form (SF) contains operators from a finite universal list such as DO-CAUSE, BECOME, etc.;
- Bierwisch hypothesizes that the tendency for mapping to grammatical functions to follow a “thematic hierarchy” follows from a universal embeddedness principle which says that arguments are ordered according to the level of embeddedness in SF ;
- arguments corresponding to variables which are less embedded precede arguments corresponding to variables which are more embedded;
- this ordering determines the mapping to morphosyntax and to grammatical relations;

Bierwisch 1988 (cont.)

- **for example**, in a logical form like (30) below

(30) $\lambda y \lambda x [x \text{DO} [\dots x \dots] \text{CAUSE} [\text{BECOME} [\text{accomplishment-verb}(y)]]]]$

- the variable x would precede y , since y is more deeply embedded; because of the ordering on morphosyntactic features, x will be the grammatical subject (linked by agreement) and y the grammatical object (linked by adjacency);
- thus, with respect to linking this universal embeddedness principle serves the same function that a thematic hierarchy serves for thematic-role based theories;
- like Foley and Van Valin's, Bierwisch's approach relies on the assumption that each clause can be mapped to a unique SF, or at least that all SFs associated with a given clause have the same relative embedding of variables.

The problem of semantic primitives

1. What is the primitive semantics basis for thematic roles approaches in general?
2. How do we know a semantic primitive when we encounter one?
3. What sort of criteria should we impose?

Weaknesses of thematic role types and lexical decomposition systems

- a general weakness of thematic role types, as well as lexical decomposition systems is that the primitive thematic roles or relations are not independently required by the grammar;
- even semantic tests such as adverbial modification do not seem to point to a unified notion of **Agent**, due to the fragmentation problem Dowty (1986) pointed out: that is, some adverbs diagnose the presence of a volitional agent, some an initiative agent, and so forth;
- cover terms, like **Agent**, and **Theme** do not seem to be independently motivated;

Answers to these problems

- one answer to this problem which has been advanced is that thematic roles are *conceptual* primitives which are in principle independent of language and exist external to language knowledge;
- according to one version of this idea, thematic roles must meet a condition of “epistemological priority” allowing them to form the basis for language acquisition (cf., Chomsky (1981, p. 10));
- in a similar way, Jackendoff (1983) justifies semantic primitives by bringing information to bear from different cognitive domains, under the assumption of his **Conceptual Structure Hypothesis** (cf., Jackendoff (1983, p. 17)):

There is a *single* level of mental representation, *conceptual structure*, at which linguistic, sensory, and motor information are compatible.

- concerning his *Cognitive Constraint*, which holds that this neutral level of conceptual structure is required, Jackendoff admits that it is “difficult to see how to apply it usefully. Our notions of the information conveyed by nonlinguistic peripheral systems are if anything feebler than our understanding of linguistic information” (cf., Jackendoff (1983, p. 18));

Answers to these problems (cont.)

- at this stage it seems that the study of cognition is not capable of providing independent evidence for or against particular grammatical analyses, and as a result there is very little support given for the specific conceptual structures which are claimed to be associated with sentences. Like the epistemological criterion, the Cognitive Constraint is an interesting hypothesis but difficult to confirm or falsify, or even to apply usefully on the assumption of its validity.