The Nature of Lexical Knowledge

James Pustejovsky 1995

“It is now standardly assumed by most linguistic frameworks that much of the structural information of a sentence is best encoded from a lexicalized perspective.”
A Lexicalized Perspective

The most pressing problems for lexical semantics are:

- Explaining the *polymorphic nature* of language;
- Characterizing the *semanticality* of natural language utterances;
- Capturing the *creative use of words* in novel contexts;
- Developing a richer, *co-compositional* semantic representation.
Two Assumptions

- Without an appreciation of the syntactic structure of a language, the study of lexical semantics is bound to fail.
- The meanings of words should somehow reflect the deeper conceptual structures in the cognitive system, and the domain it operates in.
Try vs. Attempt

a. He **tried** to start his car in the morning.
b. He **attempted** to start his car in the morning.
c. He **tried** in the morning.
d. *He **attempted** in the morning.

- He attempted a task/a suicide.
  - try to ‘achieve’ something
Principles that Guide Computational Lexical Semantics

- A clear notion of semantic well-formedness will be necessary in order to characterize a theory of possible word meaning.
- Lexical semantics must look for representations that are richer than thematic role descriptions.
- Lexical semantics must study all syntactic categories to characterize the semantics of natural language.
Goal of lexical semantic theory

- To adequately classify the lexical items of a language into classes predictive of their syntactic and semantic expression.
- It should capture the semantic relations between words (of a sentence) in such a way which facilitates the mapping of meanings of lexical items.
A Major Approach

- Verbal Alternations
  - A recently developed linguistic methodology
  - Grouping the meanings of words into semantic classes to study the syntactic patterns that words participate in.
Semantic Classes and Categorial Alternation

- Categorial or type information determines not only how a word behaves syntactically, but also what the elements of the category refer to.
- Selectional subsets are determined by distributional analysis on the basis of collocation and co-occurrence tests.
- eg. dog vs. book
Levin (1993): outlines a broad classification of verb argument alternations in English to classify verbs into semantically unique classes.
Illustration

- Verbs *sink/roll/break* (unaccusative verbs)
  - All have transitive and intransitive forms, where the lexical senses are related by the feature of causation.

(1) a. The boat ___ in stormy weather.
    b. The plane ___ the boat in stormy weather.

(2) a. The ball ___ down the hill.
    b. Bill ___ the ball down the hill.

(3) a. The bottle ___ suddenly.
    b. Mary ___ the bottle suddenly.
Verbs *arrive/die/fall*

Intransitive verbs without zero-derived causative (transitive) form:

(4) a. The letter **arrived** on time.
    b. *The mailman **arrived** the letter on time.

(5) a. My terminal **died** last night.
    b. *The storm **died** my terminal last night.

(6) a. The block tower **fell**.
    b. *Zachary **fell** the block tower.
    c. Zachary **felled** the block tower.
Questions

- What is it that these two classes share such that they have grammatical intransitive forms?

- Equally important: how do they differ such that the latter class permits no transitive form?
Comments on Alternation Approach

- Participation in one grammatical alternation does not sufficiently determine the semantic class of the verb.
- The diversity of complement types that a verb may take is in large part also determined by the semantics of the complements themselves.
- Alternation classifications do not constitute theory:
  - The theoretical mechanisms which give rise to the descriptive distribution of syntactic behavior are not transparent in the classes by themselves.
Argument dropping alternations

Besides argument changing alternations, there are argument dropping alternations: “indefinite NP deletion

(11) a. The woman ate her meal quickly.
   b. The woman ate quickly.

(12) a. The dog devoured the cookie.
   b. *The dog devoured.

(13) a. John drank his beer feverishly.
   b. John drank feverishly.

(14) a. John gulped his beer feverishly.
   b. *John gulped feverishly.
Argument dropping alternations

(15) a. Mary hummed a song while she walked.
    b. Mary hummed while she walked.

(16) a. Mary performed a song while she ate her dinner.
    b. *Mary performed while she ate her dinner.

- A possible account: aspectual distinction
  - Unbounded (eat) vs. transition (devour)

- But it cannot explain the patterns of deletion for the other cases of complement-dropping. This would seem difficult for many of the verbs entering into this alternation.
Contrast in near-synonyms

- Near synonyms seem to behave differently with respect to licensing of complement-drop
  (17) a. Mary tried to start her car in the morning.
      b. Mary tried in the morning.
  (18) a. Mary attempted to start her car in the morning.
      b. *Mary attempted in the morning.
- → No one semantic parameter will be sufficient to explain all complement drop cases
Ditransitive-transitive alternation

- John gave a book to Mary.

  * John gave a book.

- John gave a lecture to the class.

- John gave a lecture.

  → What allows the alternation is the interaction of the verbal semantics with semantic information from the complement itself.
Aktionsarten

- Verbs and verb phrases differ in the kinds of eventuality (Smith 1991)
  - State: alive, happy
  - Activity: walk, run
  - Accomplishment: build, destroy
  - Achievement: broke, die

- Test for accomplishment:
  - Frame adverbial: in an hour

- Test for achievement:
  - Point adverbial: at 3 pm
Lexical properties may change

- Mary ate cookies (activity)
- Mary ate a cookie (accomplishment)
- Bill built a house. (accomplishment)
- Bill built houses. (activity)
States

- Individual-level: permanent
  - John is tall/intelligent

- Stage-level: non-permanent
  - John is sick/hungry/clean

- Test for stage-level state:
  - Resultative construction

   (36) a. John drank himself **sick** with that cheap brandy.
     b. Watching the commercial on TV made John **hungry**.

   (37) a. *Bill ate himself **overweight** over the years.
     b. *John read himself **intelligent** with the *Great Books.*
The progressive paradox

- *John is running* (therefore, John has run)
- *John is building a house* (*John has built a house*)

- Factor involved: whether the action is homogeneous in nature or has a culmination of some sort.

- Membership in an aspectual class determines much of the semantic behavior of a lexical item, but it should be noted that the aspectual properties of a sentence may change as the result of other factors:
  - adverbial modification (durative or frame)
  - the structure of the NP (bare or definite)
  - The presence of PP
Conclusion

- How to deal with ‘type-shifting’ phenomena where non-lexical issues may be involved?
- How to determine the relevant syntactic behavior that is crucial for verb meanings?