The Representation of Verb Meaning in Large-Scale Lexical Resources

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Large-Scale Lexical-Semantic Resources
• Assignment of meanings/senses to words
• Transparent data format; suitable for computational purposes
• Reasonable size and coverage

Examples
• #verbs/verb senses (approx)
  - WordNet [1] (GermNet, …) 11500/25000 (8300/12400)
  - FrameNet [2] (SALSA, …) 2800/4100 (500/1300)
  - SIMPLE [3]; inspired by Pustejovsky’s GL several thousand
  - OntoSem lexicon & ontology [4] several thousand
  - HuGenLex [5]; based on Helbig’s MultiNet approach 4600/7500
  - LCS Database [6]; based on Jackendoff’s theory 4200/10000
  - VerbNet [7]; extension of Levin’s verb classes 3500/5000

Typology
• Framework of semantic representation: relational vs decompositional approach, metalanguage or not,…
• Coverage and motivation: exclusion of certain word classes, idioms,…
• Method of acquisition: manual vs automatic, corpus-based,…
• Embeddedness: possible interfaces to syntactic processing and/or knowledge processing

Two Desiderata
1. The representation is integrated into a full-fledged formalism that allows inferential reasoning on the level of sentences and texts.
2. The representation serves as an explanatory basis for effects at the syntax-semantics interface, i.e., allows predictions on argument realization, adverbial modification, etc.

Case Study
remember, recall, remind

- John remembers? recalled abruptly what had happened last night.
- John was remembering? recalled one cold morning, his father shoveling snow,…
- John remembered/recalled that the door was locked/locking the door.
- His father reminded John to look through/look for the door the door…

WordNet synsets
• remember: retrieve, recall, call back, call up, recollect (recollection from memory)
• think of (keep in mind for attention or consideration)
• think back (recall the past; indulge in memories)
• exercise, or have the power of memory
• echo, recall (call to mind)
• remind (put in the mind of someone)
  - prompt, remind, cue (assist (somebody acting or reciting) by suggesting the next words)

Framework Frames
• Memory
  - Uses: (Evocative/affecting) [Cognizer Content Topic]
    - This frame is concerned with Cognizers remembering and forgetting mental Content.
    - Uses: (Evocative/affecting) [Cognizer Content Topic]
    - A Cognizer retains facts in memory and is able to retrieve them. …
  - Uses: (Evocative/affecting) [Cognizer Content Topic]
    - A Cognizer thinks of and performs an Action that is a self- or other-imposed task or some other kind of desirable behavior. The Action may involve a Salient entity in some way affected by the Cognizer. …
    - Uses: (Evocative/affecting) [Cognizer Content Topic]
      - A Cognizer calls up an episodic memory of past Experience or an Experience of a Salient entity formed on the basis of past experience. The Cognizer may also remember the Salient entity in a particular State. …
    - Uses: (Evocative/affecting) [Cognizer Content Topic]
      - “Some Stimulus causes a Cognizer to think of a prior Phenomenon due to its perceived similarity.”
  - Evoking
    - Uses: (Memory) [Cognizer Phenomenon Stimulus]
      - “Some Stimulus causes a Cognizer to think of a prior Phenomenon due to its perceived similarity.”

VerbNet classes
• characterize-29.2.1-1 [ING-AC WHAT A-WHAT TO-INP HOW IN HOW-TO-INP]
• accept, define, describe, envisage, identify, imagine, recollect, remember, represent
• consider-29.9.1-1 [ING-AC WHAT A-WHAT TO-INP WHAT-TO-INP HOW IN WHAT-TO-INP]
• recall, remember, forget, recall, look back, reminiscence

Representative of Verb Meaning

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MP
- Meaning postulates, glosses, sense descriptions
SR
- Sense relations (synonymy, hypernymy, meronymy, causation, causation, …)
SF
- Semantic features, binary or not (static +, connotation: negative, …)
SC
- Sortal classification, often hierarchically, “top-level ontology”
TR
- Thematic/semantic roles (Agent, Experiencer, Buyer, Seller, …)
SP
- Selective preferences
LD
- Lexical decomposition (or relational simulation via cause relation etc)
ES
- Event structure
ML
- Metallanguage, interlingua
KR
- Embedding in knowledge representation paradigm
LI
- Theory of the syntax-semantics interface, linking theory
SY
- Syntactic realization patterns
CB
- Corpus-based syntagmatic patterns

A General Methodology

I Sufficiently expressive (empirically justified) metalanguage
- Sortal and relational terms, formalized constraints (inheritance, attribute-value restrictions, …)

II Sufficiently rich structural (“frame-like”) representation
- Description of sub-events, incremental changes, result states, …

III Systematic extraction/correlation of meaning components (I, II)
- from/with syntagmatic behavior/indicators/patterns
- Argument realization, diatheses, selective preferences, oriented adverbs, secondary predication, temporal/directional adverbials, aspectual composition, …

Issue
- Lexical semantics vs conceptual representation (cf. [8], [9])

References