Why frames

Introducing the Collaborative Research Centre 991
„The Structure of Representations in Language, Cognition, and Science“

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1. Working hypothesis and goals of the CRC
2. Barsalou frames
3. Research perspectives
4. Projects in the CRC
1. Working Hypothesis and Goal of the CRC

Hypothesis

- There is a general format of concept representation. This format is found at the neural, cognitive, linguistic, and institutional level of concept formation.

- The general structure of conceptual representation is a modified and extended version of Barsalou frames.

Goal

Development of a general **theory of concepts**: a comprehensive, empirically grounded formal theory of frames as conceptual representations.
2. Barsalou Frames

2.1 Example
2. Barsalou Frames

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2.2 Essential structural properties?

- Unlimited recursion and embedding
- Uniqueness of the frame referent
- Uniqueness of the attributes of a node
  The attributes of a node are mutually different
- Uniqueness of attribute values
  Attributes are partial functions
2. Barsalou Frames

2.3 Why Barsalou Frames?

- **Expressive power** combined with **nontrivial constraints**
- **Empirical evidence** from experimental cognitive science
- **Evidence from linguistics**
  - **Syntax:** Syntactic structures exhibit the essential frame properties
  - **Semantics:** Case frames
  - **Lexicon:** Emergence of abstract attribute vocabulary
3. Perspectives of research

3.1 For linguistics

- Modeling lexical meanings
- Grounding lexical meanings in cognition
- Exploring the syntax semantics interface deeper into lexical meanings
- Grounding semantic composition in lexical decomposition
  - Exploring semantic composition from an autonomous semantic perspective
- Exploring the interface between the linguistic lexicon and world knowledge
- Applying frames in computational linguistics
3. Perspectives of research

3.2 Beyond linguistics

- Neuro-cognitive science: grounding verb meanings in the sensorimotor system
- Philosophy: grounding noun meanings in actions ("affordances")
- Selected sciences: conceptual analysis of paradigm changes in terms of scientific frames
- Mathematics: formal mathematical theory of frames and frame spaces
3. Perspectives of research

3.3 Components of a theory of frames (selective)

- **Model-theoretic semantics** for frames
- Frames for different **types of concepts**
- **Dynamic frames** for actions and events: capturing temporality, causality, and modality
- **Operations and relations** concerning frames
  - conceptual shifts, including metonymy and metaphor
  - frame composition
4. Three groups of projects

A Foundations of a frame theory of concept representations
   mathematics – computation – psycholinguistics – philosophy

B Dynamic concepts
   verb meanings – processes – paradigm changes
   legal terms – psychiatric disorders

C Nominal concept types and type shifts
   grammatical typology – corpus statistics – processing – diachrony
   conceptual combinatorics
Thank you for your attention!

For detailed information, please, visit our homepage:

http://www.sfb991.uni-duesseldorf.de/