Frame role type constraints and frame metonymy in metaphorical interpretation

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Overview: MetaNet Metaphor Analysis Project

- Represents a union of Conceptual Metaphor Theory (Lakoff & Johnson 1980; 1999), Embodied Construction Grammar (Dodge et al. 2014; Fillmore 2009), and Frame Semantics (Filmore 1976; Ruppenhofer et al. 2006).
- Formalization of CMT in a multi-language repository of frames and metaphors in order to support cognitive linguistic analysis of metaphor (David et al. 2014).
- Languages are likely to converge on primary frames and metaphors, and diverge on more complex and culturally specific ones.
- Consists of two main components: 1) Analyst-defined frame and metaphor repository, and 2) automated metaphor extraction pipeline that scans over large corpora to identify and annotate possible linguistic and conceptual metaphors.

Embodied Construction Grammar: Formalization

- Structuring frames, role frames, and constructions in ECG:
  - Frames are defined according to whether they are Entities (such as Physical Entities, animate Entities, Abstract Entities...), Processes, Locations, and several other types.
  - Frames contain entity/participant frame elements and process frame elements, which are bound appropriately to constructional slots.
- The type constraints on frame roles are defined in the grammatical construction. Metaphorical interpretations are triggered in part by a type mismatch, where a lexical unit evoking a particular type occurs in a construction specifying a role of a different type.
- Example: Poverty infects society occurs in the Transitive construction; poverty is of type Abstract and the noun society specifies an Entity in the Agent role. This conflict results in a metaphorical reading.

Conceputal Metaphor Theory: Formalization

- Metaphors and frames are organized into a complex lattice-like ontological network.
- Frames are formally defined according to their role frames; their relations to other frames; the lexical units that evoke them; and specified for internal inferential structure.
- Frames are further organized into macro frames according to semantically coherent domains.
- Metaphors use frames as source and target domains, with mappings across the frame roles.
- Metaphors are also organized in families and ontological network relationships.

Goals of this Poster

- Metonymic relations between frame roles and type constraints on those roles play a major function in metaphor conceptualization.
- These elements are frequently elided in traditional metaphor analysis.
- We demonstrate how formal implementations of the ontological structures developed in Embodied Construction Grammar and the MetaNet repository instantiate those relationships.
- Contributions of metonymy and frame structure to metaphor analysis are illustrated using examples collected from our extraction system from internet-sourced corpora.