Metonymy, metaphors, and constructions in a corpus-based Embodied Construction Grammar framework

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## Puzzling data

<table>
<thead>
<tr>
<th></th>
<th>N-N</th>
<th>N’s N</th>
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</tr>
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<tbody>
<tr>
<td><strong>non-metaphoric</strong></td>
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Questions & Thesis

- How are metaphoric senses of a construction related to literal senses, and why can they differ in usage?
- Close analysis reveals an interaction between the semantics of literal and metaphoric constructions (Sullivan 2007, 2013; Sweetser, 1999)
- What tools are needed for such an approach?
  - Construction-based analysis including detailed semantics
  - Formalized analysis of conceptual metaphors integrating frame semantics
  - Usage and frequency data collected from large corpora
Metaphoric nominal constructions

- Metaphoric language reliably occurs in specific nominal and verbal constructional patterns (Sullivan, 2007, 2013)

- Nominals understudied and less frequent in comparison to verbal constructions (Dodge & Wright, 2002, Langacker, 1992, 1995)
  
  - Requires large datasets to uncover subtle patterns (Stickles, David, & Sweetser, in press)

- Semantics of constructional patterns restrict lexical realization
# Construction patterns

## Nominal constructions: Source domain in argument

<table>
<thead>
<tr>
<th>Construction</th>
<th>Target Noun</th>
<th>Source Noun</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun Compound</td>
<td>Noun(Target)</td>
<td>Noun(Source)</td>
<td>poverty monster</td>
</tr>
<tr>
<td>Possessive</td>
<td>Nouns’s(Target)</td>
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<td>Noun of Noun</td>
<td>Noun(Source) of Noun(Target)</td>
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MetaNet system

- Repository of networked frames and conceptual metaphors
MetaNet system

- Repository of networked frames and conceptual metaphors
- Metaphor identification system automatically identifies linguistic expression of metaphor in corpora using the repository data (Dodge, Hong, & Stickles, 2015)
- Result: Large datasets of richly annotated metaphor expressions
MetaNet System: Data

- English MetaNet Repository
  - 652 frames
  - 785 metaphors

- Extracted metaphoric expressions with target domain lexeme *poverty* from English Gigaword corpus (Parker et al., 2011)

- Total Gigaword corpus size: 4 billion words; 193,813,076 sentences
  - # instances with *poverty*: 702,056
  - # possibly metaphoric instances with *poverty*: 174,674
  - # likely metaphoric instances with *poverty*: 67,106
Construction distribution by type

Relative frequency of construction type in metaphoric usage

- Verbal
- Nominal
- Other
Construction distribution by type
Analysis: N of N construction

solutions that will help tackle the monster of poverty which is eating Zambians [xin_eng-01:7719]

- Metaphoric Constitutive N1 of N2 construction
  - ‘N2 is a N1’

- Metaphor: POVERTY IS A HARMFUL CREATURE
  - Direct metaphoric mapping from harmful entity monster to causal force behind effect of poverty
Social problems are adversative entities.

Metaphor: Poverty is a harmful creature.

Poverty
causer
Role type: Abstract entity
poor_individual
role type: Person

Harmful Creature Scenario
harmfulCreature
Role type: Animate entity
victim
role type: Animate entity
harmfulBodyPart
role type: Physical object

experiencingPoverty
role type: Process

undergoingHarm
role type: Process

Metaphoric Constitutive N1-of-N2 cxn
N1.meaning <-- source frame.role
N2.meaning <-- target frame
cxn meaning_whole = target frame role

Lexical cxn Poverty
noun.meaning <-- Poverty frame

Lexical cxn Monster
noun.meaning <--
Harmful_c_scenario.harmfulCreature

poverty.n

monster.n
Analysis: N of N construction

since its skeleton is made of cartilage, the jaws of the shark can protrude from the mouth\(^1\)

- Non-metaphoric Part-Whole N1 of N2 construction
- ‘N1 is a part of N2’
- jaws is a role with the frame evoked by shark

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The diagram represents a scenario involving a harmful creature, its role, and the part-whole relationship with the shark. The harmful creature is characterized as an animate entity, and the body part experiencing harm is a physical object. The scenario includes a lexical connection between 'shark' and 'jaws', indicating that 'jaws' is a body part of the shark.
Africans wanted them to help the people escape from the jaws of poverty [apw_eng-04:29252]

- Metaphoric Part-Whole N1 of N2 construction
  - Blend of Metaphoric Constitutive N1 of N2 and Part-Whole N1 of N2
  - Part-whole: N1 jaws is a role within the frame shark it evokes
  - Constitutive: N2 poverty is an entity shark metonymically evoked by N1 jaws
  - Metaphor: POVERTY IS A HARMFUL CREATURE
### Semantics of nominal constructions

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Network of N of N semantics

- Constitutive
  - Literal: problem of poverty
  - Metaphoric: monster of poverty
- Part-Whole
  - Metaphoric: jaws of poverty
- Measure phrases
  - Literal: jaws of the shark
  - Literal: sea of salt water
  - Metaphoric: sea of poverty
Conclusions

- Construction and metaphor analyses complement one another
  - Construction-based analyses of linguistic metaphors provide insights into how conceptual metaphors are expressed in language

- The inclusion of detailed semantics (including metaphor) in constructional analyses reveals relations between the different senses of constructions
  - Explains variations in attested usage frequencies

- Both analyses benefit from formalized instantiation (ECG, MetaNet)
  - More rigorous analysis
  - Enables development of NLP, corpora tools for large data sets
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References


Repository data publicly available soon!