Alternations in constructional models of argument structure
Towards an integrated approach

Florent Perek
Freiburg Institute for Advanced Studies
& UMR 8163 STL – Université Lille 3
florent.perek@gmail.com
Overview

- Research domain: argument structure
- Brief comparison of projectionist and constructionist approaches
- Re-appraising the role of alternations
- Alternations in a constructionist model
- Conclusion and prospects
Research domain: argument structure

- i.e., knowledge about how verbs realize their arguments
- A (once) prevalent view:
  - Verbs are stored with their “subcategorization frames” in the lexicon (Chomsky 1965); e.g., *kill*: [NP ___ NP]
  - Knowledge of argument structure amounts to knowledge about individual verbs
- But an incomplete account
  - Neither predictive nor explanatory: it misses potential generalizations and regularities
  - From a psycholinguistic point of view:
    - Speakers can store a huge amount of lexical information
    - But they are also aware of more general principles
Research domain

- Overgeneralization by children but also by adults
  - *She fell the cup (vs. She made the cup fall)
  - *What’s fussing her? (vs. What is she fussing about?)
  - Speakers are able to extend the syntactic possibilities of verbs to fit their communicative needs

- A theory of argument structure:
  - is concerned with defining the principles of argument realization which speakers are aware of
  - has been argued to be a solution to Baker’s paradox in LA
Theories of argument structure

- Large body of evidence for the semantic basis of AS
  - Verbs cluster in argument realization classes that seem to be to a large extent semantically motivated (Levin 1993)
  - Argument realization is determined by some aspects of verbal semantics:
    - thematic roles (Gruber 1965, Jackendoff 1983)
    - event structure (Rappaport and Levin 1998)
    - aspectual structure (Tenny 1987)
    - causal structure (Croft 1998)
    - ...

Theories of argument structure

- Many verbs present multiple argument realizations
  - John kicked the ball. (transitive)
  - John kicked at the ball. (conative)
  - John kicked Bo the ball. (ditransitive)
  - John kicked the ball to Bo. (to-dative)
  - John kicked the ball off the field. (caused-motion)
  - John kicked the man unconscious. (resultative)

- The theory must account for:
  - The mapping of verbs to frames
  - The variation in meaning between each frame
Theories of argument structure

- **Two positions:**
  - **Projectionist approaches**
    - All grammatically relevant information is projected by the verb
    - Therefore, several frames correspond to as many verbs
    - Variation in meaning = verbal polysemy
    - Limits: rampant polysemy, hard to account for “creative” uses of verbs (the sneeze-sentences, e.g., *John sneezed the foam off the cappucino* )
  - **Constructionist approaches**
    - Verb meaning does not (always) change with AS
    - The syntax itself provides the missing aspects of meaning
    - Do not suffer from the limits of projectionist approaches
Theories of argument structure

  - Subcategorization projected from a verb’s semantic structure according to general linking rules
  - Lexical rules relate semantic structure templates and can derive new lexical entries from existing ones
    - Implementation of alternations (e.g., the dative alternation below)

\[ \begin{align*}
\text{Argument structure 1} & : \quad \text{NP}_x \quad \text{V} \quad \text{NP}_y \quad \text{NP}_z \\
\quad & : \quad \text{e.g., Bill gave Bo a ball}
\end{align*} \]

\[ \quad \begin{align*}
\text{Argument structure 2} & : \quad \text{NP}_x \quad \text{V} \quad \text{NP}_y \quad \text{to} \quad \text{NP}_z \\
\quad & : \quad \text{e.g., Bill gave a ball to Bo}
\end{align*} \]
Theories of argument structure

  - Argument structure = independent construction, i.e., pairing of a syntactic form with a semantic template
  - Verb meaning is reduced to a minimum
  - A verb can instantiate the construction if its meaning is compatible with the semantic template

[Diagram showing the construction with examples of verbs]

- NP\_{agent} \ V \ NP\_{recipient} \ NP\_{theme}
- NP \ give \ NP \ NP
- NP \ tell \ NP \ NP
- NP \ kick \ NP \ NP
Theories of argument structure

- **Projectionist models = alternation-based**
  - Emphasize “horizontal” relations between different syntactic uses of the same verb
  - Alternations are linguistic structures themselves
- **Constructionist models = fusion-based**
  - Emphasize “vertical” relations of instantiations between abstract constructions and verbs in context
  - Alternations are epiphenomenal: they result from a verb being able to “fuse” with two distinct constructions
Theories of argument structure

- The two types of model are functionally equivalent
  - Verb-frame mapping is determined by some “inherent” semantic aspect of the verb
  - A strict separation between lexis and syntax makes constructions incompatible with many projectionist models
  - But the converse is not necessarily true: constructionists sometimes tentatively posit relations between constructions
    - e.g., Goldberg (1995) relation of truth-conditional synonymy between the variants of the dative alternation
    - But they are largely under-studied and their exact role (if any) is rarely elaborated on
My claims

- A constructionist model is not strictly speaking incompatible with alternation-based representations
- Alternations might provide a better account of some phenomena
  - (non-exhaustive) review of some empirical evidence
Niches for alternations

- Language acquisition: statistical preemption
  - Originally suggested to account for the acquisition of irregular morphology, e.g., *goed → went
  - Indirect negative evidence derived from the significant absence of a plausible form in the input; e.g., explain in the ditransitive
  - Goldberg (1995, to appear): speakers have contextual expectations; e.g., information structure properties
  - Presupposes that speakers notice the functional equivalence and structural correspondences in a pair of structures
  - Learners have to be aware of horizontal relations between constructions if they are to use this learning strategy
  - cf. Marcotte (2006): model of LA based on alternations, called analogical paradigm completion
 Niches for alternations

- The directionality effect (cf. Conwell & Demuth 2007)
  - Two novel verbs: one modelled in the double-object form, the other modelled in the prepositional form
    - Goal: elicit the other variant from the 3-years old subjects
    - They did generalize but the two exposure conditions differ
    - \( \Rightarrow \) the subjects were more likely to go from double-object to prepositional dative than the other way around

- The dative alternation is asymmetric: not predicted by a purely constructional account \( \Rightarrow \) evidence for alternations?
Niches for alternations

- Possible explanations:
  - A frequency-based explanation? ...
    - ... must be ruled out: F(double-object) > F(prepositional-object)
  - Discourse context of the experiment?
    - The variables influencing the dative alternation (cf. Bresnan et al. 2007) do not clearly decide
  - Conwell and Demuth:
    - either (1) bias towards a goal interpretation of the recipient phrase
    - or (2) there are many more to-dative-only verbs than alternating verbs, leading to a lower alternation likelihood if the verb is presented in the to-dative
      - Levin (1993): 115 alternating, 147 to-only, 32 double-object-only
      - ICE-GB corpus: 44 alternating, 292 to-only, 24 double-object-only
      - Distinctive collexeme analysis (Stefanowitsch and Gries 2004): 15 verbs prefer the double-object, 49 prefer the to-dative
Niches for alternations

• “Language-general” facts: Wonnacott et al. (2008)
  - Experiments with an artificial language
  - 12 action verbs, 2 synonymous constructions
  - The “degree of alternation” of verbs between the two constructions was varied among conditions
  - Subjects more likely to use new verbs creatively if the degree of alternation was higher
    - Very few or no overgeneralization in the “lexicalist” language
    - Overgeneralization matching the constructions’ frequency in the “generalist” language
  - Taken as evidence that
    - speakers store not only knowledge about verbs and constructions
    - but also knowledge about the language as a whole
Niches for alternation relations

- Language change: paradigmatic analogy
  - Diffusional change motivated by semantic analogy: a new construction spreads to semantically similar verbs first
  - De Smet (2008) argues for paradigmatic analogy:
    - More likely for a verb to adopt a new complementation pattern if the existing paradigm of that verb is similar to that of other verbs already occurring in the pattern
    - Example of the *for...to* infinitives in English
      - No semantic motivation for *arrange*
      - But the verb also occurs with a *for-PP* or a *to-infinitive*, and so do many verbs in the distribution of the *for...to* construction
      - De Smet (2008) suggests that the motivation for this change is paradigmatic
Niches for alternation relations

- Alternations provide a better account of some patterns
  - A case in point: the English conative construction
    - Insertion of *at* before the direct object of a transitive verb: *John kicked at the ball*
    - Various semantic effects: cancels entailments of affectedness of patient or intentionality of agent, “bit-by-bit” reading, etc.
    - The meaning of the construction eludes a general characterization => polysemous construction?
  - Alternative account:
    - Conatives do not seem to have some constant aspect of meaning in common …
    - … rather a contrast with their transitive counterpart: they are somehow “less transitive” (cf. Perek 2010, Perek & Lemmens 2010)
    - Better captured by the application of an alternation
Niches for alternation relations

- **The status of alternations**
  - Most likely, speakers are aware of alternations and use them
  - Thus, a model “concerned with defining the principles of argument realization which speakers are aware of” should not neglect this dimension
  - Constructionist models have yet to meet this requirement

- **A (tentative) model**
  - Couched in a symbolic grammar
  - A combination of the two perspectives
  - Constructions contain semantic restrictions
  - But there is an additional layer of abstraction which embodies relations between constructions as second-order symbols
Alternations in CxG

- Alternations = systematic form/meaning shifts
  - Dative alternation:
    - Mary gave/sent/promised John the book
    - Mary gave/sent/promised the book to John
    - near-synonymous: both encode caused change of possession
    - differ in terms of information structure (inter alia)
  - Causative alternation:
    - John broke/opened/emptied the jar
    - The jar broke/opened/emptied
    - (de)causativization
Alternations in CxG

- Basic reasoning:
  - Formal change correlated to semantic change
  - Formal and semantic changes = relations between formal or semantic structures

- Second-order symbols
  - Symbolic pairings of a formal and semantic relation
  - Semantic relations can concern aspects of event structure or construal

\[
\begin{array}{c|c|c}
A & R & B \\
\hline
a & r & b \\
\end{array}
\]

- A, B: phonological structures (forms)
- a, b: semantic structures (meanings)
- R: formal relation
- r: semantic relation
Alternations in CxG

• Productivity by analogy
  – Second-order symbols are patterns of analogy: “Form A is to form B what meaning a is to meaning b”
  – They can trigger productivity through higher-order analogy
  – Combinations derived by second-order symbols can be blocked by semantic restrictions on constructions
Alternations in CxG

• Example with the dative alternation:
  - *carry, push, drag, lower* all take the *to*-dative only
  - However Bresnan *et al.* (2007) report the following attested ditransitive examples:
    
    Karen hand-carried her a form  
    Player A pushed him the chips  
    Sumomo dragged him a can of beer  
    Buddha lowered him the silver thread of a spider  

  - The target meanings have a pronominal, animate, highly prominent goal argument
    
    • mismatch with the entrenched meanings of the *to*-dative form
    • double-object form derived by analogy with other alternating pairs
Conclusion

• The status of alternations
  – Not incompatible with constructionist models of AS
  – Desirable in some cases
  – Eventually calls for more empirical evidence
    • Are alternations cognitively real?
    • If so, what (other) functions do they perform?
Thanks for your attention!


