The status of alternations in construction grammar: a sorting task experiment

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Overview

- Overview
  - Study in the architecture of Construction Grammar
    - i.e., what kind of generalizations does a construction grammar consist of?
    - generalizations of form and meaning only or also generalizations of meaning with different forms?
  - A sorting task experiment
    - provides evidence for alternation-based generalizations
  - Conclusion and prospects

Introduction

- Alternations
  - Pairs of constructions which can fulfill the same function:
    - e.g., the genitive alternation: *of*-PP vs. *'s*

      the goal of the government vs. *the government's goal*
  - Much focus in the domain of argument realization
    - Dative alternation

      John gave a book to Mary vs. *John gave Mary a book*
      - Events of caused transfer of possession
      - No major difference in meaning but different discourse profiles
    - Locative alternation (*spray/load* alternation)

      John loaded hay onto the truck vs. *John loaded the truck with hay*
      - Events of caused change of location
      - Different construals of the event: action on theme vs. action on location

Introduction

- Alternations in Construction Grammar
  - Variants of alternations are seen as independent constructions
  - Goldberg's (2002: 329) *surface generalizations hypothesis*
    - "There are typically broader syntactic and semantic generalizations associated with a surface form than exist between the same surface form and a distinct form that it is hypothesized to be syntactically or semantically derived from."
    - Against transformational and derivational accounts
  - But she also acknowledges the role of paraphrase relations
    - "[their] statistical use […] in actual discourse contexts is critical to unlocking Baker's paradox of partial productivity" (ibid: 349)
    - "[they] can also be seen to be relevant to on-line choices made in production" (ibid.)

Introduction

- Yet, very little discussion of their theoretical status
  - Much focus on functional differences between variants, but no account of their similarity
  - Some scarce exceptions:
    - Goldberg's (1995: 91) link of "S-synonymy" (same "truth conditions") between the variants of the dative alternation
    - Cappelle's (2006) "allostructions" for particle placement in English: "variant structural realizations of a construction that is left partially underspecified"
  - But all in all, very few construction grammarians posit a level of alternation-based generalizations
    - Is that an accurate picture of speakers' knowledge?
    - Such generalizations might be useful in several domains:
      - Language acquisition: statistical preemption
      - Language change: cf. De Smet's (2008) paradigmatic analogies

Introduction

- Hypotheses
  - The constructional hypothesis: there are only construction-based generalizations.
  - The alternations hypothesis: there are also alternation-based generalizations that capture similarities between formally distinct constructions.
- Tested with a sorting task experiment

The experiment

- The experiment
  - Inspired by Bencini and Goldberg (2000)
    - Questioned the idea that verbs are the main determinant of sentence meaning => role of constructional meaning
    - They crossed four verbs with four constructions and asked participants to sort the sentences into four groups
    - Many subjects did sort by construction
    - Conclusion: “constructions are psychologically real linguistic categories that speakers use in comprehension” (ibid: 649-650)
  - Our experiment
    - Same design, but we include the alternation factor
    - Our dataset includes *both* constructions and alternations

The experiment

- Stimuli
  - 4 sentence types based on 2 alternations:
    - dative alternation: ditransitive ↔ *to*-dative
    - locative alternation: caused-motion ↔ *with*-applicative
    - Importantly, the *to*-dative is arguably an instance of caused-motion through the metaphor “Transfer of Ownership as Physical Transfer” (cf. Goldberg 1995: 3.4.2)
    - Hence, there are 3 constructions
  - Thus, to sort into 3 groups, there are two kinds of strategies:
    - following the constructional generalization (caused-motion)

      ditransitive – CM (locative + *to*-dative) – *with*-applicative
    - forming groups cutting across constructions, matching alternations

      dative (ditransitive + *to*-dative) – CM – *with*-applicative

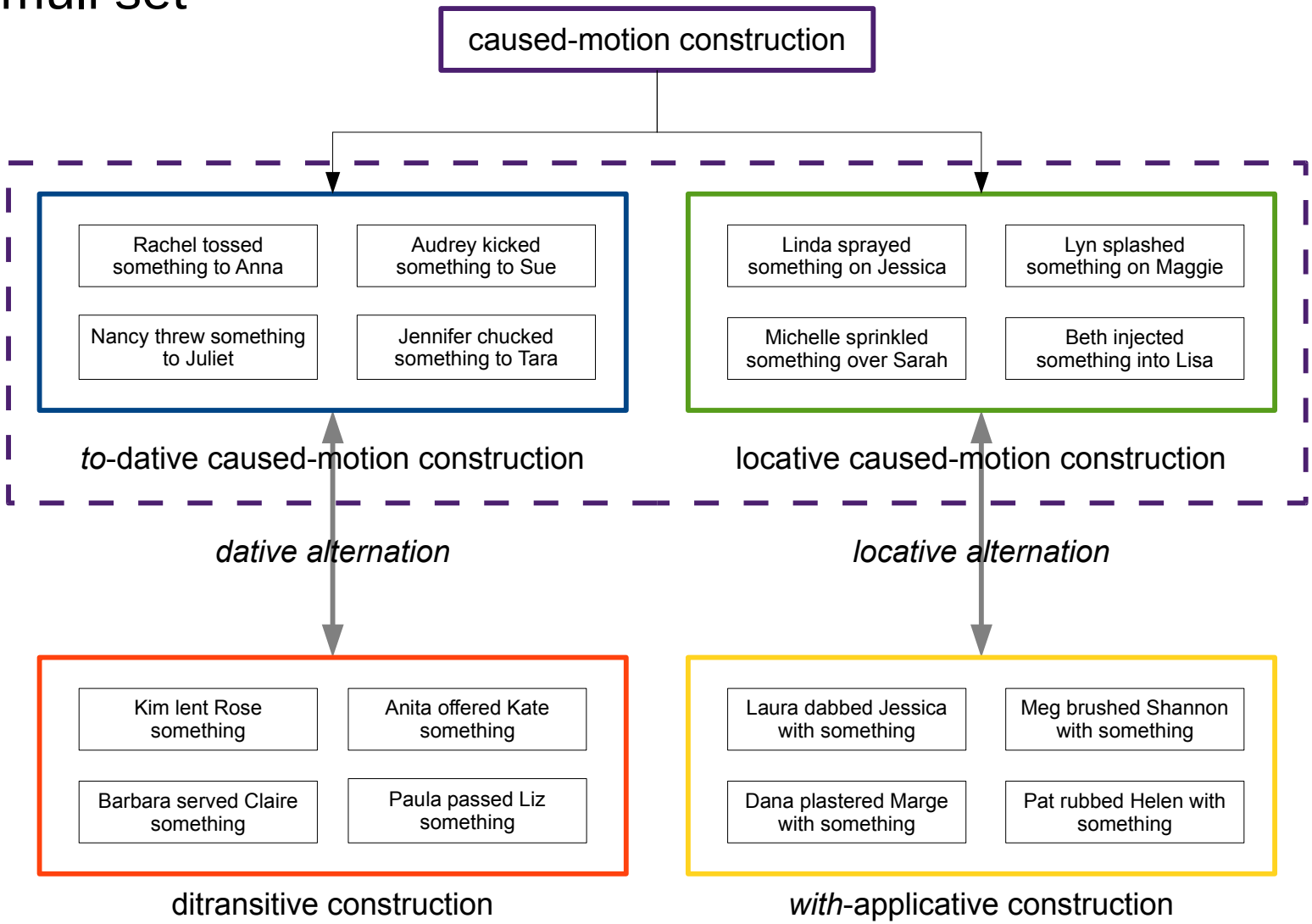
      ditransitive – *to*-dative – locative (CM + *with*-applicative)

The experiment

- Stimuli
  - To avoid parasitic sorting strategies, all sentences contain:
    - two human arguments (agent + goal/recipient; all female first names)
    - a generic theme argument “something”
    - e.g., *Nancy threw something to Juliet*
  - Verbs from the same semantic field in each sentence type
    - Proved impossible to find 16 suitable and maximally different verbs
    - Creates semantically coherent category for each sentence type
    - Does not fundamentally bias towards one type of generalization

The experiment

- Stimuli set



The experiment

- Hypotheses
  - The constructional hypothesis: there are only construction-based generalizations.
    - Subjects might see the similarity between the variants of an alternation, but the constructional generalization should be stronger.
    - Most subjects will thus sort the CMs and the *to*-datives together
  - The alternation hypothesis: there are also alternation-based generalizations.
    - Subjects will easily see the semantic similarity between instances of variants in an alternation, and prefer it if they judge this generalization stronger as a purely constructional one.
    - Many subjects (if not most) will thus sort together either the ditransitives and the *to*-datives, or the CMs and the *with*-applicatives.

The experiment

- Participants
  - 26 native speakers of English, aged 19-33 (22 on average)
  - All students at the University of Freiburg, Germany
  - Mostly from UK and US, but also Australia and Canada
  - Received 5€ as compensation (except two)

The experiment

- Procedure
  - Same as Bencini and Goldberg's (2000)
  - Sentences were printed on 15 x 10.5 cards
  - Subjects were presented with a shuffled pile of the 16 cards
  - They were asked
    - to write a paraphrase for each sentence
    - then to sort the sentences into three groups, "according to their overall meaning"
  - Post-experiment interview for them to explain their sorting

Results

- Analysis
  - To what extent do speakers use constructional vs. an alternation-based generalizations?
  - To measure this, we count:
    - C: the number of pairs of CMs and *to*-datives sorted together
    - L: the number of pairs of CMs and *with*-applicatives sorted together
    - D: the number of pairs of ditransitives and *to*-datives sorted together
  - Example:

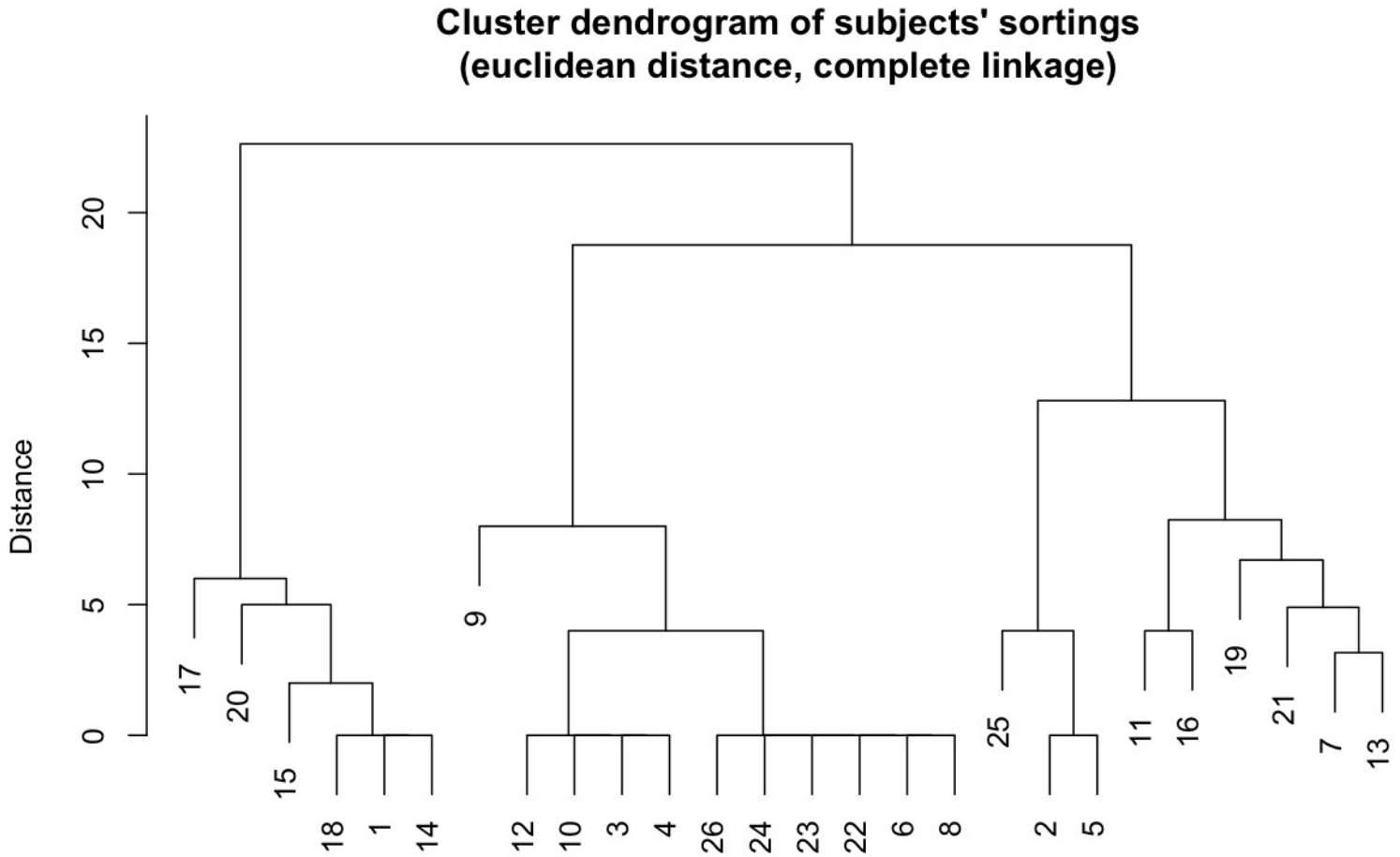
    group 1: 4 x *to*-dative + 3 x CM
    group 2: 4 x *with*-applicative + 1 x CM
    group 3: 4 x ditransitive

    C = 12
    L = 4
    D = 0

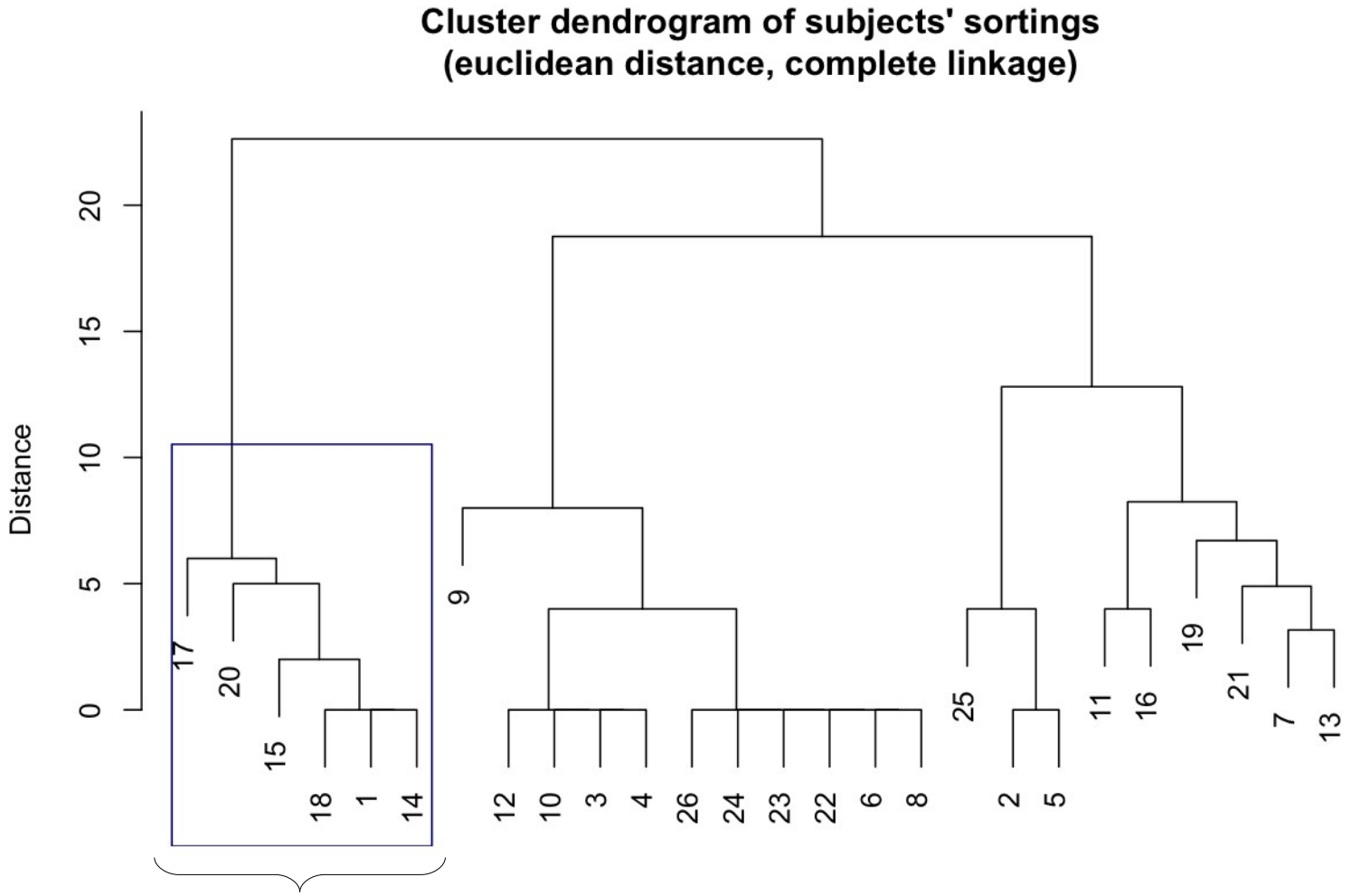
Results

- The {C, L, D} triplets were submitted to a cluster analysis
  - Automatic classification of objects according to their similarity
  - Analytical tool:
    - groups sortings according to quantitative criteria
    - identifies the broad types of sorting performed by subjects
  - Four sorting types emerge

Results

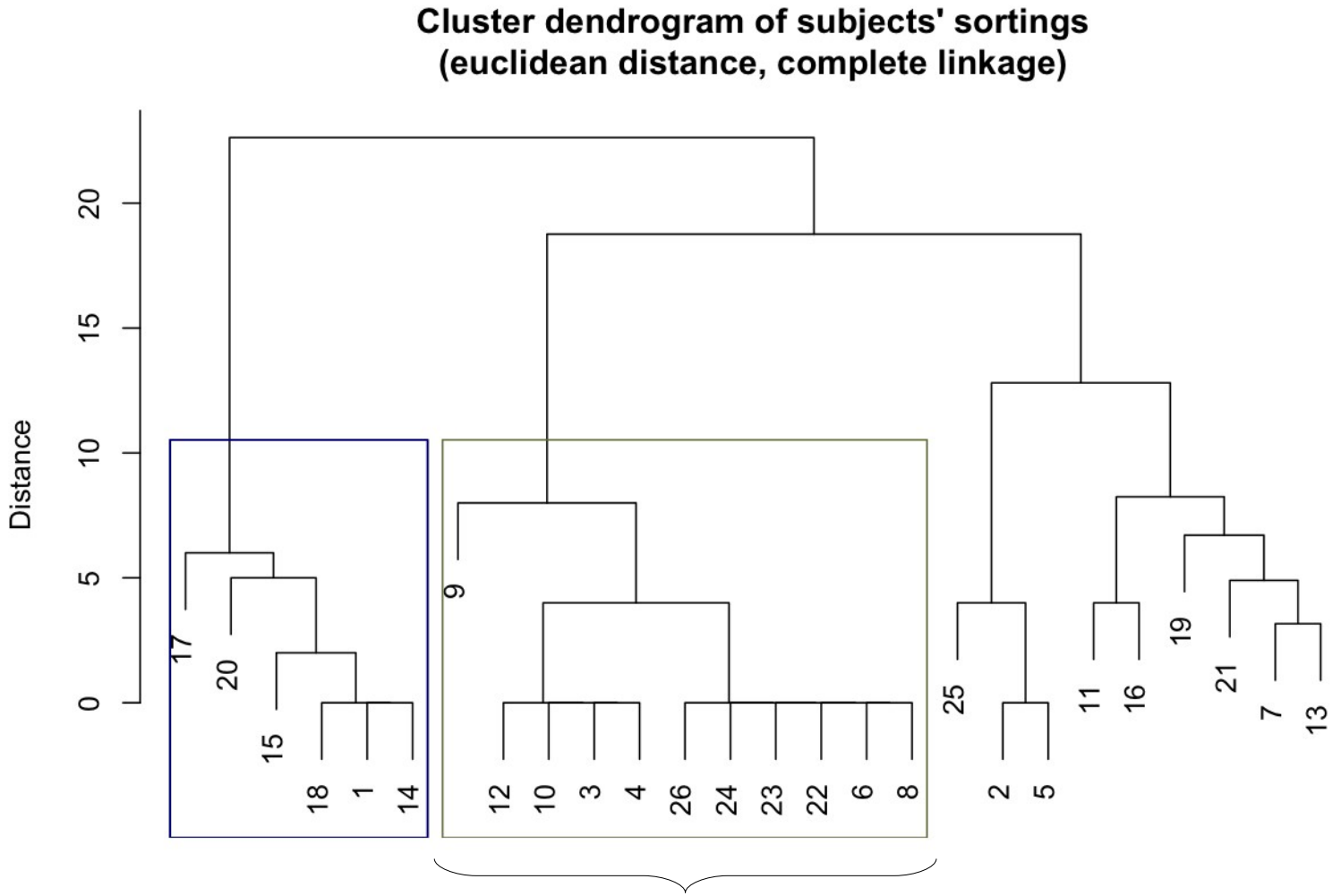

Cluster dendrogram of subjects' sortings
(euclidean distance, complete linkage)
Distance
0
5
10
15
20
17
20
15
18
1
14
9
12
10
3
4
26
24
23
22
6
8
25
2
5
11
16
19
21
7
13

Results



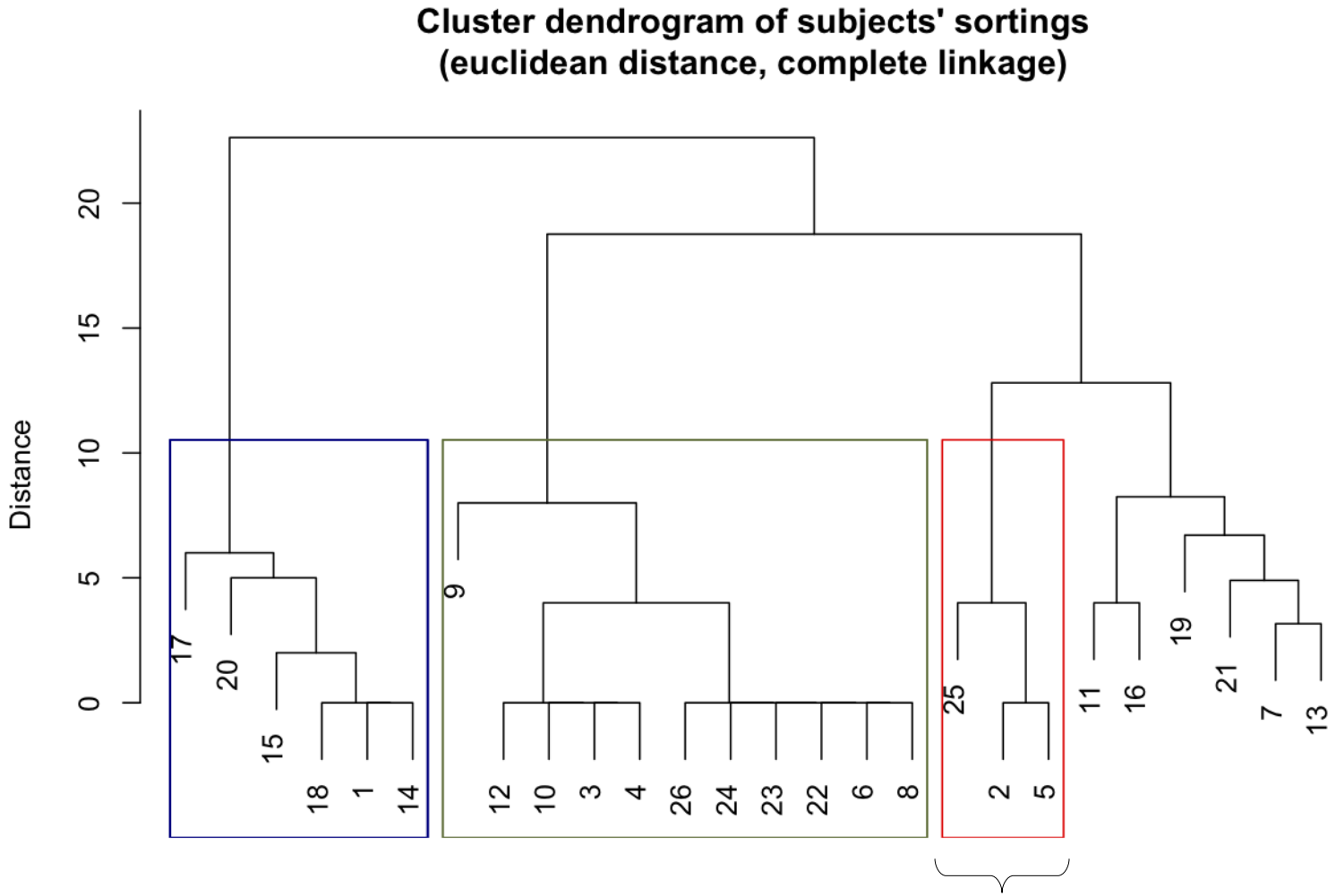
6 dative sortings:
all datives in one group

Results



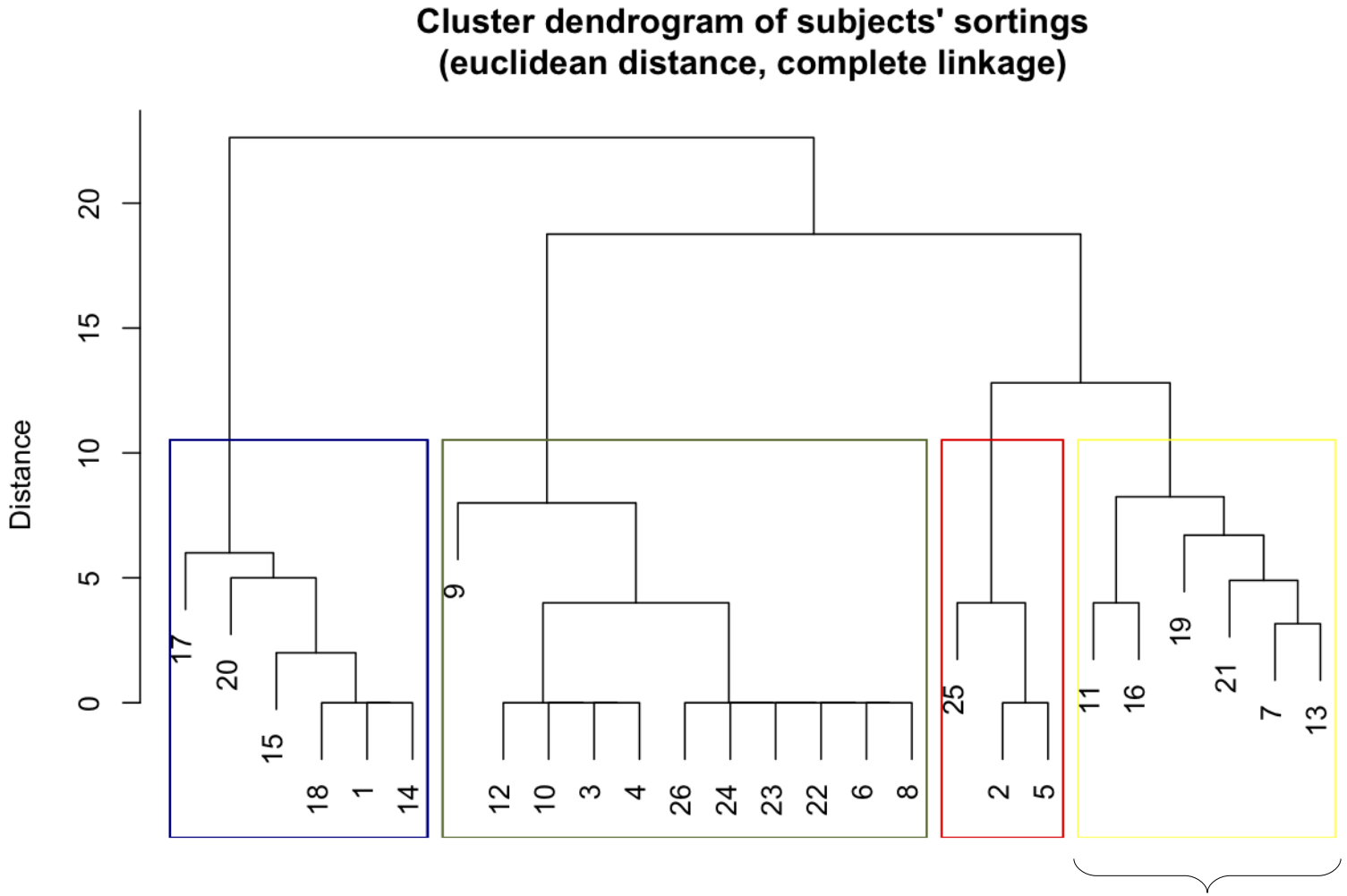
11 locative sortings:
all locatives in one group

Results



3 (loosely) constructional sortings:
most CMs and *to*-datives in one group

Results



6 miscellaneous (verb-based?) sortings:
based on some feature of the verb

Results

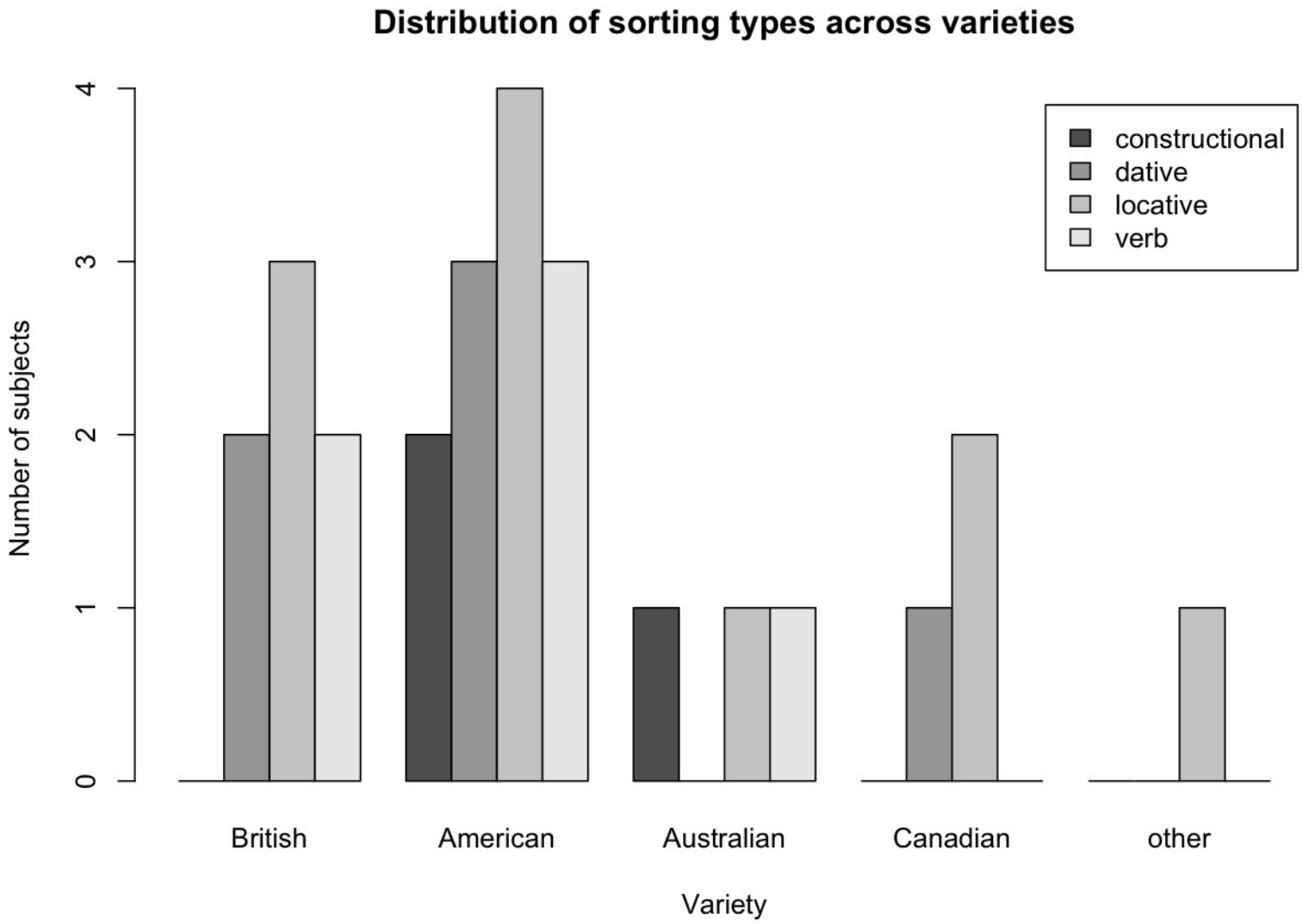
- Distribution
  - Dative: 6
  - Locative: 11
  - Constructional: 3
  - Verb: 6
- Subjects strongly disfavored the constructional sorting

Results

- Quantitative analysis confirmed by post-experiment interviews:
  - 2 on 3 constructional,
  - 6 on 6 dative and
  - 7 on 11 locative sorters provided coherent definitions for their caused-motion, dative or locative group, e.g.:
    - caused-motion construction: “indirect contact”, “at a distance”
    - locative alternation: “something put on the person or inside the person”, “usually some kind of substance being applied to someone else”
    - dative alternation: “somebody gives something to somebody else”, “an object was exchanged, went from one person’s possession to another’s”

Results

- Consistent across varieties

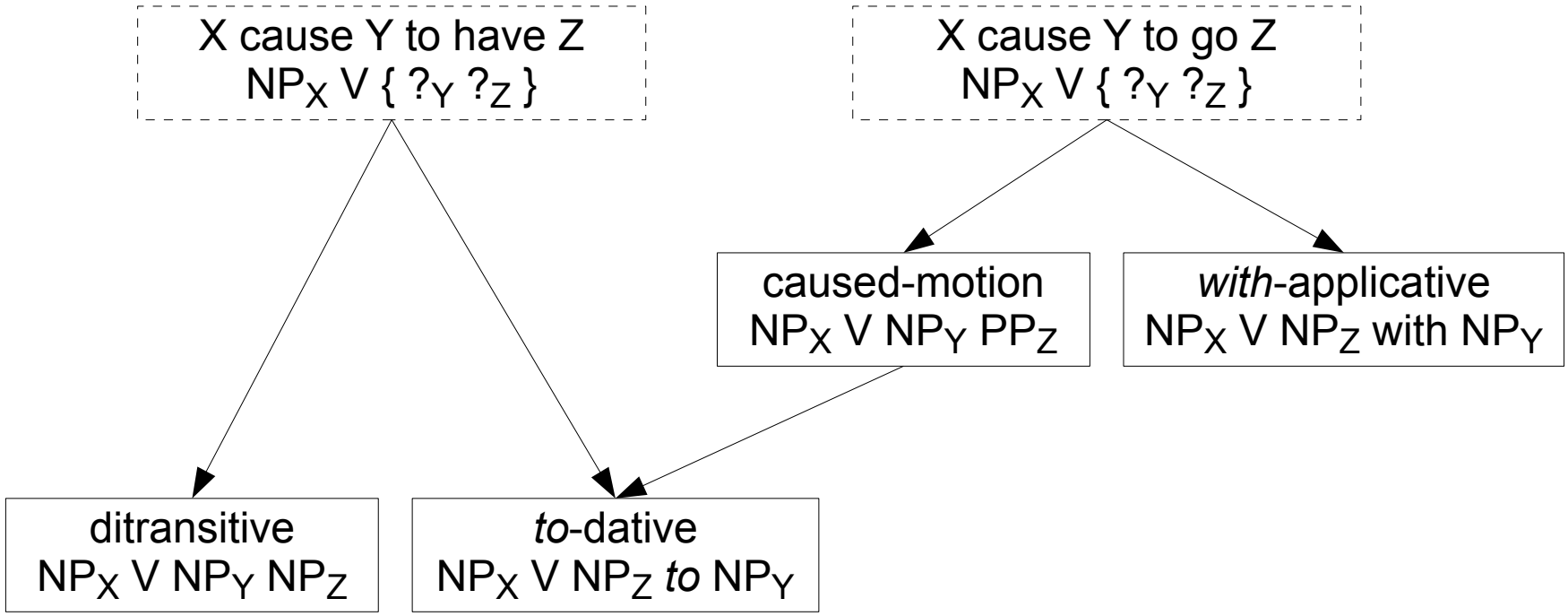


Conclusion

- Conclusion
  - The alternation-based generalizations are reflected in the subjects' sorting behavior more often than the purely constructional ones.
  - This result is more in line with the alternation hypothesis
  - i.e., that there are broader generalizations of a constructional meaning shared by formally distinct constructions

Conclusion

- Conclusion
  - Evidence that generalizations of a constructional meaning with an underspecified form are plausible
  - Modeling with Cappelle's (2006) allostructions:



Conclusion

- Prospects
  - The place of alternations in construction grammar: a thought-worthy research question
  - Pending questions
    - Higher-level generalizations or “links” between constructions?
    - There can always be the slightest semantic similarity between formally distinct constructions: where does grammar stop?
    - Usage-based explanation?
  - Calls for more empirical evidence
    - We demonstrated the plausibility of alternation-based generalizations
    - But assessing their cognitive reality calls for more “on-line” evidence

Thanks for your attention!

Bencini, G. & Goldberg, A. (2000). The contribution of argument structure constructions to sentence meaning. *Journal of Memory and Language* 43.4, 640–51.

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De Smet, H. (2008). *Diffusional change in the English system of complementation: Gerunds, participles and* for...to-*infinitives*. Unpublished doctoral thesis, University of Leuven.

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