Productivity asymmetries in argument structure alternations

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Overview

- Overview
  - Syntactic variation examined from the perspective of productivity
    - What influences the productivity of constructions seen as syntactic alternatives?
  - An experiment providing evidence for asymmetries in argument structure alternations
  - A usage-based explanation

Introduction

- Argument structure productivity
  - Property of an argument structure construction to be used innovatively with different verbs

    Don't say me that! (Gropen et al. 1989)

    She sneezed the foam off the cappuccino (Goldberg 2006)

  - What are the determinants of productivity?
    - In usage-based CxG, mostly driven by properties of constructions:
      - Constructions convey a schematic meaning
      - This meaning constrains the distribution of the construction
      - Promoted by high type frequency and semantic variability
    - But verbs never occur in isolation, always within constructions
      - Does productivity also depend on which construction(s) a verb has previously been witnessed with?

Introduction

- A relevant study: Conwell & Demuth (2007)
  - Investigated 3-year-olds' knowledge of the dative alternation
    - Ditransitive construction vs. *to*-dative construction

      John gave Mary a book vs. *John gave a book to Mary*

  - Main finding: productivity asymmetry
    - 3-year-olds readily use a verb in the *to*-dative variant if they heard it in the ditransitive variant
    - But they are much less likely to do the opposite

Introduction

- A new experiment; questions:
  - Are adult speakers also biased towards the *to*-dative?
  - How is this bias related to verb meaning?
    - Is it only found with verbs of physical transfer (i.e., goal-taking)?
  - Are other alternations similarly asymmetrical?

    => the locative alternation

    caused-motion construction vs. *with*-applicative construction

    John loaded hay onto the cart vs. *John loaded the cart with hay*

    - Events of caused change of location
    - Different construals of the event: action on theme vs. on location

Design

- Experimental design
  - Conwell & Demuth's method is inappropriate for adult speakers
    - Instead, novel verbs are introduced in short stories
    - Intended meaning hinted at by contextual cues
  - Tasks:
    - Read a short story containing a novel verb and presented one sentence at a time
    - Remember the novel verb and type it on the keyboard
    - Decide on its meaning by choosing a definition out of three
    - Production task, to elicit a productive use of the novel verb:
      - Sentence prompt containing the verb
      - Subjects must complete this prompt according to what happened in the story (not necessarily verbatim repetition)

Design

Demo

Ted and Sam were testing the new machines.

Sam pelled a box to Ted.

When the conveyor belt stopped,
Ted removed the box.

Sam wrote their boss a positive report.

(verb recall task)

What was the new word in the short story you have just read?

(meaning decision task)

What do you think this word means?
Pick the definition that you find most appropriate in the list below.

1) pack something with difficulty

2) transfer from a distance by using a conveying device

3) drag something with a rope

(sentence completion task)

Now answer this question:

What did Sam do?

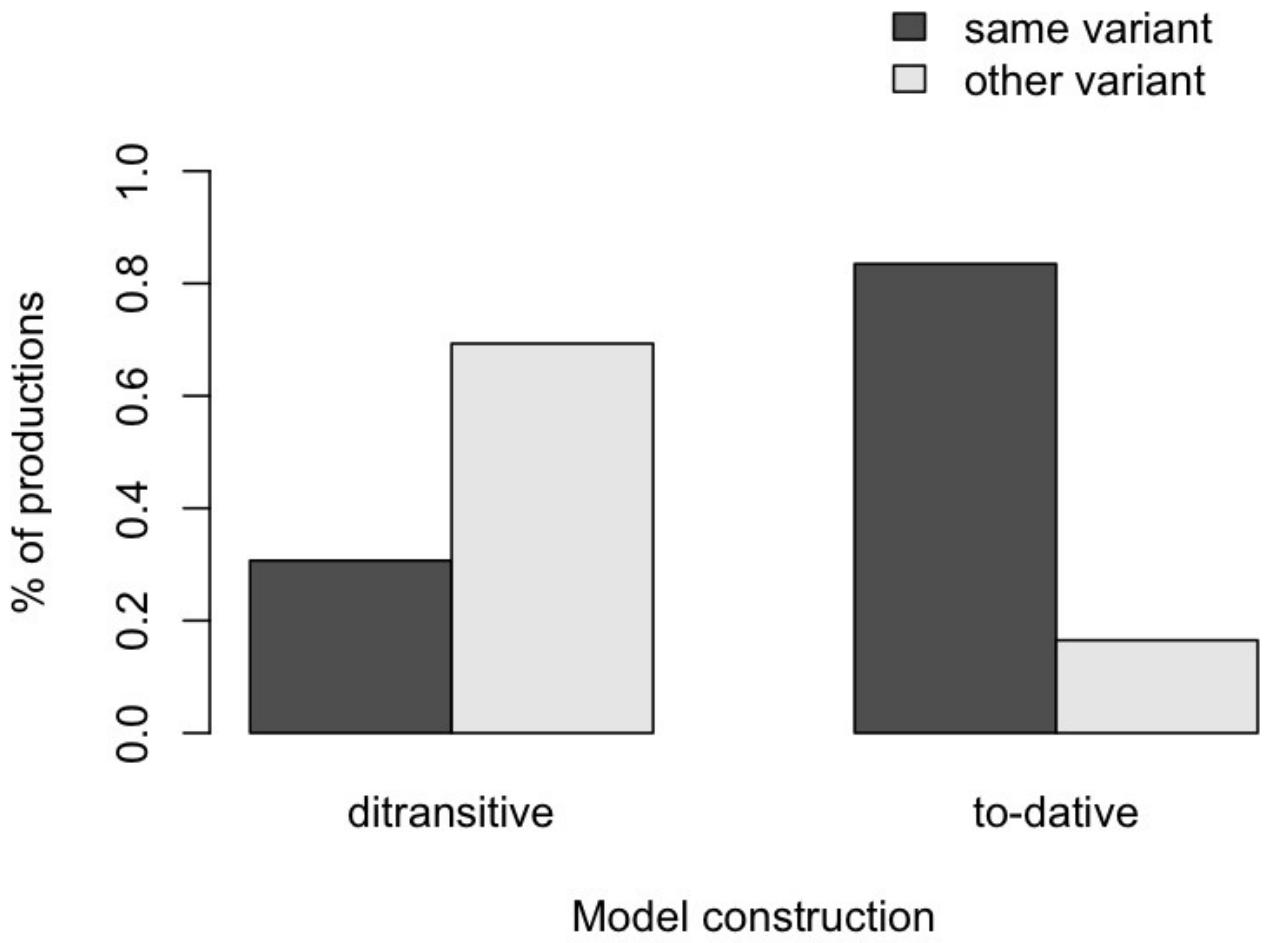
Sam pelled ...

Design

- Stimuli
  - Two alternations: dative alternation, locative alternation
  - Novel verbs are used in one variant of these alternations
  - The verb meanings fall into two classes for each alternation:
    - Dative: physical transfer vs. communication
    - Locative: change of location vs. change of state
    - 2 novel meanings in each class, one short story for each meaning
- Subjects
  - 40 English native speakers, students at the University of Freiburg
  - Each meaning was presented in one variant for half the subjects, and in the other variant for the other half

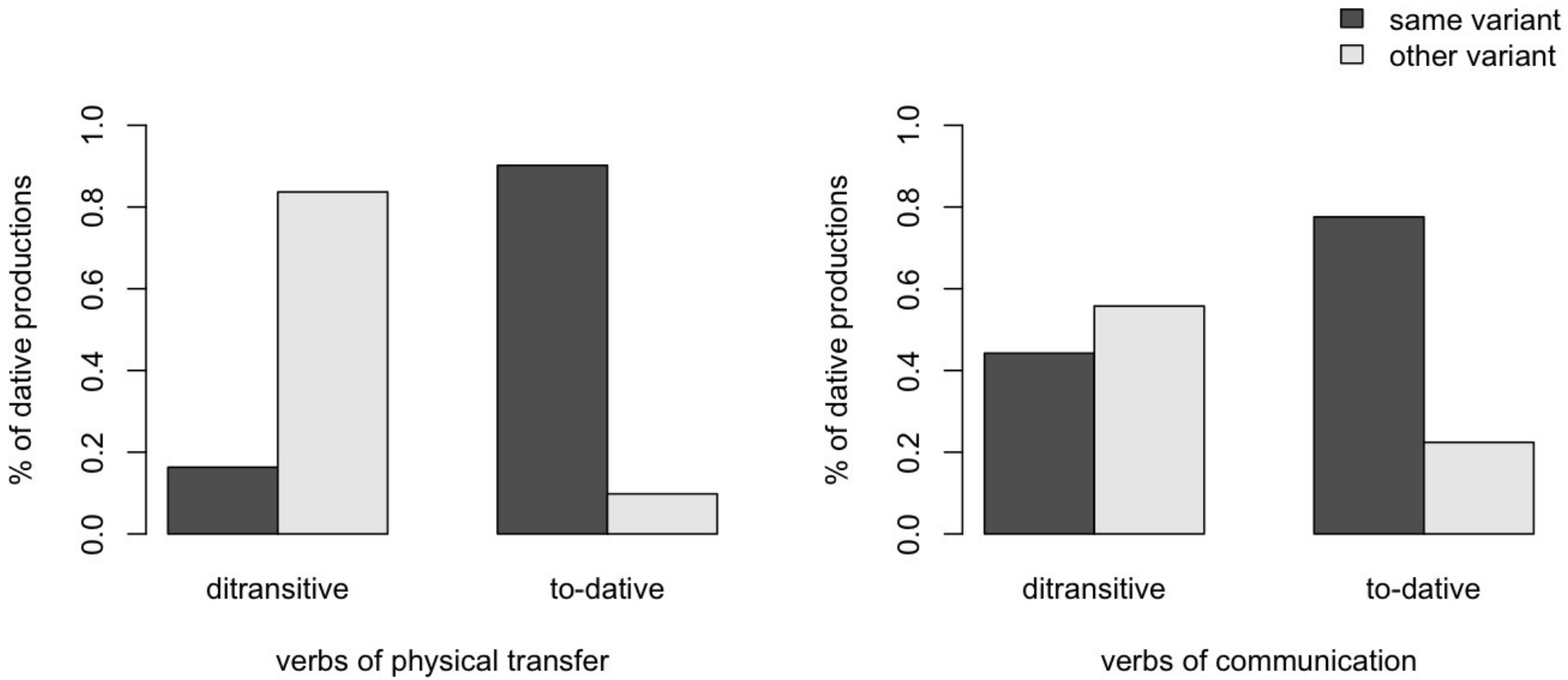
Results

- Dative alternation



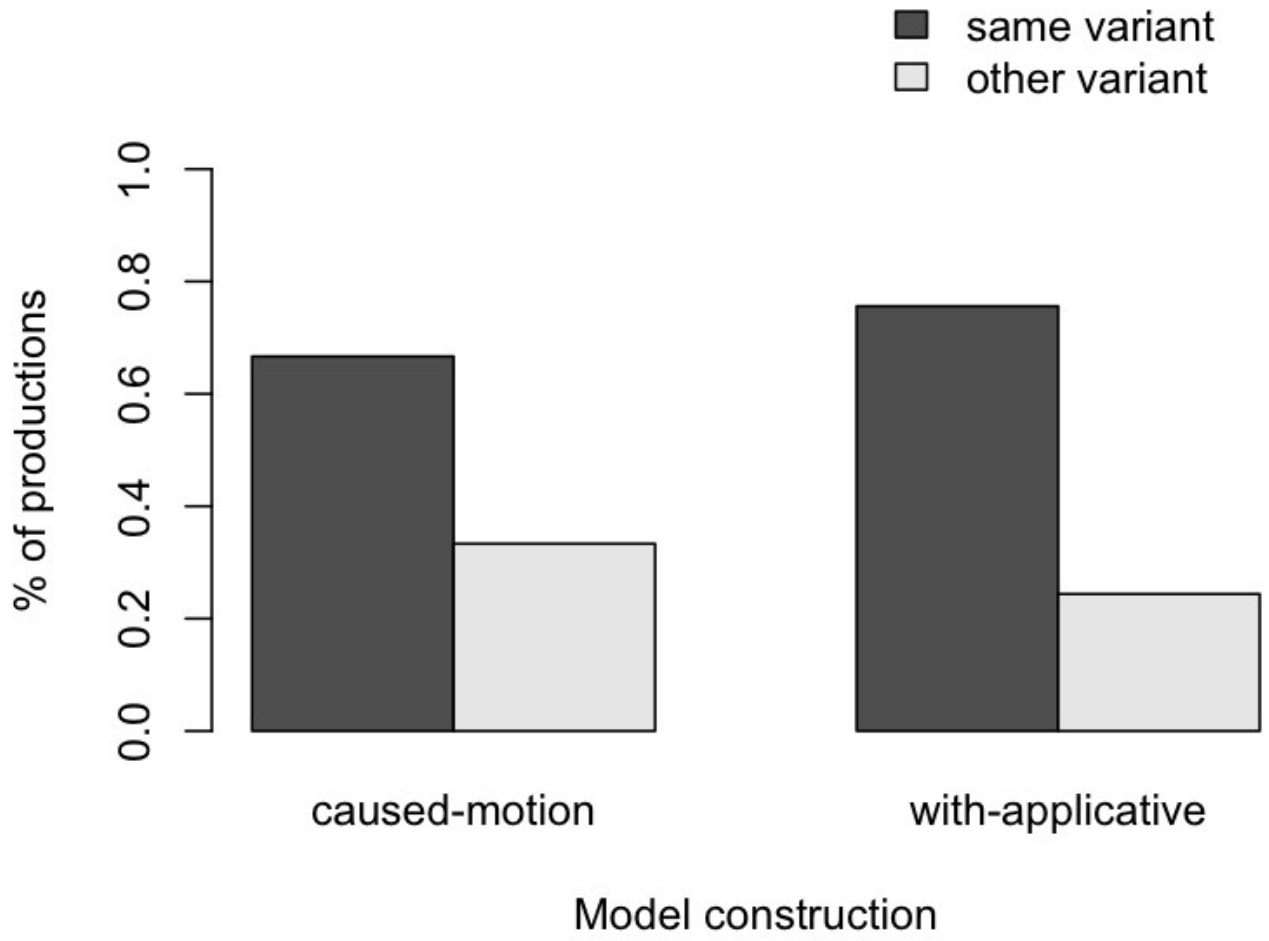
Results

- Dative alternation, by verb meaning



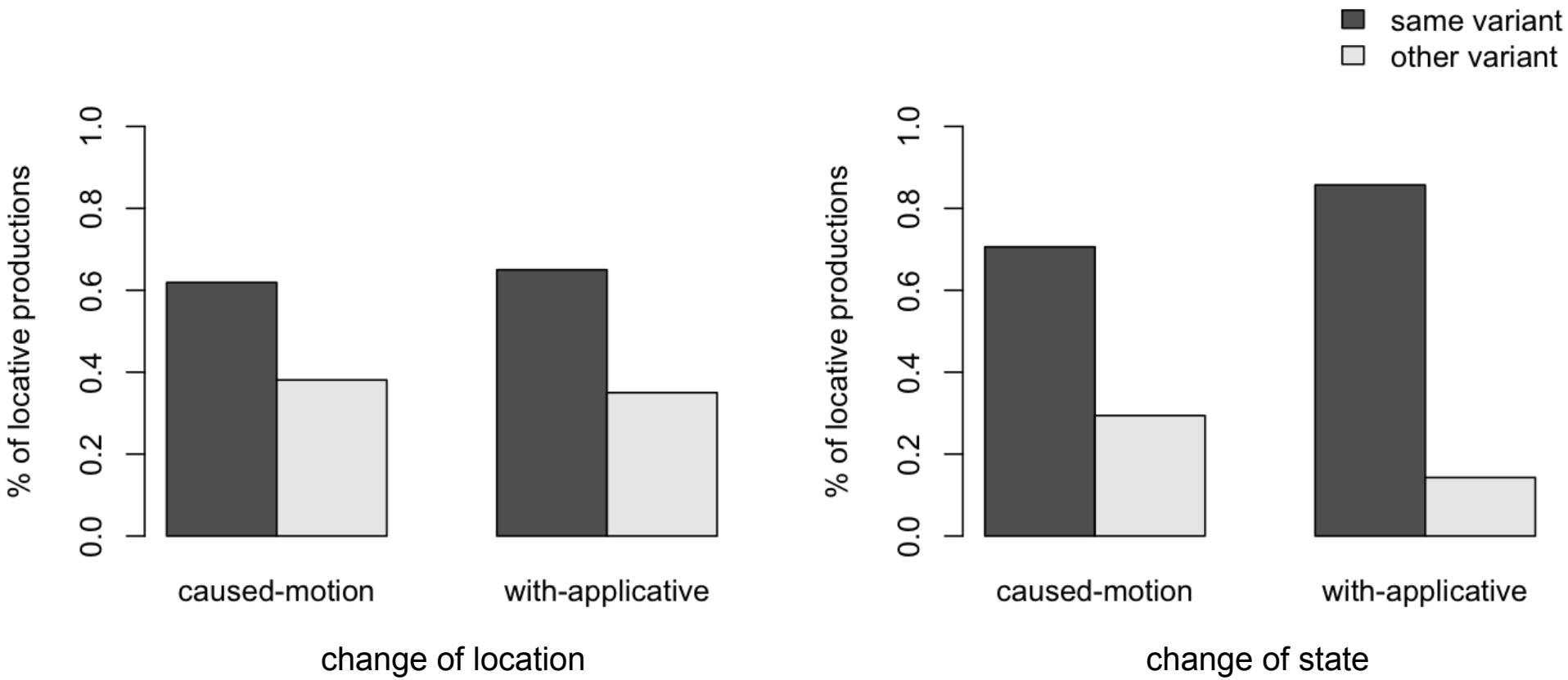
Results

- Locative alternation



Results

- Locative alternation, by verb meaning



Summary

- Summary: the road metaphor

ditransitive
V NP NP

to-dative
V NP *to* NP

Summary

caused-motion
V NP PP_{Loc}

with-applicative
V NP *with* NP

Explaining the asymmetry

- How do we explain the bias towards the *to*-dative?
  - Conwell and Demuth (2007): semantic explanation
    - The children were biased towards a construal of the toy recipients as goals (i.e., locations); hence they stick to a 'locative' construction
    - In our experiment:
      - Asymmetry found for both verb classes, including non-locative verbs of communication

    => rules out the explanation in terms of a 'goal' bias

A context-based explanation

- A context-based explanation (only for the dative alternation)
  - The choice of dative variant is governed by various properties of the post-verbal arguments (cf. e.g., Bresnan et al. 2007)
    - Pronominality, length, given/new status, definiteness, etc.
    - Could the bias towards the *to*-dative be due to other linguistic choices favoring this construction?

A context-based explanation

- Testing the context-based explanation:
  - Bresnan et al.'s (2007) regression model was taken and trained on data from the Switchboard corpus
  - In how far does this model predict the productions of our subjects?
    - Verbs of physical transfer:
      - 72 vs. 28 correctly predicted productions (72%)
      - However, both sets are biased towards the *to*-dative
    - Verbs of communication
      - 39 vs. 71 correctly predicted productions (35%)
      - The bias is provided by the incorrectly predicted productions
  - Conclusion: a context-based explanation is not the whole story

A usage-based explanation

- A usage-based explanation
  - Intuitively, very few English verbs occur in the ditransitive but not in the *to*-dative
  - Many occur in both and even more occur only in the *to*-dative
  - Confirmed by a corpus survey (source: ICE-GB):

	to-dative-only	alternating	ditransitive-only
Physical transfer	40	5	1
Communication	17	3	1
All verbs	104	37	33

  - It is more likely for a *to*-dative verb to belong to the '*to*-dative-only' class than to the 'alternating' class
  - Conversely, it is more likely for a ditransitive verb to belong to the 'alternating' class than to the 'ditransitive-only' class

A usage-based explanation

- The same explanation predicts the lack of asymmetry in the locative alternation:

caused-motion-only	alternating	*with*-applicative-only
213	14	35

  - The caused-motion variant should be more productive (highest type frequency)
  - Yet subjects were conservative with both variants

    => the relevant variable is *relative* type frequency

Conclusion

- Conclusion and prospects
  - Productivity does vary according to the exposure construction
  - This variation can be explained by patterns of type frequencies
    - Suggests that these facts are part of speakers' linguistic knowledge
    - In line with Wonnacott et al.'s (2008) claim that speakers learn "general facts" about their language
  - Other explanations?
    - The absence of asymmetry in the locative alternation could be explained by larger semantic differences between the variants
    - Statistical preemption: formation of categories of items with the same syntactic behavior (Boyd and Goldberg 2011)
  - Calls for further research ...

Thanks for your attention!

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