How many ways are there to process a sentence?

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Developmental Perspectives on Sentence Processing
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Syntax vs. Heuristics

“words in sentences sound clearer, because they have two mental resonances, not one.” (Townsend and Bever 2001: 181)

Simplicity

- Simple and efficient rules
  - “Heuristic processing saves effortful processing by proceeding through “fast and frugal” heuristics rather than slow going and computationally costly algorithmic processing.” (Karimi and Ferreira 2015: 1014)
  - “…algorithmic procedures for sentence processing are not only too costly but sometimes outright unnecessary…” (Karimi and Ferreira 2015: 1014)
  - “Good-enough” representations
    - “linguistic representations are often incomplete and lacking in detail” (Karimi and Ferreira 2015: 1013)
    - “language comprehension in many cases is shallow and incomplete” (Ferreira 2003: 169)

Claims

1. Syntactic computation is effortful.
2. Heuristics are cheap.
3. Our representations are often only “good-enough”.

(see Koornneef and Rualand 2016)

What creatures are they?

- “the nature of the simple rules that guide heuristic processing is unclear.” (Karimi and Ferreira 2015: 1019)

NVN strategy:

- NV(N) = agent – action – (patient)
  (e.g., Bever 1970, Townsend and Bever 2001, Ferreira 2003)

Application

Mary built a boat.

1. Chunk into phrases:
   Mary = NP
   built = V
   a boat = NP

2. Assign canonical structure
   Mary = NP = agent
   built = V = action
   a boat = NP = patient
Application Failure

1. Chunk into phrases:
   - John = NP
   - kicked = V
   - Mary = NP

2. Assign canonical structure:
   - John = NP = agent
   - kicked = V = action
   - Mary = NP = patient

John was kicked by Mary

Acquisition

- How does the child acquire the strategies?
  - Linguistic experience
  - “universal constraints on possible perceptual strategies” (Bever 1970: 36)

- When?
  - “The most important feature of these results is the steady increase in performance until age 3.8 for girls and 4.0 for boys, when there is a sharp (temporary) drop in performance.” (Bever 1970: 31)

Subject vs. Agent

(with Rozz Thornton)

(1a) The boy jumped.
(1b) The boy fell.
(2) The boy can fall really well on stage.

How well does the NV(N) strategy reflect children’s understanding of sentences?

Felicity Judgment Task

- Modal can:
  - Ability-can
    (cf. Hackl 1998)

(3a) The girl can hide really well.
(3b) #The girl can disappear really well.
(4a) The lolly tastes really good.
(4b) #The lolly eats really good.

<table>
<thead>
<tr>
<th></th>
<th>4-year-olds</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct Test</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>Correct Control</td>
<td>63%</td>
<td>100%</td>
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Children’s creativity

(5a) The vase broke.
(5b) Kermit broke the vase.

Children’s overgeneralizations:

(6a) She came it over there. (3;4)
(6b) Eva’s gonna die it. (5;0)
(Bowman 1982: 13, 14)

More so with non-agentives than agentives.
(Pinker 1989)
Previous work

Act-out task (Naigles et al. 1993)
(7) The lion falls the chicken.
(8) The elephant comes the giraffe.

Which entity acts upon the other?
➢ Causative meanings in about 70% of the cases for 2-, 3- and 4-year-olds.

Provide meaning (adults) (Deal 2007)
(9a) The zum arrived the nuk.
(9b) The zum laughed the nuk.
➢ More causatives for non-agentives than agentives.

Structure types

<table>
<thead>
<tr>
<th>PP</th>
<th>Made</th>
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<tbody>
<tr>
<td>He laughed at his friend.</td>
<td>He made his friend laugh.</td>
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<tr>
<td>He slipped over his friend.</td>
<td>He made his friend slip.</td>
</tr>
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</table>

(10a) Yesterday, I laughed a friend.
(10b) Yesterday, I danced a friend.
(11a) Yesterday, I slipped a friend.
(11b) Yesterday, I disappeared a friend.

Claims

1. Syntactic computation is effortful.
2. Heuristics are cheap.
3. Our representations are often only "good-enough".

(see Koomen and Reuland 2016)

Evaluation

• Not clear how cheap it is.
  – Heuristics are often misleading.
• Our mental representations of sentences are detailed and precise.
• The heuristics guide us to interpretations that are in fact difficult to get.
It just isn't good enough

Using our computational system is the only way to build mental representations of sentences.

(e.g., Marantz 2000)