





Interfering causes in acquisition

GALA workshop: Acquisition of causation:
Culmination entailments and agency
September 2015


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Acquiring verb meanings

- What is encoded and what is implied/dependent on the interplay of the verb and external factors?
- Argument structure lexically encoded
- Claim:
Five- to seven-year-old children know the argument structure and relevant operations (decausativization), yet the verb's base entry influences processing (resulting in non-adult-like behaviour)




Intransitive verbs

1) the pirate  danced

Pirate: agentive cause of dancing
Unergative verb


2) the pirate  fell

Pirate: undergoer of falling
Unaccusative verb




Structural differences

- Auxiliary Selection:
 - Unergative verbs select *have*:
(3a) De clown heeft gedanst (the clown has danced)
 - Unaccusative verbs select *be*:
(3b) De clown is gevallen (the clown is fallen)
- Impersonal passive construction:
 - Unergative verbs do passivize
(4a) Er werd gedanst (There was being danced)
 - Unaccusative verbs do not passivize
(4b) *Er werd gevallen (*There was being fallen)



Processing intransitive verbs

- The distinction between unaccusative and unergative verbs is reflected in processing (Bever and Sanz 1997, Friedmann et al. 2008, Poirier et al. 2011, Koring et al. 2012, Agnew et al. 2014, Shetreet & Friedmann 2012)
- The argument of unaccusative verbs is *reactivated* 750 ms. after verb offset, whereas the argument of unergative verbs gives rise to an early reactivation



Delay in reactivation

- Reactivation =
Semantic integration of argument and verb
- Incremental nature of the parser
- Delay as a result of a structural reanalysis

(5a) The pirate, _t [_{VP} danced]

(5b) The pirate, [_{VP} disappeared _t]

Inchoative/causative alternation



- (6a) The sword broke
 (6b) The pirate broke the sword
- (7a) The pirate disappeared
 (7b) *The captain disappeared the pirate
- Bowerman (1996: 454)
 (8) I saw a witch and she disappeared them

Transitive intransitives



- If forced to provide a meaning for an unaccusative verb in a transitive structure, participants are more likely to provide a causative meaning for unaccusatives than for unergatives

- (9a) The zum will arrive the nuk
 (9b) The zum will laugh the nuk

(Deal 2007)

Cause

(Levin & Rappaport Hovav 1995, Reinhart 2000/to appear)



- By itself

- (8a) De sleutel verdween vanzelf
 The key disappeared by-itself
- (8b) #De piraat danste vanzelf
 #The pirate danced by-itself
- (8c) De piraat danste uit zichzelf
 The pirate danced out himself

Defining the set of unaccusatives

(Reinhart 2000/to appear, cf. van Hout 1996/2012 a.o.)



- Causative verbs as the source of unaccusatives
 - Transitive alternate possible in some language
- Inhibition of the causative alternate in processing

Research Question



How do children process **unaccusative**
 and **unergative** verbs?

Children's processing



- Incremental nature of the parser (Fernald et al. 2001, Huang & Snedeker 2011, Sedivy et al. 2000, Sekerina & Brooks 2007)
 - Difficulty reanalysing previous commitments (Trueswell et al. 1999, Meroni & Crain 2003, Orfittelli & Hyams 2012)
 - Also observed in saccade latencies (Ross et al. 1994, Salman et al. 2006)
- Harder to discard the causative alternate

Predictions

- How is this reflected in processing?
1. No distinction between unergative and unaccusative
 2. Adult-like (delay in reactivation)
 3. A bigger delay
 4. Early, long lasting reactivation



Visual World Paradigm

(cf. Tanenhaus et al., 1995)

- No-task task: sit back, relax and watch pictures
- People look to a visual object (*key*) upon hearing a related word (*lock*) (Yee and Sedivy, 2006; Huettig and Altmann, 2005)
- "eye movements do not reflect the unfolding language; they reflect an unfolding (mental) world" (Altmann and Kamide, 2007)
- One of the visual objects is semantically related to the argument of the intransitive verb

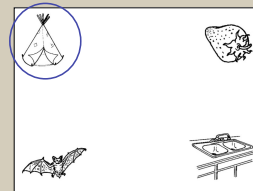


Hypothesis at work

- People will look to a visual object upon hearing a semantically related word
- People will look back to this visual object upon hearing the verb because the argument gets reactivated
- Hence, reactivation will result in an increase in looks to the related visual object in the region around the verb



Visual display



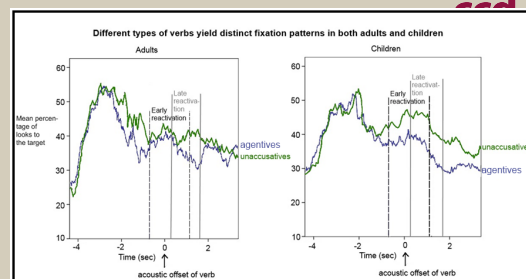
Test sentence:

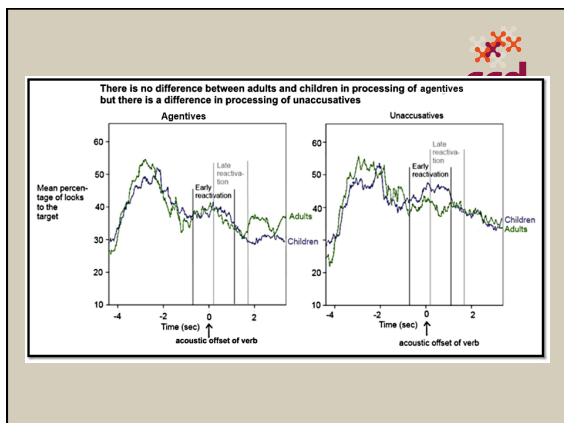
(10) Captain Willem said that *the Indian* (argument) with the tanned skin quietly *cried* (V) when the pirates had sneakily pooped on the grass



Testing children

- 79 five to seven-year-old children
 - 30 adults as a control group
- Test sentences embedded in a pirate story
- A fixation dot (actually a compass) appeared in the middle of the screen during the test sentences to force children to look away from the target
- Total of 12:58 minutes





Recapitulate



- Argument reactivation with unaccusative vs. unergative verbs
- Suppression of causative entry
- Delay as the result of a structural reanalysis
- More interference of causative alternate?

Discussion



- Children do distinguish between unaccusative and unergative verbs
- No delay: Early and long-lasting (not adult-like)
- Inhibition difficulty
- Which unaccusatives do not have a causative counterpart in my language?

Grammar and processing



- Match between computation and processing
- No need to stipulate "simple" processing heuristics (e.g. Ferreira 2003, Dabrowska 2010)