Immediate Use of Context in Aspectual Coercion – An Eyetracking during Reading Study

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Event types in language

Coercion: Implicit transitions from one class to another
An odd sentence?

(1)  *Yesterday, Peter jogged in thirty minutes.*

- Activity predicates are generally bad with *in*-adverbials (Vendler 1957, Dowty 1979 a.o.)
- *In*-adverbials modify accomplishments
- Activities are of the wrong semantic ‘type’ to serve as input
- Nevertheless, sentences such as (1) do occur
- (1) illustrates one type of coercion: Aspectual enrichment
  
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Two views on semantic composition

Encapsulated Composition

The semantic processor operates encapsulated from context. Context is only considered if a) lexical items need contextual support or b) compositional conflicts trigger coercion.

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Can discourse context eliminate coercion costs? The case of complement coercion

- Traxler et al. 2005, eyetracking during reading:

  (2)  
  (c1) The student started a book in his dorm room.
  (c2) The student read a book in his dorm room.
  (t1) Before he started it, he checked his e-mail.
  (t2) Before he read it, he checked his e-mail.

- Coercion costs in context sentence (c1), but not in target sentence (t1)

  ▶ The anaphor *it* is immediately linked to the relevant event in the discourse representation

- What kind of anaphor is ‘it’: individual or event anaphor?

  (3) If Timmy_i hits John_j, it_i/j/*k will cause a fight.  (Asher 1993, p. 233)
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The case of aspectual coercion

+telic) Half a year ago, Peter started to jog four kilometers every day. When he began, he was quite slow but now he is really fast.

–telic) Half a year ago, Peter started to jog every day. When he began, he had to stop after a short time but now he can run for quite a long time.

coerc) Als es ihm heute gelang, in nur dreißig Minuten zu joggen, war er sehr stolz auf sich.

contr) Als es ihm heute gelang, ganze dreißig Minuten zu joggen, war er sehr stolz auf sich.

‘When he managed today to jog in only / for thirty minutes he was very proud of himself.’
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Design of the experiment

- Can supportive context completely eliminate coercion costs during online comprehension?
- Three discourse conditions:
  - ENRICHMENT: telic context + coercion sentence
  - CONTROL: atelic context + control sentence
  - MISMATCH: atelic context + coercion sentence

- Interindividual differences? Immediate integration of context modulated by working memory (WM) capacity?
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Linking the hypotheses to eyetracking measures

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**Encapsulated composition**
1. **Coercion operation triggered by type mismatch**
   - first-pass reading of act.
   - verbs:
     - ENRICHMENT > CONTROL
2. Pragmatic enrichment using context info
   - ‘later’ effects, modulated by WM capacity
3. Metalinguistic evaluation

**Composition in context**
1. No compositional conflict, representation with an open slot for culmination
   - first-pass reading:
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Pretesting underlying assumptions

Out of context...
- COERCION sentences should be hardly comprehensible
- CONTROL sentences should be fully acceptable

In context...
- COERCION should be fully acceptable after telic contexts
- COERCION should lead to semantic mismatch following atelic contexts
- CONTROL should be fully acceptable after atelic contexts

- Pretest 1: sentence acceptability ratings (N=20)
- Pretest 2: discourse acceptability ratings (N=30)
Pretest results

Interpretation of experimental materials in line with our assumptions
Eyetracking experiment – Methods

- 48 native German speakers
- Eyetracking during reading of three sentence texts
  - First-pass reading: first fixation durations, first-pass times, proportions of regression out
  - ‘Late’ measures: total times, second-pass times, proportions of regression in
- 24 items + 66 filler discourses (50% sensible overall)
  - globally incoherent fillers, e.g. Lisa is very bad in maths. . . . So, she wasn’t surprised when she got an A.
  - locally incoherent fillers, e.g. The jockey sat in his horse . . .
- Sensicality judgment after each trial
- WM capacity measured via experimenter-controlled reading span task (Friedman & Miyake 2004)
  - 19 low span readers: $\varnothing$ 2.4; range 2.0–2.5
  - Median group (N=10): 3.0
  - 19 high span readers: $\varnothing$ 3.7; range 3.5–4.5
Sample display, regions of interest (ROIs), measures

- First fix. duration = rt(4)
- First-pass time = rt(4,5)
- Regression out = yes
- Total time = rt(4,5,8)
- Second-pass time = rt(8)
- Regression in = no
Mismatch effect at verb ROI, but no coercion effect
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First-pass reading – Proportions of regression out

Readers launched regressions from mismatching verbs but not from predicates in need of coercion
‘Late’ measures – Proportions of regressions in

- Mismatch condition: backtracking to adverbial ROIs
- Enrichment = control
‘Late’ measures – Total time (and second-pass time)

Mismatch and coercion effects

Coercion effect due to pragmatic enrichment?

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‘Late’ measures – Total times contingent on WM

- Coercion (and, at verb ROI, mismatch) effects but no differences between WM groups
- Analyses of second-pass times: same pattern of effects
Conclusions

- Evidence against *Encapsulated Composition*
  - Entirely different timing of mismatch and coercion effects
  - No evidence for a type conflict as triggering configuration in aspectual enrichment

- Coercion effect in total and second-pass times, two potential sources:
  - Reaccessing the particulars of the event information introduced in the first context sentence
  - Metalinguistic evaluation of the discourse in order to judge its semantic well-formedness

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Thank you for your attention!

Many thanks to Salome Mauthe and Maximilian Müller for help in constructing the experimental materials and conducting the experiments.
Second-pass times

- Sign. mismatch effects at all three adverbial ROIs and verb ROI
- Sign. coercion effect at verb ROI