“I like work: I can sit and look at it for hours”

type clash vs. plausibility in covert event recovery

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1. Covert Events (CE)

- the **trigger** problem: what triggers CEs?
  ➜ type-clash hypothesis
- the **range** problem: what CEs are triggered?
  ➜ qualia structure hypothesis
  (Pustejovsky 1995, Jackendoff 1997)

	Example		Interpretation	Paraphrase
EV	begin the **afternoon**	➪	✔ no-CE: begin(afternoon) ✘ CE: begin(CE(afternoon))	
EN	begin the **newspaper**	➪	✘ **no-**CE: begin(newspaper) ✔ CE: begin(CE(afternoon))	begin **reading** the newspaper
EN/EV	begin the **breakfast**	➪	**?** no-CE: begin(breakfast) **?** CE: begin(CE(breakfast))	begin **eating** the breakfast

2. Open issues in CEs

- the **trigger** problem: CEs can be triggered for EV and EN/EV nouns, depending on context

–*“I like work: I can sit and look at it for hours”* (J. K. Jerome)
–*Mary began the translation*
➜ began the translation process (EV)
➜ began **reading/revising/typing** the translation (EN)
–John is a famous wrestler. He really enjoyed the fight tonight.
–John is a wrestling fan. He really enjoyed the fight tonight.
➜ enjoyed **watching** the fight

- the **range** problem: the range of CEs can go beyond qualia-structure-determined events

– One friend works in the kitchen, helping with food
  ➜ help **cooking/preparing** food
– I need help with dog food
  ➜ help **choosing/selecting** food

3. An alternative hypothesis: plausibility-driven recovery

1. **candidate retrieval**: a number of CE interpretations ce are activated, showing high plausibilities Plaus(v, ce, $o|c$);
2. **CE triggering**: Plaus(v, ce, $o|c$) for the selected interpretations are compared to Plaus(v, $o|c$);
   1. if Plaus(v, $o|c$) is high enough to warrant non-CE interpretation, then no CE is retrieved;
   2. if instead the most plausible interpretation involves a CE, then the CE interpretation is selected;
3. **CE range**: the most plausible CE interpretation for v, o given c is selected and the meaning of e is integrated into the sentence meaning.

4. Method of inquiry

Web-based elicitation study (crowdsourcing):

- trigger problem:
  correlation between EN/EV and CE/no-CE
- range problem:
  elicit CEs and explore their range

Task: e.g. *“Jan enjoyed the automobile”*

– CE/no-CE: does the sentence involve an additional activity that is not mentioned in the sentence?
– elicited CEs: if yes, please give an example

5. Design and materials

Design: 2 (verb factor) x 3 (object factor)
Materials: 10 <EN, EV, EN/EV> triplets, each in two contexts (begin-verbs vs. spot-verbs)

- **EN:** Keith enjoyed/approved the automobile on the premises of the company
- **EV:** Daniel enjoyed/approved the conference on the premises of the company
- **EN/EV:** Walter enjoyed/approved the translation on the premises of the company.

- Participants: 15 participants from the US

6. Analysis 1: CE vs. no-CE

- low agreement (α = .35) but good agreement with GS (α = .6)
- *answer ~ obj_type * verb_type*:
  sign. effect obj_type ($p < 0.001$) and verb_type ($z = -8.322$; $p < 0.001$)
  with interaction ($p < 0.001$)

condition	CE	no-CE
begin,EN	63%	37%
spot,EN	11%	89%
begin,EN/EV	39%	61%
spot,EN/EV	6%	94%
begin,EV	18%	82%
spot,EV	6%	94%

- **the type-clash hypothesis is not enough**
  ➜ exceptions possible
  ➜ what is a “begin-verb”?
  ➜ behavior of EN/EV objects highly lexically determined

condition	V-obj. pair	CE	no-CE
begin,EN	begin the newspaper	89%	11%
begin,EN/EV	begin the breakfast	81%	19%
begin,EN	enjoy the automobile	50%	50%
begin,EN/EV	enjoy the translation	39%	61%
spot,EN	remember the brandy	34%	66%
begin,EV	enjoy the conference	24%	76%
spot,EV	remember the revolt	10%	90%
spot,EN/EV	remember the shower	8%	92%
begin,EV	endure the revolt	3%	97%
spot,EN	approve the automobile	0%	100%
spot,EN/EV	organize the breakfast	0%	100%
spot,EV	organize the afternoon	0%	100%

7. Analysis 2: Range of elicited CEs

- average 1.4 CEs per VP and participant (1-6)
- average 3.2 CEs per VP when participant only elicited 1 CE (1-7)

- **EN:** consider the butter ➜ 8 CEs: eat (x4), add, buy, churn, cook with, eat, make, melt
- **EV:** start the semester ➜ 3 CEs: spend, teach, join
- **EN/EV:** prefer the collection ➜ 6 CEs: view (x3), buy, discuss, polish, study, watch

- average 5 CEs per VP across participants 1-15)

- **EN:** start the portrait ➜ 9 CEs: paint (x20), draw (x4), critique (x3), hang (x2), model (x2), sketch (x2), admire, pose for, review
- **EV:** enjoy the conference ➜ 4 CEs: attend (x3), hold (x2), participate in, watch
- **EN/EV:** finish the harvest ➜ 15 CEs: gather (x5), collect (x4), plan (x3), reap (x3), sell (x3), load (x2), store (x2), cook, eat, enjoy, jar, package, pick, pull, ship

	tot	QS CEs		other CEs
		agentive	telic	
elicited CEs (tokens)	542	132 24.3%	162 29,9%	248 45.8%
elicited CEs (types)	205	31 15.1%	25 12.2%	149 72.7%

- **the qualia-structure hypothesis is not enough**

8. Conclusions

- An alternative mechanism: plausibility
- CEs also for EV nouns and wide range of recovered CEs
- the type-clash and the QS hypothesis are not enough
- highly lexically determined CE interpretation

9. Next steps:

- Self-paced reading study, expectations:
  ➜ RT for EN > RT for EV (TC hypothesis)
  ➜ RT for EN/EV highly lexically determined
  ➜ correlation RT - plausibility estimations
- Computational modeling: estimating plausibilities from corpus data
  (Erk et al. to appear)

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