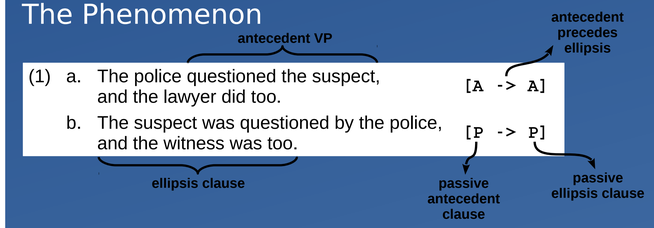
Against memory accounts of asymmetries in voice-mismatched VP-ellipsis

Till Poppels & Andrew Kehler

UCSD

Background

The Phenomenon



VP-ellipsis **less acceptable** under **voice mismatch**:

(2) a. The suspect was questioned by the police, and the lawyer did too. `[P -> A]`

b. The police questioned the suspect, and the witness was too. `[A -> P]`

2 key empirical findings:

- **Mismatch penalty**: (2) less acceptable than (1)
  (Kehler, 2000; Kertz, 2013; Frazier, 2013; but see Merchant, 2013)
- **Mismatch asymmetry**: (2b) is less acceptable than (2a)
  (Arregui et al., 2006; Kim et al., 2011; Kim & Runner, 2018; Parker, 2017)

The Recycling Hypothesis (Arregui et al., 2006; Frazier, 2013; inter alia)

- **Grammar:** mismatches are ungrammatical
- **Processing:** non-identical antecedents can be "recycled"
- **Memory asymmetry:** passives **misremembered** as active more readily than actives are misremembered as passive (Mehler, 1963):

(3) a. ~~The suspect was questioned by the police,~~ and the lawyer did too. `[A -> A]`

b. The police questioned the suspect, and the witness was too. `[A -> P]`

- **Memory asymmetry** causes **mismatch asymmetry**:
  - greater **"illusion of grammaticality"** for [P → A] mismatches like (2a)
  - more exposure to [P → A] as **speech errors** (syntactic blends)

Content-addressable memory (CAM) model

(Lewis & Vasishth, 2005; Parker, 2017; see also Martin & McElree, 2008)

- **Ellipsis resolution:** retrieving antecedent VP from memory
- **Ellipsis clause:** retrieval cues (mis)match antecedent features
- **Markedness:** voice cue more misleading for marked passive voice

	antecedent features		retrieval cues (ellipsis clause)	
(2a) [P -> A]	Voice: Marking:	passive marked	Voice: Marking:	active unmarked
(2b) [A -> P]	Voice: Marking:	active unmarked	Voice: Marking:	passive marked

Table 1. Schematic representation of retrieval cues and antecedent features involved in (2), with misleading retrieval cues in **red**.

Methods

Research Question:	**3 experiments, each with:**
What drives mismatch asymmetry? Do memory constraints play a role?`	• 2x2 design: Mismatch x Voice • 30 participants, 24 experimental items • 48 (un)acceptable fillers, like (4)

Examples of (un)acceptable filler items:

(4) a. The thief was arrested and his brother was as well. (acceptable)
b. A proof that God exists doesn't. (unacceptable)

Stimuli & Results

Experiment 1

(5) a. The report was first read by the judge, and then the lawyer did too. `[P -> A]`

b. The judge read the report first, and then the confession was. `[A -> P]`

c. The judge read the report first, and then the lawyer did too. `[A -> A]`

d. The report was first read by the judge, and then the confession was too. `[P -> P]`

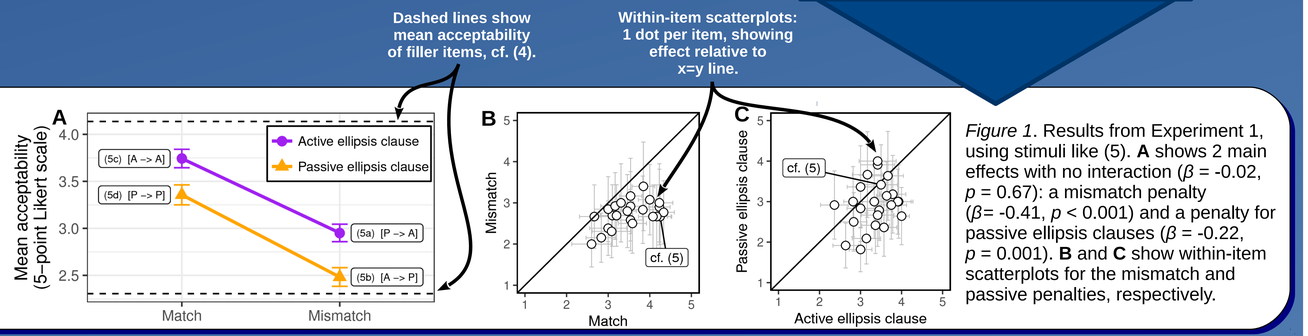


Figure 1. Results from Experiment 1, using stimuli like (5). **A** shows 2 main effects with no interaction (β = -0.02, p = 0.67): a mismatch penalty (β= -0.41, p < 0.001) and a penalty for passive ellipsis clauses (β = -0.22, p = 0.001). **B** and **C** show within-item scatterplots for the mismatch and passive penalties, respectively.

Experiment 2

(6) a. The report was first read by the judge **before** the lawyer did. `[P -> A]`

b. The judge read the report first, **before** the confession was. `[A -> P]`

c. The judge read the report first, **before** the lawyer did. `[A -> A]`

d. The report was first read by the judge, **before** the confession was. `[P -> P]`

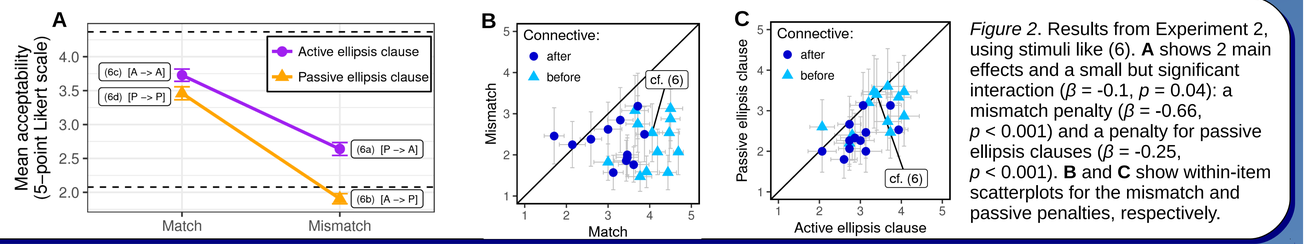


Figure 2. Results from Experiment 2, using stimuli like (6). **A** shows 2 main effects and a small but significant interaction (β = -0.1, p = 0.04): a mismatch penalty (β = -0.66, p < 0.001) and a penalty for passive ellipsis clauses (β = -0.25, p < 0.001). **B** and **C** show within-item scatterplots for the mismatch and passive penalties, respectively.

Under cataphora, ellipsis clause *precedes* antecedent.

Experiment 3

(7) a. **Before** the lawyer did, the report was first read by the judge. `[P <- A]`

b. **Before** the confession was, the judge read the report first. `[A <- P]`

c. **Before** the lawyer did, the judge read the report first. `[A <- A]`

d. **Before** the confession was, the report was first read by the judge. `[P <- P]`

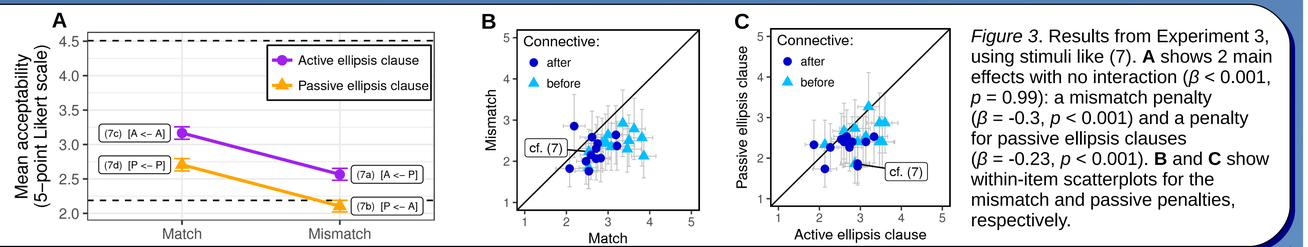


Figure 3. Results from Experiment 3, using stimuli like (7). **A** shows 2 main effects with no interaction (β < 0.001, p = 0.99): a mismatch penalty (β = -0.3, p < 0.001) and a penalty for passive ellipsis clauses (β = -0.23, p < 0.001). **B** and **C** show within-item scatterplots for the mismatch and passive penalties, respectively.

Discussion

2 key results:

- No **order effect** (Expt 3)
- **Passive penalty**

before* vs. *after

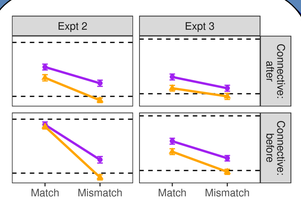


Figure 4. Results from experiments 2 and 3 by connective. Interaction in experiment 2 is driven by *before* items.

Against memory accounts:

- **Recycling Hypothesis**: predicts order effects
- **CAM approach**: silent on cataphora (Expt 3)

Mismatch penalty and passive penalty explain all results, except for *before* items in Expt 2 (cf. Fig. 4).

Possible explanations:

- Ceiling effect
- Veridicality: under QUD analysis of passive penalty (see right), *before* clauses may be analyzed as non-assertive

New puzzle: passive penalty

Explanation #1: temporary ambiguity

(8) The report was read by the judge...
a. ...and then the confession was ~~read~~. (VPE)
b. ...and then the confession was ~~next~~. (incomplete sentence)

Prediction: no passive penalty without ellipsis

Explanation #2: QUD analysis

(9) {Who read the report?}
a. The judge read the report and then the lawyer did.
b. The report was read by the judge and then # the confession was.

Prediction: passive penalty even in the absence of ellipsis

Follow-up experiment (Fig. 5) provides tentative support for QUD analysis (data collection ongoing): passive clauses degraded in the absence of ellipsis, though perhaps to a lesser extent.

Work-in-progress

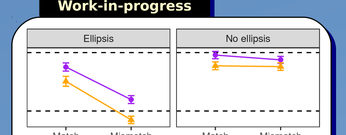


Figure 5. Partial results from follow-up experiment testing non-elliptical variants of (5).

References

Arregui, A., Clifton, C., Frazier, L., & Moulton, K. (2006). Processing elided verb phrases with flawed antecedents: The recycling hypothesis. Journal of Memory and Language, 55(2).
Frazier, L. (2013). A recycling approach to processing ellipsis. In Cheng and Corver (2013).
Kehler, A. (2000). Coherence and the resolution of ellipsis. Linguistics and Philosophy, 23(6).
Kertz, L. (2013). Verb phrase ellipsis: The view from information structure. Language, 89(3).
Mehler, J. (1963). Some effects of grammatical transformations on the recall of English sentences. Journal of Verbal Learning and Verbal Behavior, 2(4), 346-351.
Merchant, J. (2013). Voice and ellipsis. Linguistic Inquiry, 44(1), 77-108.
Parker, D. (2017). Navigating ellipsis structures in memory: New insights from computational modeling. Talk at Corpus-based and Experimental Approaches to Ellipsis workshop.
Martin, A. E., & McElree, B. (2008). A content-addressable pointer mechanism underlies comprehension of verb-phrase ellipsis. Journal of Memory and Language, 58(3), 879-906.
Lewis, R. L., & Vasishth, S. (2005). An activation-based model of sentence processing as skilled memory retrieval. Cognitive Science, 29(3), 375-419.
Kim, C. S., Kobele, G. M., Runner, J. T., & Hale, J. T. (2011). The acceptability cline in VP ellipsis. Syntax, 14(4), 318-354.
Kim, C.S. & Runner, J.T. (2018). The division of labor in explanations of verb phrase ellipsis. Linguistics and Philosophy, 41(1), 41-85. https://doi.org/10.1007/s10988-017-9220-0

Acknowledgements
We are grateful for comments and suggestions from members of the Computational Psycholinguistics Lab at MIT. We further gratefully acknowledge support from NSF grant BCS-1456081.

tpoppels.github.io