

Asymmetries in voice-mismatched VP-ellipsis ¹

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1 The "mismatch asymmetry"

1.1 An example

Consider (1), adapted from Arregui et al. (2006).

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|-----|-------------------|---|----------|
| | antecedent clause | ellipsis clause | |
| (1) | a. | <u>The judge read the report first, and then the lawyer did too.</u> | [A -> A] |
| | b. | The report was first read by the judge, and then <u>the confession was too.</u> | [P -> P] |
| | c. | The report was first read by the judge, and then <u>the lawyer did too.</u> | [P -> A] |
| | d. | The judge read the report first, and then <u>the confession was too.</u> | [A -> P] |

Two empirical findings

- **Mismatch penalty:** (c-d) are less acceptable than (a-b) (Sag, 1976; Kehler, 2002; Kim et al., 2011; SanPietro et al., 2012; Kertz, 2013; note that the theoretical status of this fact, which is irrelevant for our purposes, remains controversial: Merchant, 2013; Kim & Runner, 2018; and many others)
- **Mismatch asymmetry:** [A -> P] less acceptable than [P -> A] (Arregui et al., 2006; Kim & Runner, 2018; Parker, 2017; but note null effect in Kim et al., 2011)

1.2 A memory-based account: the Recycling Hypothesis ²

²The Recycling Hypothesis was first proposed in Arregui et al. (2006) and further defended in Frazier (2013).

- Two explanatory components:
 - **Grammar:** simple syntactic identity \Rightarrow rules out mismatches as ungrammatical
 - **Processing:** RECYCLING of non-ID antecedents \Rightarrow "acceptable ungrammaticality"
- **Memory asymmetry:** passive antecedents are more likely to be misremembered as active than vice versa (Mehler, 1963).
- memory asymmetry \Rightarrow asymmetric **illusion of grammaticality** \Rightarrow mismatch asymmetry: [P -> A] mismatches more likely to be misremembered as [~~P~~A -> A] matches.

- | | | | |
|-----|----|---|------------------------|
| (2) | a. | The report was first read by the judge, and then <u>the lawyer did too.</u> | [P A -> A] |
| | b. | The judge read the report first, and then <u>the confession was too.</u> | [A -> P] |

1.3 The remainder of this talk

- **Thesis:** mismatch asymmetry can't be explained in terms of Recycling
- **Support:** evidence from 3 acceptability judgment experiments
- **Next directions:** preliminary look at alternative, ellipsis-specific explanation (Expt 4)

2 Experiment 1

- **Goals:**
 - Replicate the mismatch asymmetry
 - Test voice-matched controls
- **Methods:** 2x2 design; 30 participants; 24 items like (3), 40 fillers; 5-point acceptability judgment task

2.1 Stimuli (Expt 1)

Expt 1 tested items like (1), repeated in (3).³

- | | | | |
|-----|----|--|---------------------|
| (3) | a. | The judge read the report first, and then <u>the lawyer did</u> . | [A -> A] |
| | b. | The report was first read by the judge, and then <u>the confession was too</u> . | [P -> P] |
| | c. | The report was first read by the judge, and then <u>the lawyer did too</u> . | [P -> A] |
| | d. | The judge read the report first, and then <u>the confession was too</u> . | [A -> P] |
| (4) | a. | The thief was arrested and his brother was as well. | Acceptable filler |
| | b. | A proof that God exists doesn't. | Unacceptable filler |

³ These items were adopted from Arregui et al. (2006). Half of them featured connective 'and' or 'and then', as shown in (3), and the other half employed 'after'.

2.2 Predictions from Recycling (Expt 1)

- **Mismatch penalty:** [P -> A] and [A -> P] less acceptable than [A -> A] and [P -> P]
- **Mismatch asymmetry:** [P -> A] more acceptable than [A -> P]
- **No "match asymmetry":** [A -> A] and [P -> P] should be equally acceptable

2.3 Results (Expt 1)

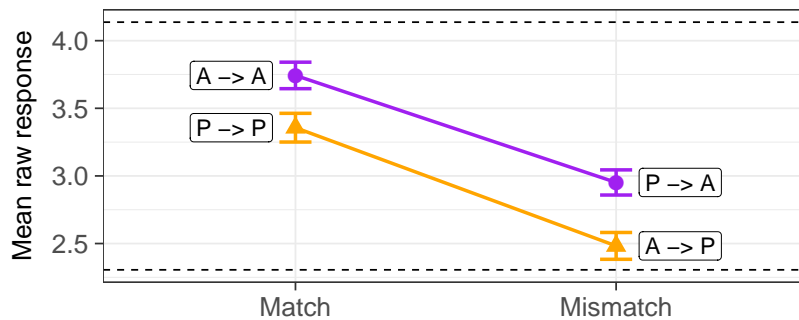


Figure 1: Results from Expt 1. There was a **mismatch penalty** ($\beta = -0.41, p < 0.001$), and a **passive penalty** ($\beta = -0.22, p = 0.001$), but **no interaction** between the two ($\beta = -0.02, p = 0.67$). Statistical results here and throughout are based on linear mixed-effects regression analyses with maximal random effect structure (Barr et al., 2013), and all p -values are derived from likelihood-ratio model comparisons. Dashed lines indicate mean ratings of (un)acceptable elliptical fillers.

- As predicted: **mismatch penalty** and **mismatch asymmetry**
- Contrary to Recycling: “**match asymmetry**”
- Mismatch asymmetry due to **penalty for passive ellipsis clauses**

3 Experiment 2

- **Goal:** introduce subordination (‘before’ or ‘after’ instead of ‘and (then)’)
- **Methods** (same as in Expt 1): 2x2 design; 30 participants; 24 items like (5), 40 fillers; 5-point acceptability judgment task

3.1 Stimuli

- | | | | |
|-----|----|---|----------|
| (5) | a. | The judge read the report first before <u>the lawyer did</u> . | [A -> A] |
| | b. | The report was first read by the judge before <u>the confession was</u> . | [P -> P] |
| | c. | The report was first read by the judge before <u>the lawyer did</u> . | [P -> A] |
| | d. | The judge read the report first before <u>the confession was</u> . | [A -> P] |

3.2 Predictions (same as for Expt 1)

- **Mismatch penalty:** [P -> A] and [A -> P] less acceptable than [A -> A] and [P -> P]
- **Mismatch asymmetry:** [P -> A] more acceptable than [A -> P]
- **No “match asymmetry”:** [A -> A] and [P -> P] equally acceptable

3.3 Results

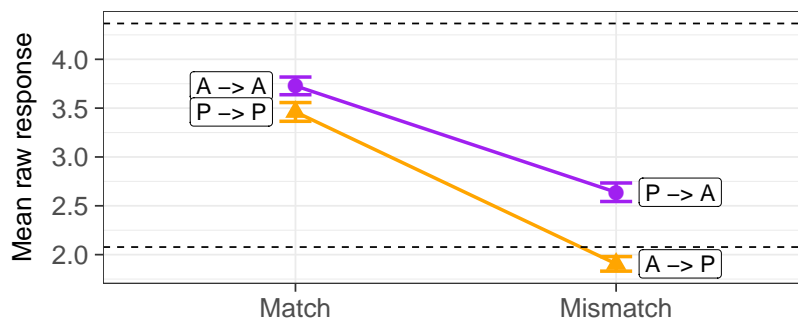


Figure 2: Results from Expt 2. Like Expt 1, Expt 2 revealed significant **mismatch** ($\beta = -0.66, p < 0.001$) and **passive** penalties ($\beta = -0.25, p < 0.001$). Unlike Expt 1, there was also a small, but significant interaction: $\beta = -0.1, p = 0.04$. Dashed lines indicate mean ratings of (un)acceptable elliptical fillers.

- As in Expt 1, 2 main effects:
 - **Mismatch penalty**
 - **Passive penalty**
- Contrary to Expt 1: small, but significant interaction: asymmetry greater in mismatched items than their matched counterparts
- This interaction is driven by items with ‘before’ connective:

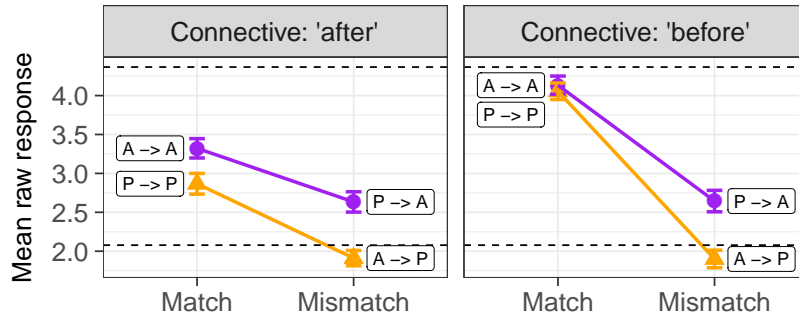


Figure 3: Results from Expt 2, broken up by connective. Dashed lines indicate mean ratings of (un)acceptable elliptical fillers.

4 Experiment 3

- **Goal:** Distinguish passive-penalty and Recycling explanations by manipulating clause order
- **Methods** (same as in Expts 1-2): 2x2 design; 30 participants; 24 items like (6), 40 fillers; 5-point acceptability judgment task

4.1 Stimuli (Expt 3)

- | | | | |
|-----|----|--|----------|
| (6) | a. | Before <u>the lawyer did</u> , the judge read the report first. | [A <- A] |
| | b. | Before <u>the confession was</u> , the report was first read by the judge. | [P <- P] |
| | c. | Before <u>the lawyer did</u> , the report was first read by the judge. | [A <- P] |
| | d. | Before <u>the confession was</u> , the judge read the report first. | [P <- A] |

4.2 Predictions (Expt 3)

- **Passive penalty explanation:** if mismatch asymmetry is driven by passive penalty, [P <- A] should be **less acceptable** than [A <- P]
- **Recycling explanation:** if asymmetry is due to asymmetrically noisy memory for past material, [P <- A] should be **more acceptable** than [A <- P] (cf. (7) and (8))

Logic behind Recycling prediction:

Without cataphora, repeated from (2):

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|-----|----|---|------------------------|
| (7) | a. | The report was first read by the judge before <u>the lawyer did too</u> . | [P A -> A] |
| | b. | The judge read the report first before <u>the confession was too</u> . | [A -> P] |

Under cataphora, the predictions flip:

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|-----|----|--|------------------------|
| (8) | a. | Before <u>the lawyer did</u> , the report was first read by the judge. | [A <- P] |
| | b. | Before <u>the confession was</u> , the judge read the report first. | [P A <- A] |

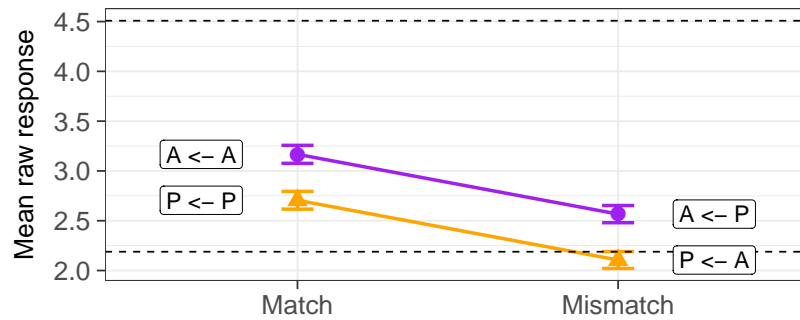


Figure 4: Results from Expt 3. There was a mismatch penalty ($\beta = -0.3, p < 0.001$), a passive penalty ($\beta = -0.23, p < 0.001$), and no interaction between the two ($\beta = 0.001, p = 0.99$). Dashed lines indicate mean ratings of (un)acceptable elliptical fillers.

4.3 Results (Expt 3)

- As in Expts 1 and 2: **mismatch penalty** and **passive penalty**
- Contrary to Recycling: **mismatch asymmetry did not flip**

4.4 Discussion (Expt 3)

- **Passive ellipsis clauses remain degraded** even when they *precede* the antecedent (despite being subject to misremembering), which is **inconsistent with Recycling** account
- Across Expts 1-3, we found 2 independent main effects:
 - mismatch penalty
 - passive penalty
- Expt 4: are these effects ellipsis-specific?

5 Experiment 4

- **Goals:**
 - Replicate Expt 1
 - Test if passive penalty is specific to ellipsis
- **Methods:** 2x2x2 design; 60 participants; 24 items like (9), 40 fillers; 5-point acceptability judgment task

5.1 Stimuli (Expt 4)

In addition to the VP-ellipsis variants in (3), Expt 4 tested their non-elliptical counterparts:

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|-----|----|---|---------|
| (9) | a. | The judge read the report first, and then the lawyer read it. | [A - A] |
| | b. | The report was first read by the judge, and then the confession was read too. | [P - P] |
| | c. | The report was first read by the judge, and then the lawyer read it too. | [P - A] |
| | d. | The judge read the report first, and then the confession was read too. | [A - P] |

5.2 Predictions (Expt 4)

- Replicate results from Expt 1: mismatch and passive penalties
- If mismatch penalty and passive penalty are ellipsis-specific effects, they should **disappear in non-elliptical variants**.

5.3 Results (Expt 4)

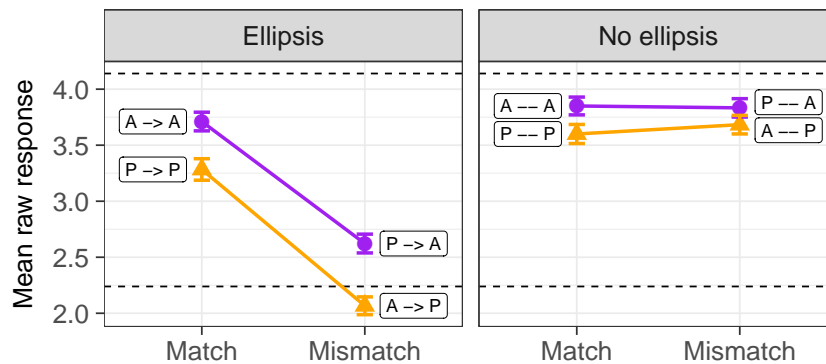


Figure 5: Results from Expt 4. Left: full replication of Expt 1. Right: Non-elliptical item variants revealed **no mismatch penalty**, and a substantially reduced, statistically **marginal passive penalty**: $\beta = -0.1, p = 0.068$. Dashed lines indicate mean ratings of (un)acceptable elliptical fillers.

- Full replication of Expt 1
- **No mismatch penalty** without ellipsis
- **No (or much reduced) passive penalty** without ellipsis

6 Conclusion

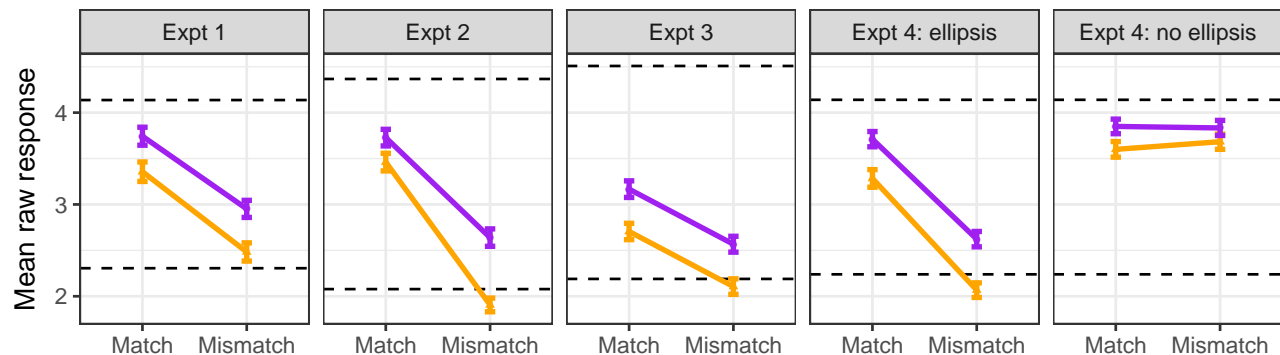


Figure 6: Overview of results from Expts 1-4. Orange lines indicate items with passive ellipsis clauses, which were consistently less acceptable across all experiments.

- **Main take-away:** mismatch asymmetry can't be explained in terms of Recycling
- Evidence is inconsistent with memory-based accounts more generally, e.g. Parker (2017) or Xiang & Klafka (2018)
- New puzzle: ellipsis-specific passive penalty

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