Abductive inferences in discourse: complex causes
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Synopsis
In an eyetracking study of German discourses involving the causal conjunction *weil* *because*, we compared the processing of partial and full explanations while manipulating the influence of world knowledge.

Research questions
- How are partial explanations processed?
- What role does world knowledge play?
- Interaction with the ordering of discourse?

Bayesian modeling: Theoretical considerations and predictions

**Novelty vs. Anomaly**

- *weil* cause2, effect: establish causal network between cause2 and effect.
- Insufficient causal information; triggering abduction – novelty: no known causal connection – anomaly: causal connection between negation of cause2 and effect known.

**Novelty**

- *weil* 1. Weil auf Bank gesetzt (C2=1)
- Ausschlag bekommt... (E=1)
- Peter had a skin rash because he sat on the bench.

**Anomaly**

- *weil* 1. Weil Blumen m. Eimer entsorgt (C2=1)
- Blumen eingeengange... (E=1)
- Mary disposed of turpentine in the bucket.

**Pre-condition context** (introduces discourse referents)

- **Conditions** (only novelty, for anomaly cf. (1a)/(b))
- *weil* cause1 and cause2, effect. (control)
  - *weil* cause1 and cause2, effect.
  - *weil* 1. Weil Blumen m. Eimer entsorgt (C2=1)
  - Blumen eingeengange... (E=1)

- *weil* cause2, effect. (left dislocation)
  - *weil* 1. Weil Blumen m. Eimer entsorgt (C2=1)
  - Blumen eingeengange... (E=1)

- *weil* cause2, effect. (right dislocation)
  - *weil* 1. Weil Blumen m. Eimer entsorgt (C2=1)
  - Blumen eingeengange... (E=1)

- **Post-condition context**
  - *weil* cause2, effect is kept constant across all conditions.

Materials

**Preconditions for interpreting causal statements in discourse**

- **How are partial explanations processed?**
- **What role does world knowledge play?**
- **Interaction with the ordering of discourse?**

Conclusion and future work

- **Conclusions**
  - *weil* cause2, effect: establish causal network between cause2 and effect.
  - Insufficient causal information; triggering abduction – novelty: no known causal connection – anomaly: causal connection between negation of cause2 and effect known.

**Pretesting causal connectedness**

**Eyetracking experiment**

- **First-pass times**
  - First fixations: Integration
  - *Anomaly: right disl. = control
  - Novelty: right disl. > control
  - But readers encountering anomalous effects, initiated regressions!

- **First-pass regression ratios**
  - How often does regression occur?
  - *A: right dislocation > control
  - N: right dislocation = control

- **Go-past times**
  - Integration and reinspection
  - *A: right dislocation > control
  - N: right dislocation > control

- **Second-pass times**
  - Reinspection duration
  - *A: right dislocation > control
  - N: right dislocation = control

**References**