1. Agreement Attraction and Processing Accounts

Agreement attraction errors are characterized by the verb’s faulty number mismatch with the subject (chemist) and its simultaneous match with the attractor (test tubes).

*The chemist with the test tubes are conducting an experiment.*

They occur during the comprehension of subject-verb dependencies [1,2,3] and are asymmetrical:
- They occur more often with sg subject heads and pl attractors
- They mostly affect ungrammatical sentences, where the subject head and verb mismatch in number

Two alternative accounts based on content-based memory retrieval have been proposed [1,3]:

(i) Memory retrieval account
- Cue-based retrieval always occurs during agreement processing
- Verb number is used as a cue to retrieve subject

(ii) Error-driven account
- Reanalysis specifically caused by subject-verb number mismatch
- Cue-based retrieval to find matching noun to resolve mismatch

2. Link to the P600

The P600 has been interpreted in terms of reanalysis (e.g. [4]).

Consequences for processing accounts:
- Memory retrieval account → no P600 modulations due to lack of reanalysis
- Error-driven account → P600 modulations due to reanalysis

3. Predictions

(i) P600 for ungrammatical items
(ii) Memory retrieval account
- No reduced P600 in case of agreement attraction (pl, ungram vs sg, ungram)
(iii) Error-driven account
- Reduced P600 in case of agreement attraction (pl, ungram vs sg, ungram)

4. Design

2 × 2 fully-crossed factorial design
- Factor 1: Number of attractor NP (sg vs pl)
- Factor 2: Grammaticality of verb (gram vs ungram)

- 33 participants (26 included into analysis)
- Items presented in RSVP mode (SOA = 450ms)
- Method: ERP technique
- Task: acceptability judgments

5. Materials

120 experimental items (German SOV structures) + 140 filler items

Item structure: matrix clause + subordinate clause I (SOV) + subordinate clause II

<table>
<thead>
<tr>
<th>Condition</th>
<th>Matrix Clause</th>
<th>Subject</th>
<th>Attractor</th>
<th>Adverb I</th>
<th>Adverb II</th>
<th>Verb (critical region)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sg, gram</td>
<td>Pia erzählt, dass der Mann</td>
<td>die Frau</td>
<td>beobachtet</td>
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</table>

6. Results

Linear mixed model:
- Predictors: attraction (-0.5 vs 0.5), grammaticality (-0.5 vs 0.5), their interaction
- Maximal random effects structure

Time window: 600 - 1000ms
Electrode: Pz

Effects:
1. Reliable effect of grammaticality (b=3.00, t=8.82)
- Increased positivity for ungrammatical sentences (sg, ungram, pl, ungram) → P600 effect
2. Reliable interaction of grammaticality and attractor number (b=-2.06, t=-2.73)
- Decreased positivity for ungrammatical sentences with plural attractors (pl, ungram) → agreement attraction effect

7. Conclusion

Reduced P600 if attractor number matches with the ungrammatical verb.

1. Support for error-driven account
- Reduction of P600 as indicator of reduced reanalysis
2. Evidence against memory retrieval account
- Would have predicted no modulation of P600

3. Evidence for error-driven account in a syntactic configuration (SOV structures) different from PP-modifiers (see [5] for comparison)
4. First ERP evidence for agreement attraction in German

8. References