(Mis)interpreting agreement attraction: Evidence from a novel dual-task paradigm

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Subject-Verb Relationship

- Processing a sentence involves establishing
  - agreement relationship between subject and verb
  - semantic relationship between subject and verb

agreement (morphosyntactic)

The boys usually eat apples.

subject          verb

thematic binding (semantic)
Question

Does computing the agreement relation between the subject and verb relate to the computation of the semantic relation?

Q1:
Is there one retrieval operation for both?
One Computation

The boys usually eat apples.

[+ plural, + semantic features]

[plural, semantic cues]

One Retrieval for Agreement Checking & Thematic Binding
One Computation

The boys usually eat apples.

[+ plural, + semantic features]  [plural, semantic cues]

One Retrieval for Agreement Checking & Thematic Binding
Separate Computations

The boys usually eat apples.

[+ plural,
+ semantic features]

[plural,
semantic cues]

Retrieval for Thematic Binding

Retrieval for Agreement Checking
Question

Does computing the agreement relation between the subject and verb relate to the computation of the semantic relation?

Q1: Is there one retrieval operation for both?

Q2: Can processing for one dependency leverage cues for the other dependency?
Separate Computations

The boys usually eat apples.

[+ plural,
+ semantic features]  [plural,
semantic cues]

Retrieval for Agreement (or Thematic Binding)
Question

Does computing the agreement relation between the subject and verb relate to the computation of the semantic relation?

Q1: Is there one retrieval operation for both?

Q2: Can processing for one dependency leverage cues for the other dependency?
Agreement Attraction

*The key to the cabinet are rusty.

*The key to the cabinets are rusty.

↑

attractor

Bock & Miller (1991); Bock & Eberhard (1993); Pearlmutter, Garnsey & Bock (1999); Wagers et al. (2009); Tanner et al. (2014)
Agreement Attraction

*The key to the cabinets are rusty.

Target: does not match all retrieval cues
Attractor: partial match
- facilitative similarity-based interference (misretrieval)
- Eased processing of ungrammatical verbs

Lewis & Vasishth (2005); Wagers et al. (2009); Tanner et al. (2014)
One retrieval operation?

Misinterpretation in Agreement Attraction
• misretrieval for agreement $\rightarrow$ misinterpretation?
• Previous results are mixed

Barker, Nicol & Garrett, 2001; Thornton & MacDonald, 2003;
Pittman & Smyth, 2005; Lau et al., 2008; Patson & Husband, 2016
Dual-task paradigm

Combines
• online measure of processing at the verb (centered SPR)
• speeded interpretive outcome measure (adjective choice)

SPR: *attractor number* x *grammaticality*

“ The bed by the lamp/lamps *was/were* undoubtedly quite…”

Adjective choice: head-matching vs. attractor-matching
(normed for plausibility, N=32)

48 items, N=64

Inspired by Pittman & Smyth, 2005
Dual-task paradigm
Dual-task paradigm

comfortable

bright

time limit: 3000ms
Dual-task paradigm

The **bed** by the **lamp/lamps** **was/were** undoubtedly quite **comfortable**

**bright**

**head-match**

**attractor-match**
The bed by the lamps were undoubtedly quite comfortable or attractor-match.

Predictions: Adjective Choice
SPR Results

Region-by-region average reading times

- Singular Grammatical
- Singular Ungrammatical
- Plural Grammatical
- Plural Ungrammatical

The lamp/lamps was/were undoubtedly quite
SPR Results

Replicates agreement attraction effect

Reading time (ms)

<table>
<thead>
<tr>
<th>Replicates agreement effect</th>
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<tbody>
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<td>*</td>
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attractor noun | verb

280 300 320 340 360 380 400 420 440 460

Singular Grammatical
Singular Ungrammatical
Plural Grammatical
Plural Ungrammatical

the lamp/lamps
was/were
undoubtedly
quite
SPR Results

Frequency of agreement attraction

- grammaticality effect with plural attractor ca. 1/3 of grammaticality effect with singular attractor (15ms vs. 47ms)
- Attraction occurs on no fewer than 2/3 of trials
Adjective Choice Task

% Head-matching adjective choice

condition

singular attractor; gram.
singular attractor; ungram.
plural attractor; gram.
plural attractor; ungram.
Response-Contingent SPR

• Dual-task paradigm allows us to look at RTs profiles by adjective choice
• If retrieval output for agreement feeds interpretation, we expect stronger attraction for trials with attractor-matching response
Adjective choice matched target (head)

Choice of adjective not dependent on attraction outcome

Adjective choice matched attractor
Attraction = Misinterpretation?

No!

• 1. Only very small subset of attraction trials also lead to misinterpretation
• 2. Choice of adjective not dependent on attraction outcome

Suggestion:
Computation of interpretation is not parasitic on retrieval output for agreement checking
Future Directions

Does computing the agreement relation between the subject and verb relate to the computation of the semantic relation?

Q1: Is there one retrieval operation for both?

Q2: Can processing for one dependency leverage cues for the other dependency?

No
Thank you!

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