

Early and late effects of agreement attraction in comprehension

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Agreement attraction in comprehension

Agreement attraction: a grammatical/ungrammatical asymmetry?

Speakers are more likely to erroneously use a plural verb with a singular subject when a plural noun intervenes [1]. Comprehenders are less likely to notice the error in this configuration [2]. This is termed **agreement attraction**:

The **key** to the **cells** are on the table >> The **key** to the **cell** are on the table

A similar pattern can be observed when subject and verb are embedded in a relative clause, a configuration in which the plural noun does not linearly intervene [3,4]:

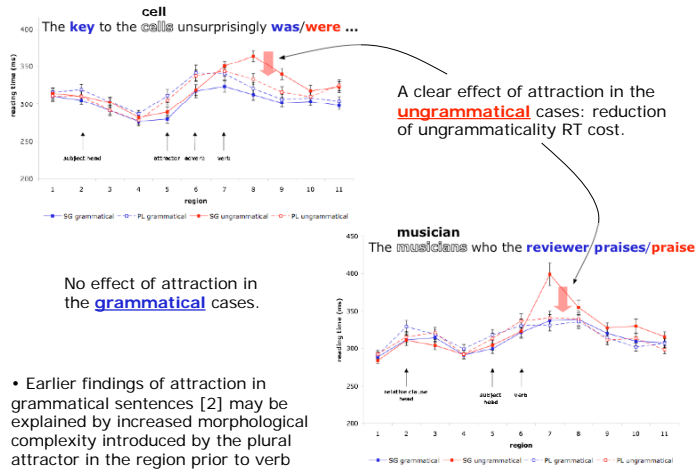
The **musicians** who the **reviewer** praise.. >> The **musician** who the **reviewer** praise..

These examples are usually thought of as **ungrammatical**: the subject head number does not match the verb number. What happens in the comprehension of **grammatical** cases, when subject head and verb match, is crucial for understanding the mechanism by which the attractor

- Does attraction reflect misanalysis of the subject number?
 - Ungrammatical cases get better: **illusion of grammaticality**.
 - Grammatical cases get worse: **illusion of ungrammaticality**.
- Does attraction reflect factors particular to reanalysis of errors?
 - Grammatical cases are unaffected by attractors.
 - Only an illusion of grammaticality** for ungrammatical cases.

S-V agreement comprehension online

We previously examined these predictions in five self-paced reading experiments, for both configurations, and have found **only illusions of grammaticality** [5].



• Earlier findings of attraction in grammatical sentences [2] may be explained by increased morphological complexity introduced by the plural attractor in the region prior to verb

• However, other studies found attractor effects in grammatical sentences in offline, end-of-the-sentence measures [6,7].

• Here we test the same stimuli using an offline judgment task.
-Online data tells us how agreement representation is initially constructed
-Offline data can tell us more about representation comprehenders end up with.

Methods

Procedure: Speeded acceptability judgment task, following RSVP: 300 ms/word, 2 s to respond

Experiments: Run as two experiments, each with 4 PP modifier and 8 RC conditions.

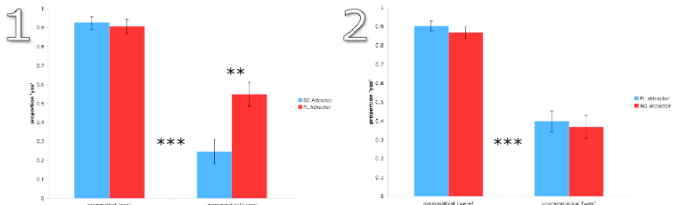
Materials: Examples presented below, 6 items per condition. Consequently, 72 targets per experiment.

Fillers: 56 items per experiment, 50% contain violations, which are unrelated to agreement

Participants: Experiment 1, n=16, Experiment 2, n=24

Offline attraction in PP modifier constructions

SG subject	PL subject
Gram: The key to the cell was rusty...	The keys to the cells were rusty...
Gr/Attr: The key to the cells was rusty...	The keys to the cell were rusty...
Ungram: *The key to the cell were rusty...	*The keys to the cells was rusty...
Un/Attr: *The key to the cells were rusty...	*The keys to the cell was rusty...

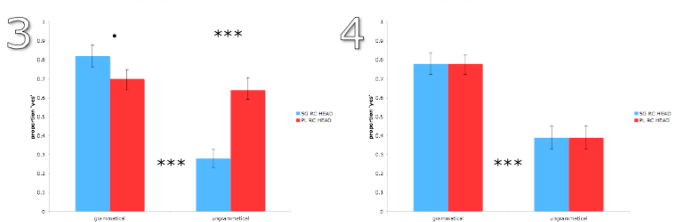


- Strong attraction effect in ungrammatical singular subject cases: Fig. 1, right.
- No attraction effect in grammatical singular subject cases: Fig. 1, left.
- No attraction effect in plural subject cases, replicating previous studies: Fig. 2.

Offline judgments replicate online results: attractor only exerts an effect when subject head and verb do not agree.

Offline attraction in RC subject constructions

SG subject	PL subject
Gram: The player who the coach likes...	The players who the coaches like...
Gr/Attr: The players who the coach likes...	The player who the coaches like...
Ungram: *The player who the coach like...	*The players who the coaches likes...
Un/Attr: *The players who the coach like...	*The player who the coaches like...



- Strong attraction effect in ungrammatical singular subject cases: Fig. 3, right.
- No attraction effect in plural subject cases: Fig. 4.
- Marginal attraction effect in **grammatical** singular subject cases: Fig. 3, left.

Offline judgments largely replicate online results, though a small effect in grammatical sentences is evident.

Subject-object position asymmetry

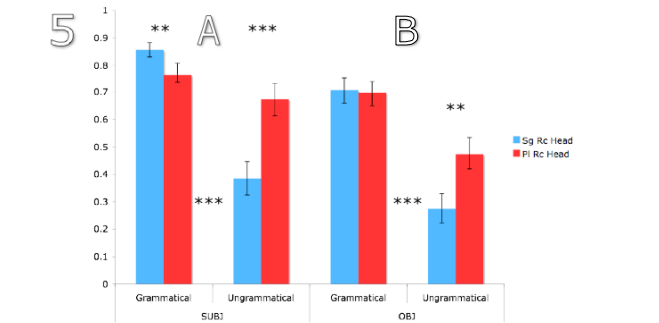
- RC cases show strong attraction effects even though attractor is not intervening
- One explanation is that a plural RC head sets up a prediction for plural marking on the **matrix** verb, which causes the plural verb inside the RC to seem acceptable
- We can test this by looking for attraction in the object position

RC in subject position

The player who the coach likes best...
The players who the coach likes best...
*The player who the coach likes best...
*The players who the coach likes best...

RC in object position

Stacey met the player who the coach likes best...
Stacey met the players who the coach likes best...
*Stacey met the player who the coach likes best...
*Stacey met the players who the coach likes best...



- Replicates small attraction effect in grammatical subject-position RCs: Fig. 5A, left.
- Object-attached RCs show an attraction effect in ungrammatical sentences similar in size to PP modifiers and RCs in subject position: Fig. 5B, right.
- Object-attached RCs do **NOT** show attraction in grammatical sentences: Fig. 5B, left.

Object-attached RCs show the attraction pattern observed in complex subjects: only for ungrammatical sentences.

Discussion

- Offline speeded judgments replicate asymmetrical pattern seen in online measure: **attraction effects are much larger in ungrammatical sentences than grammatical sentences**
- Only subject-position RCs** show any grammatical attraction effect.
 - Contrast with object-position RCs and PP modifiers suggests **not about relative position of subject and attractor**.
 - Given the early position of the error in sentence relative to judgment: error may occur in **regeneration of sentence** rather than in first-pass.
 - Alternately, case ambiguity of RC head and RC embedded subject may lead to modest interference, but only when RC is in subject position [cf. 8]
- Asymmetrical pattern consistent with **predict-and-retrieve model**:
 - Encountering a subject head initiates a **prediction** for verb number
 - If verb number mismatches prediction, a checking process attempts **retrieval** for subject head with matching number cues and sometimes incorrectly retrieves attractor.

References

[1] Bock & Miller, 1991. [2] Pearlmutter, Garnsey & Bock, 1999. [3] Kimball & Aissen, 1971. [4] Deavy cite. [5] Wagers, Lau, & Phillips, under review. [6] Nicol, Forster, & Veres, 1997. [7] Haussler & Bader, cite [8] Badecker & Kuminiak, 2007