Implicit causality: When more than one explanation is missing

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Introduction

It has been shown (de la Fuente 2015; de la Fuente et al., 2016) that focus particles like "only" and "even" give way to a pattern of pronoun production and resolution similar to what has been observed with implicit causality (IC) verbs like "criticize" or "annoy" in (1) where so-called N1-biased verbs like "annoyed" systematically trigger explanations related to the subject (Peter) and N2-biased verbs like "criticized" continuations related to the object (Mary) (e.g. Ferstl et al., 2011; Garvey & Caramazza, 1974; Koornneef et al., 2006).

(1) a. Peter annoyed Mary because … **he** …

b. Peter criticized Mary because … **she** …

Similarly, continuation studies in English and in French, with sentences like (2) using unbiased verbs, showed that "only" systematically triggers continuations related to the antecedent in its scope, while the antecedent in the scope of "even" is systematically dispreferred (de la Fuente, 2015).

(2) a. Only Peter called Mary because … **he** …

b. Even Peter called Mary because … **she** …

Implicit causality and missing explanations:

- IC verbs, when combined with discourse connectives like *because*, create expectations for an explanation about the ensuing discourse that need to be filled to avoid the accommodation of missing information (Bott & Solstad, 2014)
- We assume that the same kind of explanation is at stake for focus particles:
  - "Only" triggers a missing explanation of presupposed exclusivity, i.e. why does only Peter call and nobody else.
  - "Even" involves an implicature of unlikeliness, triggering an explanation of the unlikeliness of Peter calling, i.e. what it is about Mary that makes even him call.

Research questions

Open question: What happens when we combine IC biased verbs with focus particles thus provoking matching or mismatching expectations?

- Are verb bias and FP bias both contributing to missing expectations?
- Can the strong semantic requirements of focus particles override or mask verb biases?

Predictions

If both factors contribute:

- Matching biases (even N2 + N2-biased verb; only N1 + N1-biased verb) where the focus particle and the verb bias demand an explanation related to the same antecedent should trigger the strongest biases since a single explanation can easily be found to fill discourse needs (e.g. "Only Peter fascinates Mary because he is just the best.", "Even Peter criticized Mary because she really messed up this time.").
- In mismatching cases (even N2 + N1-biased verb; only N1 + N2-biased verb), only one of the missing explanations can easily be provided. In (3) we can either explain exclusivity (… because he is never satisfied) or the N2-bias of the verb (… because she had messed up.).

(3) Only Peter criticized Mary because …

If the semantics of focus particles overrides verb bias, "seul" (only) should lead to an N1 bias, "même" (even) to an N2 bias.

Continuation Experiment: Design

Materials

- 2 factors
  - Verb based IC bias (10 N1 verbs, 10 N2 verbs, 10 unbiased verbs) Focus partide based IC bias (seul-N1, même-N2)
- 84 native French participants recruited from the RISC page and via social media
- Continuation task administered via Ibex Farm http://adrummond.net/software
- Participants were provided with 30 sentence onsets distributed across two lists as in Table 1 which they had to complete

	seul	*même*
N1 bias	Seul Marie enchante Adrien parcqu' … 'Only Mary enchants Adrian because …	Même Marie enchante Adrien parcqu' … Even Mary enchants Adrian because …
N2 bias	Seul Pierre félicite Auriane parce qu' … Only Peter congratulates Auriane because …	Même Pierre félicite Auriane parce qu' … Even Peter congratulates Auriane because …
No bias	Seul Pierre fréquente Marie parce qu' … Only Peter visits Marie because …	Même Pierre fréquente Marie parce qu' … Even Peter visits Marie because …

Table 1. Example of sentence onsets used for the continuation experiment

Corpus of French IC-Verbs (Mertz, Amsili, Hemforth, in prep)

- Mertz et al. established a corpus of 300 French Implicit Causality verbs similar to Ferstl et al.'s (2011) corpus of English verbs.
- Verbs were distributed across 5 lists of 60 verbs each and verb biases were estimated from about 60 continuations for each verb.
- 10 N1 biased verbs (+70% N1 choices), 10 N2 biased verbs (+70 % N2 choices) and 10 unbiased verbs (between 45 and 55% N1 choices) were selected for this experiment.

Results

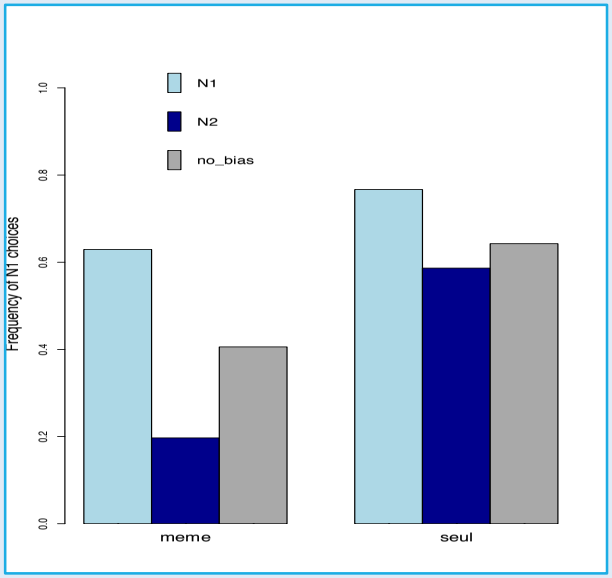
- 94.2 % of the continuations unambiguously referred to N1 or N2.
- Logistic regressions showed:
  - Both, focus particles as well as the IC-bias of the verb have a significant effect (FP: z= 4.471, p<.001; IC-bias: N1/N2: z= -8.932, p<.001; N1/no-bias: z= -4.329, p<.001).
  - As expected, matching cases showed a very strong bias (Only+N1-bias = 79% N1; Even+N2-bias: 81% N2), while mismatching cases were more varied.
  - Completions seem to provide only one of the missing explanations.

Completion examples:

Seul Pierre félicite Auriane parcqu' (Only Pierre congratulates Auriane because…)

… il est heureux pour elle / … he is happy for her.

…elle le merite vraiment. / … she really deserves it.



Conclusion

- **Missing expectations triggered by focus particles or by verb bias both contribute to next mention preferences without one masking the other.**
- **Future research: Are the mismatched cases less acceptable?**

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