Clouds of uncertainty and presupposition projection

RTG 2636 Form-meaning mismatches

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Introduction and Key Points

- Presupposition projection out of **quantified expressions** has been problematic in terms of judgments: Heim (1983) assumes that resuppositions always project universally, but Chierchia (1995) and Chemla (2009) a.o. suggest that a more nuanced view is required.
- Fox (2013) (building on George 2010) maintains that a trivalent system based on a **Strong Kleene** logic, (2) and (3), makes correct predictions for presupposition projection out of quantifiers.
- We test presupposition triggers that occur in the scope of the **attitude predicate** *be certain*, considering the possibility that it is a universal quantifier over possible worlds: it is not a neg-raiser and it triggers an indirect scalar implicature under negation, (1).
- A quantificational approach predicts that *be certain* patterns with a GQ like *everyone*, (4); instead, **Dynamic Semantics** (Heim 1992) generally assumes universal projection for attitude predicates.

(1) Abigail isn't certain that Taro submitted late.
⇝ Abigail is certain that Taro didn't submit late.
⇝ Abigail considers it possible that Taro submitted late.

(2) Strong Kleene truth tables:

∧	T	F	#
T	T	F	#
F	F	F	F
#	#	F	#

∨	T	F	#
T	T	T	T
F	T	F	#
#	T	#	#

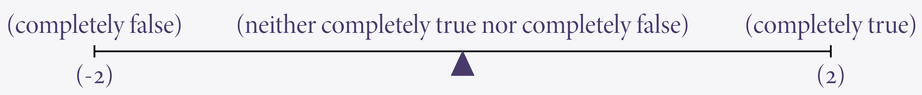
(3) **Projection out of a universal quantifier:**
The truth value of a formula $\forall x \in D\ [\phi(x)]$ is
- T if $\phi(x) = \mathrm{T}$ for all $x \in D$ (**universal** definedness projection for ϕ);
- F if there is an $x \in D$ such that $\phi(x) = \mathrm{F}$ (**existential** definedness projection for ϕ);
- # otherwise (if there is an $x \in D$ such that $\phi(x) = \#$ and no $x \in D$ such that $\phi(x) = \mathrm{F}$).

(4) Taro is **certain** that Aditi **stopped** drinking wine.
- T if Taro is certain that Aditi used to drink wine and stopped.
- F if Taro considers it possible that Aditi used to drink wine and didn't stop.
- # if Taro is either certain that Aditi didn't use to drink wine, or if he is not certain whether she used to drink wine, he is certain that if she used to, she has stopped now.

The Experiment

This experiment aims at testing whether the participants' intuitions match the prediction of the Strong-Kleene-based system or rather a Heimian system for attitude predicates embedding a presupposition trigger where anything but universal satisfaction of the presupposition leads to presupposition failure (modulo local accommodation, cf. Heim 1983, Beaver & Krahmer 2001).

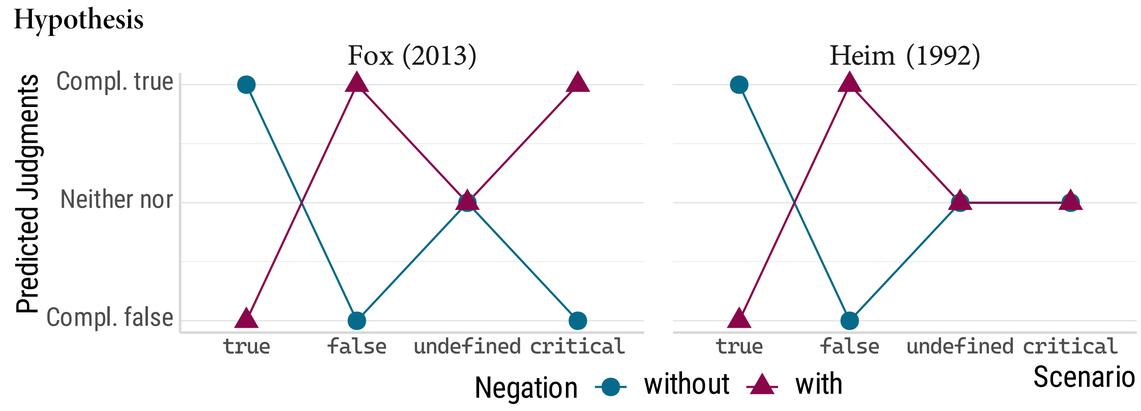
- Continuous trivalent truth-value judgment task (cf. Križ & Chemla 2015)
- 2 × 4 design (within-within; 48 items and participants)
  1. NEGATION: without vs. with matrix negation
  2. SCENARIO: `true` vs. `false` vs. `undefined` vs. `critical`
- The SCENARIO factor was manipulated using the **visual and verbal** context of the critical utterance.
- Presupposition TRIGGER as a pseudo-factor: *stop* vs. *again* (between items, 24 each)



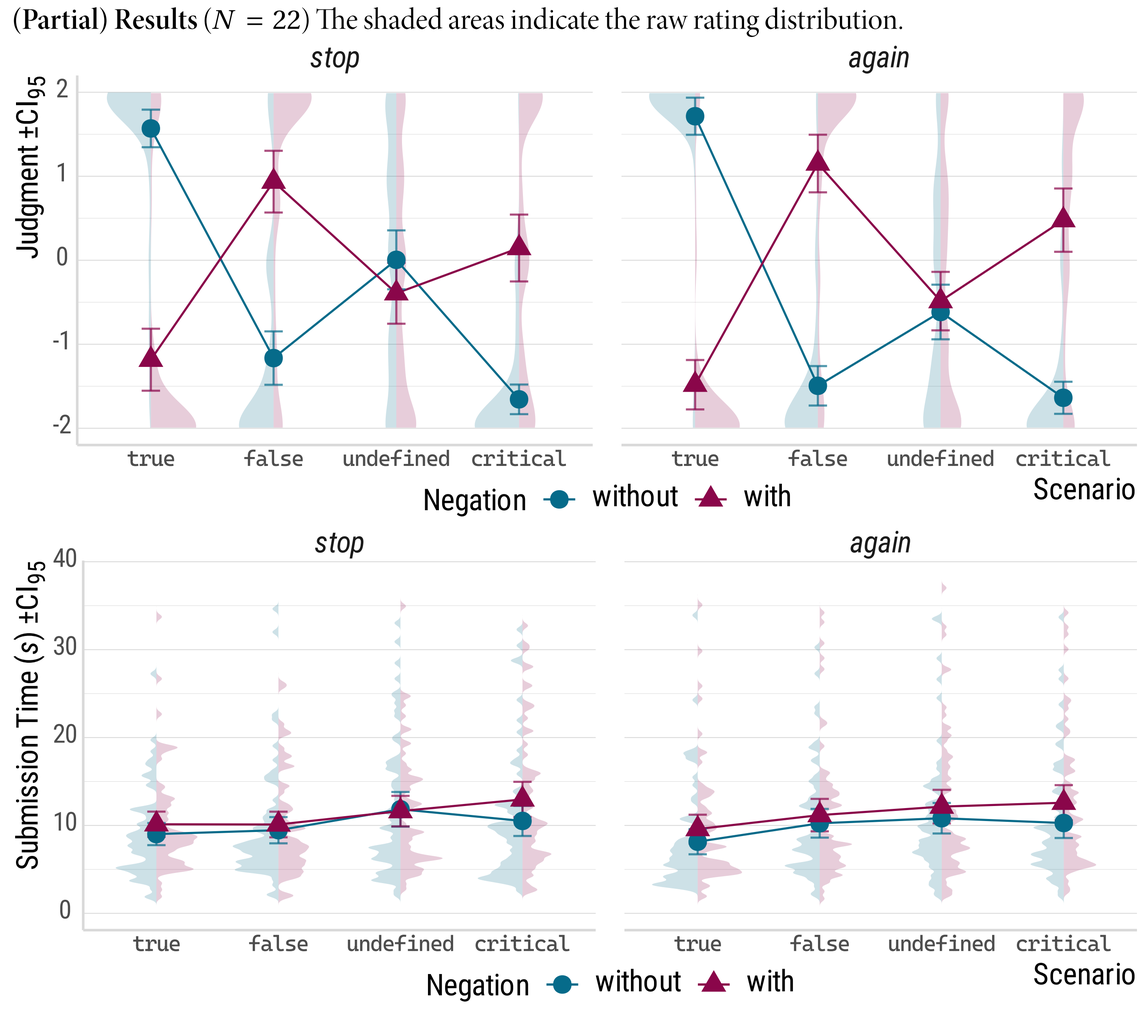
Materials (translated from German)

(5) NEGATION: without TRIGGER: *stop*
- a. SCENARIO: `true`
  Markus: «I'm certain that Sonja drank wine in the past, and I'm certain that Sonja doesn't drink wine now.»
  Markus is certain that Sonja stopped drinking wine.
- b. SCENARIO: `false`
  Markus: «I'm certain that Sonja drank wine in the past, but I have no idea if now, Sonja drinks wine or not.»
  Markus is certain that Sonja stopped drinking wine.
- c. SCENARIO: `undefined`
  Markus: «I have no idea if in the past, Sonja drank wine or not, but I am certain that Sonja doesn't drink wine now.»
  Markus is certain that Sonja stopped drinking wine.
- d. SCENARIO: `critical`
  Markus: «I have no idea if in the past, Sonja drank wine or not, and I have no idea if now, Sonja drinks wine or not.»
  Markus is certain that Sonja stopped drinking wine.

(6) NEGATION: with TRIGGER: *again* SCENARIO: `false`
Marie: «I'm certain that Jan canoed last time, but I have no idea if this time, Jan canoed or not.»
Marie is not certain that Jan canoed again.



(Partial) Results ($N = 22$) The shaded areas indicate the raw rating distribution.



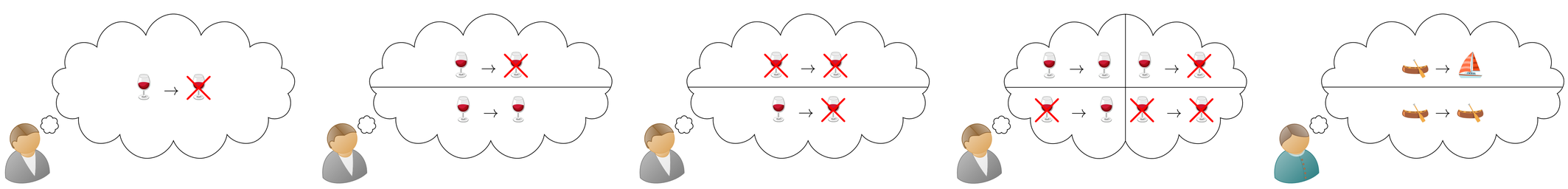
Conclusions and Next Steps

- Our (preliminary) experimental results are better captured by a system where presuppositions project out of *be certain* as third values out of universal quantifiers in a Strong Kleene logic:
  - In the `undefined` scenario, the target sentences receive intermediate judgments for both factor levels of NEGATION;
  - Instead, in the `critical` scenario, NEGATION affects the judgment: without negation, sentences are judged as false; with negation, they receive a higher truth value;
  - The `critical` scenario patterns more like `false` than `undefined`, thus giving support to the prediction of Strong Kleene; a hypothesis of generalized universal projection does not explain the contrast between `undefined` and `critical`;
  - Modals like *be certain* can be treated as quantifiers over possible worlds that behave like quantifiers over entities (cfr. Fox 2013) also in terms of presupposition projection.
- We plan on exploring related research questions using a similar methodology:
  - Can the presupposition projection pattern predicted by Fox (2013) be observed with the same design for quantifiers over entities? (`true` scenario not shown below)

(7) All men stopped drinking wine.

- Does anaphora under *be certain* behave the same as presuppositions (Rothschild 2017)?

• **Beaver**, D. I. & **Krahmer**, E. 2001. A partial account of presupposition projection. *Journal of Logic, Language and Information* 10(2). 147–182. • **Chemla**, E. 2009. Presuppositions of quantified sentences: experimental data. *Nat. Lang. Semant.* 17(4). 299–340. • **Chierchia**, G. 1995. *Dynamics of meaning: Anaphora, presupposition, and the theory of grammar*. • **Fox**, D. 2013. Presupposition projection from quantificational sentences: trivalence, local accommodation, and presupposition strengthening *From grammar to meaning*, 201–232. • **George**, B. 2010. A new case for an old logic: reviving strong Kleene approaches to presupposition projection. Unpublished ms. UCLA. • **Heim**, I. 1983. On the projection problem for presuppositions *WCCFL 2: Second Annual West Coast Conference on Formal Linguistics*, 114–125. • **Heim**, I. 1992. Presupposition projection and the semantics of attitude verbs. *J. Semant.* (9). 183–221. • **Križ**, M. & **Chemla**, E. 2015. Two methods to find truth-value gaps and their application to the projection problem of homogeneity. *Nat. Lang. Semant.* 23(3). 205–248. • **Rothschild**, D. 2017. A trivalent account of anaphora and presupposition *Proceedings of the 21st Amsterdam Colloquium*, 1–13. •



(5a): *stop*, `true` (5b): *stop*, `false` (5c): *stop*, `undefined` (5d): *stop*, `critical` (6): *again*, `false`