

Trivalence without Local Accommodation: Presupposition Projection from Attitudes



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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 presuppositions 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 generalized quantifier like *everyone*, (4a); instead, other approaches (such as the **dynamic** framework in Heim 1992) often assume universal projection for attitude predicates, (4b).

- (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 $\phi(x) = T$ for all $x \in D$ (**universal** definedness projection for ϕ);
 - F if there is an $x \in D$ such that $\phi(x) = F$ (**existential** definedness projection for ϕ);
 - # otherwise (if there is an $x \in D$ such that $\phi(x) = \#$ and no $x \in D$ such that $\phi(x) = F$).

(4) Taro is **certain** that Aditi canoed **again**.

a. Strong Kleene, after (3):
 - T if Taro is certain that Aditi canoed last time and this time.
 - F if Taro considers it possible that Aditi canoed last time and didn't this time.
 - # if Taro is either certain that Aditi didn't canoe last time, or that if she did canoe last time, she canoed this time, too.

b. Universal Projection:
 - T if Taro is certain that Aditi canoed last time and this time.
 - F if Taro is certain that Aditi canoed last time and considers it possible that she didn't this time.
 - # if Taro considers it possible that Aditi didn't canoe last time.

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 manipulation of the SCENARIO factor was encoded with a **visual** and a **verbal** component.

> Presupposition TRIGGER as a pseudo-factor: *stop* vs. *again* (between items, 24 each)

(completely false)

(neither completely true nor completely false)

(completely true)

(-2)

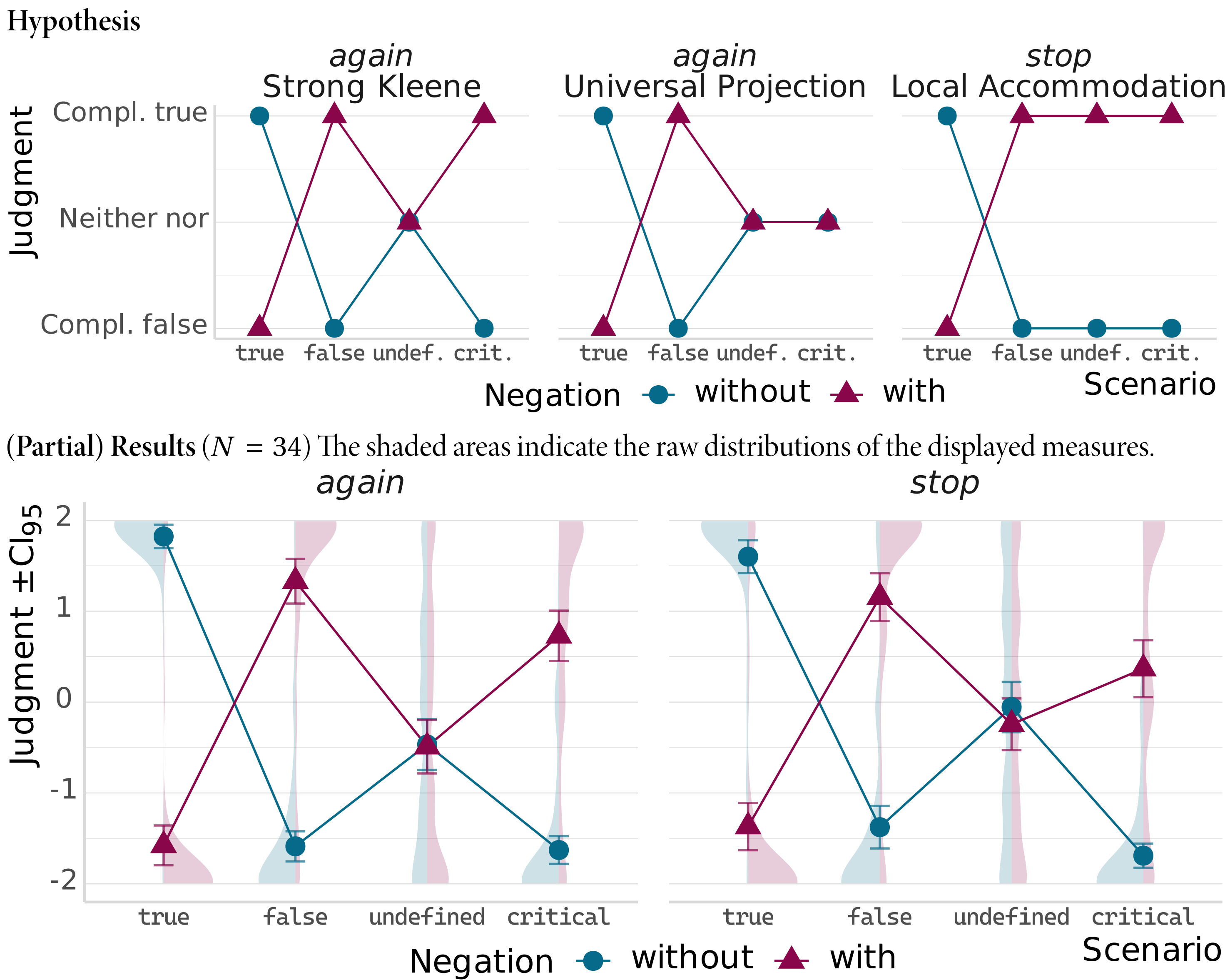
(2)

- Materials (translated from German)
- (5) NEGATION: without TRIGGER: *stop*

a. SCENARIO: **true**
Peter: «I'm certain that Jan canoed last time, and I'm certain that Jan canoed this time.»
Peter is certain that Jan canoed again.

b. SCENARIO: **false**
Peter: «I'm certain that Jan canoed last time, but I have no idea if this time, Jan canoed or not.»
Peter is certain that Jan canoed again.

c. SCENARIO: **undefined**
Peter: «I have no idea if last time, Jan canoed or not, but I am certain that Jan canoed this time.»
Peter is certain that Jan canoed again.
- d. SCENARIO:
- critical**
-
- Peter: «I have no idea if last time, Jan canoed or not, and I have no idea if this time, Jan canoed or not.»
-
- Peter is certain that Jan canoed again.**

(6) NEGATION: with TRIGGER: *again* 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 not certain that Sonja stopped drinking wine.

- To B or not to B?
- > *Local accommodation* has been thought of as an operator that collapses Undefined and False:
$$\llbracket B \rrbracket = \lambda p_t. T \text{ if } p = T, F \text{ if } p \neq T$$

> It has been used to derive weaker projection patterns out of the scope of quantifiers (Fox 2013);

> *B* should be possible with soft triggers (*stop*), but not with hard triggers (*again*) (Abusch 2010);

> A parse with *B* for our **undefined** items would be pragmatically desirable because it would return True instead of Undefined in the presence of presupposition failure:
$$\text{NOT } (B) \text{ Markus certain } \lambda w. (B) [\text{Sonja stopped drinking wine in } w_{\text{Sonja drank wine in the past in } w}]$$

> Our results suggest that participants do not have access to such parses with *B*;

> Rather, they motivate a view where *local accommodation* is not an operator freely available to syntax, but a phenomenon restricted to certain semantically determined environments; such as the antecedent (restrictor), but not the consequent (scope) of a conditional;

> The predictions of Strong Kleene for presupposition projection seem to be correct for both soft and hard triggers (contra Charlow 2009).

- 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; instead, 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 the men stopped drinking wine.

false

undefined

critical

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