

# No Hard Feelings If Hard Presuppositions Project



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Introduction and Key Points

> Hard presupposition triggers like *too* pattern differently than soft presupposition triggers like *win* (Abusch 2002) in that the former rarely give rise to non-projection readings: (1a) and (1c)

> We consider the hypothesis that *semi-factive* predicates behave like soft triggers and *emotive factive* predicates like hard triggers (Abbott 2006, Abrusán 2016): (1b) and (1d)

> However, we do find non-projection with hard triggers in mistaken belief contexts: (2)

> Some research questioned the validity of a distinction between semi-factives and robust factives (Egré 2008). Karttunen (2016) claims that most factives, other than those that take clausal subjects (*be odd*), are not real presupposition triggers

> If the distinction between semi-factives and emotive factives is not real, we should find no difference in their projection rate. Instead, our results support a distinction between the two classes of factive predicates, matching the soft-hard hypothesis

> We argue that mistaken belief contexts are special and can affect all presupposition triggers in attitudinal contexts uniformly, contra Karttunen (2016): (3) to (5); *be odd* only resists mistaken-belief contexts if it lacks a syntactically expressed attitude holder

- (1)
- a.

I don’t know whether Eleni participated in a race, but if she *won*, she is drunk now.
- b.

I don’t know whether Eleni participated in a race, but if Taro *discovers* that she did, he will be furious.
- c.

# I don’t know whether anybody else was ill, but if Eleni was ill *too*, she needed rest.
- d.

# I don’t know whether Taro is ill, but if Eleni *regrets* that he is, she will console him.

Non-projection contexts with emotive factives lead Karttunen (2016) a.o. to argue that only predicates like *be odd* presuppose factivity, but others do not (example from Egré 2008: 14; cf. Klein 1975: B12):

- (2)
- John wrongly believes that Mary got married, and he *regrets* that she is no longer single.

→ Mary is no longer single.

This is a quite stable fact that arises when a presupposition trigger interacts with an attitude predicate:

- (3)
- a.

# Taro mistakenly believes that Eleni likes soccer and it’s awkward that she does.
- b.

Taro mistakenly believes that Eleni likes soccer and he believes it’s awkward that she does.

Even *be odd* allows for non-projection when an *attitude holder* is introduced with *to him*:

- (4)
- a.

# Taro mistakenly believes that Eleni likes linguistics, and it’s *odd* that she does.
- b.

Taro mistakenly believes that Eleni likes linguistics, and it’s *odd to him* that she does.

The same can be observed with the hard trigger *too* when embedded under *believe*:

- (5)
- Eleni didn’t pass the syntax exam. Aditi, despite having passed, comes out of the department crying for some other reason, and Taro thinks that she got a failing grade.

a.

# Aditi, too, failed syntax.
- b.

Taro believes that Aditi, too, failed syntax.

Emotive factives are special here because they are both presupposition triggers and attitude predicates.

The Experiment

We carried out an Acceptability Judgment Task (Likert scale from 1 to 7) to probe into the effects of presupposition violations with a variety of triggers, accessible (in Italian) here: <https://farm.pcibex.net/r/WMrLKZ/> (Zehr & Schwarz 2022).

40 participants (mean age 21.3±3.29) were tested. The experiment consisted of two parts so that the items in the first sub-experiment occurred before the second; with 24 fillers interspersed throughout.

Sub-experiment 1

4 × 2 Design, 32 items

> PREDICATE (*too*, *again* vs. *be angry*, *be sad* vs. *understand*, *realize* vs. *think*, *believe*)

> CONTEXT (▲:  $\neg p$  if vs. ●:  $\neg B_x(p)$  if)

Sub-experiment 2

2 × 2 Design, 16 items

> PREDICATE (*be angry*, *be sad* vs. *understand*, *realize*)

> CONTEXT (■:  $\neg p$  and vs. ◆: *mistaken belief*)

(not acceptable) 1 2 3 4 5 6 7 (completely acceptable)

Materials (slightly adapted to resolve pronoun ambiguities of the English translation)

- (6)
- Additive particles

*too*, *again*

▲ Taro didn’t steal anything from Aditi, but if he stole her hat too, Aditi will rip off his bathing suit.

● I don’t know whether Taro stole anything from Aditi, but if he stole her hat too, Aditi will rip his bathing suit.
- (7)
- True factives

*be angry*, *be sad*

▲ Eleni didn’t lose the kite, but if Taro is angry that she did, he will hurl her sunglasses into the sea.

● I don’t know whether Eleni lost the kite, but if Taro is angry that she did, he will hurl her sunglasses into the sea.

■ Taro didn’t make the roses die, but Eleni is angry that he made them die.

◆ Eleni mistakenly believes that Taro made the roses die, and is angry that he made them die.
- (8)
- Semi-factives

*understand*, *realize*

▲ Aditi didn’t manipulate the card deck, but if Taro realizes that she did, he will uninvite her from the next sleeper.

● I don’t know whether Aditi manipulated the card deck, but if Taro realizes that she did, he will uninvite her from the next sleeper.

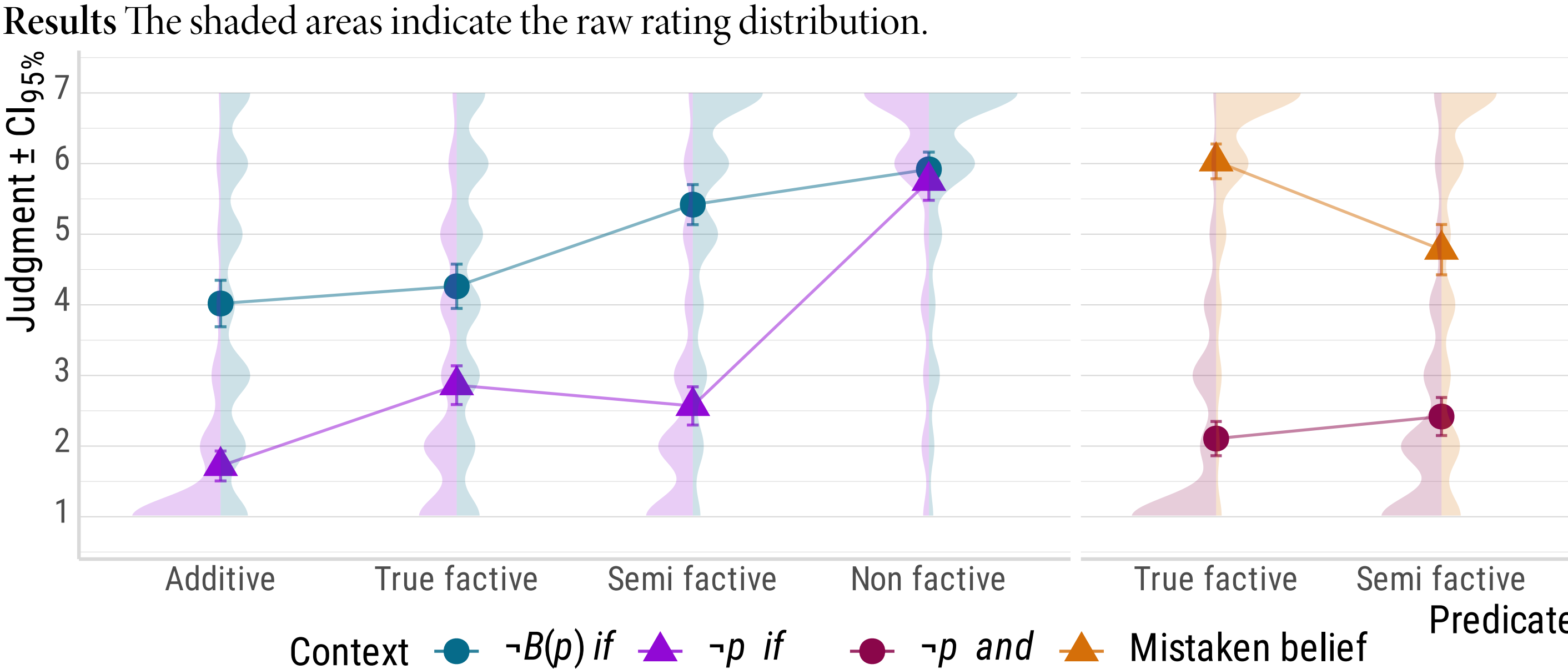
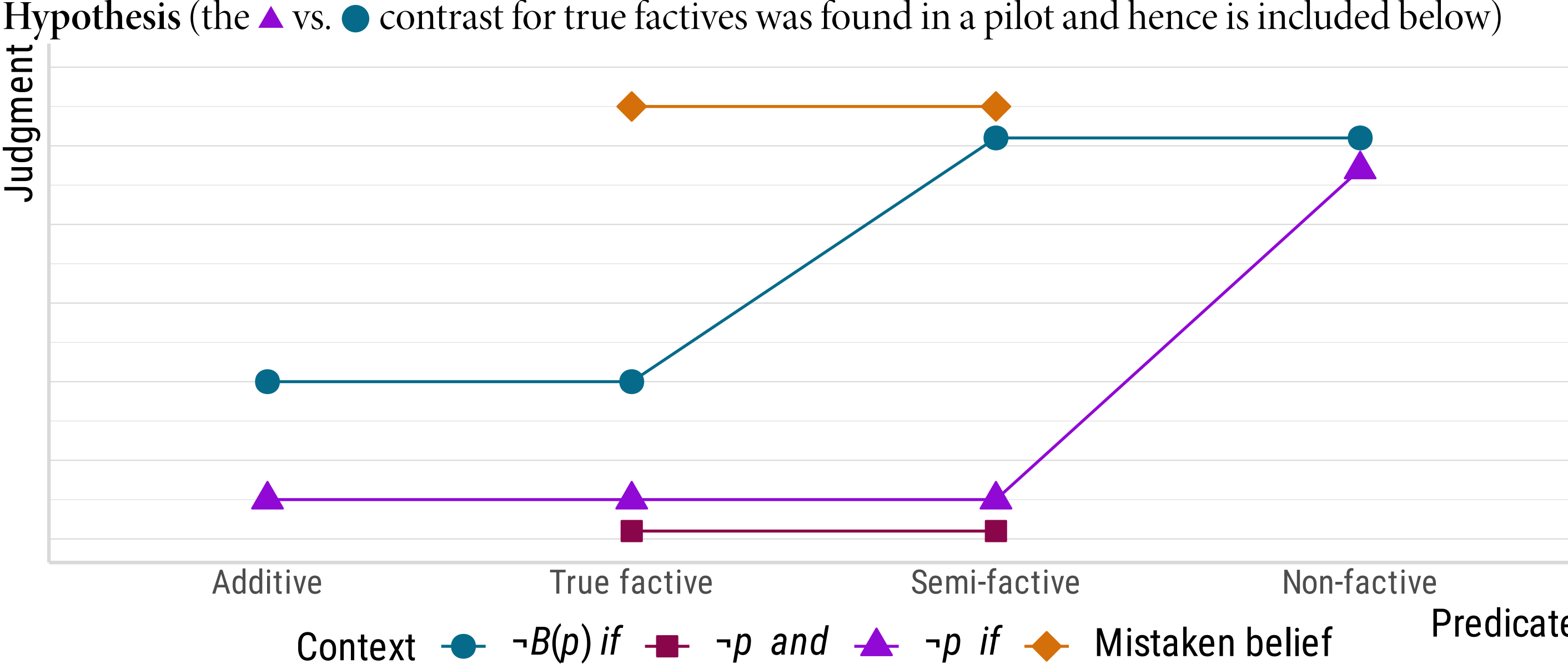
■ Aditi didn’t break the toy train, but Taro, after examining it, realized that she broke it.

◆ Aditi didn’t break the toy train, but Taro, after examining it, mistakenly realized that she broke it.
- (9)
- Non-factives

*think*, *believe*

▲ Eleni didn’t get the top grade, but if Taro thinks that she did, he will be jealous.

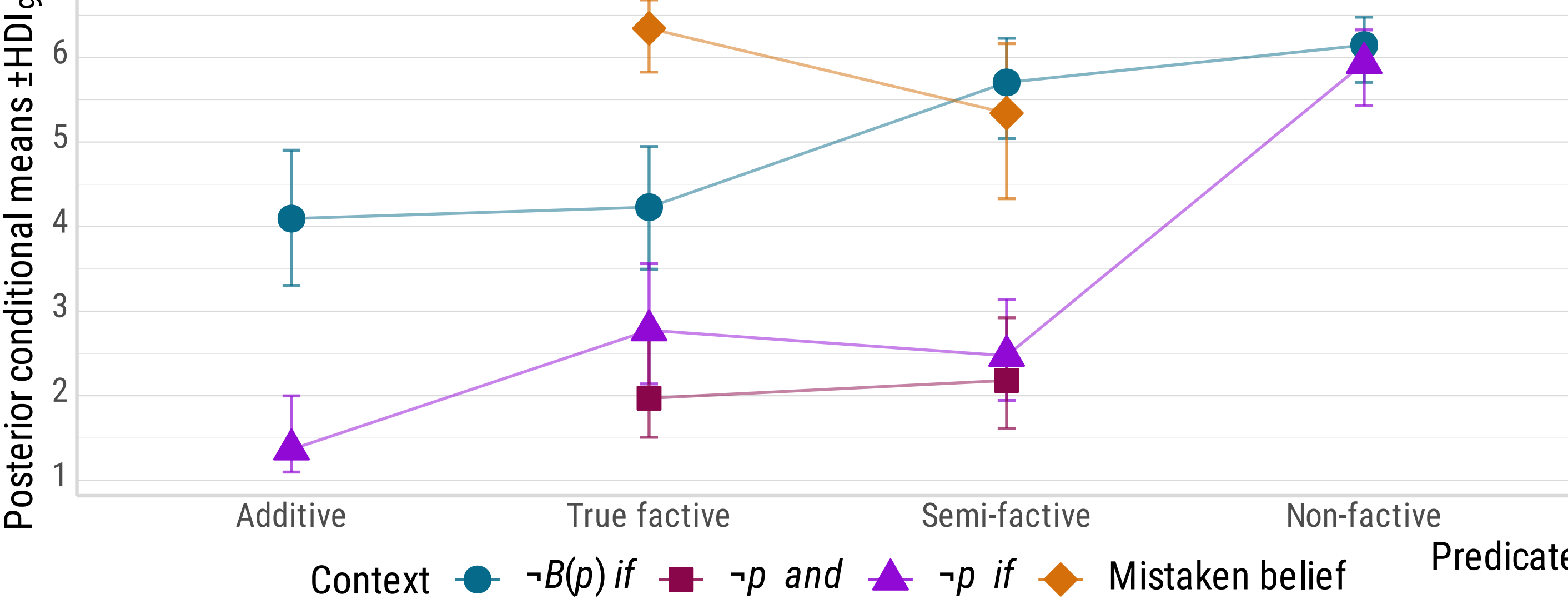
● I don’t know if Eleni got the top grade, but if Taro thinks that she did, he will be jealous.



Statistical Analysis We fit two Bayesian cumulative probit mixed models, one for each sub-experiment, in R (4.3.2; R Core Team 2023) using *brms* (Bürkner 2021). 40k iterations,  $N(0, 1)$  slope priors.

$$Y \sim \text{PREDICATE} * \text{CONTEXT} + (1 + \text{PREDICATE} * \text{CONTEXT} \mid \text{ITEM}) + (1 + \text{PREDICATE} * \text{CONTEXT} \mid \text{ID})$$

The estimates and HDIs in the plot below are based on the posterior conditional effects of the models detailed above, calculated using the *emmeans* package (Lenth 2019).



Bayes Factor analyses (note that these probably slightly favor the null due to the uninformative priors.) Positive values support difference hypotheses, negative ones support the null.

Parameter	log <sub>BF</sub>	Parameter	log <sub>BF</sub>	Parameter	log <sub>BF</sub>
●: realize vs. be angry	4.73	▲: realize vs. be angry	−1.66	● vs. ▲: be angry	4.20
●: realize vs. too	4.66	▲: realize vs. too	2.35	◆: be angry vs. realize	2.15
●: be angry vs. too	−1.52	▲: be angry vs. too	2.79		

Conclusions and Next Steps

> Our experimental results do not seem consistent with the claims by Karttunen (2016)

> True factives pattern with additive particles wrt. presupposition violations, and contrast with semi-factives and non-factives; they should be classified as hard triggers

> Non-projection for true factives is only available in ◆ mistaken belief contexts

> Semi-factives can give rise to non-projection in mistaken belief contexts, too

> The ▲ vs. ● contrast with true factives and additive particles has not been observed before.

> Local accommodation is normally not available for hard triggers, see (1c) and (1d)

> The effect cannot be due to the accommodation of a mistaken belief context: cfr. ▲ and ■ where  $\neg p$  is asserted (compatible with a mistaken belief)

> How does the interaction between PREDICATE and the ▲ ● conditions come about?

> Why are ◆ mistaken belief contexts worse with semi-factives? State vs. achievement?

> Do presupposition triggers embedded under attitudes, (3) and (5), pattern like emotive factives?

A Theoretical Puzzle

The presupposition in ◆ mistaken belief contexts is interpreted relative to the belief state of the subject instead of the Context Set. Two preconditions appear to be necessary, see (2) to (5):

> the syntactic realization of an attitude holder (compare *regretful* vs *regret*)

> the mention of a false belief that individual has

Is the factive presupposition of true factives the result of a (hardly defeasible) pragmatic principle?

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