

The influence of lexical meaning and prior belief on projectivity*

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January 29, 2018

Abstract

Projective content, like presuppositions or conventional implicatures, is utterance content that a speaker may be taken to be committed to even when the expression associated with the content occurs embedded under an entailment-canceling operator (e.g., Chierchia and McConnell-Ginet 1990). It has long been observed that non-entailed content may also be taken to be a commitment of the speaker when the expression associated with the content is embedded under such operators (e.g., Simons 2001; Schlenker 2010; Simons et al. 2017). Some authors, like Anand and Hacquard 2014, assume that speaker commitment in such cases is a different phenomenon/should be given a different analysis (“illusion of factivity” and “illusion of projection”), whereas others, like Schlenker 2010 talks of “part-time triggers”. Former authors assume that entailed content = presupposition, and non-entailed content = something else. Entailment is a binary property but is it really the way in which language users treat it?

The goal of this paper was to investigate whether projectivity is influenced by entailment and by the prior probability of the event described by the projective content.

We show that...and that....

1 Introduction

- Tonhauser, Beaver, and Degen accepted found that lexical content of projective content matters for projection.
- Presuppositions are entailed content that is projective, i.e., that a speaker may be taken to be committed to even when the expression that the presupposition is associated with occurs under an entailment-canceling operator.
- So projective content is often assumed to be entailed.
- But we know that not only entailed content may be projective.
- Entailment
 - Entailment is a relation between two statements: A entails B if and only if every model in which A is true is also one in which B is true.
A sentence (meaning) A entails B if whenever A is true, then B must also be true.
Entailment is assumed to hold no matter what the facts of the world are.
 - Chierchia and McConnell-Ginet 1990:19f. “A entails B =df whenever A is true, B is true [...]
A and not B is contradictory (can’t be true in any situation)”

*This work was partially supported by NSF grant BCS-1452674 (JT).

- (1) a. Context: Mary is a responsible 30-year old.
Mary has announced to her parents that she is pregnant.
it follows: Mary is pregnant (Schlenker 2010:139)
- b. Context: Mary is playful 7-year old.
Mary has announced to her parents that she is pregnant.
it does not follow: Mary is pregnant (Schlenker 2010:140)
- c. John has announced that he has met Elvis
it does not follow: John has met Elvis. (Schlenker 2010:140)

Assuming that less likely events are more likely to be at-issue, and that at-issue content does not project (Simons et al. 2010; Tonhauser et al. accepted), prior event probability is predicted to influence projectivity.

CCMG:

p.349f.: “the main empirical characteristics of presuppositions can be taken to be the following two: being backgrounded and being taken for granted.” THIS DOES NOT INCLUDE BEING ENTAILED!!

p.350: “What the P family test essentially tests for is backgroundedness of implications: it marks out implications that are attached to S, not only when it is asserted but also when it is denied, questioned, or offered as a hypothetical assumption.”

p.352: “The hallmark of a presupposition is that it is taken for granted in the sense that its assumed truth is a precondition for felicitous utterance of the sentence and places a kind of constraint on discourse contexts that admit the sentence for interpretation. [...] The P family test does not definitively identify presuppositions, because background status of an implied proposition is compatible with its being presented as not already assumed. If there is no suggestion of infelicity in using S in a discourse where p is clearly not taken to be part of the common ground, then S does not presuppose p even if p is backgrounded by S (as in the case of nonrestrictive relative clauses).”

SPENADER: many presuppositions are new information in discourse

¹

¹The data and R code for generating the figures and analyses of the norming studies and the experiment reported on in this paper are available at <https://github.com/judith-tonhauser/projective-probability>.

2 Norming study: Prior probabilities of events

This norming study explored the prior probability of 20 events described by English sentences given a fact about the world that made the event more likely and given a fact about the world that made the event less likely. Gradient likeliness ratings were collected for each of the 40 fact/event pairings.

2.1 Methods

Participants 95 participants with U.S. IP addresses and at least 99% of previous HITs approved were recruited on Amazon’s Mechanical Turk platform (ages: 21-75; median: 33; 45 female, 50 male). They were paid 55 cents for participating in the experiment.

Materials The 20 events were described by English sentences, as were the 2 facts about the world that each event was presented with. As illustrated with the two sample fact/event pairs in (2), the fact in each fact/event pair was preceded by the label ‘Fact:’. For each event, we hypothesized that one of the two facts that the event was paired with makes the event more likely than the other fact. For instance, for the event of Julian dancing salsa in (2), we hypothesized that this event would be more likely given the fact that Julian is from Cuba than given the fact that Julian is from Germany. A second consideration in choosing the two facts was that the prior probability of an event given a fact would be neither at ceiling nor at floor. If the prior probability of an event given a fact was at ceiling, one could argue that the proposition denoted by the sentence that describes the event is entailed by the fact, i.e., a speaker might be taken to be committed to the proposition just because they are committed to the fact about the world. Likewise, if the prior probability of an event given a fact was at floor, one could argue that the negation of the proposition denoted by the sentence that describes the event is entailed by the fact, i.e., a speaker might be taken to be committed to the negation of the proposition just because they are committed to the fact about the world. To be able to explore the influence of the prior probability of events on the commitment of the speaker to the content of the clausal complement of an attitude predicate, we avoided contents that were entailed by or whose negation was entailed by facts about the world. See Appendix A for the remaining 38 fact/event pairs.²

- (2) a. Fact: Julian is from Cuba.
Julian dances salsa.
- b. Fact: Julian is from Germany.
Julian dances salsa.

The experiment also included two control stimuli, which were used to assess whether participants were attending to the task. Like the target stimuli, both control stimuli consisted of an English sentence describing a fact about the world and an English sentence describing an event, as shown in (3). The two control stimuli differ in the probability of the event given the fact about the world: the prior probability of the control event in (3a) is 1 (the proposition denoted by the sentence is entailed by the fact) and the prior probability of the control event in (3b) is 0 (the negation of the proposition denoted by the sentence is entailed by the fact).

- (3) a. Fact: Barry lives in Germany.
Barry lives in Europe.
- b. Fact: Tammy is a rabbit.
Tammy speaks Italian and Greek.

The 40 target stimuli were distributed across two lists of 20 target stimuli each so that each list included the 20 event descriptions as well as 10 fact/event pairs for which the event was hypothesized to be likely

²Need to say that we use ‘event’ for events and states, rather than ‘eventuality’.

and 10 fact/event pairs for which the event was hypothesized to be less likely. The two control stimuli were added to both lists, for a total of 22 stimuli per list.

Procedure Participants were randomly assigned to a list. They were told that they would read a fact about the world and were asked to assess how likely a particular event was, given the fact. The 22 stimuli were presented in random order to each participant. On each trial, participants read the fact and the corresponding response question, which was formed from the question *How likely is it that...?* with the sentence describing the event realizing the embedded clause of the question. Participants gave their response on a slider marked ‘impossible’ at one end (coded as 0) and ‘definitely’ at the other (coded as 1), as shown in Fig. 1.

Figure 1: A sample trial in the prior probability norming study

After completing the experiment, participants filled out a short optional survey about their age, their gender, their native language(s) and, if English is their native language, whether they are a speaker of American English (as opposed to, e.g., Australian or Indian English). To encourage them to respond truthfully, participants were told that they would be paid no matter what answers they gave in the survey.

Data exclusion Prior to analysis, the data from 8 participants who did not self-identify as native speakers of American English were excluded. For the remaining 87 participants, we inspected their responses to the two control stimuli; the group means were .86 for (3a) and .03 for (3b). 19 participants gave responses lower than .8 to (3a) or responses higher than .2 to (3b), suggesting that these participants did not attend to the task or interpreted the task differently. The data from these 19 participants were also excluded, leaving data from 68 participants (ages 21-75; median: 36; 31 female, 37 male).

2.2 Results and discussion

As expected, the likeliness ratings of events were influenced by facts about the world: the mean prior probability of the events was .7 (sd = .21) when presented with facts that made the events more likely and .16 (sd = .17) when presented with facts that make the events less likely. Figure 2 shows the likeliness ratings for the 20 events given facts that make the events more likely (brown dots) and given the facts that make the events less likely (blue dots). Mean likeliness ratings for each of the 40 fact/event pairs are shown as black dots. Error bars indicate 95% confidence intervals.

Figure 2 shows that, for each event, the likeliness of the event is higher given the fact that makes the event more likely than given the fact that makes the event less likely. The most likely event is that of Charley speaking Spanish given the fact that he lives in Mexico (mean: .89, sd: .14). The least likely event is that of Isabella eating a steak on Sunday given the fact that she is a vegetarian (mean: .05, sd: .07). Given that, for the 68 remaining participants, the mean prior probability of the control event in (3a) was .99 (sd: .01) and the mean prior probability of the control event in (3b) was .01 (sd: .01), we conclude that the likeliness of none of the 40 event/fact pairs is at ceiling or at floor.

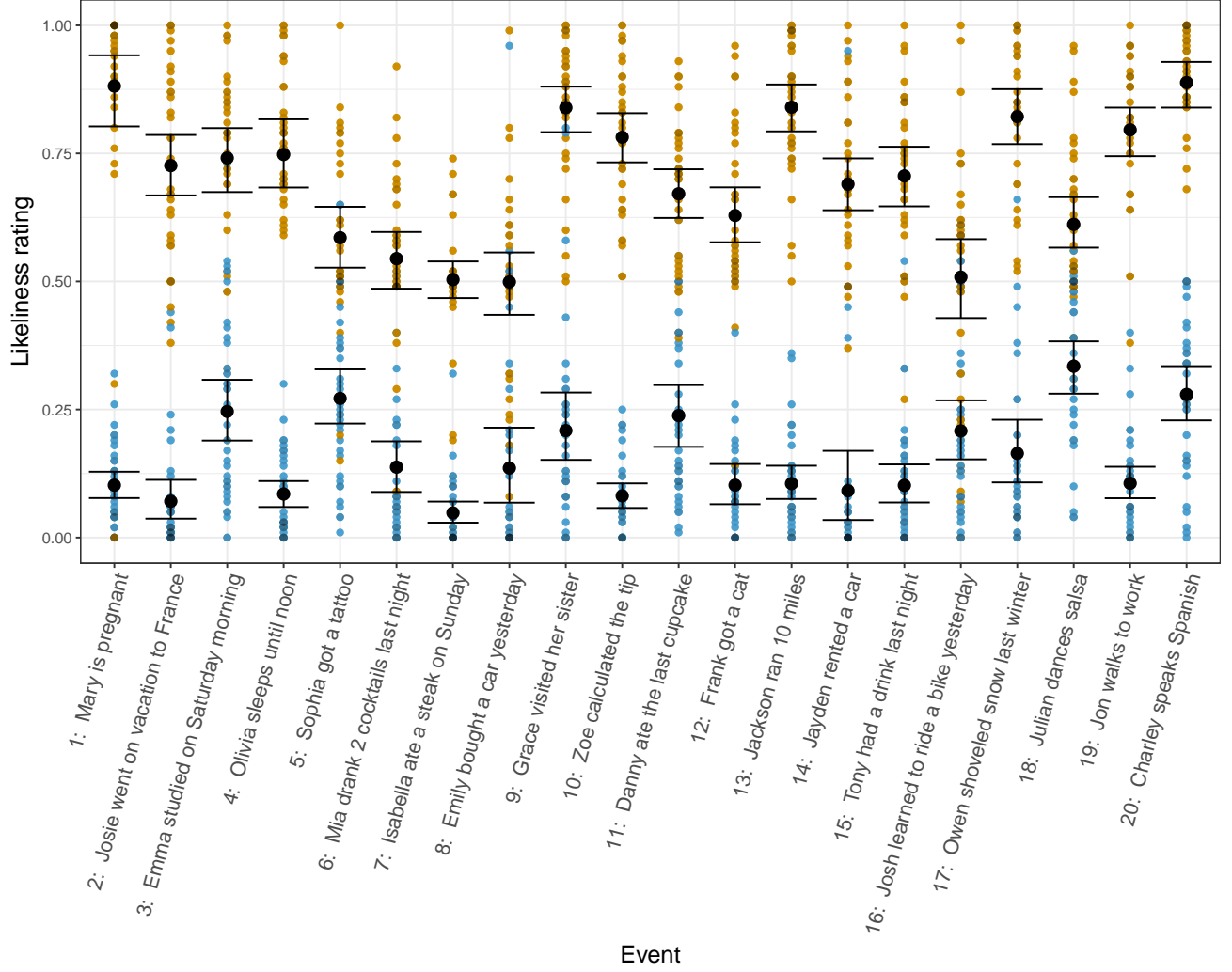


Figure 2: Likelihood ratings for 20 events given facts about the world that make the events more likely (brown dots) and facts about the world that make the events less likely (blue dots); darker dots indicate overlapping ratings. Mean likelihood ratings for the 40 fact/event pairs are given by black dots. Error bars indicate 95% confidence intervals.

3 Entailment

Chierchia and McConnell-Ginet 1990:19f.: “Asked to define entailment, you might come up with any of the following:

- (4) A entails B = *df*
- whenever A is true, B is true
 - the information that B conveys is contained in the information that A conveys
 - a situation describable by A must also be a situation describable by B
 - *A and not B* is contradictory (can’t be true in any situation)

“Judgments about entailment relations can be defended and supported by evidence. As in the case of any linguistic phenomenon, there may be areas of real diversity within the community of language users, dialectal and even idiolectal differences. This complication must not, however, obscure the important fact that judgments about semantic phenomena are interconnected, and thus that there is relevant evidence to be offered in support of such judgments.” (p.22)

3.1 Norming study 1: Is *A and not B* contradictory?

This norming study explored whether the content of the clausal complement of 20 clause-embedding English predicates is entailed. Specifically, this norming study implemented the diagnostic for entailment from Chierchia and McConnell-Ginet 1990 according to which *A* entails *B* if and only if *A and not B* is contradictory. Gradient contradictoriness ratings were collected.

3.1.1 Methods

Participants 300 participants with U.S. IP addresses and at least 99% of previous HITs approved were recruited on Amazon’s Mechanical Turk platform (ages: 18-72, median: 35; 137 female, 162 male, 1 other). They were paid 75 cents for participating in the experiment.

Materials Whether the content of the clausal complement was entailed was tested for 20 clause-embedding predicates, namely *be annoyed, know, discover, reveal, see, establish, be right, pretend, think, suggest, say, hear, prove, demonstrate, confess, inform, announce, acknowledge, admit* and *confirm*. Of these 20 predicates, 7 are typically taken to entail the complement (*be annoyed, know, discover, reveal, see, establish, be right*), 5 are typically taken to not entail the complement (*pretend, think, suggest, say, hear*), and the remaining 8 are typically taken to not entail the content of the complement even though they may sometimes appear to (V: *prove, demonstrate, confess, inform, announce, acknowledge, admit, confirm*); see e.g., Schlenker 2010; Swanson 2012; Anand and Hacquard 2014. **say more**

Each predicate was paired with each of the 20 event-describing sentences from section 2 and a proper name subject, for a total of 400 sentences.³ The 400 target stimuli consisted of one of these 400 sentences followed by an elliptical clause that denied the truth of the complement clause, as shown in the sample stimuli in (5). The speaker of the target stimuli was realized by a (bold-faced) proper name. The proper names that realized the speakers, the subjects of the 20 predicates or that occurred in the complement clauses were all unique. The gender of the proper name subject of the predicate was distinct from the gender of the proper name in the complement clause, to ensure that the pronoun in elliptical clause unambiguously referred to the individual referred to in the complement clause of the predicate.

³Eventive predicates, like *discover* and *hear*, were realized in the past tense and stative predicates, like *know* and *be annoyed*, were realized in the present tense. The indirect object of *inform* was always realized by the proper name *Sam*.

- (5) a. **Christopher:** Melissa knows that Danny ate the last cupcake, but he didn't.
 b. **Susan:** Jerry pretended that Emma studied on Saturday morning, but she didn't.

The experiment also included eight control stimuli, which were used to assess whether participants were attending to the task and to allow participants to use the full response scale. The four control stimuli in (6) were hypothesized to be non-contradictory, and the four control stimuli in (7) were hypothesized to be contradictory.

- (6) a. Zack believes that I'm married, but I'm actually single.
 b. Tara wants me to cook for her and I'm a terrific cook.
 c. Frederick is both smarter and taller than I am.
 d. Vanessa is really good at math, but I'm not.
 (7) a. Dana has never smoked in her life and she stopped smoking recently.
 b. Hendrick's car is completely red and his car is not red.
 c. Madison laughed loudly and she didn't laugh.
 d. Sebastian lives in the USA and has never been to the USA.

Each participant saw a random set of 28 stimuli: each set contained one stimulus for each of the 20 predicates (each with a unique complement clause) and the same 8 control stimuli. Trial order was randomized.

Procedure. Participants were told that they would read utterances made by a speaker and were asked to assess whether the speaker's utterance is contradictory. On each trial, participants read the speaker's utterance and then gave their response on a slider marked 'definitely no' at one end (coded as 0) and 'definitely yes' at the other (coded as 1), as shown in Figure 3.

Susan: "Catherine is annoyed that Julian dances salsa, but I know that he doesn't."

Is Susan's utterance contradictory?

definitely no definitely yes

Next

Figure 3: A sample trial in the veridicality norming study

To familiarize participants with the task, they first completed the two familiarization items in (8): participants who gave a rating below .5 to (8a) or a rating above .5 to (8b) were given an explanation for why their answer is wrong and participants could only advance to the 28 stimuli if they corrected their rating.

- (8) a. **Bill:** Drew is aware that Patty lives in Canada, but she doesn't.
 b. **Bob:** Drew thinks that Patty lives in Canada, but she doesn't.

After responding to the 28 stimuli, participants filled out a short, optional survey about their age, their gender, their native language(s) and, if English is their native language, whether they are a speaker of American English (as opposed to, e.g., Australian or Indian English). To encourage them to respond truthfully, participants were told that they would be paid no matter what answers they gave in the survey.

Data exclusion. Prior to analysis, the data from 19 participants who did not self-identify as native speakers of American English were excluded. For the remaining 281 participants, we inspected their responses to the 8 control stimuli: we expected low responses to the non-contradictory stimuli in (6) and high responses to the contradictory stimuli in (7). The response means of 12 participants were more than 3 standard deviations above the group mean for the non-contradictory control stimuli or below the group mean for the contradictory control stimuli (the group means were .15 and .92, respectively).⁴ Closer inspection revealed that these participants' responses to the control stimuli were systematically higher or lower, suggesting that these participants did not attend to the task or interpreted the task differently. The data from these 12 participants were also excluded, leaving data from 269 participants (ages 18-72; median: 36; 128 female, 140 male, 1 other).

3.1.2 Results

The boxplot in Figure 4 shows the contradictoriness ratings by predicate, collapsing over the 20 complement clauses that each predicate was paired with. Predicates whose clausal complement is typically taken to not be an entailment are given in brown, predicates whose clausal complement is typically taken to be an entailment are given in blue, and the remaining predicates are given in green. As expected, target stimuli with the 5 predicates whose clausal complement is typically taken to not be an entailment, namely *pretend*, *suggest*, *think*, *hear* and *say*, received the lowest contradictoriness ratings. Likewise, target stimuli with *be right* received the highest contradictoriness ratings, in line with the assumption that the clausal complement of this predicate is an entailment. However, target stimuli with the other predicates whose clausal complement is typically taken to be an entailment did not receive as high ratings as *be right* and target stimuli with some of these predicates received lower contradictoriness ratings than target stimuli with predicates whose clausal complement only appears to be an entailment. Thus, the contradictoriness diagnostic for entailment does not appear to categorically distinguish between entailed and non-entailed contents of clausal complements. Furthermore, the large box sizes and whisker lengths suggest a high degree of by-participant variation.

To determine which predicates differed from one another in the contradictoriness ratings, we conducted post hoc pairwise comparisons using Tukey's method (allowing for by-participant variability), using the *lsmeans* package (Hothorn et al., 2008) in R (R Core Team, 2016). P-values for each pair of predicates are displayed in Table 1.

- *think*, *pretend*, *hear*: significantly lower than all other predicates
- *inform*, *announce*: no significant difference, in line with Anand and Hacquard 2014, contrary to Schlenker 2010
- "Entailed" predicates:
 - *reveal/annoyed* not different from one another
 - *establish* higher than *reveal/annoyed* but no different from *discover*, but lower than *see* and *know*

⁴The response mean of one of the non-contradictory control stimuli, (6a) *Zack believes that I'm married, but I'm actually single*, was higher, at .17, than the response means of the remaining three non-contradictory control stimuli (which were .05 or .06). We hypothesize that some participants gave higher responses to this stimulus because the speaker can be taken to contradict Zack's belief.

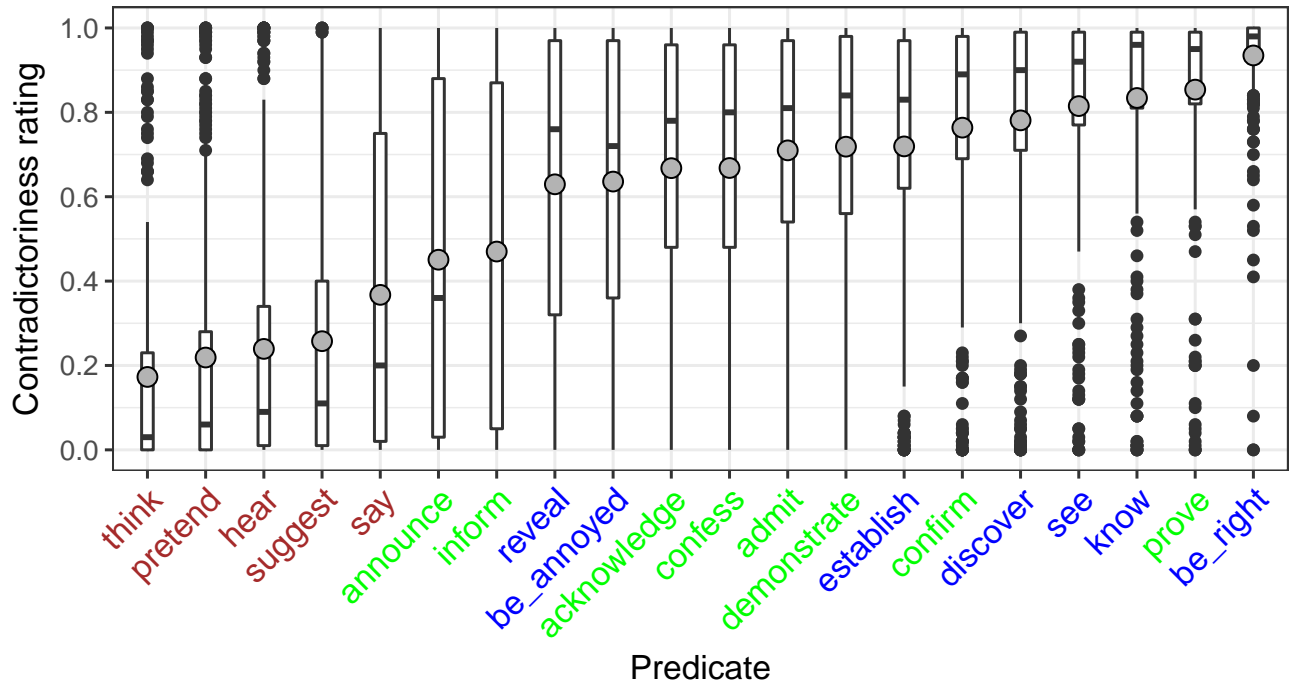


Figure 4: Boxplot of contradictoriness ratings by predicate, collapsing across complement clauses. Grey dots indicate means and notches indicate medians. Predicates whose clausal complement is typically taken to not be an entailment are given in brown, predicates whose clausal complement is typically taken to be an entailment are given in blue, and the remaining predicates are given in green.

- *discover/see/know*: no significant differences from one another
- *be right* significant different from all the others
- Several of the predicates whose status is unclear are not significantly different from the entailed predicates
- *prove, know, see*: no significant differences from one another
- *be right*: significantly higher ratings than all other predicates

These results confirm commonly-made assumptions about entailment. First, the five predicates that are typically taken to not entail the content of the complement (*pretend, suggest, think, hear, say*) received significantly lower contradictoriness ratings than the seven predicates that are typically taken to entail the content of the complement (*annoyed, know, discover, reveal, see, establish, be right*). Furthermore, these results suggest that, of the five predicates that are typically assumed to not entail the content of the complement, all but *say* are significantly less veridical than *inform*, the least veridical of the entailed? predicates.

The results suggest no differences in the veridicality of the verbs of saying, *say, inform* and *announce*. The next set of predicates for which the results suggest no difference in veridicality consists of *be annoyed, confess, reveal, acknowledge* and *demonstrate*. This set of predicates consists both of predicates for which the content of the complement is typically taken to be entailed (e.g., *be annoyed*) and of predicates for which the content of the complement is not really entailed (e.g., *confess*). The next set consists of *discover, confirm* and *see*. Finally, *know* and *prove*, which are indistinguishable, and *be right*, which is significantly more veridical than all other predicates.

	<i>think</i>	<i>pretend</i>	<i>hear</i>	<i>suggest</i>	<i>say</i>	<i>announce</i>	<i>inform</i>	<i>reveal</i>	<i>be annoyed</i>	<i>confess</i>	<i>acknowledge</i>	<i>admit</i>	<i>establish</i>	<i>demonstrate</i>	<i>confirm</i>	<i>discover</i>	<i>see</i>	<i>know</i>	<i>prove</i>
<i>pretend</i>	n.s.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>hear</i>	n.s.	n.s.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>suggest</i>	*	n.s.	n.s.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>say</i>	***	***	***	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>announce</i>	***	***	***	***	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>inform</i>	***	***	***	***	**	n.s.	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>reveal</i>	***	***	***	***	***	***	***	-	-	-	-	-	-	-	-	-	-	-	-
<i>be annoyed</i>	***	***	***	***	***	***	***	n.s.	-	-	-	-	-	-	-	-	-	-	-
<i>confess</i>	***	***	***	***	***	***	***	n.s.	n.s.	-	-	-	-	-	-	-	-	-	-
<i>acknowledge</i>	***	***	***	***	***	***	***	n.s.	n.s.	n.s.	-	-	-	-	-	-	-	-	-
<i>admit</i>	***	***	***	***	***	***	***	*	.	n.s.	n.s.	-	-	-	-	-	-	-	-
<i>establish</i>	***	***	***	***	***	***	***	**	*	n.s.	n.s.	n.s.	-	-	-	-	-	-	-
<i>demonstrate</i>	***	***	***	***	***	***	***	**	*	n.s.	n.s.	n.s.	n.s.	-	-	-	-	-	-
<i>confirm</i>	***	***	***	***	***	***	***	***	***	**	**	n.s.	n.s.	n.s.	-	-	-	-	-
<i>discover</i>	***	***	***	***	***	***	***	***	***	**	**	n.s.	n.s.	n.s.	n.s.	-	-	-	-
<i>see</i>	***	***	***	***	***	***	***	***	***	***	***	**	**	**	n.s.	n.s.	-	-	-
<i>know</i>	***	***	***	***	***	***	***	***	***	***	***	***	***	***	n.s.	n.s.	n.s.	-	-
<i>prove</i>	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**	n.s.	n.s.	n.s.	-
<i>be right</i>	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**	*

Table 1: P-values associated with pairwise comparison of contradictoriness ratings of predicates using Tukey’s method. ‘****’ indicates significance at .0001, ‘***’ at .01, ‘*’ at .05, ‘.’ marginal significance at .1, and ‘n.s’ indicates no significant difference in means. Predicates whose clausal complement is typically taken to not be an entailment are given in brown, predicates whose clausal complement is typically taken to be an entailment are given in blue, and the remaining predicates are given in green.

Significant differences for restricted set:

- The five predicates that are typically taken to not entail the content of the complement ('no': *pretend*, *suggest*, *think*, *hear*, *say*) received significantly lower contradictoriness ratings than the seven predicates that are typically taken to entail the content of the complement (*annoyed*, *know*, *discover*, *reveal*, *see*, *establish*, *be right*). **except that now say is not different from annoyed**
- *inform* (no?) is still least veridical of the no?/yes predicates, next is *announce* (no?): 'no' predicates *suggest* and *pretend* are less veridical than *inform* and *announce*, *think* and *hear* are only less veridical than *announce*
- The results suggest no differences in the veridicality of the verbs of communication, *say*, *inform* and *announce*.
- Highest veridicality, indistinguishable: *see*, *discover*, *prove* (no?), *confirm* (no?), *be right*, *know*, all have medians at ceiling
- *confess* (no?), *reveal* (yes), *admit* (no?), *acknowledge* (no?), *establish* (yes), *demonstrate* (no?) are indistinguishable the highest veridicality verbs except *know*, so probably also indistinguishable from *know*.
- *annoyed* is more veridical than *hear* and less veridical than *discover*, i.e., indistinguishable from *say*, *inform*, *announce*, *confess*, *reveal*, *admit* *acknowledge*, *establish*, *demonstrate*, *see*

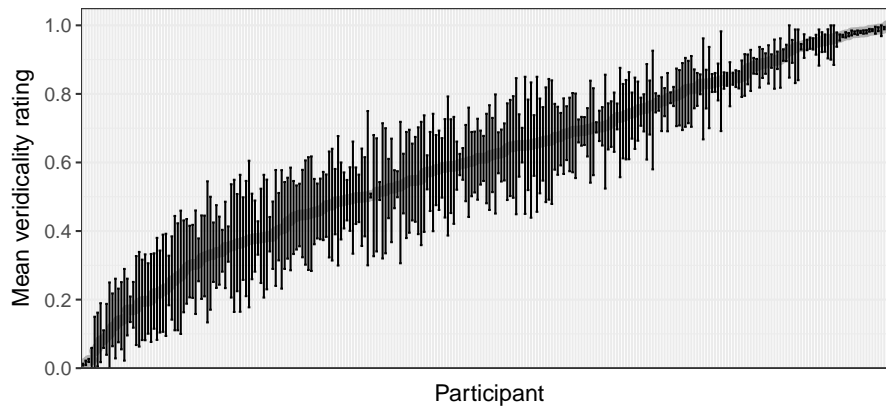


Figure 5: Boxplot of contradictoriness ratings by participant, collapsing across predicates and complement clauses. Grey dots indicate means and error bars indicate bootstrapped 95% confidence intervals.

3.2 Discussion

3.3 Interim summary

4 Projectivity

5 Discussion

6 Conclusions

A Materials used in the event probability norming study

The list below provides the 20 English sentences that describe the events whose prior probability was explored in the norming study described in section ??, together with the fact about the world that makes the event more likely and the fact about the world that make the event less likely.

1. Mary is pregnant (Mary is a middle school student / Mary is taking a prenatal yoga class)
2. Josie went on vacation to France (Josie doesn't have a passport / Josie loves France)
3. Emma studied on Saturday morning (Emma is in first grade / Emma is in law school)
4. Olivia sleeps until noon (Olivia has two small children / Olivia works the third shift)
5. Sophia got a tattoo (Sophia is a high end fashion model / Sophia is a hipster)
6. Mia drank 2 cocktails last night (Mia is a nun / Mia is a college student)
7. Isabella ate a steak on Sunday (Isabella is a vegetarian / Isabella is from Argentina)
8. Emily bought a car yesterday (Emily never has any money / Emily has been saving for a year)
9. Grace visited her sister (Grace hates her sister / Grace loves her sister)
10. Zoe calculated the tip (Zoe is 5 years old / Zoe is a math major)
11. Danny ate the last cupcake (Danny is a diabetic / Danny loves cake)
12. Frank got a cat (Frank is allergic to cats / Frank has always wanted a pet)
13. Jackson ran 10 miles (Jackson is obese / Jackson is training for a marathon)

14. Jayden rented a car (Jayden doesn't have a driver's license / Jayden's car is in the shop)
15. Tony had a drink last night (Tony has been sober for 20 years / Tony really likes to party with his friends)
16. Josh learned to ride a bike yesterday (Josh is a 75-year old man / Josh is a 5-year old boy)
17. Owen shoveled snow last winter (Owen lives in New Orleans / Owen lives in Chicago)
18. Julian dances salsa (Julian is German / Julian is Cuban)
19. Jon walks to work (Jon lives 10 miles away from work / Jon lives 2 blocks away from work)
20. Charley speaks Spanish (Charley lives in Korea / Charley lives in Mexico)

B Materials used in Exp 2

C Materials used in Exp 3

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