On the projectivity of entailed and non-entailed content

This paper provides experimental evidence from English utterances with clause-embedding predicates that i) the content of entailed and non-entailed clausal complements may be projective, ii) the projectivity of both types of content is influenced by the prior probability of the event described by the clause, and iii) that (gradient) veridicality is a better predictor of projectivity than (binary) entailment. These findings challenge analyses of projective content that are limited to entailed content (e.g., Heim 1983, van der Sandt 1992) and motivate a unified analysis of projectivity according to which listeners integrate multiple sources of information, some conventional and some non-conventional, in determining what speakers are committed to (e.g., Simons et al. 2010, Beaver et al. 2017, Abrusán 2011, 2013, Tonhauser et al. ms).

Presuppositions versus non-entailed projective content
The content of the clausal complement in (1a), that Julian dances salsa, is 'projective': a speaker who utters one of the variants in (1a) may be taken to be committed to this content even though the clause occurs in a polar question (e.g., Chierchia and McConnell-Ginet 1990, Simons et al. 2010). The question of how this content comes to be projective is traditionally given a radically different answer for *discover* vs. *announce*. Whereas the content of the complement of *discover* is typically taken to be projective because it is a presupposition (e.g., Heim 1983, van der Sandt 1992), the content of the complement of *announce* is not analyzed as a presupposition because it is not entailed by the atomic sentence in (1b), in contrast to the content of the complement of *discover*. Thus, whereas *discover* is considered to be a factive predicate (i.e., it both entails and presupposes the content of its complement), *announce* is merely a "part-time trigger" (Schlenker 2010:139) that gives rise to the "illusion of factivity" (Anand and Hacquard 2014:76).

(1) a. Did Sandy {discover / announce} that Julian dances salsa?

　　b. Sandy {discovered / announced} that Julian dances salsa.

This paper provides experimental evidence that suggests that it is empirically inadequate to analyze the projectivity of entailed and non-entailed content in fundamentally different ways.

Factors that influence the projectivity of projective content
The projectivity of (entailed) projective content is variable (e.g., Karttunen 1971, Kadmon 2001, Tonhauser et al. ms) and influenced by several conventional and non-conventional factors, incl. syntax (e.g., Potts 2005), context (e.g., Beaver 2010), prosody (e.g., Cummins and Rohde 2015, Tonhauser 2016) and at-issueness (e.g., Tonhauser et al. ms). We examined the influence of two novel factors on the projectivity of the content of the clausal complement of predicates: the prior probability of the event described by the embedded clause and the veridicality of the clause-embedding predicate. (Participants were recruited on Amazon's Mechanical Turk platform.)

Norming study #1 (n=68): We measured the prior probabilities of 20 events described by English clauses (e.g., *Julian dances salsa*) given one of two facts about the world for each event: one fact made the event more likely than the other fact (e.g., *Julian is Cuban* vs. *Julian is German*). 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.

Norming study #2 (n=271): Veridicality was defined as the extent to which sentences like (2) were judged to be contradictory (e.g., for (2): Is Carol's utterance contradictory?). Responses were given on a sliding scale from 'definitely no' to 'definitely yes'.

(2) **Carol:** Sandra {discovered / announced / suggested} that Julian dances salsa, but he doesn't.

The veridicality of 20 clause-embedding predicates was tested: 7 are typically taken to entail the content of the complement (E: *be annoyed, know, discover, reveal, see, establish, be right*), 5 are typically taken to not entail the content of the complement (NE: *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. Each predicate was paired with the 20 clauses that describe the aforementioned events. As shown in Fig. 1, predicates in the NE class are least veridical, as expected, but predicates in the E class are not uniformly highly veridical and instead form a veridicality gradient with predicates in the V class.

Experiment: Projectivity

This experiment explored the influence of prior probability and veridicality on the projectivity of the contents of clausal complements. Of the 20 predicates, 7 are typically taken to be factive (*be annoyed, know, discover, reveal, see, hear, inform*), 7 are typically taken to not be factive (*be right, pretend, think, suggest, say, prove, demonstrate*), and the remaining 6 predicates have been suggested to be "part-time triggers" or to give rise to the "illusion of factivity" (*establish, confess, announce, acknowledge, admit, confirm*; see references above).

Materials and procedure. Polar questions were formed from one of the 20 predicates paired with one of the 20 event-describing complement clauses. Participants were presented with 20 polar questions (one for each predicate), uttered by a named speaker, as shown in (3). Each polar question was presented with one of the two facts for the event described by clausal complement. Participants were asked to assess whether the speaker was certain of the content of the clausal complement and gave their responses on a sliding scale from 'no' to 'yes'.

(3)   **Fact (which Carol knows):** Julian is German.

       Carol: Did Sandra {discover / announce / suggest} that Julian dances salsa?

Results (n=XX) and discussion.

Theoretical implications

Presuppositions are standardly analyzed as conventionally specified conditions on the felicitous use of utterances with presupposition triggers. Such lexicalist analyses predict that presuppositions follow from utterances with presupposition triggers (modulo accommodation), regardless of whether the trigger is embedded under an entailment-canceling operator, as in (1a), or occurs in an atomic sentence, as in (1b). Consequently, lexicalist analyses of projectivity are necessarily restricted to entailed content. ABRUSAN?? An analysis of projectivity that does not rely on conventional specification, but e.g., on at-issueness is not restricted to entailed content. (e.g., Simons et al. 2010, Beaver et al. 2017, Abrusán 2011, 2013). Thus, the question of whether entailed and non-entailed content differs in projectivity will help decide between theories.
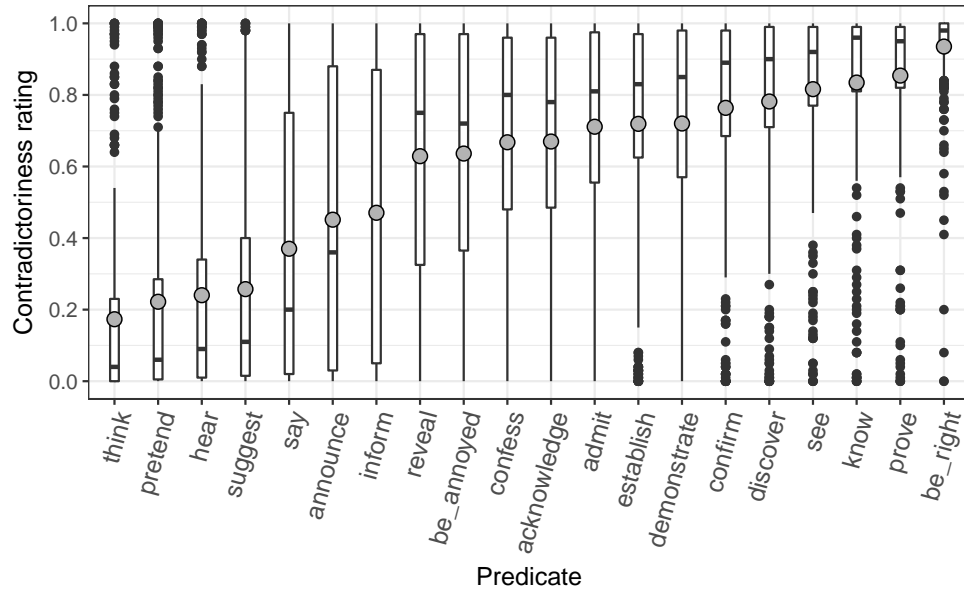
Figure 1: Boxplot of contradictoriness ratings by predicate, collapsing across complement clauses. Grey dots indicate means and notches indicate medians.

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