

# Evaluative adjective sentences: A question-based analysis of projection

April 25, 2019

## Abstract

Two contents of evaluative adjective sentences, like *Kim was smart to watch the movie*, are the prejacent (that Kim watched the movie) and the generalization (that the degree to which Kim watching the movie is smart is higher than the contextual standard of *smart*). The prejacent is standardly analyzed as a presupposition (e.g., Norrick 1978, Barker 2002, Oshima 2009, Kertz 2010). This paper argues against such [jd: such = what?] analyses [mcdm: what about “such an analysis” or “analyses which view the prejacent as a presupposition”] because, among other things, they do not capture an interaction between the prejacent and the generalization that has not yet been observed for projective content: when the prejacent projects, the generalization does not, and when the prejacent does not project, the generalization does [jd: does the evidence really favor such categorical a view?]. We develop an analysis according to which the prejacent is not a lexically specified presupposition but projects if it is not at-issue with respect to the question addressed by the utterance of the evaluative adjective sentence. In addition to capturing the interaction between the prejacent and the generalization, our question-based projection analysis significantly expands on previous such analyses (e.g., Beaver and Clark 2008, Simons et al. 2017, Beaver et al. 2017, Abrusán 2011) by incorporating a novel constraint on the question addressed by an utterance: the more the truth of an utterance content follows from the common ground [jd: can something follow more or less, or should this instead be “the more likely the truth of an utterance content is to follow from the common ground...”], the less likely the question is about that content. We provide experimental evidence for the proposed analysis and argue that our analysis improves on that of Karttunen et al. 2014, according to which evaluative adjectives are systematically ambiguous.

## 1 Introduction

In an evaluative adjective sentence (EAS) like (1), the evaluative adjective *stupid* subcategorizes for a non-pleonastic subject noun phrase (*Feynman*) and a *to*-infinitive (*to dance on the table*); the subject of the predicate *be stupid* is the understood subject of the *to*-infinitive (e.g., Wilkinson 1970, Norrick 1978, Barker 2002, Kertz 2010). One of the contents standardly discussed in the literature is (what we refer to as) the prejacent: in (1), the prejacent is that Feynman danced on the table.

(1) Feynman was stupid to dance on the table.

(Barker 2002:18)

The prejacent has traditionally been analyzed as a presupposition (e.g., Norrick 1978, Barker 2002, Oshima 2009, Kertz 2010). On formal analyses in this tradition, evaluative adjectives like *stupid* lexically specify that the prejacent must be entailed by or satisfied in the common ground of the interlocutors in order for an EAS to be interpretable (e.g., Heim 1983, van der Sandt 1992). Such analyses are motivated by and straightforwardly account for the variants of (1) in (2) in which the prejacent projects over entailment-canceling operators, i.e., negation in (2a), a polar question in (2b), the possibility adverb *perhaps* in (2c) and

the antecedent of the conditional in (2d). That is, speakers who utter (2a-d) may be taken to be committed to the prejacent, that Feynman danced on the table, even though the evaluative adjective is embedded under an entailment-canceling operator.

- (2) a. Feynman wasn't stupid to dance on the table.
- b. Was Feynman stupid to dance on the table?
- c. Perhaps Feynman was stupid to dance on the table.
- d. If Feynman was stupid to dance on the table, then tell him. (Barker 2002:18f.)

Recently, Karttunen et al. (2014) provided naturally occurring examples that show that utterances of sentences in which the evaluative adjective is embedded under negation can receive an interpretation according to which the prejacent does not project, but is interpreted in the scope of negation. For instance, the speaker of (3a) is not committed to living close to their parents and instead communicates that they do not live close to their parents. Likewise, the speaker of (3b) is not committed to having stumbled through the junkyard in the dark but [mcdm: why "but rather"? Isn't "committed to not p" part of "not committed to p"?] rather communicates that they did not go stumbling through the junkyard. [mcdm: It seems to me that the reading that they did go is also available. You can easily continue with "I saved him". So perhaps "Likewise, the speaker of (3b) can be not committed to having stumbled through the junkyard in the dark, and even communicating that they did not go stumbling through the junkyard."]

- (3) Karttunen et al. 2014:235
  - a. I wasn't fortunate to live extremely close to my Mom and Dad for most of my adult life. The closest was when I was in Denver and they were in Garden City, KS.
  - b. Now I knew someone was in the junkyard and the cold wind was carrying the cries. I wasn't stupid to go stumbling through the junkyard in the dark and get hurt.

We discuss below why such examples are problematic for analyses of the prejacent as a lexically specified presupposition. But we first need to mention [jd: "mention" sounds very offhand here. perhaps instead "Before discussing why such examples are problematic for..., we first would like to acknowledge that there is variation..."] that there is variation in the population of native speakers of American English: whereas all speakers are able to interpret EASs in which the prejacent does not project, i.e., are able to retrieve the intended interpretations of examples like (3), a sizeable portion strongly prefers to realize such interpretations with variants that includes *enough*, as in *I wasn't stupid enough to go stumbling through the junkyard in the dark* for (3b); see also Karttunen 2013 and Karttunen et al. 2014 for this observation. Nevertheless, EASs in which the prejacent does not project are part of American English, as evidenced by the existence of naturally occurring examples like (3); further such examples are presented in this paper. Additional evidence comes from the fact that there are native speakers who judge such EASs to be perfectly acceptable<sup>1</sup> and who produce examples like (3). We therefore assume that all [jd: really "all"? is it necessary to assume that? it might be wrong] native speakers of American English are able to retrieve both interpretations of EASs even if they might not produce EASs in which the prejacent does not project. Our goal in this paper is to analyze the interpretation of EASs; we briefly return to the observed variation after developing our analysis.

To account for examples like (3), in which the prejacent is not a commitment of the speaker, presupposition analyses appeal to local accommodation, a process whereby a presupposition is added to a local

<sup>1</sup>The audiences to which this research was presented over the years always included native speakers that judged examples like (3) to be acceptable. More systematic evidence for the existence of such speakers comes from the acceptability rating study presented in Appendix A: of the 94 self-reported native speakers of American English that participated in the study, about 20-30% judged negated evaluative adjective sentences without *enough* to be acceptable under a non-projecting interpretation of the prejacent.

context, such as the context created by negation: presuppositions can be locally accommodated if adding the presupposition to the common ground of the interlocutors (a process known as global accommodation) would result in a contradiction, un informativity or problems with binding (Heim 1982, van der Sandt 1992). In example (3a), for instance, the prejacent, that the speaker lived close to their parents, is locally accommodated under negation because globally accommodating the prejacent in the common ground would result in a contradiction: indeed, according to the context, the closest that the speaker lived to their parents was when the speaker lived in Denver, Colorado, i.e., about 300 miles (480 km) away from their parents in Garden City, Kansas. The prejacent is correctly predicted to be locally accommodated in (3a), i.e., does not become a commitment of the speaker.

Negated evaluative adjective sentences (NEASs) like (3) point to two problems for analyses according to which the prejacent is a presupposition. The first problem concerns the prejacent. In example (3b), globally accommodating the prejacent does not result in a contradiction, un informativity or problems with binding: if the prejacent, that the speaker went stumbling in the junkyard, was added to the common ground, (3b) would mean that the speaker knew that someone was in the junkyard, that they stumbled through the junkyard and got hurt, and that the speaker does not consider these actions stupid (perhaps because these actions led to the person in the junkyard receiving help). Because such an interpretation does not result in a contradiction, un informativity or problems with binding, analyses that take the prejacent to be a presupposition incorrectly predict that the prejacent of (3b) is globally accommodated, i.e., is a commitment of the speaker.<sup>2</sup>

The second problem concerns content other than the prejacent: here, the two previous analyses that explicitly consider content other than the prejacent, Oshima 2009 and Barker 2002, do not make sufficiently strong predictions. Consider first Oshima 2009. On this analysis, the prejacent is a presupposition and what is asserted is the following complex content: from the prejacent it can be inferred that the denotation of the subject is in the extension of the evaluative adjective (p.371). That is, (2a) is predicted to presuppose that Feynman danced on the table and to assert that it cannot be inferred from Feynman dancing on the table that Feynman is stupid. Similarly then, (3b) is predicted to convey that the speaker did not stumble through the junkyard (if the prejacent is locally accommodated) and to assert that it cannot be inferred from the speaker stumbling through the junkyard that the speaker is stupid. This assertion is too weak: (3b) means that the speaker stumbling through the junkyard would be stupid.

Next consider Barker 2002. This analysis considers the prejacent, which is taken to be presupposed, and a content that we refer to as the generalization: the generalization of (2a) is that the degree to which Feynman dancing on the table is stupid is higher than the contextual standard of *stupid*; that of (3b) is that the degree to which the speaker stumbling through the junkyard in the dark is stupid is higher than the contextual standard of *stupid*. On Barker's (2002) dynamic semantic analysis, the update effect of a NEAS like (2a) is to check that, for each world, the presupposed prejacent is true and to filter out those worlds in which the generalization is false; thus, only those worlds remain in which Feynman dancing on the table is not considered stupid. Similarly then, the update effect of (3b), in which the prejacent is locally accommodated, is to filter out those worlds in which the contextual standard of *stupid* is too high for the speaker's participation in the event of stumbling through the junkyard to count as stupid. The worlds that remain are ones in which the speaker does not stumble through the junkyard and in which the speaker stumbling through the junkyard is not stupid. This, again, is not what (3b) is understood to mean.

The examples in (3) reveal a remarkable property of EAS that was not noted in Karttunen et al. 2014, namely an interaction that has not yet been observed for projective content: when the prejacent projects,

<sup>2</sup>It may be possible to account for the non-projection of the prejacent on the basis of plausibility considerations: von Stechow 2008:162, for instance, proposed that "what gets accommodated depends on the best guess of the hearers about what the speaker might have intended as the adjustment to the common ground that would admit the asserted sentence". The cues to the projectivity of the prejacent identified in the following sections may help flesh out the reasoning process that hearers and readers undergo in interpreting EASs. Plausibility considerations do not, however, address the second problem that presuppositional analyses face.

the generalization does not, as in (2b), and when the prejacent does not project, the generalization does, as in (3b). To illustrate that this behavior is strikingly different from the interpretation of utterances of other sentences that give rise to projective content consider (4). When the content of the clausal complement of *know*, that the meeting was canceled, projects, what is denied is Sam's knowledge of this content. The critical difference between EAS and examples like (4) comes out when the content of the complement does not project, as is brought out, for instance, by continuing (4) with ... *he, like all of us, is in the dark about whether the meeting will take place*. In this case, Sam's knowledge of the content that the meeting was canceled is still denied and the speaker is not taken to be committed to either its truth or its falsity. Thus, the two contents of (4) do not exhibit the interaction of the projectivity of the prejacent and the generalization.

- (4) Sam doesn't know that the meeting was canceled.

This observation has strong implications for analyses of EAS according to which the prejacent is a lexically-specified presupposition. First, when the prejacent is locally accommodated under negation, the speaker is committed to the falsity of the prejacent; this is in contrast to a locally accommodated factive presupposition, for which the speaker is not committed to its truth or falsity. Second, when the prejacent is locally accommodated under some operator, the generalization is not interpreted under that operator, in contrast to the attitude ascription with *know* which is always interpreted in the scope of the operator. These observations are problematic for advocates of analyses according to which the prejacent is a lexically-specified presupposition and projection is assumed to be governed by the standard mechanisms of presupposition projection (Heim 1983, van der Sandt 1992).

Karttunen et al.'s 2014 analysis made progress over previous analyses by assuming that evaluative adjectives are ambiguous between the two schematic lexical entries in (5): the prejacent is specified as presupposed in the lexical entry in (5a) but not in (5b).

- (5) Karttunen et al. 2014:249: Presuppositions and assertions of EASs of the form 'NP was Adj to VP'
- a. *adj*<sub>1</sub>  
 Presupposed content: NP VPed  
 Asserted content: For NP to VP would be Adj
  - b. *adj*<sub>2</sub>  
 Presupposed content: For NP to VP would be Adj & for NP not to VP would not be Adj  
 Asserted content: What NP did about VPing was Adj

These two lexical entries allow Karttunen et al. 2014 to correctly predict an interpretation of the NEAS in (2a) in which the prejacent projects and an interpretation of the NEAS in (3b) according to which the prejacent does not project. Furthermore, the lexical entry in (5b) predicts that the NEAS in (3b) has an interpretation according to which it is presupposed that for the speaker to stumble through the junkyard would be stupid and for the speaker to not stumble through the junkyard would not be stupid; thus, in contrast to Oshima's 2009 and Barker's 2002 analyses, this analysis correctly predicts that (3b) conveys that the speaker stumbling through the junkyard would be stupid. Finally, Karttunen et al.'s analysis captures the interaction between the projection of the prejacent and the generalization: when the prejacent projects, as in the lexical entry in (5a), the generalization does not, by virtue of following from the asserted content; when the prejacent does not project, as in the lexical entry in (5b), the generalization does, by virtue of being part of the presupposed content.

However, there are also concerns with Karttunen et al.'s analysis. Because it is not formalized, it is not clear that it makes correct predictions about content other than the prejacent. According to the lexical entry in (5a), what is asserted is that it is not the case that for Feynman to dance on the table would be stupid: Karttunen et al. (2014:248) assume that from this asserted content and the presupposed prejacent it is not the case that Feynman dancing on the table was stupid. According to the lexical entry in (5b), what is asserted

is that it is not the case that what the speaker did about stumbling through the junkyard was stupid. That the prejacent is negated (the speaker didn't stumble through the junkyard) follows, according to Karttunen et al. 2014:249, from what is presupposed and what is asserted. Another concern is that Karttunen et al.'s analysis comes at a high cost: to derive the two interpretations, evaluative adjectives are systematically ambiguous. In addition to hardwiring the projection of the prejacent into one lexical entry but not the other, the analysis also hardwires the interaction between the projection of the prejacent and the generalization, which would preferably fall out from a projection analysis.

In the next section, we develop an analysis of EASs under which evaluative adjectives only have a single lexical entry. The analysis correctly predicts the two attested interpretations of EASs and the interaction between the projection of the prejacent and the generalization falls out from the analysis. Section 3 provides experimental evidence for two predictions of the analysis. After briefly considering the aforementioned interspeaker variation in section 4, the paper concludes in section 5.

## 2 A question-based analysis of the projective content of EAS

As mentioned above, previous analyses of EAS have attributed the projectivity of the prejacent of EAS to its lexical specification as a presupposition. More recently, the observation that some utterance content is not highly projective and sensitive to the discourse context has led to the development of analyses according to which the projectivity of content is not analyzed as derived from a lexical specification but rather from being backgrounded or not-at-issue content (e.g., Abrusán 2011, 2016, Simons et al. 2010, 2017, Beaver et al. 2017). In this paper, we follow such proposals and argue that the prejacent of an EAS projects when it is not at-issue with respect to the question addressed by the utterance of the EAS. Empirical motivation for developing such an analysis comes from the observation that the prejacent of EAS is not highly projective. AUTHORS' [jd: can just cite and not say "we", no?] 2018 experimental investigation found that the projectivity of the prejacent of EASs with *stupid* was significantly lower than that of non-restrictive relative clauses and appositive content, as well as of the content of the complement of the factive predicates *be annoyed* and *know*. In naturally occurring data, too, the prejacent of NEASs is not highly projective. In a corpus-based web study, we collected 'certainty' ratings on a 7-point Likert scale from 226 native speakers of American English for the prejacent of 59 naturally occurring NEAS: the higher the certainty rating, the more projective the prejacent. Figure 1 shows the mean certainty ratings of the 59 NEASs by evaluative adjective: across the 59 examples, the prejacent is not highly projective; the mean certainty rating was only 3.2. Details on this study are provided in Appendix B.<sup>3</sup>

In this section, we develop a question-based projection analysis for EASs.<sup>4</sup> In section 2.1, we introduce relevant aspects of the question-based projection analysis developed in Simons et al. 2017. In section 2.2,

<sup>3</sup>Although this paper largely considers EAS embedded under negation, the examples in (i) show that when an EAS is embedded under other entailment-canceling operators, such as the antecedent of a conditional or the epistemic possibility modal *perhaps*, the prejacent also need not project.

- (i) a. A: I wonder how many people would be banned for using SAM on Killing Floor.  
       B: If they were stupid to leave it running then maybe a few.  
           [steamcommunity.com/app/730/discussions/0/540744934462316309/](http://steamcommunity.com/app/730/discussions/0/540744934462316309/)
- b. I am seaching [sic] for a remote cabine in Finland that is available for renting. [...] Region wise I would prefer Lapland or Lakeside. Perhaps we are lucky to see northern lights.  
           [www.tripadvisor.com/ShowTopic-g189896-i442-k11448709-Remoterentalcottage-Finland.html](http://www.tripadvisor.com/ShowTopic-g189896-i442-k11448709-Remoterentalcottage-Finland.html)

[jd: hm, example b) sounds very L2 overall (the nature of the typos, "cabine"; and the "we are" instead of "we'll be"). and that it's from tripadvisor further increases the prob that it's not from a native english speaker, which would be a shot in the foot i think]

<sup>4</sup>This is not to suggest that lexicalist projection analyses are never appropriate: we assume, for instance, that contents associated with what Tonhauser et al. 2013 refer to as a Strong Contextual Felicity constraint are lexically specified presuppositions and that

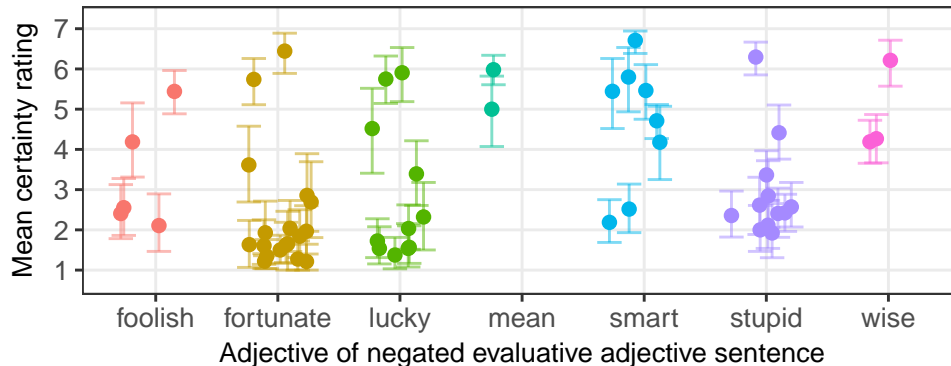


Figure 1: Mean certainty ratings of 59 naturally occurring NEASs by evaluative adjective. Error bars indicate bootstrapped 95% confidence intervals.

we show that the prejacent and the generalization are lexical entailments of EAS and that, furthermore, exactly one of them is at-issue in any given utterance; this predicts the interaction in the projection of these two contents. In section 2.3, we expand on previous question-based projection analyses by incorporating a constraint on the questions addressed by utterances of EASs.

## 2.1 Utterance content projects if it is not at-issue with respect to the Discourse Question

As illustrated in section 1, it is a long-standing observation that the content of the complement of an example like (4) *Sam doesn't know that the meeting was canceled* can project, but need not. Under lexicalist projection analyses, the projection of the content of the complement is predicted by specifying it as a presupposition in the lexical entry of the factive predicate (e.g., Heim 1983, van der Sandt 1992, Schlenker 2010). Several non-lexicalist analyses have been proposed over the years: these argue that the projection of the content of the complement is due to pragmatic considerations to capture, among other things, that content of the complement is not highly projective and sensitive to the discourse context (e.g., Wilson 1975, Simons 2001, Abusch 2002, 2010, Abrusán 2011, 2016, Romoli 2015). In this paper, we adopt Simons et al.'s 2017 question-based projection analysis for the content of the complement of factive predicates to account for the projective content of EASs.

According to Simons et al. 2017, one of the conditions under which the content of the complement of a factive predicate projects, i.e., is understood as a commitment of the speaker, is if the content of the complement is not at-issue with respect to the Discourse Question addressed by the utterance of the sentence with the factive predicate. The Discourse Question “provides the topic of a segment of discourse and imposes relevance constraints on conversational contributions” (p.192) and utterance content is at-issue with respect to the Discourse Question of the utterance if the content addresses the Discourse Question, i.e., entails at least a partial answer to the question (Roberts 1996/2012). To illustrate, consider the content of the clausal complement of *discover* in B's utterance in (6a) and (6b), that Harriet was at Princeton for a job interview. In the these examples, the Discourse Questions that B's utterances address are made explicit by A's interrogative utterances. In (6a), the content of the clausal complement of *discover* is at-issue because it addresses the Discourse Question: that Harriet was at Princeton for a job interview is an answer A's interrogative utterance of where Harriet was yesterday. In (6b), on the other hand, the content of the clausal complement of *discover* is not-at-issue because it is not an answer to A's interrogative utterance; rather, here the Discourse

the projection of conventional implicatures is best attributed to conventional specification (e.g., Potts 2005, Murray 2014). For discussion see AUTHORS 2013, 2018, 2019.

Question is addressed by the main clause content of B's utterance.

(6) a. A: Where was Harriet yesterday?

B: Henry discovered that she was at Princeton for a job interview.

b. A: Why is Henry in such a bad mood?

B: He discovered that Harriet was at Princeton for a job interview.

(examples adapted from Simons 2007:1035)

In (6), *discover* is not embedded under an entailment-canceling operator. Consequently, B is taken to be committed both to the content of the complement and to Henry having discovered it.

Now consider an example in which *discover* is embedded under an entailment-canceling operator, like (7). Here, the speaker is not taken to be committed to the content of the main clause, because that content is merely an entailment: the speaker is asking whether Henry discovered the content of the complement.

(7) Did Henry discover that Harriet was at Princeton for a job interview?

The content of the complement of *discover*, by contrast, is not merely an entailment but may project, as noted above.<sup>5</sup> According to Simons et al. 2017, one of the conditions under which the content of the complement projects is when it is not at-issue with respect to the Discourse Question addressed by the utterance. Consider the examples in (8), where A's interrogative utterances again make explicit the Discourse Questions addressed by B's utterances. In (8a), the content of the complement of B's utterance does not address the Discourse Question, i.e., is not at-issue. Here, B is taken to be committed to the content of the complement: to make sense of B's utterance as an answer to A's question, there must be a connection between the possibility of Henry discovering something about Harriet and Henry's mood; an obvious connection is that B takes the content of the complement to be true, i.e., that it is possible that Henry discovered that Harriet was at Princeton for a job interview. Thus, the content of the complement projects. In (8b), by contrast, the content of the complement addresses the Discourse Question, i.e., is at-issue. Here, B need not be taken to be committed to the content of the complement to make sense of how B's utterance addresses A's question, i.e., the content of the complement does not project.

(8) a. Context: Henry and Harriet are an academic couple that lives on the West Coast.

A: Why is Henry in such a bad mood?

B: Did he discover that Harriet was at Princeton for a job interview?

b. Context: Henry is a nosy colleague of Harriet and well-informed about her whereabouts.

A: Where was Harriet yesterday?

B: Did Henry discover that she was at Princeton for a job interview?

In sum, under Simons et al.'s 2017 proposal, utterance content may project if it is not at-issue with respect to the Discourse Question addressed by the utterance. The question of why not-at-issue content projects has received several different answers. Potts (2005) assumed that it was due to such content being contributed to a separate dimension of meaning, and Simons et al. (2010) proposed that not-at-issue content is not targeted by operators, such as negation, thereby resulting in the content projecting over such operators. In this paper, we follow Abrusán 2011, 2016 in assuming that the not-at-issue content is backgrounded and projects as a result of its discourse status.<sup>6</sup> For empirical evidence that at-issueness predicts projection, see AUTHORS

<sup>5</sup>For the assumption that presuppositions, as well as other projective content, are entailments that may project see, e.g., Gazdar 1979, Barker 2002, Schlenker 2010, Abrusán 2011, 2016, Anand and Hacquard 2014.

<sup>6</sup>We do not otherwise follow Abrusán's analysis of which content is backgrounded because it, unfortunately, does not appear to make correct predictions for EAS. Abrusán (2011) proposed that entailments of utterances that are about the running time of the



2018 [jd: just cite t et al], who investigated the hypothesis for 19 projective contents associated with American English expressions.

In naturally occurring discourse, the Discourse Question addressed by an utterance is more likely to be implicit rather than explicit. When the Discourse Question is implicit, the utterance itself and the discourse context in which it is made provide cues to the Discourse Question, and thereby to the at-issueness and projection of utterance content. For utterances of sentences with factive predicates, for instance, the information structure of the utterance, in particular prosodically marked focus have been shown to constrain the question addressed by the utterance and, hence, the at-issueness and projection of the content of the complement (e.g., Beaver 2001, Cummins and Rohde 2015, Tonhauser 2016, Simons et al. 2017, Djärv and Bacovcin 2017, Mahler 2019). After considering which contents of EAS can be at-issue in the next section, we show in section 2.3 that the discourse status of utterance content constrains the Discourse Question that the utterance of the EAS is taken to address.

## 2.2 Lexical entailments of evaluative adjective sentences

This section shows that both the prejacent and the generalization are lexical entailments of EAS and that both of these utterance contents can but need not be at-issue. What follows, given the framework set up in the previous section, is that both the prejacent and the generalization can project (when not at-issue) and, furthermore, that when one is at-issue and doesn't project, the other one is not at-issue and projects.

We assume, with Barker 2002, that the prejacent and the generalization are lexical entailments of unembedded EAS (but not that the prejacent is lexically specified as presupposed).<sup>7</sup> As shown in (9), the generalization is timeless and the tense of the EAS determines the temporal reference of the prejacent.

- (9) Consider an unembedded EAS of the form 'NP be.TENSE Adj to VP'. Assume that the translation of the NP is the constant  $np$  (of type  $e$ ), of the Adj is  $adj'$  (of type  $\langle\langle ev, t \rangle, t \rangle$ ) and of the VP is  $VP'$  (of type  $\langle e, \langle ev, t \rangle \rangle$ ), and that the temporal location of the reference time  $rt$  is constrained by the tense marking of the EAS. The EAS has the following lexical entailments:
- a. Prejacent:  $\exists e(VP'(np)(e) \wedge at(rt, \tau(e)))$   
 "There is an event of  $np$  vping and the run time of that event is located at the reference time."
  - b. Generalization:  $adj'(VP'(np))$   
 "The degree to which events of  $np$  vping are  $adj$  is higher than the contextual standard for  $adj$ ."

By (9), a past tense EAS like (1) *Feynman was stupid to dance on the table* entails that Feynman danced on the table (the prejacent) and that the degree to which events of Feynman dancing on the table are stupid

---

main event are the default main point, i.e., what we have referred to as the at-issue content. This analysis, however, does not make correct predictions for EAS: given Abrusán's notion of aboutness, both the prejacent and the generalization of EASs are about the running time of the main event. For instance, Abrusán (2011:508) took the entailment of (i), that John solved the exercise, to be "non-accidentally (i.e., necessarily) about the matrix event time". By the same argument, the prejacent of (ii) would be about the matrix event time, which means that neither the prejacent nor the generalization are predicted by Abrusán 2011 to be the default at-issue content of EASs.

- (i) John managed (at time  $t_1$ ) to solve the exercise (at  $t_1$ ). (Abrusán 2011:508)
- (ii) John was smart (at time  $t_1$ ) to solve the exercise (at  $t_1$ ).

<sup>7</sup>Some EASs with *will* appear to not entail the prejacent: for example, some speakers do not judge (i) to entail that Johnson will take what he can get. We thank David Beaver (p.c.) for this point, which we sidestep here.

- (i) With more teams denying interest in Johnson, he will be smart to take what he can get.  
 (<http://www.sportsworldreport.com/articles/28999/20140407/chris-johnson-rumors-ny-jets-release-mike-goodson-free-agent-signs-dallas-cowboys-demarco-murray-rams-falcons.htm>)



is higher than the contextual standard for *stupid* (the generalization). Generalizations are timeless and the events involved may but need not be actual: for instance, it does not follow from the generalization of (1) that an event of Feynman dancing on the table took place; this follows only from the prejacent.

The proposal that the prejacent and the generalization are entailments predicts that unembedded EASs are judged to be unacceptable if either of the two lexical entailments is false. The examples in (10) show that that prediction is borne out. Consider (10a), whose prejacent is false and whose generalization is true (under the assumption that the degree to which events of anybody, including Kim, being born into poverty are unfortunate is higher than the contextual standard of *unfortunate*): this example is correctly predicted to be unacceptable because the prejacent is false. In (10b), on the other hand, the prejacent is true and the generalization is false (under the assumption that the degree to which events of anybody, including Sandy, being born into poverty are lucky is lower than the contextual standard of *lucky*). This sentence is correctly predicted to be judged to be unacceptable because the generalization is false.

- (10) a. What is true: Kim was born to rich parents  
       #Kim was unfortunate to be born into poverty.  
       b. What is true: Sandy was born into poverty  
       #Sandy was lucky to be born into poverty.

Having motivated that both the prejacent and the generalization are lexical entailments of EAS, we now turn to the discourse status of these contents. The discourse status of the prejacent and the generalization is not conventionally specified by the EAS: both can be entailed by the common ground at the time at which the utterance is made or new information at the time at which the EAS is uttered (in other words, neither content is associated with what Tonhauser et al. 2013 call a Strong Contextual Felicity constraint). To illustrate, consider the naturally occurring EASs in (11). The EAS in (11a) is acceptable in a context in which the prejacent follows from the common ground, i.e., the interlocutors already know that Trump gave Wolff unlimited access, and in which the speaker conveys the generalization as new information, i.e., that they consider the degree to which events of Trump giving Wolff unlimited access are stupid is higher than the contextual standard of *stupid*. The EAS in (11b) illustrates that the discourse status of the prejacent and the generalization can also be reversed: (11b) is acceptable in a context in which the generalization follows from the common ground, whereas the prejacent, that MacLean grabbed Kouassi in his private parts is new information. And, finally, there are also EAS in which both the prejacent and the generalization may be new information: (11c) is acceptable in a context in which neither the generalization nor the prejacent follow from the common ground. When a speaker utters the EAS in (11c), the speaker may be thereby committing to the truth of the prejacent, that they bought an Xbox, to the truth of the generalization, that the degree to which events of them buying an Xbox 360 elite are stupid is higher than the contextual standard of *stupid*.

- (11) a. Trump was stupid to give Wolff unlimited access.<sup>8</sup>  
       b. Steven MacLean was stupid to grab Eboue Kouassi in his private parts.<sup>9</sup>  
       c. I was stupid to buy the Xbox 360 elite.<sup>10</sup>

Not only can both the prejacent and the generalization of an EAS be new information, they can also both be at-issue with respect to the Discourse Question addressed by an utterance of the EAS. Of course, it follows from the characterization of at-issue content as addressing the Discourse Question that only one of them is at-issue in any given utterance of an EAS. We further assume that the prejacent and the generalization are the only contenders for at-issue content of an EAS, which means that exactly one of them is at-issue in

<sup>8</sup><https://www.eastbaytimes.com/2018/01/07/letter-trump-was-stupid-to-give-wolff-unlimited-access/>

<sup>9</sup><https://www.heraldscotland.com/sport/17189197.brendan-rogers-steven-maclean-was-stupid-to-grab-eboue-kouassi-in-his-private-parts/>

<sup>10</sup>[www.gamespot.com/forums/xbox-association-1000003/i-was-stupid-to-buy-the-xbox-360-elite-26937557](http://www.gamespot.com/forums/xbox-association-1000003/i-was-stupid-to-buy-the-xbox-360-elite-26937557)

any given utterance of an EAS, the other one is not-at-issue.<sup>11</sup> To illustrate, consider the examples in (12), in which utterances of the same EAS address four distinct Discourse Questions. The Discourse Questions in (12a) and (12b) are about the prejacent: both the question of whether Sam got a ticket in (12a) and who got a ticket in (12b) are answered by the prejacent of B's utterances, that Sam got a ticket.<sup>12</sup> Thus, in (12a) and (12b), the prejacent is at-issue and the generalization, that the degree to which events of Sam buying a ticket the day the tickets went on sale are smart is higher than the contextual standard of *smart* is not at-issue. The Discourse Questions in (12c) and (12d), on the other hand, are not about the prejacent: neither the question about B's assessment of events of Sam buying a ticket they went on sale (12c) nor the question of whether Sam was smart to buy a ticket the day they went on sale in (12d) are answered by the prejacent of B's utterances; rather they are answered by the generalization. Thus, in (12c) and (12d), the generalization is at-issue and the prejacent is not at-issue.

- (12) a. A: The show was sold out. Did Sam get a ticket?  
       B: She was smart to buy one the day they went on sale.
- b. A: There were so few tickets for the show! Who got a ticket?  
       B: Sam was smart to buy one the day they went on sale.
- c. A: How do you assess Sam's buying of a ticket the day they went on sale?  
       B: Sam was smart to buy one the day they went on sale.
- d. A: Was Sam smart to buy a ticket for the show the day the tickets went on sale? The price would have gone down after a few days!  
       B: Sam was smart to buy one the day they went on sale. The show sold out the day the tickets went on sale.

We are now ready to return to our question-based projection analysis of EAS, according to which the prejacent projects when it is not at-issue with respect to the Discourse Question addressed by the EAS, and likewise for the generalization. Consider the minimal pair in (13a) and (13b), where, B utters the same NEAS, modulo whether the subject is a pronoun or a proper name. The prejacent of this NEAS is at-issue in (13a) because A's interrogative utterance, assumed to be the Discourse Question, is about the prejacent. Thus, according to our proposal, the prejacent of B's utterance in (13a) is predicted to not project but the generalization, as not-at-issue content, projects: accordingly, B's utterance means that Sam didn't buy a ticket the day they went on sale (the prejacent does not project) and that the degree to which events of Sam buying a ticket the day they went on sale are smart is higher than the contextual standard of *smart*, i.e., it would have been smart for Sam to buy a ticket on the day they went on sale. In (13b), on the other hand, A's interrogative utterance, is about the generalization. Thus, the prejacent of B's utterance is not at-issue and, according to our proposal, is predicted to project, whereas the generalization does not project over negation. Accordingly, B's utterance is interpreted to mean that Sam bought a ticket the day they went on sale (the prejacent projects) and that the degree to which events of Sam buying a ticket the day they went on sale are smart is not higher than the contextual standard of *smart*, i.e., Sam having bought a ticket on the day they went on sale wasn't smart.

<sup>11</sup> As discussed in detail in Barker 2002:§4.2, EAS also give rise to subject-related entailments, namely that the denotation of the subject noun phrase is capable of volition and, regarding the situation described by the *to*-infinitive, has the power to bring it about and intends for it to come about. We follow Barker 2002 in assuming that these entailments are lexically-specified presuppositions. Consequently, these entailments are conventionally specified as not at-issue.

<sup>12</sup> Some native speakers of American English would prefer to produce B's utterances in (12a) and (12b) with *enough*: *She was smart enough to buy one the day they went on sale.* We hypothesize that such speakers disprefer producing EAS in which the prejacent is at-issue. Given our hypothesis that the prejacent projects when it is not at-issue, we would expect such speakers to also disprefer producing NEAS like (3) in which the prejacent does not project. Crucially, as discussed in section 1, even speakers who prefer to produce (12a) and (12b) with *enough* can retrieve the intended interpretations of the variants without *enough*.

- (13) a. A: The show was sold out. Did Sam get a ticket?  
       B: She wasn't smart to buy a ticket the day they went on sale. (So, she didn't go to the show.)  
       b. A: You keep criticizing Sam for doing some not-so-smart things. I'm not sure I agree. Can you give me an example (of something not-so-smart that Sam did)?  
       B: Sure! Remember the rock show we talked about? Sam wasn't smart to buy a ticket the day they went on sale. The price went down a couple of days later.

The proposal not only accounts for the projectivity of the prejacent of EAS but also for the interaction in the projection of the prejacent and the generalization. Given that both the prejacent and the generalization can be at-issue, but exactly one of them may be at-issue in any given utterance of an EAS, it falls out from [jd: I think "from" should be "of" here and in other places? not sure about my L2 intuitions] the analysis that if the prejacent projects, the generalization does not, and vice versa: if the prejacent is not at-issue, it projects, and hence the generalization must be at-issue and doesn't project.

In the examples we have entertained so far, the Discourse Question was realized by an interrogative utterance, thereby making clear whether the prejacent or the generalization are at-issue. But in naturally occurring discourse, the Discourse Question is often implicit. As mentioned above, previous work has identified focus marking as constraining the question that an utterance can be taken to address and thereby influencing projection. Because the prosody of EASs is quite poorly understood, we will only entertain focus marking in a tentative manner in section 4. Instead, the next section identifies a novel constraint on the Discourse Question of utterances, including utterances of EAS.

### 2.3 At-issue content is not redundant content

One of the constraints on the Discourse Question addressed by an utterance comes from a felicity requirement that is found in different guises in the literature: an utterance of an indicative sentence is felicitous only if the sentence is informative in the context in which it is uttered. Groenendijk (1999:144), for instance, formulates this as the requirement that indicative sentences be non-redundant. We assume here that an utterance of a sentence is informative if its at-issue content is not already entailed by the common ground of the interlocutors prior to the utterance of the sentence.<sup>13</sup> Since content is at-issue with respect to the Discourse Question addressed by the utterance, this means that the Discourse Question cannot be about content that is entailed by the common ground because such a Discourse Question would render the utterance uninformative. What follows is that the more a particular utterance content follows from the common ground, the less likely the Discourse Question of the utterance is about that content:

(14) **Non-redundancy principle for at-issue content**

For utterance content *c*, the stronger the inference to the truth of *c* from the common ground, the less likely is it that the Discourse Question of the utterance is about *c*, i.e., the less likely *c* is at-issue.<sup>14</sup>

The principle in (14) has consequences for the interpretation of EAS: the stronger the inference to the truth of the prejacent from the common ground, the less likely the Discourse Question of the EAS is about the prejacent, i.e., the more likely the generalization is at-issue and doesn't project. And vice versa: the stronger the inference to the truth of the generalization from the common ground, the less likely the

<sup>13</sup>No such requirement exists for not-at-issue content: some not-at-issue content, like presuppositions, may be entailed by the common ground prior to utterance and other not-at-issue content, like conventional implicatures, may even be required to not be entailed, as argued in Potts 2005. We follow works like Potts 2005 and Murray 2014 in assuming that conventional implicatures are always not at-issue. Thus, while both the at-issue content and conventional implicatures may be new information, they differ at-issueness.

<sup>14</sup>To be clear, this principle is meant as a conditional, not a bi-conditional, as it is not the case that the less likely it is that the Discourse Question is about a particular content, the stronger the inference to the truth of that content from the common ground. We thank an anonymous reviewer for this comment.

Discourse Question of the EAS is about the generalization, i.e., the more likely the prejacent is at-issue and doesn't project. To illustrate the predictions the principle in (14) makes for the projection of the prejacent and the generalization, consider the following naturally occurring examples: whereas the prejacent of (15) projects, according to the ratings obtained in the web-based corpus study, that of (3b) does not, as discussed in section 1.

- (15) God offers Hope to Hispanics! In His pages are solutions to every immigration problem. God loves citizens and immigrants equally. His solutions are for all of us. They are practical. They work. He is not stupid to think so.
- (3b) Now I knew someone was in the junkyard and the cold wind was carrying the cries. I wasn't stupid to go stumbling through the junkyard in the dark and get hurt.

The prejacent of the NEAS in (15) is that God thinks that his solutions are practical and work. Given that the strength of the inference from the common ground to the truth of the prejacent is quite high, the principle in (14) predicts that the Discourse Question of (15) is not likely to be about the prejacent, which is therefore more likely to be at-issue and to project, as observed. Now consider the NEAS in (3b), whose generalization is that the degree to which events of the speaker stumbling through the junkyard in the dark and getting hurt are stupid is higher than the contextual standard of *stupid*. Given that the strength of the inference from the common ground to the truth of the generalization is quite high, the principle in (14) predicts that the Discourse Question of (3b) is not likely to be about the generalization; rather, the Discourse Question is expected to be about the prejacent, which, as predicted, is observed to not project.

## 2.4 Summary of the question-based projection analysis of EAS

This section has presented a question-based projection analysis of EASs. This analysis builds on previous question-based projection analyses (Simons et al. 2017, Beaver et al. 2017) in assuming that entailed utterance content projects if it is not at-issue with respect to the Discourse Question addressed by the utterance. To apply this analysis to the projective content of EAS, section 2.2 demonstrated that both the prejacent and the generalization are entailed content that can but need not be at-issue. In contrast to previous analyses of EAS, the analysis developed in this section predicts that both the prejacent and the generalization can project and, furthermore, that when the prejacent projects, the generalization does not, and vice versa. Unlike Karttunen et al.'s 2014 analysis, our analysis captures these empirical generalizations without assuming that evaluative adjectives are systematically ambiguous. Finally, our question-based analysis of the projective content of EAS expands on previous such analyses by incorporating the 'Non-redundancy principle for at-issue content', which constrains the Discourse Question addressed by utterances of EAS.

The next section provides experimental evidence in support of the question-based projection analyses of EAS. Specifically, it presents the findings of two experiments designed to investigate two predictions of the analysis: the first prediction is that the stronger the inference to the truth of the generalization from the common ground, the less likely the prejacent is taken to project. The second prediction is that the stronger the inference to the truth of the generalization from the common ground, the more likely the prejacent is taken to be not at-issue. **[jd: here the predictions are formulated in probabilistic terms, but the way the theory is framed above is in absolute terms: if one projects, the other doesn't. is the idea to stick to the absolute view in any given instance, but allow for uncertainty (and consequently, gradedness in behavior) in identifying the discourse question? also, can we shorten and make the predictions easier to read/follow, eg like so:]**

**[jd: Predictions: The stronger the inference to the truth of the generalization from the common ground,**

- 1. the less likely the prejacent is taken to project.**

## 2. the more likely the prejacent is taken to be not at-issue.

]

### 3 Empirical evidence for the analysis

The question-based projection analysis we developed in the previous section leads us to expect that the more the prejacent or the generalization are not at-issue, the more they project. Preliminary evidence that the at-issueness of the prejacent influences its projection comes from AUTHORS 2018 [jd: cite]. One of the contents they investigated was the prejacent of EASs with *stupid* embedded under the polar question operator. The four evaluative adjective polar questions studied in their work are given in (16):

- (16) a. Was Raul stupid to cheat on his wife?  
b. Were John’s kids stupid to be in the garage?  
c. Is Mary’s daughter stupid to be biting her nails?  
d. Is Richie stupid to be a stuntman? (AUTHORS 2018, Appendix A)

AUTHORS 2018 assumed that both projection and at-issueness are gradient properties of utterance content and, consequently, collected projection and at-issueness ratings on a scale. Figure 2 shows participants’ projectivity ratings for the prejacent of the four items in (16) against their not-at-issueness ratings. There is a clear relationship between at-issueness and projectivity: the more a participant rated a prejacent as not-at-issue, the more projective they rated it ( $r = .91$ ; when not collapsing over the four questions  $r = .57$ ).

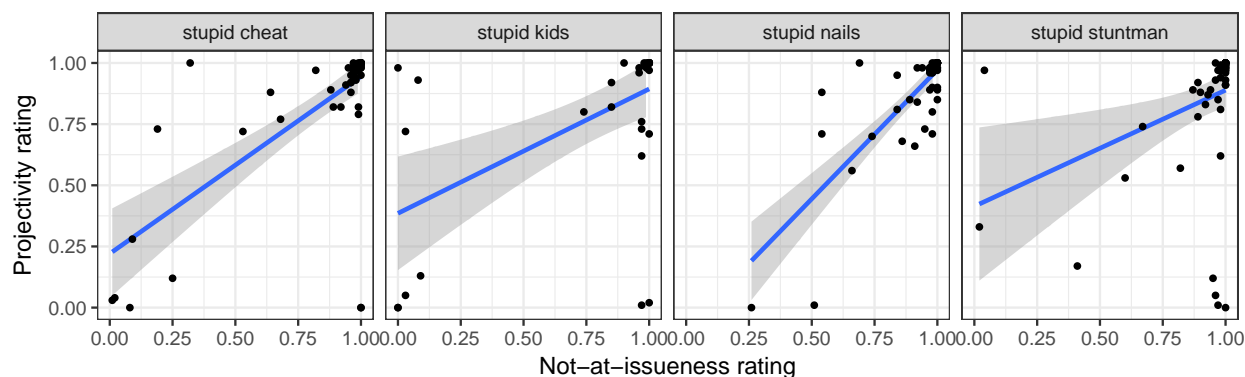


Figure 2: Projectivity ratings against not-at-issueness ratings for the prejacent of the four polar question EASs in AUTHORS 2018. Each dot represents one participant’s ratings. Linear smoothers with 95% confidence intervals overlaid.

AUTHORS’ 2018 finding provides preliminary evidence that the projectivity of the prejacent is sensitive to its at-issueness. However, in AUTHORS’ 2018 experiment, at-issueness was only measured, not manipulated. In the experiments reported on in the following two sections, we manipulated the strength of the inference to the truth of the generalization from the common ground, i.e., we manipulated the at-issueness of the generalization, and measured the projection of the prejacent (Exp. 1, section 3.1) and the at-issueness of the prejacent (Exp. 2, section 3.2).<sup>15</sup>

<sup>15</sup>The materials, data and the R code for generating the figures and analyses of the experiments reported on in this paper are available at [name of GitHub repository].

### 3.1 Experiment 1: Projectivity of the preja-cent

The experiment we report on in this section tested the prediction of our analysis that the stronger the inference to the truth of the generalization from the common ground, the less projective the preja-cent.

[jd: the whole following discussion of karttunen feels weirdly disjoint from the discussion of tonhauser et al 2018 above, even though both are framed as preliminary evidence for the analysis and as motivation for the current exp. maybe move the karttunen discussion up to the exp 1 intro? ] Preliminary evidence for this prediction comes from an experiment reported on in Karttunen et al. 2014. In that experiment, participants were presented with written NEASs like those in (17), referred to as ‘statements’, and they were asked whether the author of the statement believes the preja-cent or the negation of the preja-cent; a third response option was ‘cannot decide’. The experiment included one triple like that in (17) for each of the 19 evaluative adjectives tested (*arrogant, brave, careless, cruel, evil, foolish, fortunate, heroic, humble, lucky, mean, nice, polite, rude, sensible, smart, stupid, sweet, wise*). Each triple included a NEAS referred to by Karttunen et al. (2014) as ‘consonant’, which means that “there is a predisposition to assume or grant that for NP to VP would be Adj” (p.237). For instance, the NEAS in (17a) is consonant because for Paul to take the best piece is smart; this is comparable to what we have characterized as the generalization following from the common ground. Each triple also included a NEAS that Karttunen et al. (2014) referred to as ‘dissonant’, which means that “there is a predisposition to assume or grant that for NP to VP would not be Adj” (*ibid*). The NEAS in (17c) is dissonant because for the man to take the worst piece is not smart; this is comparable to what we have characterized as the falsity of the generalization following from the common ground. Finally, the third NEAS in each triple was considered ‘neutral’, i.e., neither consonant or dissonant, like (17b).

(17) Sample stimuli from Karttunen et al. 2014:241

- |  |             |
|--|-------------|
| a. Paul wasn’t smart to take the best piece.     | [consonant] |
| b. Sally wasn’t smart to take the middle piece.  | [neutral]   |
| c. The man wasn’t smart to take the worst piece. | [dissonant] |

Karttunen and his colleagues found that the preja-cent of dissonant NEASs was more likely to project than the preja-cent of neutral ones, and that the preja-cent of neutral ones was more likely to project than that of consonant ones. Thus, Karttunen et al.’s findings support the prediction of our analysis that the discourse status of the generalization influences the projectivity of the preja-cent.

A first goal of our Exp. 1 was to replicate Karttunen et al.’s 2014 finding and to address two potential shortcomings of their experiment. First, as mentioned above, Karttunen et al.’s 2014 experiment included only three items for each evaluative adjective: one in which the generalization follows from the common ground, one in which the falsity of the generalization follows from the common ground, and one in which neither the generalization nor its negation follow. Our experiment included a greater variety of items: for each evaluative adjective, there were 3 items in which the generalization follows and 3 in which the negation of the generalization follows from the common ground. Second, the stimuli of Karttunen et al.’s 2014 experiment were not normed to establish that native speakers of American English share their assumptions about whether the generalization or its negation follow from the common ground. Furthermore, the stimuli were presented to the participants without a context even though context can influence whether the generalization follows from the common ground. For instance, if Sally is on a diet and *middle piece* in (17b) is understood as *middle piece of the cake*, then (17b) is not neutral, but dissonant: for Sally to take the middle piece is not smart because for her to take any piece of the cake is not smart, given that she is on a diet. To address this worry, the stimuli in Exp. 1 were presented with a context and were normed to ensure that native speakers of American English share our assumption about whether the generalization or its negation follow from the common ground.

A second goal of Exp. 1 was to explore the prediction of our analysis that the discourse status of the generalization is influenced not just by the truth-conditional content of the EAS but also by contextual information.**[jd: is that really a direct prediction?]** For this reason, Exp. 1 manipulated whether the critical information about the discourse status of the generalization came from the EAS or from context. Exp. 1 collected participants' ratings of the projection of the prejacent of NEASs. Specifically, the experiment collected gradient projection ratings, under the assumption that projection is a gradient property of utterance content, because speakers can be taken to be more or less committed to the truth of a particular content (AUTHORS 2018).<sup>16</sup>

### 3.1.1 Methods

**Participants** 152 participants with US IP addresses and at least 97% of HITs approved were recruited on Amazon's Mechanical Turk platform (ages: 18-69, mean age: 33). They were paid 45 cents.

**Materials** Stimuli consisted of two-sentence discourses. In the target stimuli, the first sentence was a context sentence and the second sentence was a NEAS with one of the following 10 evaluative adjectives: *stupid, smart, wise, fortunate, lucky, brave, polite, mean, foolish* and *rude*. For each NEAS, either the generalization or its negation follow from the common ground: the prejacent of the latter is expected to be more projective than the prejacent of the former.

Whether the generalization or its negation follow from the common ground was manipulated in two ways. For stimuli in the 'Content' condition, the content of the NEAS determined whether the generalization or its negation follow from the common ground. Sample stimuli are given in (18): the context sentences are identical and the two NEASs have distinct generalizations. In (18a), the generalization is that the degree to which events of Sally losing her wallet are fortunate is higher than the contextual standard of *fortunate* (to be clear: the generalization is established on the EAS, not the NEAS). Here, the strength of the inference from the common ground to the truth of the generalization is weak, given that the strength of the inference to the negation of the generalization is high. In (18b), the generalization is that the degree to which events of Sue speaking French are fortunate is higher than the contextual standard of *fortunate*. Here, the strength of the inference from the common ground to the truth of the generalization is high. For stimuli in the 'Context' condition, the context sentence determined whether the generalization of the NEAS or its negation follow from the common ground. Sample stimuli are given in (19): the NEASs are identical and the context sentences differ. In (19a), the generalization is that the degree to which events of Jane prank-calling the police are smart is higher than the contextual standard of *smart*; here, the strength of the inference from the common ground is weak. In (19b), the generalization is that the degree to which events of Jane calling the police Jane are smart is higher than the contextual standard of *smart*; here the strength of the inference from the common ground is strong, given that Jane saw a man with a gun.

#### (18) Sample stimuli in the Content condition

- a. Sue was traveling in France. She wasn't fortunate to lose her wallet.
- b. Sue was traveling in France. She wasn't fortunate to speak some French.

<sup>16</sup>As discussed in AUTHORS: 498f., there are at least two interpretations of what it means for projectivity to be a gradient property: "On a first interpretation, a listener's (or reader's) judgment that a content is projective to a certain extent means that the listener takes the speaker (or writer) to be committed to the content to that extent. On this interpretation, projectivity being a gradient property is a consequence of speaker commitment being a gradient property. On a second interpretation, a listener's judgment that a content is projective to a certain extent reflects the probability with which they believe the speaker to be committed to the content. On this interpretation, speaker commitment may be a binary, categorical property and projection variability arises from the listener's uncertainty about the whether the speaker is committed." Like AUTHORS 2018, we remain agnostic about the underlying interpretation of projectivity as a gradient property, though our discussion of projection variability will be in line with the first interpretation.



(19) Sample stimuli in the Context condition

- a. Jane was prank-calling people. She wasn't smart to call the police.
- b. Jane saw a man with a gun. She wasn't smart to call the police.

To assess the projectivity of the prejacent, participants were asked whether the prejacent is true, e.g., 'Did Sue lose her wallet?' in (18a), 'Did Sue speak some French?' in (18b), and 'Did Jane call the police?' in (19a) and (19b).<sup>17</sup>

The experiment included, for each of the 10 evaluative adjectives, 3 pairs of target stimuli in the Content condition and 3 pairs of target stimuli in the Context condition, for a total of 60 pairs of target stimuli, i.e., a total of 120 target stimuli. We selected these 60 pairs of target stimuli from a total of 120 pairs of potential target stimuli for which we collected ratings in a norming study from native speakers of American English about whether the generalization or its negation follow from the common ground. For each evaluative adjective, we chose the 3 pairs of target stimuli in the Content and Context conditions for which the generalization and its negation most strongly followed from the common ground. The norming study is described in detail in Appendix C and the full set of stimuli is provided in Appendix D.

The 120 target stimuli were distributed across 12 lists of 10 target stimuli so that each evaluative adjective occurred once per list. Each list included 5 target stimuli in which the generalization follows from the common ground and 5 in which the negation of the generalization follows from the common ground. Further, each list included 5 stimuli from the Content condition and 5 from the Context condition.

To assess whether participants were attending to the task, the same 6 control stimuli were added to each list, for a total of 16 stimuli per list. As shown in (20), the control stimuli also consisted of two-sentence discourses: the content of interest in (20a-c) was hypothesized to be true, and the content of interest in (20d-f) was hypothesized to be false. [jd: put these sentences in the appendix]

- (20)
- a. Fran lived in Paris. She wasn't sad to live alone.  
(Question to participants: Did Liv live alone?)
  - b. Charles served in Iraq. He was proud to have been a soldier.  
(Question to participants: Was Charles a soldier?)
  - c. Tess participated in a marathon. She was happy to cross the finish line.  
(Question to participants: Did Tess cross the finish line?)
  - d. Earl had a bad toothache. He forgot to call his dentist.  
(Question to participants: Did Earl call his dentist?)
  - e. Ross was doing his laundry. He didn't manage to find coins anywhere.  
(Question to participants: Did Ross find coins anywhere?)
  - f. Liv went on a trip to Europe. She failed to visit Italy.  
(Question to participants: Did Liv visit Italy?)

**Procedure** Participants were told that they would read short descriptions of scenarios and were asked a question about each scenario. They were randomly assigned to a list and presented with the 16 stimuli, one after the other, in random order. They gave their response to the polar question on a 7-point Likert scale labeled at four points: No/1, Possibly no/3, Possibly yes/5, Yes/7, as shown in Figure 3.

<sup>17</sup>This diagnostic for projectivity differs from the 'certain that' diagnostic used in the web-based corpus study or in AUTHORS 2018. Exp. 1 relied on a different diagnostic because it was run before the 'certain that' diagnostic was developed. Under the assumption that participants only take the prejacent to be true if it follows from the two-sentence discourse, i.e., if the author of the two-sentence discourse is committed to the prejacent, we take the two diagnostics to be comparable in diagnosing projectivity. See AUTHORS 2018 for a discussion of additional diagnostics for projectivity.

*Jane was baby-sitting for her sister. She wasn't smart to keep an eye on the baby at all times.*

Did Jane keep an eye on the baby at all times?

☐ No
 ☐
☐ Possibly no
 ☐
☐ Possibly yes
 ☐
☐ Yes

Continue

Figure 3: A sample trial in Experiment 1

After rating the 16 stimuli, participants completed a brief questionnaire about their age, their native language(s) and, if English is a native language, whether it is American English, as opposed to e.g., Indian or Australian English. Participants were told that they would be paid no matter how they responded to these questions, in order to encourage them to answer truthfully.

**Data exclusion** The data from 5 participants who did not self-identify as native speakers of American English were excluded. 13 participants gave a response lower than 5/Possibly yes to at least one of the control stimuli in (20a-c) or higher than 3/Possibly no [mcdm: above you have the reverse “Possibly no/3” – not sure which way is best, but I would use the same way throughout] to at least one of the control stimuli in (20d-f). Their data were also excluded, leaving data from 134 participants (ages: 18-69; mean age: 33).

### 3.1.2 Results and discussion

Each of the 120 target stimuli received between 9 and 14 ratings (mean: 11.2). Figure 4 shows the mean certainty ratings for prejacent of NEASs in the Content condition (left panel) and the Context condition (right panel) by whether the generalization or its negation follow from the common ground. As expected, the prejacent were more projective when the negation of the generalization follows from the common ground than when the generalization follows from the common ground: in the Content condition, the mean certainty ratings were 5.2 and 2.6, respectively; in the Context condition, the mean certainty ratings were 4.7 and 2.9, respectively. As shown by the overlaid adjective means in Figure 4, the effect of the discourse status of the generalization was observed to varying degrees for all of the adjectives, albeit to varying degrees.

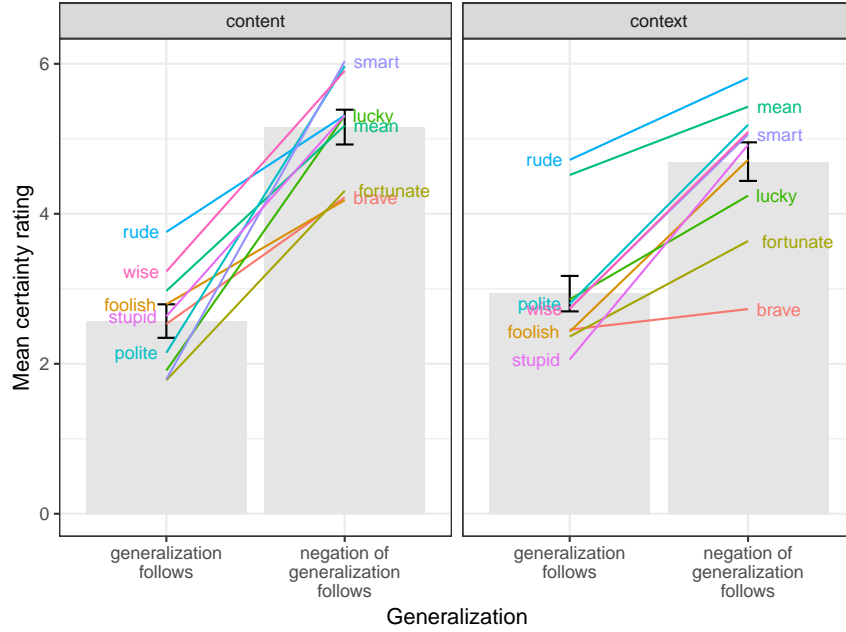


Figure 4: Mean certainty rating for prejacent of NEASs in the Content condition (left panel) and the Context condition (right panel) by whether the generalization or its negation follow from the common ground. Error bars indicate bootstrapped 95% confidence intervals. Adjective means in the two conditions overlaid.

We fitted ordinal mixed-effects regression models to the target data in the Content and Context conditions (668 and 672 data points, respectively), using the `clmm` function of the `ordinal` package (Christensen 2013) in *R* (R Core Team 2016; version 3.2.0). The models predicted projectivity ratings on the 7-point Likert scale from the fixed effect of the discourse status of the generalization (with ‘generalization follows’ as the reference level). The models included the maximal random effects structure justified by the data and the theoretical assumptions: random by-participant intercepts (capturing differences in projectivity between participants) and random by-item intercepts (capturing differences in projectivity between context/adjective/*to*-infinitive combinations) as well as random slopes for the discourse status of the generalization by participant (capturing that the effect of the discourse status may vary across participants). We obtained *p*-values by comparing models via likelihood ratio tests.

There was a significant main effect of the discourse status of the generalization such that the prejacent of items in which the negation of the generalization follows received higher projectivity ratings in the Content ( $\beta = 3.29$ ,  $SE = 0.34$ ,  $z = 9.6$ ,  $LR(1) = 73$ ,  $p < .001$ ) and Context ( $\beta = 2.1$ ,  $SE = 0.37$ ,  $z = 5.73$ ,  $LR(1) = 29.68$ ,  $p < .001$ ) conditions. These findings suggest that the discourse status of the generalization influences the projectivity of the prejacent, as predicted by the analysis developed in section 2: prejacent of NEASs in which the negation of the generalization follows from the common ground, i.e., in which the generalization is likely to be at-issue, are more projective than prejacent of NEASs in which the generalization follows from the common ground, i.e., in which the generalization is not likely to be at-issue. These findings also suggest that readers attend both to information from the EAS and to information from the context in determining the extent to which the generalization follows from the common ground and, therefore, the extent to which the prejacent projects.

## 3.2 Experiment 2: At-issueness of the prejacent

This experiment tested the prediction that the stronger the inference from the common ground to the truth of the generalization, the more likely the Discourse Question is about the prejacent, i.e., the more likely the prejacent is at-issue. The at-issueness diagnostic used in Exp. 2 relies on the assumption that at-issue and not-at-issue content differ in the extent to which it is up for debate and can be directly assented/dissented with. For previous uses of diagnostics that rely on this assumption see, e.g., Amaral et al. 2007, Xue and Onea 2011, Murray 2014, AnderBois et al. 2015, Destruel et al. 2015, Tonhauser 2012, Syrett and Koev 2015 and AUTHORS 2018. The diagnostic we used in Exp. 2 is the same as that in AUTHORS’ 2018 Exps. 2. The 3-turn dialogue in (21) illustrates how the diagnostic was set up on the basis of the appositive content associated with nominal appositives. The speaker of the first turn, Debby, utters an indicative sentence with the target expression, here a nominal appositive, and thereby commits herself to various utterance contents, including the appositive content that Martha’s new car is a BMW. The speaker of the second turn, Harry, utters the question *Are you sure?*, thereby challenging some content of Debby’s utterance. In the third turn, Debby utters an indicative sentence in which the content to be diagnosed for at-issueness, here the appositive content of her first utterance, realizes the content of the clausal complement of *sure*, thereby identifying it as the content that Debby took the Harry to be challenging.

- (21) At-issueness diagnostic from AUTHORS 2018  
Debby: Martha’s new car, a BMW, was expensive.  
Harry: Are you sure?  
Debby: Yes, I am sure that Martha’s new car is a BMW.

To assess whether the relevant content is up for debate, i.e., at-issue, participants were asked whether Debby’s utterance answered Harry’s question, with ‘yes’ and ‘no’ as response options. A ‘yes’ response was taken to indicate that the relevant content was at-issue: the content was targeted by Harry’s question and, therefore, Debby answered Harry’s question. A ‘no’ response, in turn, was taken to indicate that the relevant content was not at-issue: the content was not targeted by Harry’s question and, therefore, Debby did not answer Harry’s question. We assume that the more ‘yes’ responses a content receives, the more likely it is at-issue.

### 3.2.1 Methods

**Participants** 75 participants, with US IP addresses and at least 97% of HITs approved, were recruited on Amazon’s Mechanical Turk platform (18-66, mean: 35). They were paid 35 cents.

**Materials** Stimuli consisted of 3-turn discourses between Debby and Harry, as (22) and (23). In the target stimuli, the first turn of each discourse consisted of a past tense EAS that realized one of the 10 evaluative adjectives explored in Exp. 1. The second turn of the target stimuli consisted of Harry asking *Are you sure?*. In the third turn, Debby uttered *Yes, I am sure that*, with the prejacent of the EAS realized as the content of the finite complement of *sure that*. There were 6 sentences for each of the 10 evaluative adjectives, for a total of 60 target stimuli. Of the 6 sentences for each evaluative adjective, the generalization of 3 followed from the common ground, as in (22); for the other 3 sentences, neither the generalization nor its negation followed from the common ground, i.e., the generalization was neutral, as in (23). The full set of 60 target stimuli is provided in Appendix E. Participants were asked whether Debby answered Harry’s question: a ‘yes’ response was taken to indicate that Harry’s question targeted the prejacent, i.e., the prejacent of Debby’s utterance was taken to be at-issue; a ‘no’ response was taken to indicate that Harry’s question did not target the prejacent, i.e., the prejacent of Debby’s utterance was not taken to be at-issue. Given the

analysis developed in section 3, we expect the prejacent of EASs whose generalization follows from the common ground to be more at-issue, i.e., to receive more positive responses, than the prejacent of EASs with a neutral generalization.

(22) Generalization follows from the common ground

Debby: Jane was stupid to post her social security number on Facebook.

Harry: Are you sure?

Debby: Yes, I am sure that Jane posted her social security number on Facebook.

(23) Neutral generalization

Debby: Jane was stupid to dance like that.

Harry: Are you sure?

Debby: Yes, I am sure that Jane danced like that.

The 60 target stimuli were distributed across 6 lists so that each of the 10 adjectives occurred once per list and each list had 5 target stimuli for which the generalization followed from the common ground and 5 target stimuli with a neutral generalization. To assess whether participants were attending to the task, each list also included the same two control stimuli shown in (24): here, the main clause contents of Debby's first turns are assessed for at-issueness. We expected participants to respond 'yes' to the control stimuli because main clause content is at-issue.

(24) Main clause control stimuli

a. Debby: Mary brought a fruit salad.

Harry: Are you sure?

Debby: Yes, I am sure that Mary brought a fruit salad.

b. Debby: Phillip, a yoga teacher, is wearing sweat pants.

Harry: Are you sure?

Debby: Yes, I am sure that Phillip is wearing sweat pants.

Finally, to be able to compare the at-issueness of the prejacent to the at-issueness of other projective content, the same four control stimuli were added to each list. As shown in (25), these four control stimuli assessed the at-issueness of the content of a nominal appositive, of the possession content of a possessive noun phrase, of the content of the clausal complement of the emotive predicate *be annoyed* and of the content of the clausal complement of the cognitive change-of-state predicate *discover*. In sum, each of the 6 lists consisted of 16 stimuli.

(25) Projective content control stimuli

a. Nominal appositive

Debby: Sue, a teacher, runs three times a week.

Harry: Are you sure?

Debby: Yes, I am sure that Sue is a teacher.

b. Possessive noun phrase

Debby: Larry is flirting with your neighbor.

Harry: Are you sure?

Debby: Yes, I am sure that you have a neighbor.

c. Emotive predicate *be annoyed*

- Debby: Tamara is annoyed that the pizza is gone.  
 Harry: Are you sure?  
 Debby: Yes, I am sure that the pizza is gone.
- d. Cognitive change-of-state predicate *discover*  
 Debby: Paula discovered that her husband is cheating.  
 Harry: Are you sure?  
 Debby: Yes, I am sure that Paula's husband is cheating.

**Procedure** Participants were told that they were at a party and that, upon walking into the kitchen, they overhear a short dialogue between Debby, the party host, and another guest, Harry. They were randomly assigned to a list and presented with the 16 stimuli, one after the other, in random order. They gave their ratings to the question of whether Debby answered Harry's question with two radio buttons labeled 'yes' and 'no', as shown in Figure 5.

**Debby:** *Sue was fortunate to speak French when she went to France.*

**Harry:** *Are you sure?*

**Debby:** *Yes, I am sure that she spoke French when she went to France.*

Did Debby answer Harry's question?

☐ Yes
 ☐ No

Continue

Figure 5: A sample trial in Experiment 2

After rating the 16 stimuli, participants filled out a brief questionnaire about their age, their native language(s) and, if English is a native language, whether it is American English, as opposed to e.g., Indian or Australian English. Participants were told that they would be paid no matter how they responded to these questions, in order to encourage them to answer truthfully.

**Data exclusion** The data from 2 participants who did not self-identify as native speakers of American English were excluded. 5 participants answered 'no' to at least one of the main clause control stimuli. Their data were excluded, leaving data from 68 participants (ages: 18-66; mean: 35).

### 3.2.2 Results and discussion

Each of the 60 target stimuli received between 10 and 14 ratings (mean: 11.3). Figure 6 shows the proportion of 'yes' responses, indicating at-issueness, in the two conditions: as expected, prejacent of EASs whose generalization follows from the common ground received more 'yes' responses than prejacent of EASs with neutral generalizations. This finding suggests that prejacent of EASs whose generalizations follow from the common ground are more at-issue than prejacent of EASs with neutral generalizations, as predicted by

the analysis developed in section 2. As shown by the overlaid adjective means in Figure 6, the effect of the discourse status of the generalization was observed to varying degrees for all of the adjectives except *brave*.

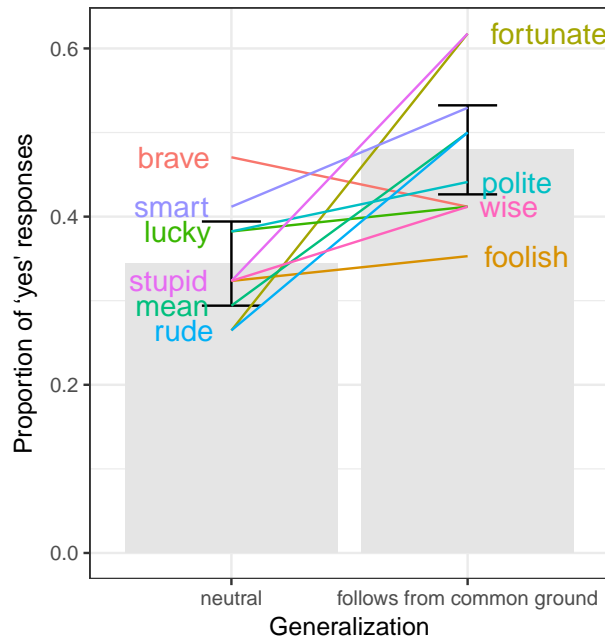


Figure 6: Proportion of ‘yes’ responses, indicating at-issueness, by condition. Error bars indicate bootstrapped 95% confidence intervals. Adjective means in the two conditions overlaid.

To statistically evaluate the effect of the discourse status of the generalization on the at-issueness of the preajcent, we fit a Bayesian binomial mixed effects model with weakly informative priors using the R package *brms* (Bürkner 2017).<sup>18</sup> The model predicted the log odds of ‘yes’ over ‘no’ ratings from a fixed effect of the discourse status of the generalization (with ‘neutral generalization’ as the reference level). We included the maximal random effects structure justified by the design: random intercepts for item (capturing random differences in at-issueness between items) and participant (capturing random differences in at-issueness between participants) as well as random by-participant slopes for discourse status (capturing that the effect of discourse status may vary by participant). Four chains converged after 2000 iterations each (warmup = 1000,  $\hat{R} = 1$  for all estimated parameters).

In order to evaluate the evidence for an effect of discourse status, we report 95% credible intervals and the posterior probability  $P(\beta > 0)$  that the discourse status coefficient  $\beta$  is greater than zero. A 95% credible interval (CI) demarcates the range of values that comprise 95% of probability mass of our posterior beliefs such that no value inside the CI has a lower probability than any point outside it (Jaynes and Kempthorne 1976, Morey et al. 2016). There is substantial evidence for an effect if zero is (by a reasonably clear margin) not included in the 95% CI and  $P(\beta > 0)$  is close to zero or one. Posterior probabilities tell us the probability that the parameter has a certain value, given the data and model (these probabilities are not frequentist  $p$ -values). In order to present statistics as close to widely used frequentist practices, and

<sup>18</sup>We fit a Bayesian binomial mixed effects model rather than a frequentist mixed effects model because this allowed us to fit a model with a full random structure that would not converge with frequentist methods (Nicenboim and Vasisht 2016). In fact, when we fit regular binomial mixed effects models, predicting response from a fixed effect of the discourse status of the generalization, the models only converged if we included either random by-item intercepts or random by-participant intercepts, but not both. Qualitatively, the results were identical to those obtained via the Bayesian method.



following Nicenboim and Vasishth 2016, we defined an inferential criterion that seems familiar (95%), but the strength of evidence should not be taken as having clear cut-off points (such as in a null-hypothesis significance testing framework).

The model provided evidence for the predicted effect of the discourse status of the generalization on the at-issueness of the prejacent, such that prejacent of EASs with generalizations that follow from the common ground were more likely to receive a ‘yes’ rating than prejacent of EASs with neutral generalizations (posterior mean  $\beta = 1.29$ , 95% CI=[0.69,1.87],  $P(\beta > 0) = 1$ ). This finding suggests that the prejacent of EASs with generalizations that follow from the common ground are more at-issue than that of EASs with neutral generalizations, as predicted by the analysis developed in section 2.<sup>19</sup>

### 3.3 Summary

According to the analysis of EASs developed in section 2, the prejacent is not a lexically-specified presupposition but projects when it is not at-issue with respect to the Discourse Question of the utterance. The analysis predicts that the more the truth of the generalization follows from the common ground [jd: the more it follows or the more likely it is to follow?], the more likely it is that the Discourse Question is not about the generalization, but about the prejacent, and, hence, the more likely the prejacent is to not project. In this section, we provided empirical evidence for two predictions of this analysis: Exp. 1 showed that the prejacent is more likely to project when the truth of the generalization does not follow from the common ground than when the truth of the generalization does follow from the common ground, and Exp. 2 showed that the prejacent is more likely to be at-issue when the truth of the generalization follows from the common ground than when the truth of the generalization does not follow from the common ground.

## 4 Interspeaker variation

Before concluding the paper, we briefly return to the interspeaker variation we noted in section 1: not all native speakers of American English would produce NEASs in which the prejacent does not project; many speakers prefer variants with *enough*. What might this variation be due to? One hypothesis is that speakers differ in their lexical entries for evaluative adjectives. One way of specifying such a hypothesis is that speakers who produce NEASs in which the prejacent does not project (around 20-30% of the population) have a lexical entry according to which the prejacent is not lexically specified as a presupposition (as in the analysis developed in section 2), thereby allowing them to produce NEASs in which the prejacent projects as well as ones in which it doesn’t project. A second group of speakers are those that would not produce NEASs in which the prejacent does not project: they might have a lexical entry according to which the prejacent is lexically specified as a presupposition, thereby resulting in them preferring to produce EASs in which the prejacent is not-at-issue and therefore projects. When interpreting NEASs, speakers in this second group should consistently assign projecting interpretations to prejacent of NEASs in which the

<sup>19</sup>The projective content of the four control stimuli in (25) differed in the extent to which they received ‘no’ ratings (indicating not-at-issueness): 94% (64 of 68) for the appositive content in (25a), 90% (61 of 68) for the possession content in (25b), 75% (51 of 68) for the content of the clausal complement of *be annoyed* in (25c) and 44% (30 of 68) for the content of the clausal complement of *discover* in (25d). We can compare these findings with the findings reported for similar contents in AUTHORS 2018, whose Exp. 2a used the same diagnostic for at-issueness, but participants gave ratings on a slider. Further differences between the two experiments is that AUTHORS 2018 included more than one item for each of the projective contents but only included EASs with *stupid*. With these caveats in mind, we can note a similarity in the findings of the two experiments: as in the experiment reported on here, AUTHORS (2018) found that the possession content and appositive content were most not-at-issue (mean ratings of .83 and .82, respectively), followed by the content of the clausal complement of *be annoyed* (mean: .78) and the prejacent of EASs (mean: .7), and finally the content of the clausal complement of *discover* (mean .47). This finding suggests that the prejacent of EAS overall is not highly not-at-issue, which converges with the finding of the web-based corpus study (Appendix B) that the prejacent of NEAS is not highly projective.

negation of the generalization follows from the common ground because the projecting interpretation is not only the lexically specified interpretation but also supported by the common ground. A similar hypothesis can be found in Karttunen et al. (2014:243), who suggested that there are about 3 times as many speakers who prefer giving interpretations to NEASs in which the prejacent projects, using the lexical entry in (5a), than speakers who prefer giving interpretations to NEASs in which the prejacent doesn't project, using the lexical entry in (5b). Both hypotheses lead to the expectation that a substantial number of native speakers of American English (about 70-80%) consistently assign projecting interpretations to NEASs in which the negation of the generalization follows from the common ground.

A post-hoc analysis of the findings of Exp. 1 suggests that both hypotheses should be rejected. Recall that each participant in Exp. 1 rated the projectivity of the prejacent of NEASs on a 7-point Likert scale: they rated the projectivity of the prejacent of 5 NEASs in which the generalization follows from the common ground and of 5 NEASs for which the negation of the generalization follows from the common ground. To explore the aforementioned hypotheses, we calculated each participants' mean certainty ratings for these two types of NEAS: these mean certainty ratings are an indication of how projective participants rated the prejacent of the two types of NEAS. Under both hypotheses, we expect a majority of participants to assign highly projective interpretations to the prejacent of NEASs for which the negation of the generalization follows from the common ground.

The histogram in Figure 7 shows the 134 participants' mean certainty ratings for the two types of NEAS. The right panel reveals that, of the 134 participants, only 23 (17%) had mean certainty ratings of at least 6.5 for the NEAS in which the negation of the generalization follows from the common ground; when considering mean certainty ratings of at least 5.5, this number still only rises to 55 (41%) participants. Thus, we do not find that a majority of the 134 participants assigned highly projective interpretations to prejacent of NEAS for which the negation of the generalization follows from the common ground. This observation calls into question the hypothesis that a majority of native speakers of American English have a lexical entry for evaluative adjectives according to which the prejacent is a lexically-specified presupposition.

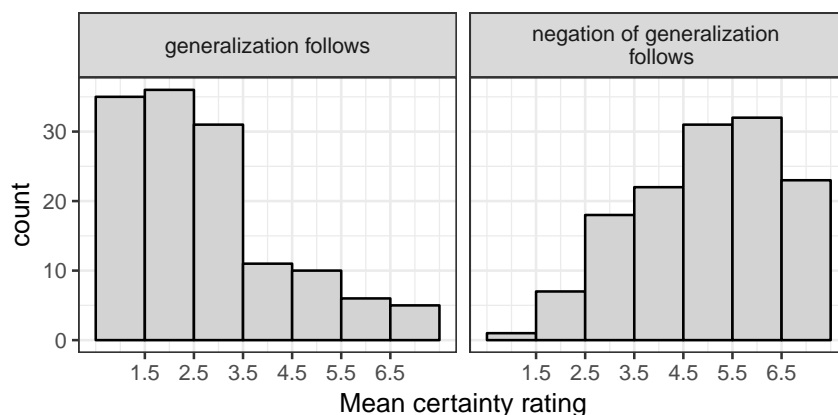


Figure 7: Count of participants in Experiment 1 by their mean certainty ratings for the two types of NEASs[jd: relabel y-axis "Number of participants"; update caption to "histogram of participants..."]

We leave further explorations of the question of how to capture the variability observed among native speakers of American English in whether they would produce NEASs with non-projecting prejacent to future research.

## 5 Conclusions

This paper investigated projective content of evaluative adjective sentences (EASs). While most of the previous literature on EASs only considered the projection of the prejacent, this paper argued that both the prejacent and the generalization can project and, furthermore, that the projective content of EASs shows an interaction in the projection of these two contents that has not yet been found for projective content: when the prejacent projects, the generalization does not, and vice versa. The question-based projection analysis we developed abandoned the assumption, made in all previous accounts, including that of Karttunen et al. 2014, that the prejacent projects because it is lexically specified as a presupposition. Instead, on our question-based account, the prejacent and the generalization project when they are not at-issue with respect to the Discourse Question addressed by the utterance of the EAS. This analysis does not rely on evaluative adjectives being ambiguous (unlike Karttunen et al.’s 2014 analysis) and the interaction in the projection of the prejacent and the generalization fall out from the assumption that exactly one of these two contents is at-issue.

There are at least two important questions about EASs that should be addressed in future work. The first concerns the observed interaction in the projection of the prejacent and the generalization. As discussed in section 1, this interaction has not yet been observed for projective content. Why does it arise with EASs, but not, for instance, for utterances of sentence with factive or change-of-state predicates? We can only speculate here that it may have to do with the nature of the two lexical entailments of EASs: the prejacent and the generalization of EASs are independent of one another in that neither is a precondition for the truth of the other. Consider (1) *Feynman was stupid to dance on the table*: it is neither necessary for Feynman to have danced on the table in order for the generalization of this EAS to be true, nor is it necessary for the generalization to be true in order for Feynman to have danced on the table. In this, EAS differ from sentences with factive or change-of-state predicates, like *Sam knows that the meeting was canceled* or *Sam stopped going to church*: in order for Sam to know that the meeting was canceled, the content of the complement must be true, and in order for Sam to not go to church anymore, the pre-state content, that they previously went to church, must be true. Future research needs to establish whether this is the reason for the interaction between the projection of the prejacent and the generalization.

The second important question that future research should address is how the information structure of EASs provides a cue to the projection of the prejacent or the generalization. As mentioned above, previous research has established that information structure, in particular prosodically marked focus, provides a cue to the questions addressed by utterances of sentences with other projective content. We hypothesize that prosodically marked focus will also provide a cue to the question addressed by EASs and, hence, to which content projects.

## A Acceptability rating experiment

The acceptability rating experiment was designed to explore the acceptability of NEASs whose prejacent does not project.

### A.1 Methods

**Participants** 134 participants with US IP addresses and at least 97% of HITs approved were recruited on Amazon’s Mechanical Turk platform (ages: 20-72; mean: 33). They were paid 45 cents.

**Materials** Stimuli consisted of three-sentence discourses. In the target stimuli, the last sentence was either a NEAS, as in (26a), or a variant of the NEAS in which the evaluative adjective was followed by *enough*, as in (26b). The first two sentences of the discourses denied the truth of the prejacent of the third sentence to

ensure that the prejacent of the third sentence could not project: in (26), for instance, the first two sentences convey that Jenny left the baby unattended, which contradicts the prejacent, that Jenny kept an eye on the baby at all times. We hypothesized that participants would judge the NEAS to be acceptable only if they would realize an interpretation in which the prejacent projects with the NEAS. We further hypothesized that the variant with *enough* would be judged to be acceptable by all participants.

- (26) a. Jenny was baby-sitting for her sister. She left the baby unattended.  
She wasn't smart to keep an eye on the baby at all times.  
 b. Jenny was baby-sitting for her sister. She left the baby unattended.  
She wasn't smart enough to keep an eye on the baby at all times.

The target stimuli consisted of 6 pairs of three-sentence discourses like (26) for each of the 10 evaluative adjectives explored in the experiments reported on in the main body of the paper, for a total of 60 pairs of target stimuli. The full set of target stimuli is provided in the GitHub repository (url, removed for anonymity). The 120 target stimuli were distributed across 12 lists of 10 stimuli each so that each adjective occurred only once per list, and each list included 5 NEASs and 5 variants with *enough*.

To assess whether participants were paying attention to the task, the same 8 control stimuli were added to each list, for a total of 18 stimuli per list. The control stimuli consisted of three-sentence discourses in which the last sentence contradicted the second one, as illustrated in (27). We expected the last sentence of the control stimuli to be judged to be unacceptable as part of the discourse.

- (27) a. Claire fell down the stairs. She broke a leg and some ribs. She was glad to not be hurt.  
 b. Earl had a bad toothache. He called his dentist. He forgot to call his dentist.  
 c. Ross was doing his laundry. He found coins in his pocket. He didn't manage to find coins anywhere.  
 d. Charles was on a date with Susanne. He was having a bad time. He was happy to be having a great time.  
 e. Keith was hiking up a steep mountain. He didn't make it to the top. He was ecstatic to have made it to the top.  
 f. Liv went on a trip to Europe. She spent a lot of time in Italy. She failed to visit Italy.  
 g. Fran lived in Paris. She shared an apartment with some friends. She wasn't sad to live alone.  
 h. Tess had failed many college classes. She didn't graduate. She was proud to have graduated from college.

**Procedure** Participants were told that they would read descriptions of a scenario and asked to judge whether the last, underlined sentence sounds good as part of the description. They gave their ratings on a 7-point Likert scale labeled at four points: No/1, Possibly no/3, Possibly yes/5, Yes/7). Participants were randomly assigned to a list and presented with the 18 stimuli, one after the other, in a random order. After rating the 18 stimuli, participants filled out a brief questionnaire about their age, their native language(s) and, if English is a native language, whether it is American English, as opposed to e.g., Indian or Australian English. Participants were told that they would be paid no matter how they responded to these questions, in order to encourage them to answer truthfully.

**Data exclusion** The ratings from 2 participants who did not self-identify as native speakers of American English were excluded. 38 participants gave a rating higher than Possibly no/3 to one or more of the eight unacceptable control stimuli. The ratings from these participants were also excluded, leaving data from 94 participants (ages: 20-67; mean: 33).

## A.2 Results

As expected, target stimuli with *enough* were judged to be acceptable: the mean rating for such items was 5.9 and most ratings were 5 or higher (409 of 477 responses, 86%). Ratings for the target stimuli with NEASs were lower, with a mean rating of 4.2. As shown in the left panel of Figure 8, NEASs received lower ratings overall.

To identify whether a participant judged NEASs in which the prejacent does not project to be acceptable, we calculated each participants’ mean rating of the 5 stimuli with a NEAS. We then subtracted this mean rating from their mean rating for the 5 stimuli with *enough*. The resulting ‘acceptability score’ is a measure of how acceptable NEASs with non-projecting prejacent are compared to acceptable stimuli with *enough*. An acceptability score of 0 means that the participant judged the NEASs with non-projecting prejacent as acceptable as stimuli with *enough*. The right panel of Figure 8 plots the participants’ acceptability scores; the red line indicates an acceptability score of 0. Of the 94 participants, 20 (21%) had an acceptability score of at least 0 and 27 (29%) had an acceptability score of at least -0.5. Thus, although there are also many participants who do not judge NEASs in which the prejacent does not project to be acceptable, a sizable portion of (self-reported) native speakers of American English judge such sentences to be acceptable.

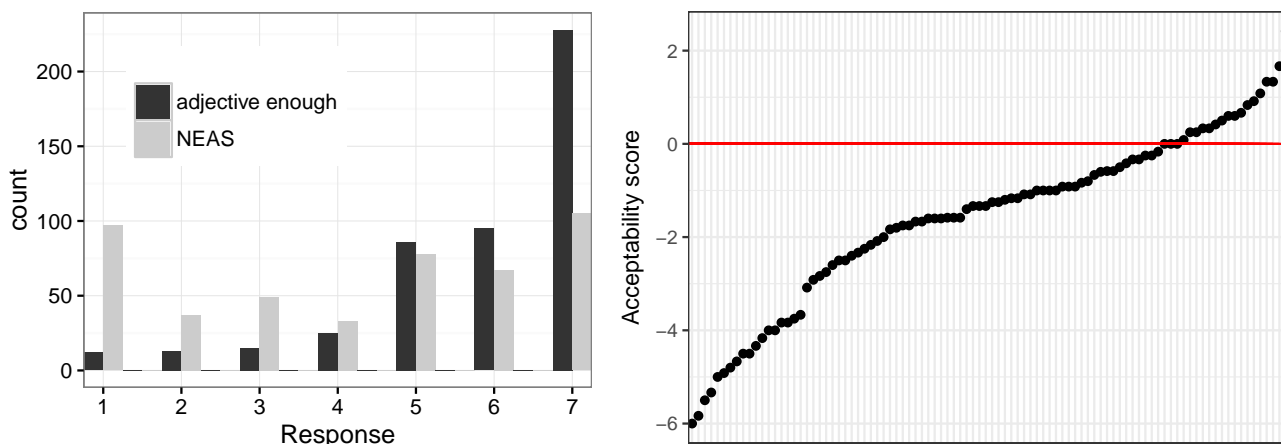


Figure 8: Count of ratings of target stimuli (left panel) and acceptability scores of participants (right panel)

## B Corpus-based web study: Projectivity of the prejacent

Karttunen et al. (2014) provided naturally occurring examples that showed that the prejacent of NEASs need not project. The goal of the study we present in this section was to more systematically explore the projection of the prejacent in naturally occurring NEAS. To explore the projectivity of the prejacent, native speakers of American English were presented with naturally occurring NEAS and asked to rate the projectivity of the prejacent.

### B.1 Methods

**Participants** We recruited 260 participants with US IP addresses and at least 97% of prior HITs approved on Amazon’s Mechanical Turk platform (ages: 18-83; mean: 35). They were paid 75 cents.

**Materials** Using the online interface of the EnTenTen corpus,<sup>20</sup> we searched for NEASs that matched one of the strings in (28), where ADJ was one of the following 10 evaluative adjectives that have been analyzed as presupposing the prejacent (e.g., Norrick 1978, Karttunen et al. 2014): *stupid, smart, wise, fortunate, lucky, brave, polite, mean, foolish and rude*.

- (28) {am not / are not / aren't / is not / isn't / was not / wasn't / were not / weren't / will not be / won't be} ADJ to

We limited ourselves to examples from the American English part of the EnTenTen corpus (region: Am) and to examples with referential subjects. We did not find examples for the adjectives *polite, brave* and *rude*. For adjectives with more than 10 pages of results, we extracted all relevant examples from the first 10 pages and then extracted a random selection of examples from the remaining pages. The final set of target stimuli consisted of 59 NEAS with preceding and following context sentences that the first author judged to be relevant to understanding the NEAS (29 with past tense, 27 with non-past tense and 3 with *will*).

Each target stimulus was attributed to an author who was identified by name, as shown for the sample stimuli in (29). As shown in the ‘Question to participants’ presented with each stimulus in (29), we used the ‘certain that’ diagnostic for projectivity to assess whether participants took the author to be committed to the prejacent, i.e., whether the prejacent projects over negation. For other applications of the ‘certain that’ diagnostic for projection see Tonhauser 2016, Djärv and Bacovcin 2017, Stevens et al. 2017 and AUTHORS 2018. In these ‘Questions to participants’, the prejacent was realized as the finite complement clause of *certain*. The tense of the finite clause that realized the prejacent was determined by the temporal and aspectual properties of the NEAS: it was past tense for past tense NEAS, as in (29a), and future tense for future tense NEAS, as in (29b); for non-past tense NEAS, the finite clause that realized the prejacent was realized in the non-past tense if the eventuality denoted by the prejacent was stative, as in (29c), and a disjunction of a past tense and a future tense verb if the prejacent was eventive, as in (29d).

(29) Sample target stimuli and questions to participants

- a. Shawn: Mr. Anderson – Just discovered your site on The 1939-40 New York World’s Fair. It brought back a lot of memories for me. Thanks for the time you spent in constructing this site. I was not fortunate to visit the 1939-40 World’s Fair but I had an uncle who did.  
Question to participants: Is Shawn certain that he visited the 1939-40 World’s Fair?
- b. Megan: For sure P1 will not be stupid to create a WiMAX netbook to allow YTL or AMAX customers to use.  
Question to participants: Is Megan certain that P1 will create a WiMAX netbook to allow YTL or AMAX customers to use?
- c. Frank: God offers Hope to Hispanics! In His pages are solutions to every immigration problem. God loves citizens and immigrants equally. His solutions are for all of us. They are practical. They work. He is not stupid to think so.  
Question to participants: Is Frank certain that God thinks that his solutions work?
- d. Anna: The flight attendants are not wise to invoke the specter of a strike.  
Question to participants: Is Anna certain that the flight attendants invoked or will invoke the specter of a strike?

We created 8 lists of 8 target stimuli each and distributed the 59 target stimuli across the 8 lists; 5 target stimuli occurred in two lists. Each list also included the following two control stimuli which were used to assess whether participants were attending to the task, for a total of 10 stimuli per list. For the control stimulus in (30a), we expected participants to not take the speaker to be committed to the relevant

<sup>20</sup>The EnTenTen 2012 corpus has 11,191,860,036 words ([www.sketchengine.co.uk](http://www.sketchengine.co.uk), Kilgarriff et al. 2014).

content (that Earl called the dentist) and, for the control stimulus in (30b), we expected participants to take the speaker to be committed to the relevant content (that Tess crossed the finish line).

(30) Control stimuli

- a. Jack: Earl had a toothache. He forgot to call his dentist.  
Question to participants: Is Jack certain that Earl called his dentist?
- b. David: Tess participated in a marathon. She was happy to cross the finish line.  
Question to participants: Is David certain that Tess crossed the finish line?

**Procedure** Participants were told that they would read short snippets coming from various internet blogs and forums. They were randomly assigned to a list and presented with the 10 stimuli, one after the other, in random order. As shown in 9, they gave their ratings to the ‘certain that’ question on a 7-point Likert scale labeled at four points: no/1, possibly no/3, possibly yes/5, yes/7.

Sally: Mr. Anderson, Just discovered your site on The 1939-40 New York World's Fair. It brought back a lot of memories for me. Thanks for the time you spent in constructing this site. I was not fortunate to visit the 1939-40 World's Fair but I had an uncle who did.

Is Sally certain that she visited the 1939-40 World's Fair?

☐  
no

☐

☐  
possibly  
no

☐

☐  
possibly  
yes

☐

☐  
yes

Figure 9: A sample trial in Experiment 1

After responding to the 10 stimuli, participants filled out a brief questionnaire about their age, their native language(s) and, if English is a native language, whether it is American English, as opposed to e.g., Indian or Australian English. Participants were told that they would be paid no matter how they responded to these questions, in order to encourage them to answer truthfully.

**Data exclusion** The responses from 6 participants who did not self-identify as native speakers of American English were excluded. 28 participants gave a rating higher than 3 to the control stimulus in (30a), for which we hypothesized that participants would not take the speaker to be committed to the relevant content, or a rating lower than 5 to the control stimulus in (30b), for which we hypothesized that participants would take the speaker to be committed to the relevant content. These responses suggest that these participants were not attending to the task or interpreted the task differently. We therefore also excluded the data from these 28 participants, leaving data from 226 participants (ages: 18-83; mean: 35).

## B.2 Results

There were 26-32 certainty ratings for each of the 59 NEAS (mean: 28.5), except for the five NEASs that appeared on two lists, for which there were 52-58 certainty ratings each (mean: 54). We calculated the mean certainty rating of the prejacet of each NEAS: the lowest mean certainty rating was 1.2, the highest was 6.7 and the mean certainty rating overall was 3.2. Given that participants gave their ratings on a 7-point scale,



with the lowest rating (1) indicating that the speaker was taken to not be certain about the relevant content and the highest rating (7) indicating that the speaker was taken to be certain about the relevant content, this mean certainty rating of 3.2 already suggests that the prejacent of naturally occurring NEAS is not highly projective. Figure 1 in section 2 showed the mean certainty rating of each NEAS by evaluative adjective. The distribution of mean certainty ratings again suggests that the prejacent of naturally occurring NEASs is projective, but not highly so, and that NEASs in which the prejacent does not project are well-attested in naturally occurring data.

## C Norming study for Exp. 1

The goal of the norming study was to identify generalizations of EASs that follow from the common ground or whose negation follows from the common ground.

### C.1 Methods

**Participants** 270 participants, with US IP addresses and at least 97% of HITs approved, were recruited on Amazon’s Mechanical Turk platform (ages 18-68, 1 undeclared; mean: 32). They were paid 45 cents.

**Materials** For each of the ten evaluative adjectives of Exp. 1, we created 12 pairs of two-sentence stimuli such that the first sentence was a context sentence and the second sentence a NEAS, as in (18) and (19). We hypothesized, for each pair of NEASs, that the generalization of one member of the pair follows from the common ground and the negation of the generalization of the other member of the pair follows from the common ground. Target stimuli in the norming study consisted of two-sentence discourses where the first sentence was the context sentence of the stimuli in Exp. 1 and the second sentence was the prejacent of the NEAS, as shown in (31) and (32) for the stimuli in (18) and (19), respectively. Given that there were 120 pairs of potential stimuli for Exp. 1, there were 120 pairs of two-sentence discourses in the norming study, i.e., a total of 240 two sentence discourses. The full set of target stimuli is provided in the GitHub repository mentioned in footnote 15. To assess whether the generalization or its negation follow from the common ground, participants were asked to assess the truth of the corresponding generalization. The generalizations were presented in the past tense to cohere with the tense of the discourses that participants read.

#### (31) Sample stimuli in the Content condition

- a. Sue was traveling in France. She lost her wallet.  
(Question to participants: ‘Was Jane fortunate to lose her wallet?’)
- b. Sue was traveling in France. She spoke some French.  
(Question to participants: ‘Was Jane fortunate to speak French?’)

#### (32) Sample stimuli in the Context condition

- a. Jane was prank-calling people. She called the police.  
(Question to participants: ‘Was Jane smart to call the police?’)
- b. Jane saw a man with a gun. She called the police.  
(Question to participants: ‘Was Jane smart to call the police?’)

The 240 target stimuli were distributed into 24 lists of 10 target stimuli so that each list included one target stimulus for each evaluative adjective. Each list included 5 target stimuli in which the generalization was hypothesized to follow from the common ground and 5 in which the negation of the generalization was hypothesized to follow from the common ground. Each list included 5 stimuli each from the target stimuli created for the Context and Content conditions.

To assess whether participants were attending to the task, the same 4 control stimuli were added to each list, for a total of 14 stimuli per list. The control stimuli consisted of two-sentence discourses, as shown in (33): the two controls in (33a-b) were expected to receive a positive answer and the two controls in (33c-d) were expected to receive a negative answer.

- (33) a. Earl worked in London last year. He was a teacher at a private school.  
(Is it true that Earl worked at a private school in London?)
- b. Liv was having a birthday party. She bought a cake for her party.  
(Is it true that Liv bought a cake for her birthday party?)
- c. Claire was knitting a sweater. She was using red yarn.  
(Is it true that Claire was knitting a blue sweater?)
- d. Ross graduated from college yesterday. He was an excellent student.  
(Is it true that Ross dropped out of college?)

**Procedure** Participants were told that they would read descriptions of a scenario and asked to respond to a question about the scenario. They gave their responses on a 7-point Likert scale labeled at four points: No/1, Possibly no/3, Possibly yes/5, Yes/7). Participants were randomly assigned to a list and presented with the 14 stimuli, one after the other, in a random order. After rating the 14 stimuli, participants filled out a brief questionnaire about their age, their native language(s) and, if English is a native language, whether it is American English, as opposed to e.g., Indian or Australian English. Participants were told that they would be paid no matter how they responded to these questions, in order to encourage them to answer truthfully.

**Data exclusion** The ratings from 9 participants who did not self-identify as native speakers of American English were excluded. 31 participants gave ratings lower than Possibly yes/5 to the control stimuli in (33a-b), for which we expected the speaker to be taken to be committed to the relevant content, or higher than Possibly no/3 to the control stimuli in (33c-d), for which we expected the speaker to not be taken to be committed to the relevant content. The ratings from these participants were also excluded, leaving data from 230 participants (ages: 18-68; mean: 32).

## C.2 Analysis

Each of the 240 target discourses received between 7 and 13 ratings (mean: 9.6). As shown in Table 1, stimuli for which the generalization was hypothesized to follow generally received high ratings and stimuli for which the negation of the generalization was hypothesized to follow generally received low ratings.

	What was hypothesized to follow:	
	generalization	negation of generalization
Content condition	6.2 (1.2)	1.6 (1.1)
Context condition	6.0 (1.3)	2.2 (1.6)

Table 1: Mean ratings and standard deviations for the 240 stimuli in the four conditions

Of the 120 pairs of target stimuli (60 pairs in the Context and Content conditions each), we selected the 6 best pairs for each evaluative adjective: 3 in the Context condition and 3 in the Content condition: the ‘best’ pairs of stimuli were those where the mean ratings of the two members of the pair were as high and low as possible, respectively. The mean ratings and standard deviations for the 120 stimuli selected for Exp. 1 are shown in Table 2.

	What was hypothesized to follow:	
	generalization	negation of generalization
Content condition	6.5 (0.9)	1.3 (0.8)
Context condition	6.1 (1.2)	1.7 (1.2)

Table 2: Mean ratings and standard deviations for the 120 selected stimuli in the four conditions

## D Materials of Exp. 1

There were 12 stimuli for each of the 10 evaluative adjectives: 6 stimuli in the Content condition (Cn) and 6 in the Context condition (Cx). For stimuli marked whose coding ends with an ‘T’ (i.e., [xxT]), the norming study established that the strength of the inference to the truth of the generalization from the common ground was high, i.e., the generalization follows from the common ground. For stimuli whose coding ends with an ‘F’ (i.e., [xxF]), the norming study established that the strength of the inference to the falsity of the generalization was high.

- **brave**

- CnT Greg wrote a controversial article. He wasn’t brave to use his own name.
- CnT Greg saw a child drowning in a river. He wasn’t brave to jump into the river.
- CnT Greg saw a man hit a dog. He wasn’t brave to stand up to the man.
- CnF Greg wrote a controversial article. He wasn’t brave to use a fake name.
- CnF Greg saw a man hit a dog. He wasn’t brave to walk away.
- CnF Greg saw a child drowning in a river. He wasn’t brave to watch from the river bank.
- CxT Greg was being attacked by five men. He wasn’t brave to take them on.
- CxT Greg was asked to speak up against the crime boss. He wasn’t brave to agree to do it.
- CxT Greg was offered a job as a lion tamer. He wasn’t brave to take the job.
- CxF Greg was asked to help his friend move. He wasn’t brave to agree to do it.
- CxF Greg was asked to mow his neighbor’s lawn. He wasn’t brave to take the job.
- CxF Greg was being tickled by two small boys. He wasn’t brave to take them on.

- **foolish**

- CnT Kate’s doctor told her to lose weight. She wasn’t foolish to ignore him.
- CnT Kate took her nephew to the playground. She wasn’t foolish to wear high heels.
- CnT Kate was working a very stressful job. She wasn’t foolish to ignore her health problems.
- CnF Kate’s doctor told her to lose weight. She wasn’t foolish to start exercising.
- CnF Kate took her nephew to the playground. She wasn’t foolish to bring water and a snack.
- CnF Kate was working a very stressful job. She wasn’t foolish to take relaxation classes.
- CxT Kate had a broken ankle. She wasn’t foolish to go for a run.
- CxT Kate was completely broke. She wasn’t foolish to go shopping.
- CxT Kate was drunk at a bar. She wasn’t foolish to take her top off.
- CxF Kate needed a new dress. She wasn’t foolish to go shopping.
- CxF Kate was getting a breast exam. She wasn’t foolish to take her top off.
- CxF Kate wanted to exercise. She wasn’t foolish to go for a run.

- **fortunate**

CnT Sue was traveling in France. She wasn't fortunate to speak some French.  
 CnT Sue was bitten by a shark. She wasn't fortunate to get away with a few cuts.  
 CnT Sue was training to become a dancer. She wasn't fortunate to have a great sense of rhythm.  
 CnF Sue was bitten by a shark. She wasn't fortunate to lose a leg.  
 CnF Sue was traveling in France. She wasn't fortunate to get robbed.  
 CnF Sue was training to become a dancer. She wasn't fortunate to develop back problems.  
 CxT Sue needed to get some rest. She wasn't fortunate to fall asleep.  
 CxT Sue spontaneously went to the beach. She wasn't fortunate to be wearing flip-flops.  
 CxT Sue needed a present for her sick friend. She wasn't fortunate to have a flower bouquet.  
 CxF Sue is allergic to pollen. She wasn't fortunate to have a flower bouquet.  
 CxF Sue was at her best friend's wedding. She wasn't fortunate to fall asleep.  
 CxF Sue spontaneously went on a hike in the mountains. She wasn't fortunate to be wearing flip-flops.

- **lucky**

CnT Eve bought a raffle ticket. She wasn't lucky to win the first prize.  
 CnT Eve was in a car accident. She wasn't lucky to get away unscathed.  
 CnT Eve wanted to be a model. She wasn't lucky to have beautiful skin.  
 CnF Eve wanted to be a model. She wasn't lucky to have bad skin.  
 CnF Eve bought a raffle ticket. She wasn't lucky to lose it the next day.  
 CnF Eve was in a car accident. She wasn't lucky to break her neck.  
 CxT Eve has a 5th grade education. She wasn't lucky to get a minimum wage job.  
 CxT Eve was a finalist in The Bachelor. She wasn't lucky to be chosen.  
 CxT Eve did not understand her chemistry class. She wasn't lucky to get a B.  
 CxF Eve was the best student in this class. She wasn't lucky to get a B.  
 CxF Eve was called in for jury duty. She wasn't lucky to be chosen.  
 CxF Eve has a first rate college education. She wasn't lucky to get a minimum wage job.

- **mean**

CnT Jack bumped his shopping cart into a woman. He wasn't mean to laugh when she cried.  
 CnT Jack walked past an old man with a cane. He wasn't mean to push the man.  
 CnT Jack saw a hungry dog. He wasn't mean to pretend to have food for him.  
 CnF Jack walked past an old man with a cane. He wasn't mean to help him across the street.  
 CnF Jack bumped his shopping cart into a woman. He wasn't mean to apologize to her.  
 CnF Jack saw a hungry dog. He wasn't mean to feed him a can of food.  
 CxT Jack didn't like the movie his wife was watching. He wasn't mean to turn off the movie.  
 CxT Jack's daughter is lactose intolerant. He wasn't mean to give her a milk shake.  
 CxT Jack's wife wanted to sleep in. He wasn't mean to wake her up at 5am.  
 CxF Jack's wife had asked him to wake her really early. He wasn't mean to wake her up at 5am.  
 CxF Jack's young daughter was watching an R-rated movie. He wasn't mean to turn off the movie.  
 CxF Jack's daughter was a little hungry. He wasn't mean to give her a milk shake.

- **polite**

CnT Chad had insulted his wife. He wasn't polite to apologize.  
 CnT Chad was standing in front of his friend's door. He wasn't polite to knock gently.  
 CnT Chad was visiting his grandmother. He wasn't polite to bring a gift.  
 CnF Chad was visiting his grandmother. He wasn't polite to insult her caretaker.  
 CnF Chad was standing in front of his friend's door. He wasn't polite to be eavesdropping.  
 CnF Chad had insulted his wife. He wasn't polite to laugh at her tears.  
 CxT Chad's friend wanted to change her clothing. He wasn't polite to close his eyes.  
 CxT Chad was watching a theater play. He wasn't polite to applaud.  
 CxT Chad watched a street comedian. He wasn't polite to laugh.  
 CxF Chad was in a meeting with his boss. He wasn't polite to close his eyes.  
 CxF Chad saw an old lady trip on the street. He wasn't polite to laugh.  
 CxF Chad saw an old lady trip on the street. He wasn't polite to applaud.

- **rude**

CnT Ann was standing in front of her friend's door. She wasn't rude to be eavesdropping.  
 CnT Ann had insulted her husband. She wasn't rude to laugh at his tears.  
 CnT Ann was visiting her older brother. She wasn't rude to insult his wife.  
 CnF Ann was visiting her older brother. She wasn't rude to bring a gift.  
 CnF Ann was standing in front of her friend's door. She wasn't rude to knock gently.  
 CnF Ann had insulted her husband. She wasn't rude to apologize.  
 CxT Ann got reprimanded by her boss. She wasn't rude to ignore him.  
 CxT Ann was eating pasta with her friends. She wasn't rude to use her fingers.  
 CxT Ann's neighbor greeted her. She wasn't rude to ignore him.  
 CxF Ann untied her shoes. She wasn't rude to use her fingers.  
 CxF Ann's neighbor made an inappropriate comment. She wasn't rude to ignore him.  
 CxF Ann's boyfriend made fun of her haircut. She wasn't rude to ignore him.

- **smart**

CnT Jane was baby-sitting for her sister. She wasn't smart to keep an eye on the baby at all times.  
 CnT Jane's computer was hacked. She wasn't smart to change her passwords immediately.  
 CnT Jane wanted to get a good job. She wasn't smart to get her high school degree.  
 CnF Jane's computer was hacked. She wasn't smart to keep using the same passwords.  
 CnF Jane wanted to get a good job. She wasn't smart to drop out of high school.  
 CnF Jane was baby-sitting for her sister. She wasn't smart to leave the baby unattended.  
 CxT Jane saw a man with a gun. She wasn't smart to call the police.  
 CxT Jane's father couldn't hear the TV. She wasn't smart to turn up the volume.  
 CxT Jane wanted to get a good job. She wasn't smart to go to school.  
 CxF Jane was prank-calling people. She wasn't smart to call the police.  
 CxF Jane's neighbor complained about the loud music. She wasn't smart to turn up the volume.  
 CxF Jane had the measles. She wasn't smart to go to school.

- **stupid**

CnT Zack left the bar drunk. He wasn't stupid to drive home.

CnT Zack was offered some contaminated heroin. He wasn't stupid to inject it.  
 CnT Zack discovered that his girlfriend was cheating. He wasn't stupid to marry her.  
 CnF Zack was offered some contaminated heroin. He wasn't stupid to refuse to take it.  
 CnF Zack left the bar drunk. He wasn't stupid to call a taxi.  
 CnF Zack discovered that his girlfriend was cheating. He wasn't stupid to break up with her.  
 CxT Zack had the measles. He wasn't stupid to go to school.  
 CxT Zack saw two wasps in his drink. He wasn't stupid to take a sip.  
 CxT Zack was sitting in the bath tub. He wasn't stupid to use the hair dryer.  
 CxF Zack was drinking a glass of wine. He wasn't stupid to take a sip.  
 CxF Zack had wet hair. He wasn't stupid to use the hair dryer.  
 CxF Zack wanted to get a good job. He wasn't stupid to go to school.

- **wise**

CnT Paul ran a marathon on Sunday. He wasn't wise to go to bed early the night before.  
 CnT Paul was staying in a bad part of town. He wasn't wise to stay at home at night.  
 CnT Paul lost his wallet with his credit cards. He wasn't wise to cancel the credit cards immediately.  
 CnF Paul lost his wallet with his credit cards. He wasn't wise to wait a week to cancel the credit cards.  
 CnF Paul ran a marathon on Sunday. He wasn't wise to get very drunk the night before.  
 CnF Paul was staying in a bad part of town. He wasn't wise to go out alone at night.  
 CxT Paul wanted to keep his excellent employee happy. He wasn't wise to promote her.  
 CxT Paul bought an expensive TV. He wasn't wise to ask about the return policy.  
 CxT Paul went on a hike in the Alps. He wasn't wise to wear hiking boots.  
 CxF Paul had an inefficient employee. He wasn't wise to promote her.  
 CxF Paul bought some heroin from a street dealer. He wasn't wise to ask about the return policy.  
 CxF Paul went into the public pool. He wasn't wise to wear hiking boots.

## E Materials of Exp. 2

There were 6 stimuli for each of the 10 evaluative adjectives: for 3 stimuli, the generalization was neutral (N); for 3, the generalization was taken to follow from the common ground (F). For each 3-turn stimulus, we provide the first and third turn, leaving out the second turn (*Are you sure?*).

- **brave**

N Greg was brave to take the job. Yes, I am sure that he took the job.  
 N Greg was brave to watch them. Yes, I am sure that he watched them.  
 N Greg was brave to agree to do it. Yes, I am sure that he agreed to do it.  
 F Greg was brave to publish a controversial article under his own name. Yes, I am sure that he published the article under his own name.  
 F Greg was brave to save a child from drowning in the river. Yes, I am sure that he saved the child.  
 F Greg was brave to take on the five men attacking him. Yes, I am sure that he took on the five men.

- **foolish**

- N Kate was foolish to wear that dress. Yes, I am sure that she wore that dress.
- N Kate was foolish to bring a snack. Yes, I am sure that she brought a snack.
- N Kate was foolish to go shopping. Yes, I am sure that she went shopping.
- F Kate was foolish to ignore her doctor's recommendations. Yes, I am sure that she ignored his recommendations.
- F Kate was foolish to wear high heels at the playground. Yes, I am sure that she wore high heels at the playground.
- F Kate was foolish to go for a run with a broken ankle. Yes, I am sure that she went for a run with a broken ankle.

- **fortunate**

- N Sue was fortunate to meet this man. Yes, I am sure that she met him.
- N Sue was fortunate to be wearing flip-flops. Yes, I am sure that she was wearing flip-flops.
- N Sue was fortunate to attend the workshop. Yes, I am sure that she attended the workshop.
- F Sue was fortunate to speak French when she went to France. Yes, I am sure that she spoke French when she went to France.
- F Sue was fortunate to have a great singing voice. Yes, I am sure that she had a great singing voice.
- F Sue was fortunate to get upgraded to first class on her flight to Asia. Yes, I am sure that she was upgraded to first class.

- **lucky**

- N Eve was lucky to grow up in that city. Yes, I am sure that she grew up in that city.
- N Eve was lucky to wake up. Yes, I am sure that she woke up.
- N Eve was lucky to get into that college. Yes, I am sure that she got into that college.
- F Eve was lucky to get the lead in a major TV show. Yes, I am sure that she got the lead.
- F Eve was lucky to win the lottery. Yes, I am sure that she won the lottery.
- F Eve was lucky to inherit a fortune from her uncle. Yes, I am sure that she inherited a fortune from her uncle.

- **mean**

- N Jack was mean to wake up his wife. Yes, I am sure that he woke her up.
- N Jack was mean to laugh. Yes, I am sure that he laughed.
- N Jack was mean to turn off the movie. Yes, I am sure that he turned off the movie.
- F Jack was mean to laugh when he bumped his shopping cart into a woman. Yes, I am sure that he laughed when he bumped his cart into her.
- F Jack was mean to turn off the movie his wife was watching. Yes, I am sure that he turned off the movie she was watching.
- F Jack was mean to give a milkshake to his lactose intolerant daughter. Yes, I am sure that he gave her a milkshake.

- **polite**

- N Chad was polite to wait for her. Yes, I am sure that he waited for her.
- N Chad was polite to close the door. Yes, I am sure that he closed the door.
- N Chad was polite to laugh. Yes, I am sure that he laughed.
- F Chad was polite to applaud the street comedian. Yes, I am sure that he applauded the comedian.



F Chad was polite to bring his grandmother a gift for her birthday. Yes, I am sure that he brought her a gift.

F Chad was polite to apologize to his insulted wife. Yes, I am sure that he apologized to her.

- **rude**

N Ann was rude to say that. Yes, I am sure that she said that.

N Ann was rude to ask that. Yes, I am sure that she asked that.

N Ann was rude to change the song. Yes, I am sure that she changed the song.

F Ann was rude to eat the pasta with her fingers. Yes, I am sure that she ate the pasta with her fingers.

F Ann was rude to laugh at her husband's pain. Yes, I am sure that she laughed at his pain.

F Ann was rude to ignore her friendly new neighbor. Yes, I am sure that she ignored him.

- **smart**

N Jane was smart to stay home. Yes, I am sure that she stayed home.

N Jane was smart to say no. Yes, I am sure that she said no.

N Jane was smart to go to the store. Yes, I am sure that she went to the store.

F Jane was smart to stay home when she had the flu. Yes, I am sure that she stayed home when she had the flu.

F Jane was smart to change her passwords when her computer was hacked. Yes, I am sure that she changed her passwords when her computer was hacked.

F Jane was smart to report her stalker. Yes, I am sure that she reported him.

- **stupid**

N Zack was stupid to go to the store. Yes, I am sure that he went to the store.

N Zack was stupid to leave the bar. Yes, I am sure that he left the bar.

N Zack was stupid to dance like that. Yes, I am sure that he danced like that.

F Zack was stupid to go to school with the measles. Yes, I am sure that she went to school with the measles.

F Zack was stupid to drive home completely drunk. Yes, I am sure that he drove home completely drunk.

F Zack was stupid to use the hair dryer in the bath tub. Yes, I am sure that he used the hair dryer in the bath tub.

- **wise**

N Paul was wise to reprimand his employee. Yes, I am sure that he reprimanded her.

N Paul was wise to wear hiking boots. Yes, I am sure that he wore his hiking boots.

N Paul was wise to stay at home. Yes, I am sure that he stayed at home.

F Paul was wise to promote his excellent employee. Yes, I am sure that he promoted his excellent employee.

F Paul was wise to go to bed early the night before the marathon. Yes, I am sure that he went to bed early that night.

F Paul was wise to wear hiking boots on his hike in the Alps. Yes, I am sure that he wore hiking boots on his hike.

## References

- Abrusán, Márta. 2011. Predicting the presuppositions of soft triggers. *Linguistics & Philosophy* 34:491–535.
- Abrusán, Márta. 2016. Presupposition cancellation: Explaining the ‘soft-hard’ trigger distinction. *Natural Language Semantics* 24:165–202.
- Abusch, Dorit. 2002. Lexical alternatives as a source of pragmatic presupposition. In *Semantics and Linguistic Theory (SALT) XII*, pages 1–19. Ithaca, NY: CLC Publications.
- Abusch, Dorit. 2010. Presupposition triggering from alternatives. *Journal of Semantics* 27:37–80.
- Amaral, Patrícia Matos, Craige Roberts, and E. Allyn Smith. 2007. Review of ‘The Logic of Conventional Implicature’ by Chris Potts. *Linguistics & Philosophy* 30:707–749.
- Anand, Pranav and Valentine Hacquard. 2014. Factivity, belief and discourse. In *The Art and Craft of Semantics: A Festschrift for Irene Heim*, pages 69–90. MIT Working Papers in Linguistics.
- AnderBois, Scott, Adrian Brasoveanu, and Robert Henderson. 2015. At-issue proposals and appositive impositions in discourse. *Journal of Semantics* 32:93–138.
- Barker, Chris. 2002. The dynamics of vagueness. *Linguistics & Philosophy* 25:1–36.
- Beaver, David. 2001. *Presupposition and Assertion in Dynamic Semantics*. Stanford, CA: CSLI Publications.
- Beaver, David and Brady Clark. 2008. *Sense and Sensitivity: How Focus Determines Meaning*. Oxford: Wiley-Blackwell.
- Beaver, David, Craige Roberts, Mandy Simons, and Judith Tonhauser. 2017. Questions Under Discussion: Where information structure meets projective content. *Annual Review of Linguistics* 3:265–284.
- Bürkner, Paul-Christian. 2017. brms: An R package for bayesian multilevel models using Stan. *Journal of Statistical Software* 80(1):1–28.
- Christensen, Rune Haubo Bojesen. 2013. “ordinal”: Regression models for ordinal data. R package. Version ordinal\_2015.6-28.
- Cummins, Chris and Hannah Rohde. 2015. Evoking context with contrastive stress: Effects on pragmatic enrichment. *Frontiers in Psychology* 6:Article 1779.
- Destruel, Emilie, Edgar Onea, Daniel Velleman, Dylan Bumford, and David Beaver. 2015. A cross-linguistic study of the non-at-issueness of exhaustive inferences. In F. Schwarz, ed., *Experimental approaches to presupposition*, pages 135–156. Springer.
- Djärv, Kajsa and Hezekiah Akiva Bacovcin. 2017. Prosodic effects on factive presupposition projection. In *Semantics and Linguistic Theory (SALT) XXVII*, pages 116–133. Ithaca, NY: CLC Publications.
- von Fintel, Kai. 2008. What is presupposition accommodation again? *Philosophical Perspectives* 22:137–170.
- Gazdar, Gerald. 1979. A solution to the projection problem. In C.-K. Oh and D. Dineed, eds., *Syntax and Semantics 11: Presupposition*, pages 57–89. New York: Academic Press.
- Groenendijk, Jeroen. 1999. The logic of interrogation. In *Semantics and Linguistic Theory (SALT)*, vol. IX, pages 109–126. CLC Publications, Cornell.
- Heim, Irene. 1982. *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. thesis, University of Massachusetts, Amherst.
- Heim, Irene. 1983. On the projection problem for presuppositions. In M. Barlow, D. Flickinger, and M. Westcoat, eds., *West Coast Conference on Formal Linguistics (WCCFL) 2*, pages 114–125.
- Jaynes, Edwin and O. Kempthorne. 1976. Confidence intervals vs. Bayesian intervals. In W. L. Harper and C. A. Hooker, eds., *Foundations of probability theory, statistical inference, and statistical theories of science*, pages 175–257. Dordrecht: Springer Netherlands.
- Karttunen, Lauri. 2013. You will be lucky to break even. In T. King and V. de Paiva, eds., *From Quirky Case to Representing Space: Papers in Honor of Annie Zaenen*, pages 167–180. Stanford: CSLI Publications.

- Karttunen, Lauri, Stanley Peters, Annie Zaenen, and Cleo Condoravdi. 2014. The chameleon-like nature of evaluative adjectives. In *Empirical Issues in Syntax and Semantics 10*, pages 233–250.
- Kertz, Laura. 2010. The argument structure of evaluative adjectives. A case of pseudo-raising. In N. Hornstein and M. Polinsky, eds., *Movement theory of control*, pages 269–298. Amsterdam/Philadelphia: John Benjamins.
- Kilgariff, Adam, Vít Baisa, Jan Bušta, Miloš Jakubíček, Vojtěch Kovář, Jan Michelfeit, Pavel Rychlý, and Vít Suchomel. 2014. The Sketch Engine: Ten years on. *Lexicography* 1:7–36.
- Mahler, Taylor. 2019. Does at-issueness predict projection? It's complicated! In *49th Annual Meeting of the North East Linguistic Society*.
- Morey, Richard D., Rink Hoekstra, Jeffrey N. Rouder, Michael D. Lee, and Eric Jan Wagenmakers. 2016. The fallacy of placing confidence in confidence intervals. *Psychonomic Bulletin and Review* 23(1):103–123.
- Murray, Sarah. 2014. Varieties of update. *Semantics & Pragmatics* 7(2):1–53.
- Nicenboim, Bruno and Shravan Vasishth. 2016. Statistical methods for linguistic research: Foundational Ideas, Part II. *Linguistics and Language Compass* 10(11):591–613.
- Norrick, Neal R. 1978. *Factive adjectives and the theory of factivity*. Tübingen: Niemeyer.
- Oshima, David Y. 2009. Between being wise and acting wise: A hidden conditional in some constructions with propensity adjectives. *Journal of Linguistics* 45:363–393.
- Potts, Christopher. 2005. *The Logic of Conventional Implicatures*. Oxford: OUP.
- R Core Team. 2016. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.
- Roberts, Craige. 2012. Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics & Pragmatics* 5:1–69. Reprint of 1998 revision of 1996 OSU Working Papers publication.
- Romoli, Jacopo. 2015. The presuppositions of soft triggers are obligatory scalar implicatures. *Journal of Semantics* 32:173–291.
- Schlenker, Philippe. 2010. Local contexts and local meanings. *Philosophical Studies* 151:115–142.
- Simons, Mandy. 2001. On the conversational basis of some presuppositions. In *Semantics and Linguistic Theory (SALT) XI*, pages 431–448. Ithaca, NY: CLC Publications.
- Simons, Mandy. 2007. Observations on embedding verbs, evidentiality, and presupposition. *Lingua* 117(6):1034–1056.
- Simons, Mandy, David Beaver, Craige Roberts, and Judith Tonhauser. 2017. The Best Question: Explaining the projection behavior of factive verbs. *Discourse Processes* 3:187–206.
- Simons, Mandy, Judith Tonhauser, David Beaver, and Craige Roberts. 2010. What projects and why. In *Semantics and Linguistic Theory (SALT) XXI*, pages 309–327. Ithaca, NY: CLC Publications.
- Stevens, Jon Scott, Marie-Catherine de Marneffe, Shari R. Speer, and Judith Tonhauser. 2017. Rational use of prosody predicts projectivity in manner adverb utterances. In *39th Annual Meeting of the Cognitive Science Society*, pages 1144–1149.
- Syrett, Kristen and Todor Koev. 2015. Experimental evidence for the truth conditional contribution and shifting information status of appositives. *Journal of Semantics* 32:525–577.
- Tonhauser, Judith. 2012. Diagnosing (not-)at-issue content. In *Semantics of Under-represented Languages in the Americas (SULA) 6*, pages 239–254. Amherst, MA: GLSA.
- Tonhauser, Judith. 2016. Prosodic cues to speaker commitment. In *Semantics and Linguistic Theory (SALT) XXVI*, pages 934–960. Ithaca, NY: CLC Publications.
- Tonhauser, Judith, David Beaver, Craige Roberts, and Mandy Simons. 2013. Toward a taxonomy of projective content. *Language* 89:66–109.
- van der Sandt, Rob. 1992. Presupposition projection as anaphora resolution. *Journal of Semantics* 9:333–377.

- Wilkinson, Robert. 1970. Factive complements and action complements. In *Proceedings of the 6th Annual Meeting of the Chicago Linguistic Society*, pages 425–444.
- Wilson, Deidre. 1975. *Presupposition and Non-truth-conditional Semantics*. London: Academic Press.
- Xue, Jingyang and Edgar Onea. 2011. Correlation between projective meaning and at-issueness: An empirical study. In *Proceedings of the 2011 ESSLLI Workshop on Projective Content*, pages 171–184.