

(NON)INTEGRATED EVALUATIVE ADVERBS IN QUESTIONS:  
A CROSS-ROMANCE STUDY

LAIA MAYOL

*Universitat Pompeu Fabra*

ELENA CASTROVIEJO

*Spanish National Research Council  
(ILLA-CCHS-CSIC)*

The goal of this article is to analyze the semantic contribution of evaluative adverbs (EAs) such as *unfortunately* in several languages of the Romance family, namely French, Catalan, and Spanish. Following Bonami and Godard (2008), we propose to analyze EAs as items that convey projective meaning in order to explain their peculiar semantic behavior (they cannot be directly denied, do not change the truth conditions of the proposition they evaluate, and are not factive) and their unacceptability in negative assertions. Unlike what has been claimed for many other languages, French allows EAs in questions, and we show that Catalan and Spanish do too, as long as some conditions are met. We propose an account that derives their interpretation in both assertions and questions: integrated French EAs take the proposition to their right, and if they appear in a *wh*-question, their interpretation is similar to that of unconditionals. In contrast, nonintegrated EAs in Catalan and Spanish have scope over a set of propositions, and are acceptable in questions only if the speaker is biased toward one of the propositions in the set denoted by the question. The acceptability of EAs in such questions, rejected by previous literature, is confirmed by an experimental study.\*

*Keywords:* evaluative adverbs, conventional implicature, negative questions, biased questions, Romance languages

**1. INTRODUCTION.** Evaluative adverbs (EAs) are sentential adverbs with which the speaker evaluates a proposition, as illustrated in 1.

- (1) a. Unfortunately, we missed the train.  
b. Strangely, the shop was closed.

With 1a, the speaker conveys that it is unfortunate that she missed the train; with 1b, that it is strange that the shop was closed. Other examples of EAs include *luckily*, *happily*, and *surprisingly*.<sup>1</sup>

Recently these adverbs have received considerable attention in the semantics literature because they do not seem to contribute to the main content of the sentence (see, among others, Jayez & Rossari 2004, Bonami & Godard 2008 (henceforth B&G), and Ernst 2009). Our goal in this article is to examine these adverbs in a very particular context: questions in several languages of the Romance family.

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<sup>1</sup> We mostly use *unfortunately* (*malheureusement* in French, *per desgràcia* in Catalan, and *por desgracia* in Spanish) in the example sentences, for several reasons: first, by keeping the semantic import of the adverb constant, we can focus on its effects in several clause types. Second, EAs are in general not as frequent in Spanish and Catalan as in French or English. The PP *por desgracia/per desgràcia* is a good counterpart of *malheureusement*, but the inventory of good correspondences is limited.

Although it has been claimed that EAs are unacceptable in questions (see, among others, Ernst 2009), it has been shown (B&G and Jayez & Rossari 2004) that they are sometimes fully acceptable in questions in French, as shown in 2.<sup>2</sup>

- (2) a. Qui est malheureusement venu ?  
 who is unfortunately come  
 ‘Who came? + Whoever came, it is unfortunate that s/he came.’<sup>3</sup>
- b. Est-ce que Marie est malheureusement venue ?  
 Q Marie is unfortunately come  
 ‘Did Marie come? + If Marie came, it is unfortunate that she did.’

From now on, we call questions with an evaluative ‘EA questions’. The EA questions in 2 are problematic, since it is not obvious how to analyze the semantic contribution of the adverb. The EA does not behave like a manner or a modal adverb and it is not interpreted within the question; that is, 2a cannot be paraphrased as ‘Who is the *x* such that it is unfortunate that *x* came?’; rather, it is interpreted as a plain WH-question, without the adverb, plus the comment that whoever came, it is unfortunate that they came. One of the goals of this article is to give an explicit account of the semantic contribution of EAs in questions.

Furthermore, we compare French with two closely related languages, namely Catalan and Spanish, which show a different distribution of EAs in questions. Such a comparison across several languages of the Romance family is interesting because, while these languages are similar in many respects, we can focus on the microvariation they present.

At first sight, in Catalan and Spanish, EAs are not possible in WH-questions (3), while they are fully acceptable in confirmation-seeking questions (4), that is, questions in which the speakers seek to confirm the proposition that they believe is true (Bolinger 1989, Vanrell et al. 2010). The polar questions in 5 would be judged unacceptable if presented out of context, but we argue that they become acceptable once the context is appropriately manipulated, as we show in §4. This proposal is substantiated experimentally by a study that uses the magnitude-estimation technique (see §4.2).

- (3) a. #Qui ha vingut, per desgràcia?<sup>4</sup> (Catalan)  
 who has come unfortunately
- b. #¿Quién ha venido, por desgracia? (Spanish)  
 who has come unfortunately  
 ‘Who came? + Whoever came, it is unfortunate that s/he came.’
- (4) a. Oi que ha vingut, la Maria, per desgràcia? (Catalan)  
 CQ Q has come the Maria unfortunately
- b. ¿Verdad que ha venido, María, por desgracia? (Spanish)  
 true that has come María unfortunately  
 ‘Isn’t it true that Maria came? + If Maria came, it is unfortunate, that she did.’

<sup>2</sup> The following abbreviations are used in the glosses: Q: question marker, CQ: confirmation question marker, and CL: verb clitic. Unless otherwise noted, the examples are ours and are our native-speaker intuitions.

<sup>3</sup> Since giving felicitous translations in English is not always possible, we use rough paraphrases when translating EAs in questions and conditionals, where ‘+’ is used informally to convey that we are introducing a side comment.

<sup>4</sup> We use ‘#’ to indicate that the sentence is unacceptable in the context under discussion or unless uttered in a particular context. We use ‘\*’ to indicate ungrammaticality, even if the ungrammaticality is due to semantic reasons.

- (5) a. #Que ha vingut, la Maria, per desgràcia? (Catalan)  
       Q has come the Maria unfortunately  
       b. #¿Ha venido, María, por desgracia? (Spanish)  
       has come María unfortunately  
       ‘Did Maria come? + If Maria came, it is unfortunate, that she did.’

EAs in French, on the one hand, and Spanish and Catalan, on the other, display prosodic and syntactic differences, which have important consequences for their interpretation. In all cases, EAs are propositional modifiers—that is, they modify a propositional argument. EAs in French can be prosodically integrated, and, when this is the case, they have scope over the proposition to their right. This allows them to occur in WH- as well as polar interrogatives. By contrast, EAs in Spanish and Catalan are always prosodically nonintegrated and sit in a higher sentential position. Since their syntactic sister is not of the right type (it is not a proposition but a set of propositions), EAs in these languages can occur in questions only when they modify a proposition toward which the speaker is biased. Thus, the acceptability of EAs in questions in these languages will crucially depend on the context of utterance.

This research has a bearing on the ongoing study of the relationship between several dimensions, or levels, of meaning (Potts 2005, 2007, Amaral et al. 2008, Simons et al. 2010, Tonhauser et al. 2013). Characteristically, presuppositions and conventional implicatures project, so the meaning they contribute is preserved despite being in the scope of negation or placed in a question. In this article, we focus on a type of projective item, EAs, that resists being in a question environment for reasons that have to do with the congruence between the meanings contributed at different levels of content (projective vs. at issue), and with the availability of a suitable (propositional) argument in the scope of the EA. In addition to considering at-issue meaning and conventional implicatures, this work puts on the table the relevance of biases, which play a role not only in the interpretation of negated polar questions, but also in the felicity of questions that include EAs when they are nonintegrated. Last, in this portrait of meaning types, we also regard the content contributed by illocutionary force operators like *ASSERT* and *QUESTION*.

Beyond the discussion about the interaction of contents at different levels, this article is concerned with a puzzling locus of linguistic variation within the Romance family. The proposal given here defends a perfect mapping between the syntax and prosody of the EA and its interpretation. Specifically, a correlation is established between prosodic integration, the lower syntactic position of the EA, and the presence of unbound variables in its scope. We assume Bonami and Godard’s (2008) analysis for French declaratives and WH-interrogatives and provide an analysis for a wider set of data. In particular, we extend their analysis to account for the restrictions on the appearance of EAs in (negative and positive) polar questions in French, and for the distribution of EAs in questions in Spanish and Catalan.

Finally, this work contributes a set of previously unnoticed data from Spanish and Catalan, and makes a case for the importance of using elicitation and survey techniques that pay special attention to the role of context. Along the lines of Matthewson 2004, which is concerned with the considerations that need to be observed in conducting semantic fieldwork, we show that out-of-the-blue data that had been considered unacceptable in the literature turn out to be well formed once the experimenter manipulates the context properly.

The article proceeds as follows. We first lay out the main properties of EAs, together with a review of previous work on these adverbs, and then present our analysis of EAs

in French. We next account for the more restrictive behavior of EAs in Catalan and Spanish, before discussing the main findings and issues raised by this article.

## 2. BACKGROUND.

**2.1. MAIN PROPERTIES OF EAs.** We start by listing the main properties of EAs and the main differences between Catalan, Spanish, and French as far as EAs are concerned.

(i) EAs are sentential adverbs; that is, they modify whole sentences. They share this property with other types of adverbs, such as modal adverbs (*probably, definitely*), frame adverbs (*linguistically, politically*), and speech act adverbs (*frankly, briefly*).

- (6) a. Martin will probably be late.  
 b. This is definitely a good idea.  
 c. Politically, the president didn't just win the week, the president has won the month.  
 d. Frankly, my dear, I don't give a damn.

Certain EAs can also be used as VP modifiers, but in this case, word order and prosody differ.

- (7) a. By luck, he survived. (sentential modifier (EA))  
 b. He survived by luck alone. (VP modifier)

(ii) Prosodically, EAs in French can be either integrated within another prosodic phrase or not, forming their own phrase. In writing, prosodic integration is usually marked by the absence of commas.

- (8) a. Paul s'est, malheureusement, comporté comme un idiot.  
 b. Paul s'est malheureusement comporté comme un idiot.  
 Paul CL.is unfortunately behaved like an idiot  
 'Paul unfortunately behaved like an idiot.'

In Catalan and Spanish, EAs cannot be prosodically integrated.

(iii) Syntactically, nonintegrated EAs behave like other parenthetical expressions. They appear in peripheral positions (both sentence-initially and -finally) as well as other adjoined positions, provided that they are prosodically nonintegrated. This means that they are not part of the core sentential syntax: they either occupy an adjoined position to the CP when they appear at the edge of the sentence (9), or otherwise appear on a different plane in a three-dimensional syntactic tree (a special position for disjuncts), as Espinal (1991) proposes (10).

- (9) a. (Malheureusement,) Marie est venue, (malheureusement). (French)  
 unfortunately Marie is come unfortunately  
 'Unfortunately, Marie came.'  
 b. (Per desgràcia,) la Maria ha vingut, (per desgràcia). (Catalan)  
 unfortunately the Maria has come unfortunately  
 'Maria came, unfortunately.'  
 c. (Por desgracia), María ha venido, (por desgracia). (Spanish)  
 unfortunately María has come unfortunately  
 'María came, unfortunately.'
- (10) a. Marie a, heureusement, envoyé la lettre à Jean. (French)  
 Marie has fortunately sent the letter to Jean  
 'Fortunately, Marie has sent the letter to Jean.'  
 b. La Maria, per sort, ha enviat la carta a en Joan. (Catalan)  
 the Maria fortunately has sent the letter to the Joan  
 'Fortunately, Maria has sent the letter to Joan.'

- c. María ha enviado, por suerte, la carta a Juan. (Spanish)  
 María has sent fortunately the letter to Juan  
 ‘Fortunately, María has sent the letter to Juan.’

In addition, integrated French EAs can also appear following the auxiliary and preceding the main verb, while this is not possible in Spanish and Catalan (11). The structure we assume for 11a is one where the auxiliary has undergone T-to-C movement, and the EA in French—but not in Catalan and Spanish—can appear as an adjunct to TP (see 12). What is important for our purposes is the relative position of the auxiliary, the adverb, and negation (see below), and not the exact syntactic import of each projection. We refer the interested reader to, for example, Pollock 1989, Espinal 1991, Cinque 1999, and Ernst 2002 for a more fine-grained analysis of the syntax of adverbs.

- (11) a. Marie est bizarrement venue. (French)  
 Marie is strangely come  
 b. \*La Maria ha estranyament vingut. (Catalan)  
 the Maria has strangely come  
 ‘Maria strangely came.’

- (12) [<sub>CP</sub> Marie<sub>i</sub> est<sub>j</sub> [<sub>TP</sub> bizarrement [<sub>TP</sub> t<sub>i</sub> [<sub>T'</sub> t<sub>j</sub> [<sub>VP</sub> venue]]]]]

(iv) In French, negative declarative sentences are not allowed when the EA is prosodically integrated and occurs to the right of negation, conveyed by *pas*.<sup>5</sup> In contrast, they are possible either when the EA is nonintegrated or when it appears to the left of negation.

- (13) a. \*Marie n’est pas malheureusement venue.  
 b. Marie n’est pas, malheureusement, venue.  
 c. Marie n’est malheureusement pas venue.  
 Marie NE.is unfortunately not come  
 ‘Unfortunately, Marie did not come.’

The EA in 13a is lower than negation (see Laka 1990 for a full-fledged analysis of the syntax of negation). Consequently, it will not take scope over the negated proposition, which, as we argue following B&G, is responsible for the ill-formedness of the sentence.

(v) The semantic contribution of EAs cannot be negated directly, as the French example in 14 shows. Reply B1 in 14 negates only that Paul lost the election, but not that this is an unfortunate state of affairs. In fact, if the addressee tries to deny this meaning directly, it results in an unacceptable reply (B2).<sup>6</sup> If the addressee wants to object to the meaning conveyed by the EA, it must be done indirectly, as in B3.

- (14) B&G (p. 285, exx. 27–29)  
 A: Paul a malheureusement perdu l’élection.  
 ‘Paul unfortunately lost the election.’  
 B1: Non/C’est faux, ou, en tout cas, ce n’est pas ce que j’ai entendu.  
 ‘No/It’s false, or, in any case, it is not what I have heard.’  
 B2: #C’est faux, je trouve que c’est une très bonne nouvelle.  
 ‘That’s not true, I think it is very good news.’

<sup>5</sup> A referee points out that, in fact, sentence 13a is marginally acceptable under a metalinguistic interpretation of negation.

<sup>6</sup> As pointed out to us by Lisa Matthewson (p.c.), since *unfortunately* can be taken to mean ‘unfortunately, according to me’, (i) is a better example of denial (though also unacceptable as a reply to 14).

(i) C’est faux, tu trouves que c’est une très bonne nouvelle.  
 ‘That’s not true, you think it is very good news.’

B3: C'est vrai, mais moi, je trouve que c'est une très bonne nouvelle!  
 'Yes, but I personally think it is very good news.'

This test is extensively used to identify not-at-issue content (see, among others, Faller 2002, Matthewson et al. 2007, Amaral et al. 2008, Murray 2009, and Tonhauser et al. 2013).

(vi) EAs do not change the truth value of the proposition they modify: that is, the truth conditions of the sentence are the same with and without the EA. Both sentences in 15 entail that John left. This is not necessarily the case in a sentence with a modal adverb: sentence 16 does not entail that John left.

(15) a. Unfortunately, John left.

b. John left.

(16) Probably, John left.

(vii) EAs are not factive, as shown by B&G and Jayez and Rossari (2004) (contra Bellert (1977), Mata (2007), and López and Morant (2002), among others). While this is not easy to see for simple sentences because they entail the proposition they take as their argument (see property (vi)), this becomes clear when we consider conditional sentences. Since the antecedent of a conditional is a hole for presuppositions, these project to the entire sentence (Karttunen 1973). Therefore, in the French example in 17a, the presupposition of the antecedent of the conditional (i.e. that the complement of the factive verb is true) is projected and the whole sentence presupposes that Marie is late. If EAs were factive (and thus, it were presupposed that the proposition they take as argument is true), we would expect a parallel behavior, and 17b should therefore presuppose that Marie is late. However, this sentence clearly does not have this presupposition.

(17) a. Si la mère de Marie sait qu'elle est en retard, elle sera très  
 if the mother of Marie knows that she is in delay she will be very  
 déçue.

disappointed

'If Marie's mother knows that she is late, she will be very disappointed.'

b. Si Marie est malheureusement en retard, sa mère sera très  
 if Marie is unfortunately in delay her mother will be very  
 déçue.

disappointed

'If Marie is late, her mother will be very disappointed. + If Marie is late, it is unfortunate that she is late.'

The same pattern holds for a language like Catalan or Spanish, where 'unfortunately' is prosodically nonintegrated. This is shown here for Catalan; example 18a presupposes that Maria is late, while this is not the case in 18b.

(18) a. Si la mare de la Maria sap que arriba tard, s'enfadarà molt.  
 if the mother of the Maria knows that arrives late will be mad a lot

'If Maria's mother knows that she is late, she'll be very mad.'

b. Si la Maria, per desgràcia, arriba tard, la seva mare s'enfadarà  
 if the Maria unfortunately arrives late the her mother will be mad  
 molt.

a lot

'If Maria is late, her mother will be very mad. + If Maria is late, it is unfortunate that she is late.'

This behavior is also found in a question context for prosodically integrated *malheureusement* in French. While the first question presupposes that Marie failed (again, *sais* is the presupposition trigger), the second does not.

(19) Jayez & Rossari 2004:219

- a. Est-ce que tu sais que Marie a raté son examen ?  
 Q you know that Marie has failed her exam  
 ‘Do you know that Marie failed her exam?’
- b. Est-ce que Marie aurait malheureusement raté son examen ?  
 Q Marie would.have unfortunately failed her exam  
 ‘Would Marie have failed her exam? + If Marie has failed her exam, it would be unfortunate.’

B&G point out that, actually, factivity is what distinguishes the semantic behavior of evaluative adverbs from evaluative adjectives. While adverbs do not presuppose the proposition they take as argument (20a), adjectives do presuppose their complement. Sentence 20b presupposes that Paul is late, and the presupposition carried by *aussi* ‘too’ is therefore satisfied.

(20) a. B&G (p. 281)

- Si Paul est malheureusement en retard, le patron sera furieux.  
 if Paul is unfortunately in delay the boss will.be very.angry  
 ‘If Paul is late, the boss will be very angry. + If Paul is late, this will be unfortunate.’
- b. S’il est malheureux que Paul soit en retard, il l’est encore plus que le  
 if.it is unfortunate that Paul is in delay it CL.is even more that the  
 patron le soit aussi.  
 boss CL be too  
 ‘If it is unfortunate that Paul is late, it is even more unfortunate that the boss is late too.’

Note also that sentence 20a can be followed by 21, which is expected since the adverb is not factive. By contrast, this is not possible with the adjective (20b) because it is factive.

(21) On espère, donc, qu’il arrive à l’heure.

‘Therefore, we hope that he will be on time.’

(viii) As mentioned in the introduction, although EAs are acceptable in questions in French, they have an unexpected meaning. In order to see this, it is useful to compare the behavior of EAs with the behavior of other types of sentential adverbs, such as the modal adverb *probablement* ‘probably’. The modal adverb in 22a has the expected interpretation under a standard analysis that takes questions to denote sets of propositions. The adverb is interpreted inside each proposition (22b), and as a consequence, the meaning of the question can be paraphrased as in 22c. Therefore, in a context in which we know that Anne and Betty probably came, while we know that Charles and David did not come, 22d would be a possible answer to question 22a.

(22) a. Qui est probablement venu ?

‘Who has probably come?’

- b. {Anne probably came, Betty probably came, Charles probably came,  
 David probably came}
- c. Who is the *x* such that it is likely that *x* came?
- d. Anne and Betty.

We do not obtain the same interpretation if we replace the modal adverb with an EA: that is, the denotation of 23a is not a set of propositions such as that in 23b, or in other words, the meaning of the question cannot be paraphrased as in 23c. In a context in which we like Anne and Betty, and deeply dislike Charles and David, and they all came to a party, 23d is not a possible answer to 23a.

- (23) a. Qui est malheureusement venu ?  
 b. {Unfortunately, Anne came, Unfortunately, Betty came, Unfortunately, Charles came, Unfortunately, David came}  
 c. Who is the *x* such that it is unfortunate that *x* came?  
 d. #Charles and David.

If 23c is not a correct paraphrase of 23a, how can it be paraphrased and how can it be used? Let us illustrate a context in which sentence 23a is acceptable. Imagine the following scenario: two friends organized a party, which had to be canceled at the last minute and not all the guests were aware of this fact. It is possible that someone showed up thinking that there was a party. In this context, 23a would be acceptable, or 24 could be used if we were particularly interested in Marie. That is, the EA is semantically independent of the meaning of the question. On the one hand, the speaker is asking a question, and on the other, she is making a side comment.

- (24) Est-ce que Marie est malheureusement venue ?  
 Q Marie is unfortunately come  
 ‘Did Marie come? + If Marie came, it is unfortunate that she did.’

**2.2. PREVIOUS WORK ON EAS.** The term EVALUATIVE ADVERB was coined by Bellert 1977. Prior to this work, Greenbaum (1969) identified what he called ATTITUDINAL DISJUNCTS as those adverbs that convey speakers’ evaluations toward what they say, and he pointed out that they cannot occur in questions in English. As we mentioned in §2.1, some adverbs may have either an evaluative or a manner interpretation, such as *strangely*. Whenever this is the case, according to Greenbaum (1969), there are two homonym adverbs with different interpretations: manner and evaluative. In contrast, Bartsch (1976) attempts to eliminate such homonymy with an approach where adverbs such as *strangely* can hold different relations to the other parts of the sentence while keeping the same meaning. Bartsch proposes that pure manner adverbs and EAs have what she calls a different ‘syntactic function’ (whereas prototypical manner adverbs characterize a process, EAs characterize a state of affairs).

Jackendoff (1972) proposes a classification of adverbs based on their syntactic position, and assumes that those adverbs that occupy the same syntactic position share the same interpretation rule. Bellert (1977) casts doubts on a purely syntactic approach and focuses on the semantic properties of speaker-oriented adverbs, which include EAs. Bellert argues that the occurrence of an EA yields two asserted propositions, one that does not contain the adverb (25a), and one that contains the evaluation of the sentence (25b).

- (25) Surprisingly, John has arrived.  
 a. John has arrived.  
 b. The speaker is surprised that John has arrived.

This follows from another claim of hers, namely that EAs are factive. Moreover, she argues that EAs cannot occur in questions and analyzes this as deriving from the following semantic inconsistency: since uttering an EA in a declarative involves asserting two propositions, using an EA in a question would imply inquiring about one part of the sentence while asserting the other part (26).

- (26) \*Has John surprisingly arrived?  
 a. Has John arrived?  
 b. The speaker is surprised that John has arrived.

In later work, Jayez and Rossari (2004), Bonami and colleagues (2004), and B&G provided data from French that show that, to begin with, EAs can indeed occur in questions, which challenges the previous explanation based on semantic inconsistency—if we assume the same analysis for EAs crosslinguistically. Also, B&G argue that EAs are not factive, which disputes Bellert's suggested meaning for the two assertions.

B&G propose that EAs are ancillary commitments, which is a lexical property that forces them to be independent of the main content of the sentence; that is, 'the evaluative adverb denotes the judgments of the speaker independently of the other commitments associated with his discourse' (Bonami & Godard 2008:285–86). According to them, there are two components of meaning in a sentence like 27. The main assertion of the sentence is that Marie came (28a), while the ancillary commitment consists in the conditional in 28b: if Marie came, it is unfortunate that she did.

- (27) Marie est malheureusement venue.  
 Marie is unfortunately come  
 'Unfortunately, Marie came.'

- (28) a. Main assertion: came(Marie)  
 b. Ancillary commitment: came(Marie) → UNFORTUNATE(came(Marie))

This analysis accounts for most of the semantic properties of EAs. Below is a list of the semantic properties explained by this account (we postpone the discussion of the behavior of EAs in questions to §3).

- EAs cannot be negated directly (property (v)), since they are not part of the main assertion.
- The truth conditions of a sentence with an EA are the same with and without the EA (property (vi)). The main assertion of the sentence is not modified by the adverb, since the adverb does not contribute meaning to the main assertion.
- EAs are not factive (property (vii)). Since the argument of the EA appears in both the antecedent and the consequent of the conditional in the ancillary commitment, it will not be presupposed.<sup>7</sup>

B&G also propose an explanation for the unacceptability of negative sentences with prosodically integrated EAs to the right of negation (property (iii)). According to them, integrated EAs can only take scope to their right, and thus negation is out of the scope of the EA in 29.

- (29) \*Marie n'est pas malheureusement venue.  
 Marie NE.is not unfortunately come  
 'Unfortunately, Marie did not come.'

The main assertion and the ancillary commitment of this sentence would be as in 30.

- (30) a. Main assertion: ¬came(Marie)  
 b. Ancillary commitment: came(Marie) → UNFORTUNATE(came(Marie))

That is, the speaker is, on the one hand, asserting that Marie did not come and, on the other, uttering a conditional ('If Marie came, ...'), as if it were possible that she had

<sup>7</sup> This is the classical context of a presupposition filter, in which a presupposition in the consequent of a conditional projects unless it also is entailed by the antecedent, as in (i) (Karttunen 1973).

(i) If Peter has sons, his sons will be bald.

come. As B&G point out, this is of course not a logical contradiction. In fact, this is the type of meaning counterfactuals express: counterfactuals allow speakers to consider a proposition that would hold of worlds that are known to be incompatible with the actual one. However, counterfactuality needs to be explicitly linguistically marked (by means of modality and past tense; cf. Iatridou 2000, Condoravdi 2002, Ogihara 2002, and Ippolito 2006, among others), or the sentence becomes unacceptable. Therefore, a sentence like 29 is unacceptable for the same reasons that the sentences in 31 are.

- (31) a. #Mary did not go to the party. If Mary went to the party, I'm sure it was a lot of fun.  
 b. #Mary is not tall. If Mary is tall, she can be a great basketball player.

Following B&G's terminology, sentences 29 and 31 are incongruent: first, the speaker asserts the falsity of some proposition, and then she goes on ignoring what she has just asserted and using this same proposition in a conditional, as if she did not believe that the proposition is false.

From quite a different starting point, Ernst (2009) proposes an analysis of discourse-oriented adverbs, which includes evaluative, modal, and evidential adverbs. According to him, some evaluative adverbs (such as *unfortunately*, *luckily*, *amazingly*, or *sadly*, which he calls 'strong evaluatives') are STRONG POSITIVE POLARITY ITEMS (PPIs).<sup>8</sup> Ernst, who only considers prosodically integrated adverbs, establishes a correlation between subjectivity and strong polarity, such that strong evaluatives are blocked in all non-veridical contexts, including negative contexts, conditionals, and interrogatives.

- (32) Ernst 2009:506, 513  
 a. \*Karen has not luckily left.  
 b. \*Did they unfortunately withdraw their funds?  
 c. \*If George unfortunately comes, the party will be a disaster.

In Ernst's analysis, the polarity behavior of strong evaluatives translates as the strong commitment of the speaker to the truth of the whole sentence ( $ADV(p)$ ).<sup>9</sup>

In contrast, modal adverbs and weak evaluatives (such as *mysteriously*, *appropriately*, and *famously*) are analyzed as WEAK PPIs. They can have either a subjective or an objective interpretation. In the latter case, they will be allowed in nonveridical contexts, such as in questions and conditionals, which is illustrated with *tragically* and *conveniently* in 33.

- (33) Ernst 2009:513  
 a. Will our hero once again tragically be deprived of his chance for love?  
 b. If they have conveniently decided to withdraw, the competition will go better for us.

The distinction between objectivity and subjectivity is modeled as in 34.

- (34) SUBJECTIVITY (for speaker orientation): Where a speaker asserts  $Q = ADV(p)$  (thus  $Q$  is in the belief set of the speaker, which we call  $M_B(s)$ ),  
 a.  $ADV$  is SUBJECTIVE iff all worlds by which  $Q$  is evaluated are consistent with respect to  $M_B(s)$  at the time of utterance;  
 b. otherwise  $ADV$  is OBJECTIVE.  
 (35) CONSISTENCY: A set of worlds ( $q$ -worlds) is consistent with a belief state  $M$  if the proposition  $q$  is true both in  $q$ -worlds and in all the worlds in  $M$ .

<sup>8</sup> For a previous polarity account of EAs, see Nilsen 2004.

<sup>9</sup> Recall that for B&G,  $p$  is asserted and  $p \rightarrow ADV(p)$  is an ancillary commitment. Both meanings are entailments and, thus, the speaker is committed to them.

That is, speaker subjectivity boils down to universal quantification over the worlds compatible with the speaker's beliefs and the statement that, in all these worlds,  $ADV(p)$  is true. In this approach, subjective adverbs are true for the speaker's entire belief set, while objective adverbs need only be true in some relevant model of belief, expectation, desire, and so forth. Consider Ernst's denotation of *unfortunately* ( $P$ ) and *mysteriously* ( $P$ ) in 36 and 37 respectively.

- (36)  $\llbracket \text{unfortunately } (P) \rrbracket =$   
 a.  $\llbracket P \rrbracket = 1$  in  $M_B(s)$   
 b.  $\forall w \in M_B(s)$ ,  $\llbracket \text{it is unfortunate that } P \rrbracket = 1$  in  $w$   
 (i.e.  $ADV(p)$  is true in all worlds in the speaker's belief set)
- (37)  $\llbracket \text{mysteriously } (P) \rrbracket =$   
 a.  $\llbracket P \rrbracket = 1$  in  $M_B(s)$   
 b.  $\forall w$  in some subset  $W$  of  $M \in \{M_B(s), M_B(h)\}$ ,  $\llbracket \text{it is mysterious that } P \rrbracket = 1$  in  $w$

According to Ernst, evaluatives are 'almost all factive, thus also representing a full commitment to the truth of  $P$ ' (2009:514). In his analysis, in both strong and weak evaluative adverbs,  $P$  is taken to be true in the speaker's belief model. The difference between subjectivity and objectivity concerns the worlds in which  $ADV(p)$  is true, whether it is the speaker's belief model or a model that also includes the hearer's beliefs. Note that this approach is at odds with the point made by B&G and Jayez and Rossari (2004) with examples 17 and 19, according to which the speaker need not be committed to the truth of  $P$  when uttering *malheureusement*  $P$ .

The main problem we see with this analysis is that there is no obvious way to account for the data we have presented in §2.1. Ernst argues that subjective evaluatives like *unfortunately* cannot occur in questions and conditionals, on the basis of data from English, French, Mandarin Chinese, and Dutch gathered by interview or questionnaire. But as we mentioned, EAs in French can appear in questions and conditionals (see 19b and 20a).<sup>10</sup> Thus, in Ernst's model, *malheureusement* should be treated as a weak evaluative. He notes, however, that weak evaluatives are acceptable in questions only when 'there is evidence to take this sentence's proposition as true' (2009:522), where 'this sentence's proposition' refers to the answer to the question. This is not the case for *malheureusement*, which can occur in (positive) questions when the speaker has no preference for either of the alternatives (e.g. the context for 24). Thus, the strategy of explaining crosslinguistic variation in terms of the variation on a scale of subjectivity (i.e. *malheureusement* being less subjective than *unfortunately*) will probably not be successful. In addition to this, naturally occurring examples such as the ones shown in 38 for English cast doubt on the robustness of the paradigm assumed by Ernst.

- (38) a. Most of his time is spent at home with his wife, sitting in an easy chair while wearing a fez and silk pajamas, sipping a brandy, and making sure he doesn't insult his wife's weight. If he unfortunately does, he is thrown into the bathroom sink, in which he snugly fits.

([http://en.wikipedia.org/wiki/Characters\\_in\\_pondus](http://en.wikipedia.org/wiki/Characters_in_pondus))

- b. Dude. I teach 8th grade. Some of my students will drop out, statistically speaking. But why? Pressure to work? Pregnancy and pressure to start families? Did they move out of state? Did they unfortunately meet with an accident and pass away?

(<http://thischildleftbehind.blogspot.com/2011/08/graduation-bouquetwho-will-get-one.html>)

<sup>10</sup> Ernst (2009) partly recognizes this fact by marking the French examples with a question mark, instead of an asterisk.

Furthermore, treating EAs as PPIs does not yet explain by itself why EAs cannot be denied or questioned by direct means, which are typical properties of not-at-issue content (i.e. of ancillary commitments, in B&G's approach). It seems that a semantics that distinguishes two layers of meaning is needed to account for the data in any case, and we aim to show that the data can be explained without the need to posit that EAs are PPIs. Although we do not deal further with English data in this article, it seems clear that the data are more complex than what has been acknowledged in the literature (see §5 for some speculation about the broader crosslinguistic implications of our proposal).

**3. INTEGRATED EAS IN FRENCH.** In this section, we take B&G's main insights and extend them so as to cover integrated EAs in questions in French using a multi-dimensional semantic model à la Potts 2005. We adopt the basic denotation B&G propose for EAs (i.e. a conditional with the evaluative predicate in the consequent, as shown in the lexical decomposition in 39) and propose that this meaning is located at a not-at-issue dimension of meaning, which we call the projective tier (borrowing the term *projective* from Simons et al. 2010).

(39)  $\lambda p. \forall^*[p \rightarrow \text{UNFORTUNATE}(p)]$ , where  $\forall^*$  denotes a universal closure operation that binds all free individual variables in its scope.<sup>11</sup>

This proposal explains most of the semantic properties of EAs: cannot be directly denied, do not change the truth conditions of the proposition they modify, are not factive, and yield a peculiar semantics in questions. While B&G sketch the semantics of EAs in WH-questions, we provide a more complete account of EAs in several types of questions. We also identify a type of negative question that is acceptable with EAs, a novel observation in the literature, as far as we know. In addition, EA's distribution in negative sentences is also accounted for by appealing to the notion of incongruence: acceptable sentences are just those with a congruent interpretation.

In the next sections, we show in detail how this analysis works for several clause types: we start with declarative sentences, then move to WH- and polar questions, and finally we consider the special case of negative polar questions. Before that, we provide an overview of the semantic model we assume.

**3.1. SEMANTIC MODEL.** To account for the particular interpretation of EAs, we propose to broaden the tools of possible-worlds semantics to include different dimensions of meaning, along the lines of Potts 2005. We consider two parallel tiers where meaning is delivered, the AT-ISSUE tier and the PROJECTIVE tier, and at the projective tier we include not only the projective meaning contributed by the EAs but also the content introduced by illocutionary force operators, which operate on the propositional content of a sentence and indicate how this proposition is intended by the speaker to affect the common ground (cf. Frege 1960 [1884], Stalnaker 1979, Chierchia & McConnell-Ginet 2000, and Han 2001, among many others). In this article, we resort to ASSERT and QUESTION, and along with Gutzmann (2008), we assume that they belong in the projective tier.

These two independent tiers correspond to Potts's (2005) at-issue vs. conventionally implicated meaning. Both at-issue and conventionally implicated meaning are entailments, in the sense that they cannot be denied by the speaker without incurring a contradiction, but only conventional implicatures (CIs) cannot be denied by the addressee by direct means. The idea behind the partition into two tiers is that certain expressions

<sup>11</sup> The need for this unselective binder, which we take from B&G, is justified when we deal with WH-interrogatives that include an EA.

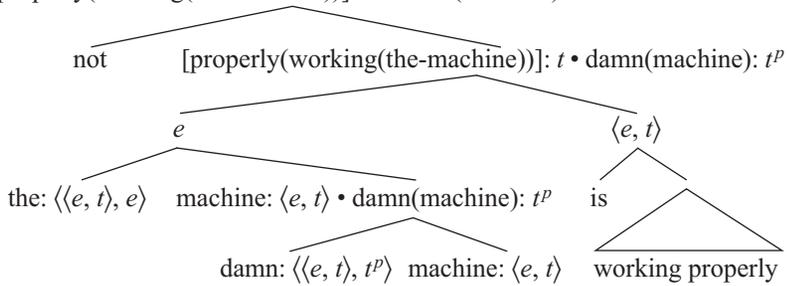
do not contribute to the main content of the sentence (i.e. in B&G's terms, CIs would make ancillary commitments). Consider the behavior of the epithet *damn* in 40.

- (40) This damn machine is not working properly.  
 a. At-issue tier: The machine is not working properly.  
 b. Projective tier: Speaker holds a negative attitude toward the machine.

In 40, *damn* represents a side comment made by the speaker, but this comment is not part of the main assertion.

Following Potts (2005), we incorporate an additional notational tool, a bullet, which indicates the parallel semantic composition that occurs when sentences include projective meaning. In 41, next to the bullet is the composition of *damn* and *machine*. The result of this combination is a projected propositional content (which we notate as  $t^p$ ), and the meaning conveyed (i.e.  $\text{damn}(\text{machine})$ ) percolates up to the root node without being touched. The at-issue composition runs in a parallel manner, and the sentence turns out to be true only if it is not the case that the machine is working properly.

- (41)  $\neg[\text{properly}(\text{working}(\text{the-machine}))]: t \bullet \text{damn}(\text{machine}): t^p$



As in Krifka 1995 and Truckenbrodt 2006, we assume the existence of force operators, and in line with Gutzmann (2008), we take them to operate on at-issue content to return meaning that is not part of the main assertion. One obvious advantage of this strategy is that we can account both for the performative status of force operators and for their inability to be directly denied.<sup>12</sup> Hence, in this model, words like *damn* are very similar to force operators. We give in 42 an informal paraphrase for the operators ASSERT (cf. Krifka 1995) and QUESTION, inspired by Truckenbrodt (2006).

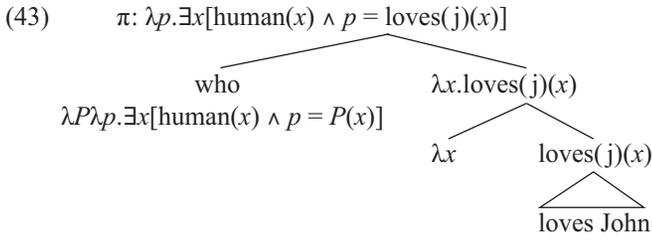
- (42) a. ASSERT: I want  $p$  to become common ground.  
 b. QUESTION: I want the addressee to put the true  $p$  in  $\pi$  into the common ground (where  $\pi$  is the set of propositions denoted by the interrogative clause).

ASSERT takes as input a proposition  $p$  and returns a propositional content at the projective tier, and QUESTION applies to a set of propositions  $\pi$  instead. Both WH-interrogatives and polar questions have to provide QUESTION with a set of propositions  $\pi$  to satisfy its requirements. However, while they both denote a set of propositions, the sets are generated differently.

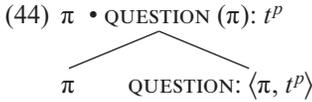
Concerning WH-questions, we assume Hamblin's (1973) claim that they denote sets of possible answers—rather than true answers as in Karttunen 1977. WH-questions denote a set of propositions by virtue of containing a WH-word, which takes as argument a property and returns a set of propositions  $\pi$ . Let us illustrate this with the sentence *Who loves John?*

<sup>12</sup> For instance, the dialogue in (i) would be infelicitous.

- (i) A: John arrived at 7:30 this morning.  
 B: #No, that's not true. You didn't make an assertion.



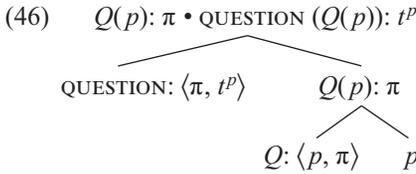
The result of this operation is thus a set  $\pi$  of the following sort: {Mary loves John, David loves John, Sue loves John, Peter loves John, ...}. The schematic representation of the combination between  $\pi$  and the force operator QUESTION is given in 44.



As for polar questions, they are the outcome of applying the operator  $Q$  to a proposition. This operator  $Q$  has the semantics in 45.<sup>13</sup>

(45)  $\llbracket Q \rrbracket = \lambda p. \{p, \neg p\}$

We represent the composition of polar questions schematically in 46.



We propose that, in all polar questions, there is what we call an ‘underlying proposition’, which combines with  $Q$ . Specifically, the underlying proposition has the polarity of the pronounced sentence.<sup>14</sup> In §§3.3 and 3.4, we show that the different generation of  $\pi$  in WH- and polar interrogatives has an effect on the interpretation of EAs in questions.

**3.2. DECLARATIVE SENTENCES.** In a declarative sentence that contains an EA, meaning is conveyed at two different dimensions; that is, the content of 47 can be decomposed into two tiers. The at-issue tier contains the denotation of 47 without the EA; that is, a plain proposition. The projective tier contains the speech act operator, ASSERT in this case, which takes a single proposition, the proposition contained at the at-issue tier. The projective tier also contains a conditional: if  $p$  holds, then it is unfortunate that  $p$  holds.<sup>15</sup>

(47) Marie est malheureusement venue.  
 Marie is unfortunately come  
 ‘Unfortunately, Marie came.’

<sup>13</sup> Other works that assume the presence of a  $Q$  operator in polar questions include Romero & Han 2004, where  $Q$  has the semantics in (i).

(i)  $\llbracket Q \rrbracket = \lambda p_{(s,t)} \lambda w_{(s)} \lambda q_{(s,t)} [q = p \vee q = \neg p]$

<sup>14</sup> When the negative operator does not affect the proposition directly but affects a null sentential operator, then the polarity of the proposition remains positive. This is relevant in §3.5 when we discuss cases where the VERUM operator plays a role.

<sup>15</sup> For the sake of simplicity and because it is not crucial for our purposes here, we avoid restricting the truth of  $p$  to worlds compatible with a conversational background.

- (48) a. At-issue tier:  $p = \text{Marie came}$ .  
 b. Projective tier:  $\text{ASSERT}(p) \ \& \ \forall^*[p \rightarrow \text{UNFORTUNATE}(p)]$ , where  $p = \text{'Marie came'}$ .

In a nutshell, the speaker is simultaneously asserting that Marie came and commenting that, if she came, it is unfortunate that she did. That is, 47 entails that Marie came (since this is the proposition contained at the at-issue tier) and, by *modus ponens*, it is also entailed that it is unfortunate that she came (49).

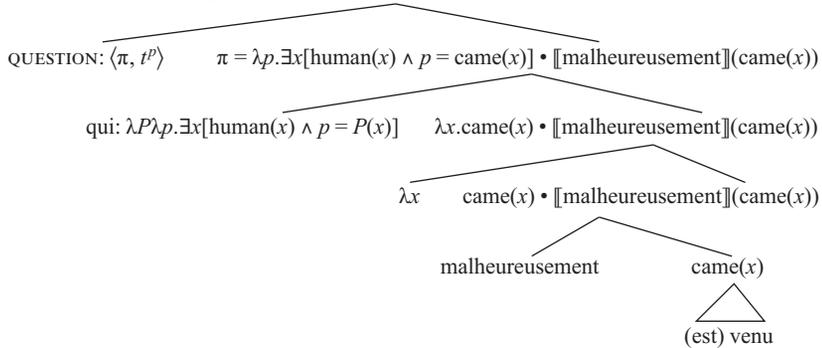
- (49) Marie came.  
If Marie came, then it is unfortunate that she did.  
 $\therefore$  It is unfortunate that Marie came.

Observe that in a declarative there is no free variable that needs binding. That is why, for the sake of simplicity, from now on we use  $\forall^*$  only when necessary.

**3.3. WH-QUESTIONS.** In an EA WH-question, meaning is also conveyed at two different levels. However, the effect of the EA in a WH-interrogative is significantly different from that presented for declaratives, as already shown by B&G. Consider sentence 50. Its at-issue tier contains the denotation of the question without the EA, that is, a set of propositions of the shape ' $x$  came'. Its projective tier contains the speech act operator, in this case QUESTION, which takes as an argument the set of propositions in the at-issue tier. In addition, the nonintegrated EA, which is adjoined to TP, as shown in the tree in 51, takes as argument the proposition to its right.<sup>16</sup>

- (50) Qui est malheureusement venu ?  
 who is unfortunately come  
 'Who came? + Whoever came, it is unfortunate that s/he came.'

- (51)  $\pi = \lambda p. \exists x[\text{human}(x) \wedge p = \text{came}(x)] \bullet \text{QUESTION}(\pi) \wedge \llbracket \text{malheureusement} \rrbracket(\text{came}(x))$



As 51 illustrates, in the scope of the EA is  $x$  came, which contains a free variable (52).

- (52) a. At-issue tier:  $\pi = \lambda p. \exists x[\text{human}(x) \wedge p = \text{came}(x)]$   
 b. Projective tier:  $\text{QUESTION}(\pi) \wedge \llbracket \text{malheureusement} \rrbracket(\text{came}(x))$

Recall from 39 that at the projective tier we have placed a universal operator that binds any individual free variables. If we thus apply the meaning of *malheureusement* to  $x$  came, we obtain 53.

- (53)  $\forall x[\text{came}(x) \rightarrow \text{UNFORTUNATE}(\text{came}(x))]$

Since this is a case where we have a free variable, B&G's universal closure operation  $\forall^*$  makes sure that at the end of the derivation the variable gets bound. The result is

<sup>16</sup> To simplify notation and because it is not central for our purposes, we get rid of world variables in both tiers. As shown in 43, we assume that questions denote sets of propositions, which are interpreted as functions from world indices to truth values.

universal quantification over  $x$ , as shown in 53. For all of the relevant individuals (i.e. the ones that covary with the propositions in  $\pi$ ), if they came, it is unfortunate that they did. Imagine that the set denoted at the at-issue tier is 54. Then, for any of the individuals Ann, Peter, and Joe, it holds that if they came, it is unfortunate that they did.

(54) {Anne came, Peter came, Joe came}

In 55 we abstract away from particular examples and propose a representation where we show the effect of having *malheureusement*( $x$  came) at the projective tier.<sup>17</sup>

(55) a. At-issue tier:  $\pi = \lambda p. \exists x[\mathbf{WH}(x) \wedge p = \mathbf{P}(x)]$   
 b. Projective tier: QUESTION ( $\pi$ )  $\wedge \forall x[\mathbf{P}(x) \rightarrow \text{UNFORTUNATE}(\mathbf{P}(x))]$

When a speaker is asking a question with an EA, she is doing two things at the same time: (i) she is asking a question, and (ii) she is making a comment that, no matter which proposition holds, it is unfortunate that it is so. Specifically, by having universal quantification over individuals that have property  $\mathbf{P}$ , we obtain exhaustivization, which lies at the heart of the meaning conveyed by so-called UNCONDITIONAL sentences, illustrated in 56.

(56) a. Whoever comes to the party, it will be fun.  
 b. Regardless of who comes to the party, it will be fun.  
 c. No matter who comes to the party, it will be fun.

As observed by Rawlins (2008), unconditionals convey a sense of indifference: it does not matter who comes in order for the party to be fun. This is exactly the same interpretation we observe for EA WH-questions: it does not matter who came to the party; whoever came to the party, it was unfortunate that they came. This is why these kinds of questions can be used in the canceled party scenario (see discussion at the end of §2.1), but cannot be used to ask who is the  $x$  such that it is unfortunate that  $x$  came, as shown in 23, repeated in 57 for convenience.

(57) a. Qui est malheureusement venu ?  
 b. {Unfortunately, Anne came, Unfortunately, Betty came, Unfortunately, Charles came, Unfortunately, David came}  
 c. Who is the  $x$  such that it is unfortunate that  $x$  came?  
 d. #Charles and David.

Finally, note that in the semantics of WH-interrogatives that we assume (where  $x$  is existentially bound), propositions of the sort ‘nobody came’ are not part of the set denoted by a clause such as 58a. This straightforwardly explains why it does not follow that ‘if nobody came, it is unfortunate that nobody came’ (see 58b). In the circumstances where an answer of the sort ‘ $x$  came’ is unfortunate, nobody coming might be deemed as fortunate.

<sup>17</sup> B&G note that universal closure alone is not going to be able to explain sentences such as (i), where the information in the restrictor of the WH-expression should also be in the restriction of the universal quantifier.

- (i) B&G (p. 284, n. 8)  
 a. Quels étudiants sont bizarrement arrivés à l’heure ?  
 ‘Which students oddly arrived on time?’  
 b.  $\forall x[[\text{student}(x) \wedge \text{arrive-on-time}(x)] \rightarrow \text{odd}(\text{arrive-on-time}(x))]$   
 c.  $\forall x[\text{arrive-on-time}(x) \rightarrow \text{odd}(\text{arrive-on-time}(x))]$

So far, our derivation would yield the reading in (ic) instead of the desirable (ib). We refer the reader to B&G for a syntactic fix to this problem.

- (58) a. Qui est malheureusement venu à la fête ?  
 who is unfortunately come to the party  
 b. If John came, it is unfortunate that he came; if Maria came, it is unfortunate that she came ... #if nobody came, it is unfortunate that nobody came.

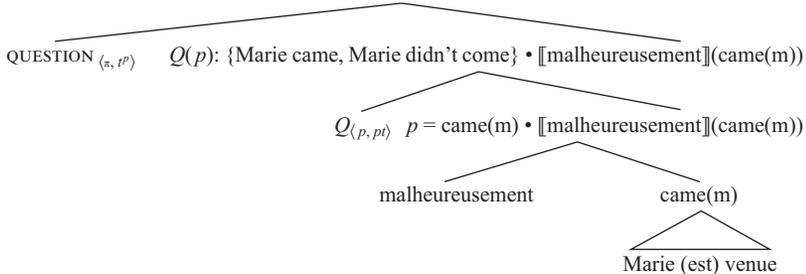
**3.4. POLAR QUESTIONS.** The semantics of EAs applied to polar questions yields a somewhat different semantics from the one we have just seen for WH-questions. The main difference is that, in polar questions, there is no indifference interpretation. Example 2b, repeated in 59, is not interpreted as in 60a, but as in 60b.

- (59) Est-ce que Marie est malheureusement venue ?  
 Q Marie is unfortunately come  
 ‘Did Marie come? + If Marie came, it is unfortunate that she did.’  
 (60) a. Whatever Marie did (coming or not), it is unfortunate that she did so.  
 b. If Marie came, it is unfortunate that she came.

We propose that this lack of indifference interpretation is due to the fact that the EA takes as argument the underlying proposition, which does not have a free variable. Consequently, unlike in WH-questions, here there is no quantification over several individuals.

Consider the derivation of 59 in 61, and its denotation in 62. The at-issue tier contains the set  $\{p, \neg p\}$ , generated after  $Q$  has applied to  $p$ . The projective tier contains the speech act operator QUESTION, and the denotation of the EA.

- (61)  $Q(p)$ : {Marie came, Marie didn't come} • QUESTION ( $Q(p)$ )  $\wedge$  [[malheureusement]](came(m))



- (62) Est-ce que Marie est malheureusement venue ?  
 a. At-issue tier:  $Q(p)$  = {Marie came, Marie did not come}  
 b. Projective tier: QUESTION ( $Q(p)$ )  $\wedge$   $p \rightarrow$  UNFORTUNATE( $p$ ), where  $p$  = ‘Marie came’.

Observe that at the projective tier there is no free variable to be bound and, as a consequence, no universal quantification over it. Hence, no indifference interpretation arises.

To sum up, the overall meaning of 59 is the combination of the semantics of the polar question ‘Did Marie come?’ and the comment that if Marie came, it is unfortunate that she did so.

**3.5. NEGATIVE QUESTIONS.** In this section, we consider a special case of questions: negative questions with EAs to the right of negation. Such negative questions provide an interesting test case for our analysis of EA questions: negative WH-questions are not acceptable (see 63a), while polar negative questions are acceptable if they appear in the appropriate context (see 63b).

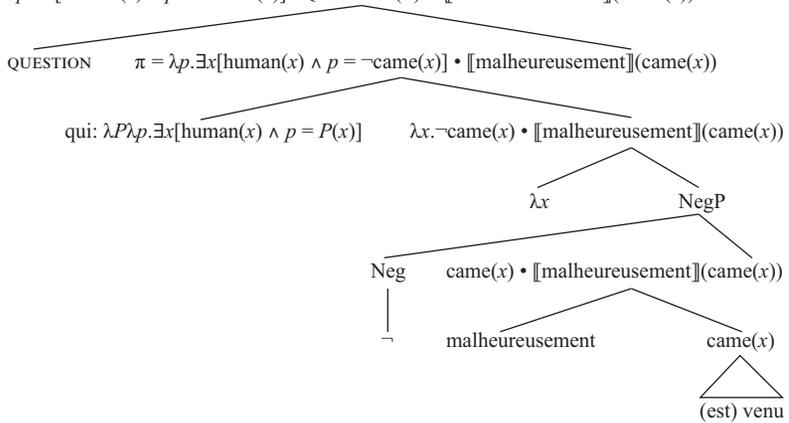
- (63) a. \*Qui n'est pas malheureusement venu ?  
 who NE.is not unfortunately come  
 ‘Who did not come? + *unfortunately*’

- b. #Est-ce que Marie n'est pas malheureusement venue ?  
 Q Marie NE.is not unfortunately come  
 'Didn't Marie come? + *unfortunately*'

Our line of explanation follows B&G's explanation for the unacceptability of negative assertions: since the EA can only take scope to its right, the proposition at the at-issue tier will contain the negation operator, while the proposition in the conditional at the projective tier will not. This difference creates an incongruent meaning that leads to unacceptability. We first examine negative WH-questions, and then turn to negative polar questions.

NEGATIVE WH-INTERROGATIVES. The denotation of a negative WH-question is shown in 64. The at-issue tier contains a set of propositions of the shape '*x* did not come to the party'. In addition, the projective tier contains the speech act operator and the conditional. However, the universal in the conditional quantifies over individuals that instantiate a different property, namely, those that are the answers to the positive question 'who came?', given that the negative operator lies outside the scope of the EA.

- (64) \*Qui n'est pas malheureusement venu ?  
 a. At-issue tier:  $\pi = \{\text{Marie did not come, Peter did not come, ...}\}$   
 b. Projective tier: QUESTION ( $\pi$ )  $\wedge \forall x[\text{came}(x) \rightarrow \text{UNFORTUNATE}(\text{came}(x))]$
- (65)  $\pi = \lambda p.\exists x[\text{human}(x) \wedge p = \neg\text{came}(x)] \bullet \text{QUESTION}(\pi) \wedge \llbracket \text{malheureusement} \rrbracket(\text{came}(x))$



Similarly to the case of negative declaratives, these two meanings do not constitute a logical contradiction, but they are conversationally incongruent. The incongruence stems from the fact that the two meanings do not share the same discourse goal (Roberts 2004), but rather have two different goals. In 63 above, the speaker is, on the one hand, making a comment about the people who came to the party, while at the same time asking a question about the complementary set of people, asking who did not come to the party. That is, while the projective tier can introduce side comments, it must do so in a way compatible with the at-issue tier and without changing the goal expressed in the at-issue tier.

Our analysis, therefore, correctly predicts that negative WH-questions should be unacceptable. In contrast, we do not derive an incongruent meaning for polar negative questions. We deal with this issue in the next subsection.

NEGATIVE POLAR QUESTIONS. Consider sentence 63b, repeated as 66 below, which is a negative polar question. The at-issue tier contains the denotation for the negative polar question: a set of propositions that include the positive and the negative proposi-

tion. That is, the speaker is asking whether Marie is coming or not. Simultaneously, in the projective tier, she is commenting that if Marie did come, this is unfortunate.

- (66) a. #Est-ce que Marie n'est pas malheureusement venue ?  
           Q           Marie NE.is not unfortunately    come  
       b. At-issue tier:  $Q(\neg p) = \{\text{Marie came, Marie did not come}\}$   
       c. Projective tier: QUESTION ( $Q(\neg p)$ )  $\wedge p \rightarrow$  UNFORTUNATE( $p$ ), where  $p =$  'Marie came'.

Unlike with WH-questions, here the question and the comment share the same discourse goal and do not go in different directions. Therefore, our prediction is that this type of question should be fully acceptable regardless of the context, which is not the case. We have been assuming, however, a very naive semantics for negative polar questions, while previous studies have shown that their semantics is more complex. Specifically, we have not taken into account that they are not neutral and involve biases. Once we take into account their more complex semantics, a different picture emerges.

Let us present here the main insights from previous work on negative polar questions. Some negative questions (for instance, those that have preposed negation in English) are not neutral and can be used only if the speaker is biased toward a particular answer (Büring & Gunlogson 2000, Romero & Han 2004). For instance, 67 is acceptable only if the speaker believes that the positive answer is correct, that is, if the speaker believes that John drinks.

- (67) Doesn't John drink?

Ladd (1981) is the first to point out that biased negative questions have two different interpretations. In one interpretation, speakers want to double-check the positive proposition  $p$ , while in the other, they want to double-check the negative one,  $\neg p$ . Following Romero and Han (2004), we call questions with the former interpretation 'PI-questions', given that they are compatible with positive polarity items and not with negative polarity items. In contrast, we call questions with the latter interpretation 'NI-questions', because they are compatible with negative polarity items and not with positive polarity items. The contrast is shown in 68 and 69.

- (68) Romero & Han 2004:610  
       A: Ok, now that Stephan has come, we are all here. Let's go!  
       B: Isn't Mary coming too/\*either?  
       (69) Romero & Han 2004:610  
       A: Pat is not coming. So we don't have any phonologists in the program.  
       B: So, isn't Mary coming either/\*too?

In 68, speaker B believes that Mary is coming and uses a negative question to double-check this belief. In contrast, in 69, speaker B believed that Mary was coming, but has received new evidence by means of her interlocutor's utterance and now expects  $\neg p$  to be true. In this case, the speaker uses a negative question to double-check the negative proposition 'Mary is not coming'. Summarizing, in an NI-question there is a change in the expectations of the speaker: she used to believe  $p$ , but after receiving new evidence she expects  $\neg p$  to be true and uses a negative question to check that this is indeed the case. In a PI-question, there is no such change of expectations, and the speaker uses the question to double-check  $p$ , which is the proposition she expects to be true.

We follow the proposal by Romero and Han (2004). They argue that negative questions contribute an epistemic operator VERUM, whose denotation can be seen in 70 and which can be paraphrased as: 'the speaker is certain that  $p$  should be added to the common ground'.

$$(70) \llbracket \text{VERUM}_i \rrbracket^{[g^{x/i}]} = \lambda p_{\langle s,t \rangle} \lambda w. \forall w' \in \text{Epi}_x(w) [\forall w'' \in \text{Conv}_x(w') [p \in \text{CG}_{w''}]]^{18}$$

According to them, the ambiguity between PI and NI readings is a scopal ambiguity between negation and the VERUM operator. In a PI-question, negation scopes over VERUM and the partition in 71 is obtained.

$$(71) \{ \text{'it is for sure that Mary is coming'}, \text{'it is not for sure that Mary is coming'} \}$$

In contrast, in an NI-question, VERUM scopes over negation, and as a consequence, we obtain a different partition.

$$(72) \{ \text{'it is for sure that Mary is not coming'}, \text{'it is not for sure that Mary is not coming'} \}$$

Going back to EAs, once this ambiguity is taken into account and negative polar questions with EAs are presented in context, the following contrast emerges: while our informants find NI-questions unacceptable, they find PI-questions acceptable. Example 73 is a PI question (it contains the positive polarity item 'too') and is acceptable. In contrast, 74 is an NI question (it contains the negative polarity item 'either') and it is not acceptable.

$$(73) \text{[A wants to talk to some phonologist. She asks whether B knows if some phonologist, besides John, will come to dinner. B, who dislikes Marie, says:] Marie n'est-elle pas malheureusement venue aussi ?} \\ \text{Marie NE.is-she not unfortunately come too} \\ \text{'Didn't Marie come too? + unfortunately'}$$

$$(74) \text{[A mentions that there won't be any phonologists at the dinner because John will not come. B, who dislikes Marie, says:] #Marie n'est-elle pas non plus malheureusement venue ?} \\ \text{Marie NE.is-she not either unfortunately come} \\ \text{'Didn't Marie come either? + unfortunately'}$$

We show that our analysis derives again a conversational incongruence between the meaning of the EA and the bias of NI-questions, while no incongruence arises in PI-questions.

In a PI-question, the goal of the speaker is to double-check the positive proposition  $p$  (i.e. 'Marie came'), which is the proposition that she believes to be true. This goal is coherent with reasoning about  $p$  by placing it in a conditional and considering it possible that  $p$  is true. Thus, PI-questions do not present any incongruence between the meanings at the at-issue tier and the projective tier, as shown in 75.

$$(75) \text{PI-question: Marie n'est-elle pas malheureusement venue ?}^{19} \\ \text{a. At-issue tier: } Q(\neg(\text{VERUM}(p))) = \{ \text{'it is for sure that Marie is coming'}, \text{'it is not for sure that Marie is coming'} \} \\ \text{b. Projective tier: QUESTION } (Q(\neg(\text{VERUM } p))) \wedge p \rightarrow \text{UNFORTUNATE}(p), \\ \text{where } p = \text{'Marie came'}.$$

By contrast, NI-questions do present the conversational incongruence we have seen before. The goal of the speaker's question is to double-check the negative proposition

<sup>18</sup>  $\text{Epi}_x(w)$  is the set of worlds that conform to  $x$ 's knowledge in  $w$ ,  $\text{Conv}_x(w')$  is the set of worlds where all of the conversational goals of  $x$  in  $w'$  are fulfilled, and  $\text{CG}_{w''}$  is the common ground.

<sup>19</sup> It may very well be that the VERUM operator actually operates at the projective tier and not at the at-issue tier (see Gutzmann & Castroviejo 2011 for a proposal along these lines). This issue is beyond the scope of this article, so we stick to Romero and Han's (2004) original proposal for the at-issue denotation of negative biased questions.

$\neg p$ , since she has received some evidence that  $\neg p$  is the case. This goal is incongruent with reasoning about  $p$  by placing it in a conditional, since she, in fact, expects  $\neg p$  to be true. The incongruence stems from the fact that the proposition in the conditional is the opposite of the proposition in the speaker's belief, as shown in 76.

(76) NI-question: Marie n'est-elle pas malheureusement venue ?

- a. At-issue tier:  $Q(\text{VERUM}(\neg(p))) = \{\text{'it is for sure that Marie is not coming'}$ ,  
 $\text{'it is not for sure that Marie is not coming'}\}$
- b. Projective tier: QUESTION ( $Q(\text{VERUM}(\neg p)) \wedge p \rightarrow \text{UNFORTUNATE}(p)$ ),  
 where  $p = \text{'Marie came'}$ .

The key difference between PI-questions and NI-questions is that, in the former, the underlying proposition is  $p$ , while in the latter it is  $\neg p$ . In a PI-question, negation does not apply to the underlying proposition, but to  $\text{VERUM}(p)$ ; since negation does not directly affect the pronounced proposition, then its polarity remains positive, and the EA is able to take the underlying proposition,  $p$ , as its argument. By contrast, since prosodically integrated EAs cannot take scope over negation (property (iii)), EAs in NI-questions are not able to take the correct underlying proposition, which should be  $\neg p$ . If the EA takes as argument  $p$ , then we end up having the same incongruence we just mentioned, where the two meanings expressed in two different tiers do not share the same discourse goal. The contrast is summarized in Table 1.

	TYPE OF QUESTION	SPEAKER'S BELIEFS	DOUBLE-CHECK	ACCEPTABILITY
$p$ in the antecedent of a conditional $\rightarrow$ reasoning about $p$	PI-question	speaker believes that $p$	double-check $p$	✓
	NI-question	speaker believes that $\neg p$	double-check $\neg p$	#

TABLE 1. *Malheureusement* in negative polar questions.

To sum up, integrated *malheureusement* takes as input a proposition and returns at the projective tier a conditional meaning. Depending on the type of clause it occurs in, its contribution has different effects. If it appears in a declarative or polar question, it conveys that if the uttered proposition is true, it is unfortunate that it is so. If it occurs in a WH-interrogative, it conveys that no matter which proposition in the set is true, it is unfortunate that it holds. It would thus seem that *malheureusement* appears freely and across the board in French. This is not completely true. The scope of negation limits the occurrence of the EA. In particular, integrated *malheureusement* is banned to the right of negation in negative declaratives, negative WH-interrogatives, and negative polar questions with inner negation (NI-questions).

#### 4. NONINTEGRATED EAS IN CATALAN AND SPANISH.

**4.1. DATA.** We turn now to Catalan and Spanish, two languages closely related to French, which, nevertheless, show quite a different distribution of EAs in questions compared to French, due to the fact that EAs in these languages must be nonintegrated. In fact, most studies dealing with EAs in Catalan and Spanish claim that they are impossible in questions (cf. Mata 2007) and that they are factive (Etxepare 1997 and López & Morant 2002). Indeed, EAs are not acceptable in most WH-questions, as shown in 77. Since contextual information is crucial to determine the acceptability of EA questions, from now on each example sentence is preceded by the context within which it must be interpreted.

- (77) [Scenario: Two friends, Anne and Betty, organize a party. Before the party starts, Anne receives a call from work and needs to leave the party. One hour later, Anne wants to find out how the party is going and whether some guests have already left. She calls Betty and asks:]
- a. #Qui ha hagut de marxar, per desgràcia? (Catalan)  
 who has had of leave unfortunately
- b. #¿Quién ha tenido que irse, por desgracia? (Spanish)  
 who has had that leave unfortunately  
 ‘Who had to leave? + *unfortunately*’

That is, while in French a question with an integrated EA would have been acceptable in the context of 77, this is not the case in Catalan and Spanish. The same is true for polar questions, as shown in 78. There is a contrast in our acceptability judgments between polar and WH-questions, in that the former are not as heavily degraded as the latter, but polar questions are nevertheless not fully acceptable, either.

- (78) [Scenario: Two friends, Anne and Betty, invite Maria for dinner. Before the dinner starts, Anne receives a call from work and needs to leave. One hour later, Anne calls Betty and asks:]
- a. #Que ja ha hagut de marxar, per desgràcia, la Maria? (Catalan)  
 Q already has had of leave unfortunately the Maria
- b. #¿Ya ha tenido que irse, por desgracia, María? (Spanish)  
 already has had that leave unfortunately María  
 ‘Did Maria have to go already? + *unfortunately*’

That said, it is not true that all EA questions are unacceptable; there exist instances of EA questions that are completely acceptable. The clearest case is that of confirmation-seeking questions (Bolinger 1989, Vanrell et al. 2010), in which EAs can freely appear, as shown in 79 and 80, even out of the blue.

- (79) Catalan
- a. Oi que aquesta situació, per sort, ha canviat?  
 CQ Q this situation fortunately has changed  
 ‘Isn’t it true that this situation changed? + If this situation has changed, this is fortunate.’
- b. Oi que la Maria, per desgràcia, ha hagut de marxar?  
 CQ Q the Maria unfortunately has had of leave  
 ‘Isn’t it true that Maria had to go? + If Maria had to go, this is unfortunate.’
- (80) Spanish
- a. ¿Verdad que esta situación, por suerte, ha cambiado?  
 true that this situation fortunately has changed  
 ‘Isn’t it true that this situation changed? + If this situation has changed, this is fortunate.’
- b. ¿Verdad que María, por desgracia, ha tenido que irse?  
 true that María unfortunately has had that leave  
 ‘Isn’t it true that María had to go? + If María had to go, this is unfortunate.’

More surprisingly, a minimal change in the context of 78 renders the polar question acceptable (81).

(81) [Scenario: Two friends, Anne and Betty, invite Maria for dinner. Before the dinner starts, Anne receives a call from work and needs to leave. One hour later, Anne arrives home and sees there's no one in the living room, other than Betty. She asks:]

- a. Ostres, que ja ha hagut de marxar, per desgràcia, la Maria?  
gosh Q already has had of leave unfortunately the Maria (Catalan)
- b. Ostras, ¿ya se ha tenido que ir, por desgracia, María?  
gosh already CL has had to leave unfortunately María  
'Gosh, did Maria have to go already? + If Maria had to go, this is unfortunate.'

Exactly the same is true for WH-questions. Although 77 was unacceptable, other WH-questions are acceptable, provided that they are found in particular types of contexts (82).<sup>20</sup>

(82) [Scenario: The speaker is the quizmaster of *Who wants to be a millionaire?*.]

- a. Quin corredor català va perdre, per desgràcia, la final dels  
which runner Catalan lost unfortunately the final of the  
100 metres de Barcelona 92? (Catalan)  
100 meters of Barcelona 92
- b. ¿Qué corredor catalán perdió, por desgracia, la final de los  
which runner Catalan lost unfortunately the final of the  
100 metros de Barcelona 92? (Spanish)  
100 meters of Barcelona 92  
'Which Catalan athlete lost the 100 meters final in Barcelona's 1992 games? + If the Catalan athlete lost the final, this is unfortunate.'

To recap, although WH-questions and polar questions are usually unacceptable with EAs in Spanish and Catalan, they can be rendered acceptable by manipulating the context of utterance. Moreover, confirmation-seeking questions are always acceptable.

Our proposal to explain the previous contrasts is that nonintegrated EAs are acceptable in questions only if the speaker is biased toward a particular proposition of the set denoted by the question. That is, nonintegrated EAs are acceptable only in biased questions. Further discussion of the analysis of bias and EAs in Spanish and Catalan is presented in §4.3.

All of the judgments reported for Spanish and Catalan in this section correspond to our intuitions as native speakers. Admittedly, these are subtle judgments, given the special care that needs to be put into constructing the contexts in which these questions are acceptable. It is therefore not surprising that studies that failed to take context into account would simply say that EAs were not possible in questions. In order to test whether our intuitions could be robustly replicated in a larger pool of speakers, we performed an experiment testing the acceptability of EAs in questions depending on the preceding context. This experiment is described in the next section.

<sup>20</sup> EAs are also acceptable in WH-questions such as that in (i). In these cases, the EA is not modifying a proposition in the question denotation, but an embedded proposition. We thank a referee for pointing this out.

(i) Saps que la Maria va venir, per desgràcia, a la festa?

'Do you know that Maria came to the party? + If Maria came to the party, this is unfortunate.'

**4.2. EXPERIMENT.** The goal of this experiment is to test the contrast presented in the previous section, according to which EA questions are acceptable in Spanish and Catalan only if the speaker is biased. Our study follows the methodology of an increasing number of studies in semantics and pragmatics that incorporate experimental techniques in order to obtain reliable and robust judgments. The details of the experiment are spelled out in what follows.

**MATERIALS.** All of the materials were in Spanish. They consisted of four questions containing either the evaluative adverbs *por suerte* ‘fortunately’ or *por desgracia* ‘unfortunately’, which were preceded by a description of the context in which the question would be uttered. There were two conditions. In condition 1, the context made it clear that the speaker was biased at the moment he was asking the question, while in condition 2, the context did not imply any such bias. One of the experimental items is shown in 83, while the rest can be consulted in the appendix: 83a shows the (biased) context for condition 1, 83b shows the (nonbiased) context for condition 2, and 83c contains the critical question, identical for the two conditions.

(83) a. Condition 1: Biased

Tengo una amiga en la Sierra que se llama Victoria y que quiere ser pediatra más que nada en el mundo. Recientemente ha hecho la selectividad y ha puesto medicina como única opción. Seguramente ya le han dado los resultados. Me la encuentro en Madrid, en una tienda, probándose un estetoscopio. Me acerco a ella y le pregunto:

‘I have a friend who lives in the Sierra (mountains close to Madrid) named Victoria and who wants to become a pediatrician more than anything in the world. She recently took the university entrance examination and applied only for medical school. It is likely that she has already received the results. I see her in Madrid, in a shop, trying out a stethoscope. I ask her:’

b. Condition 2: Not biased

En verano me voy a la Sierra, donde me encuentro con mis amigos de toda la vida. Victoria quiere ser pediatra más que nada en el mundo. Ha hecho la selectividad recientemente y ha puesto medicina como única opción. Como ya debe de tener los resultados, me acerco a ella y le pregunto:

‘In the summer I usually go to the Sierra (mountains close to Madrid) where I meet my lifelong friends. Victoria wants to become a pediatrician more than anything in the world. She recently took the university entrance examination and applied only for medical school. Since it is likely that she has already received the results, I ask her:’

c. ¿Has entrado, por suerte, en medicina?

have entered fortunately in medicine

‘Have you been admitted to medical school? + If you have been admitted to medical school, this is fortunate.’

The set of frequent evaluative adverbs in Spanish is quite limited. Our initial intention was to test the examples from B&G of EAs in questions in French (*malheureusement* and *bizarrement*). Since the Spanish counterpart of *bizarrement*, *extrañamente*, is not very common as an EA in spoken language, we decided to replace it with *por suerte* ‘luckily’. Thus, the results should be taken as applying to these two frequent EAs and suggestive of the behavior of EAs as a class.

The conditions for each item set were counterbalanced and incorporated into a questionnaire experiment together with eight filler items and two practice items (similar to

the experimental items). Some of the fillers were pragmatically unacceptable. Two counterbalanced lists were constructed, with a single randomization for all lists.

**PARTICIPANTS.** Eighty Spanish speakers from Madrid participated in this experiment.

**PROCEDURE.** The experiment was administered through the internet and uses the technique of magnitude estimation (see Bard et al. 1996 and Sorace & Keller 2005, among many others). Before starting the experimental session proper, subjects read a set of written instructions, in which the experimental procedure was explained. After reading the instructions, subjects went through a practice session, to familiarize themselves with the procedure. First, participants tested the concept of numerical magnitude estimation using line length. A reference line was shown on the screen and was given a rating of 100. Participants were then asked to assign a number to another line (i.e. the target line): if the target line was twice as long as the reference line, they were asked to give a rating of 200; if it was half as long, they were asked to give a rating of 50, and so forth. Second, a set of linguistic practice items was presented so that participants became familiar with applying magnitude estimation to linguistic stimuli. Participants were instructed to rate several sentences according to how good they sounded to them compared to a given modulus question, provided in 84, which is an acceptable question given the context and had a fixed rating of 100. Participants were asked to provide comparative judgments: if they felt that the question was twice as good as the reference question they were instructed to provide a rating of 200, if it sounded half as good they were instructed to provide a rating of 50, and so forth. Finally, they had to judge the experimental items.

(84) a. Hace un día muy caluroso de verano. Andrés y Silvia están aburridos mirando la tele. Silvia pregunta:

‘It’s a very hot summer day. Andrés and Silvia are bored in front of the TV. Silvia asks:’

b. ¿Salimos a tomar un helado por el centro?

‘Shall we get an ice cream downtown?’

Before finishing the experiment, participants were asked to guess what the experiment was about. Most participants were not aware that the experiment was about EAs in questions.

**RESULTS.** The ratings obtained were normalized, as is standard practice in the magnitude-estimation methodology, by taking the log of the item rating by the reference rating (i.e. 100) and then transforming it to a z-score (the log minus the mean of the sample divided by the standard deviation).

In order to give some intuition of the range of transformed ratings, let us give some descriptive data of the transformed sample. The maximum value of the sample was 1.5, while the minimum was  $-2.7$ . The mean normalized ratings assigned to each condition can be seen in Table 2.

	MEAN NORMALIZED RATING
Biased	0.15
Not biased	-0.15

TABLE 2. Results by condition.

Thus, biased questions get a higher rating than nonbiased questions, and this is the case for each item in our experiment, as shown in Table 3.

To test the statistical significance of these patterns, an analysis of variance (ANOVA) was performed. The ANOVA confirms that the rating of the biased questions is signifi-

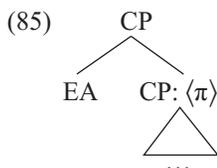
ITEM	CONDITION	MEAN NORMALIZED RATING
1	Biased	-0.10
1	Not biased	-0.24
2	Biased	0.52
2	Not biased	0.14
3	Biased	0.20
3	Not biased	0.16
4	Biased	-0.02
4	Not biased	-0.66

TABLE 3. Results by item and condition.

cantly different from the rating of the nonbiased questions ( $F = 7.4, p < 0.01$ ). Thus, this experiment supports the idea that EAs require a biased context in order to be felicitous in a question.<sup>21</sup> Our proposal is presented in more detail in the next section.

**4.3. PROPOSAL.** In a nutshell, our account of the distribution of EAs in questions is as follows: (i) since EAs in Catalan and Spanish are nonintegrated, they take scope over the whole question (i.e. over a set of propositions); (ii) EAs cannot take as argument a set of propositions; and (iii) the question can be saved only if the speaker is biased toward a particular proposition of the set denoted by the question.

As shown schematically in 85, the EA is adjoined at the CP level. Thus, if it were to compose with the clause to its right (i.e. the constituent it has scope over), it should be able to compose with the set of propositions denoted by the question. But EAs are proposition modifiers, which take a proposition and return a proposition (39), so  $EA(\pi)$  would yield a semantic clash due to a type mismatch.



Recall that the situation is different with integrated EAs in French, because these occupy a lower syntactic position, and their sister is a proposition (see 51).

We argue that an EA question will be acceptable only if there is a proposition toward which the speaker is biased.<sup>22</sup> Bias is the state in which ‘the speaker believes that the probability that a proposition is true is greater than the probability that it is false, but this belief is not [necessarily] shared by the hearer’<sup>23</sup> (Eilam & Lai 2009). That is, for a question to be biased, there needs to be a proposition in the denotation of the question whose probability of being true is believed by the speaker to be greater than 50%. As a result, all of the other propositions in the question denotation will necessarily have a probability lower than 50%.

The denotation of the projective tier of an EA sentence can be informally represented as in 86 (where  $\phi$  is  $\pi$  or  $p$  depending on the content of the at-issue tier).

<sup>21</sup> As we mentioned, we only tested two frequent EAs. We assume that the results are suggestive of how the whole class works. Further work would be necessary to determine whether different EAs have different properties.

<sup>22</sup> This is reminiscent of what Hara and Kinuhata (2011) propose for the composition of the Japanese particle *nen* and the meaning conveyed by a specific prosodic contour. They treat this composition as an instance of PARATACTIC ASSOCIATION, as in Lyons 1977 and Bartels 1997. The composition between the EA and the biased proposition could be dealt with along the same lines.

<sup>23</sup> The adverb in brackets is our addition.

- (86) Projective tier: FORCE OPERATOR( $\phi$ )  $\wedge$   $p \rightarrow$  UNFORTUNATE( $p$ ), where  $p$  is the proposition the speaker is biased toward.

Inspired by Davis et al. 2007, we formalize speaker bias as a subjective probability implemented in the shape of a function  $C_{A,c}$  (i.e. the credence of agent  $A$  in context  $c$ ) that maps any proposition  $p$  onto  $A$ 's degree of belief in  $p$  in context  $c$ . A proposition  $Dox_{A,c}$  represents the epistemic state of an agent  $A$  in a context  $c$ , and the function  $C_{A,c}$  takes a proposition  $p$  and yields the conditional probability of  $p$  given the epistemic state of the speaker (that is, given  $Dox_{A,c}$ ).

$$(87) C_{A,c}(p) = \frac{P(p \cap Dox_{A,c})}{P(Dox_{A,c})}$$

The application of this function to a proposition  $p$  yields a probability between 0 and 1, the former representing that the speaker fully believes that the proposition is false and the latter that the speaker fully believes that the proposition is true.<sup>24</sup>

- (88) From Davis et al. 2007:77
- a.  $C_{A,c}(p) = 1$        $A$  fully believes  $p$ .
  - b.  $C_{A,c}(p) = 0.98$      $A$  strongly suspects  $p$ .
  - c.  $C_{A,c}(p) = 0.5$       $A$  is unbiased about  $p$ .
  - d.  $C_{A,c}(p) = 0$        $A$  disbelieves  $p$ .

As we just mentioned, a speaker is biased toward a proposition  $p$  if the credence function  $C_{A,c}$  applied to  $p$  yields a probability greater than 0.5: that is, the speaker considers it more likely that the proposition is true than that it is false. Using this function, we are now in a position to give the conditions in which an EA will be acceptable in a question in Catalan and Spanish.

- (89) Projective tier: FORCE OPERATOR( $\phi$ )  $\wedge$   $p \rightarrow$  UNFORTUNATE( $p$ ), where  $p$  is such that  $C_{sp,c}(p) > 0.5$ .

We call the proposition that, when credence applies to it, yields a value greater than 0.5 the ‘outstanding proposition’; that is, the outstanding proposition is a proposition that is singled out by the speaker in terms of its probability of truth. In the denotation of a biased question, there is an outstanding proposition in  $\pi$ . If this is the case, it will also be the case that this is the only outstanding proposition in the set and that all other propositions of  $\pi$  will yield values lower than 0.5 (given that all of the values yielded by the credence function must sum to 1).

This restricts the interrogative contexts in which EAs occur to confirmation-seeking questions, biased polar questions (which include antiexpectational and negative questions), and WH-questions in which the speaker manifestly knows the answer. In contrast, questions where credence is manifestly 0.5 cannot include EAs. One such case would be alternative polar interrogatives. They are not acceptable in biased contexts (see 90), and they are incompatible with EAs, as shown in 91.

- (90) [Scenario: Two friends, Anne and Betty, invite Maria for dinner. Before the dinner starts, Anne receives a call from work and needs to leave. One hour

<sup>24</sup> The notion of bias that we need could also be captured in a Hintikka 1969-style semantics in the following way.

- (i) a.  $\forall w'$  compatible with  $A$ 's beliefs in  $w$ :  $p(w') = 1$        $A$  fully believes  $p$ .
- b.  $|\{w' \text{ compatible with } A\text{'s beliefs in } w \mid p(w') = 1\}| =$   
          $|\{w'' \text{ not compatible with } A\text{'s beliefs in } w \mid p(w'') = 1\}|$        $A$  is unbiased about  $p$ .
- c. MOST  $w'$  compatible with  $A$ 's beliefs in  $w$ :  $p(w') = 1$        $A$  is biased about  $p$ .

later, Anne arrives home and sees there's no one in the living room, other than Betty. She asks:]

#Que ja ha hagut de marxar la Maria o no?  
 Q already has had to leave the Maria or not  
 'Did Maria already have to leave or not?'

- (91) a. #Que ha perdut el tren, per desgràcia, en Joan o no? (Catalan)  
 Q has lost the train unfortunately the Joan or not  
 b. #¿Ha perdido el tren, por desgracia, Juan o no? (Spanish)  
 has lost the train unfortunately Juan or not  
 'Did John miss his train or not? + *unfortunately*'

Below, we examine each type of acceptable EA question and show that there exists an outstanding proposition whenever EAs appear in questions. For the sake of brevity, we include only Catalan examples, but the same would hold for their Spanish counterparts.

**Confirmation-seeking questions.** Confirmation-seeking questions are polar questions in which the speaker is heavily biased toward the underlying proposition and seeks the addressee's confirmation that this proposition is indeed true; that is, they would not be acceptable in a context in which the speaker is not biased. In Catalan, confirmation-seeking questions are headed by an initial marker followed by the complementizer *que*. The initial marker can be either polarity items, such as *no*, *oi* 'isn't it', or a noun, such as *veritat* 'truth', or a particle, such as *eh* 'huh' (Hernanz & Rigau 2006, Prieto & Rigau 2007).

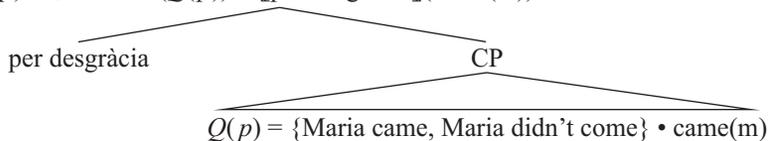
- (92) a. Oi que la Maria ha vingut, per desgràcia?  
 CQ Q the Maria has come unfortunately  
 b. Eh que la Maria ha vingut, per desgràcia?  
 CQ Q the Maria has come unfortunately  
 'Isn't it true that Maria came? + If Maria came, this is unfortunate.'

Example 92 is not acceptable unless the speaker is biased. We can, therefore, conclude that there is an outstanding proposition in the set of propositions of the question denotation. That is, the speaker is biased toward the proposition  $p$  corresponding to the pronounced cell and expects it to be true. The denotation of the two tiers of meaning of the sentences in 92 is illustrated in 93.

- (93) Oi que la Maria ha vingut, per desgràcia?  
 a. At-issue tier:  $Q(p) = \{\text{Maria came, Maria did not come}\}$   
 b. Projective tier:  $\text{QUESTION}(Q(p)) \wedge p \rightarrow \text{UNFORTUNATE}(p)$ , where  
 $p = \text{'Maria came'}$  and  $C_{sp,c}(p) > 0.5$ .

In 94 we show the semantic composition of this example. As noted above, we use the bullet as a notation device to separate at-issue and projective content, which we take to include presuppositions and biases (cf. Potts (2005), who uses the bullet to separate at-issue from conventionally implicated content).

- (94)  $Q(p) \bullet \text{QUESTION}(Q(p)) \wedge \llbracket \text{per desgràcia} \rrbracket (\text{came}(m))$



Since all EAs in Catalan and Spanish are nonintegrated, they can take scope over the whole sentence, even if negation precedes them. Recall that, in French, integrated ad-

verbs and negation interacted, and, in some circumstances (negative assertions and some negative questions), the resulting sentence was incongruent. We do not expect to find such incongruences in Catalan and Spanish. Indeed, negative confirmation-seeking questions are acceptable. The sentences in 95 would be acceptable only if the speaker is biased toward  $\neg p$ , and we therefore can again conclude that there is an outstanding proposition in the question denotation of the two sentences.

- (95) a. Oi que la Maria no ha vingut, per desgràcia?  
 CQ Q the Maria not has come unfortunately  
 b. Eh que la Maria no ha vingut, per desgràcia?  
 CQ Q the Maria not has come unfortunately  
 ‘Isn’t it true that Maria didn’t come? + If Maria didn’t come, this is unfortunate.’

The denotation of the two tiers of meaning of 95 are shown in 96: the at-issue tier contains the plain question denotation, and the projective tier the speech act operator and the semantics contributed by the adverb, which takes the negative proposition as its argument. It is conveyed that if Maria did not come, it is unfortunate that she did not come.

- (96) Oi que la Maria no ha vingut, per desgràcia?  
 a. At-issue tier:  $Q(p) = \{\text{Maria came, Maria did not come}\}$   
 b. Projective tier: QUESTION ( $Q(p)$ )  $\wedge \neg p \rightarrow$  UNFORTUNATE( $\neg p$ ), where  $p =$  ‘Maria came’ and  $C_{sp,c}(\neg p) > 0.5$ .

**Antiexpectational questions.** Consider again example 81, repeated here as 97.

- (97) [Scenario: Two friends, Anne and Betty, invite Maria for dinner. Before the dinner starts, Anne receives a call from work and needs to leave. One hour later, Anne arrives home and sees there’s no one in the living room, other than Betty. She asks:]  
 Ostres, que ja ha hagut de marxar, per desgràcia, la Maria?  
 ‘Gosh, did Maria have to go already? + If Maria had to go, this is unfortunate.’

In this example, just before the utterance of the question there is a change in the speaker’s epistemic state. The speaker believed that Maria would not have left yet, but receives some evidence (i.e. the living room being empty) that this is probably not the case. Thus, the speaker has to revise her epistemic state and, at the moment of uttering the question, she is not truly neutral and does not think that all answers to her question are equally likely; that is, she is biased. We call this type of question ‘antiexpectational question’. It is easy to see that in antiexpectational questions there is an outstanding proposition that will yield a value greater than 0.5 when credence applies to it. The EA will take this proposition as argument and, in the case of 97b, it conveys that if Maria had to leave, it is unfortunate that she had to leave.

The difference between the question in 78 and that in 97 is that, in the former, the speaker is not biased toward any of the answers (and, thus, the EA is not acceptable). The question is truly neutral, and, therefore, there is no outstanding proposition in the question denotation. By contrast, in the latter, the same question is uttered in a biased context, which creates the outstanding proposition necessary for EAs to be acceptable.

**Biased negative questions.** As in French, biased negative questions provide a good set of data with which to test our analysis. As mentioned before, EAs are prosodically nonintegrated in Catalan and Spanish, and they scope over the whole question. Thus,

we do not expect to find cases of incongruences between the projective and the asserted meaning. In addition, the biasing condition for EAs to occur in a question in these languages is met: negative questions are biased (i.e. there is an outstanding proposition in their denotation), and we therefore expect EAs to be felicitous in this context.

Recall that two types of negative questions have been identified: NI-questions and PI-questions. In NI-questions, which are compatible with negative polarity items, the speaker believed that the positive proposition  $p$  was true, but has received some new evidence and, at the moment of utterance, expects  $\neg p$  to be the true answer. In PI-questions, which are compatible with positive polarity items, the speaker believed  $p$  and still expects  $p$  to be the true answer. It turns out that EAs are acceptable in both types of questions, but that the EA takes a different proposition as its argument in each case.

NI-questions are the mirror image of antiexpectational questions. There has been a change in the epistemic state of the speaker, who believed  $p$ , but has received some evidence that  $\neg p$  is true. Thus,  $\neg p$  is the outstanding proposition in the question denotation and will be the argument of the EA. An NI-question is illustrated in 98: the speaker thought that she would meet Maria at the station, but she sees only Peter.

(98) [Scenario: You are waiting at the train station for Peter and Maria to arrive. When the train comes, only Peter gets off.]

Oh, que no ha pogut venir, per desgràcia, la Maria?

‘Oh, couldn’t Maria come? + If Maria could not come, this is unfortunate.’

The negative proposition ‘Maria is not coming’ is the argument of the EA, and it is conveyed that if this is true, it is unfortunate that it is true (99).

(99) Projective tier: QUESTION ( $Q(\text{VERUM}(\neg p))$ )  $\wedge \neg p \rightarrow \text{UNFORTUNATE}(\neg p)$ ,  
where  $p =$  ‘Maria came’ and  $C_{sp,c}(\neg p) > 0.5$ .

By contrast, in a PI-question, there is no change in the speaker’s epistemic state: the speaker believed  $p$  and is still biased toward  $p$  at the moment of utterance. As a consequence,  $p$  is the outstanding proposition and the proposition that will serve as argument to the EA. The examples in 100 illustrate a PI-question: speaker B, who does not hold Maria in high esteem, thinks that Maria is coming and asks her interlocutor if he has any reason to doubt that this is true.

(100) A: Durant el sopar m’agradaria parlar amb algun fonòleg. A banda d’en Joan, saps si vindrà algú més?

‘At dinner I’d like to talk to some phonologist. Other than John, do you know if someone else is coming?’

B: Que no vindrà, també, per desgràcia, la ximpleta de la teva amiga, la Maria?

‘Isn’t this silly friend of yours, Maria, also going to come? + If Maria comes, this is unfortunate.’

The positive proposition ‘Maria is coming’ is the argument of the EA, and it is conveyed that if this is true, it is unfortunate that it is true (101).

(101) Projective tier: QUESTION ( $Q(\neg(\text{VERUM}p))$ )  $\wedge p \rightarrow \text{UNFORTUNATE}(p)$ ,  
where  $p =$  ‘Maria came’ and  $C_{sp,c}(p) > 0.5$ .

**Exam questions.** Exam questions are those that are uttered by a speaker who is not ignorant about which proposition in the set holds in the actual world, and the rest of the participants are aware of these special circumstances. In these contexts, then, it is common ground that the speaker knows the true proposition in the set  $\pi$ . Recall example 82, repeated here as 102.

- (102) [Scenario: The speaker is the quizmaster of *Who wants to be a millionaire?*.]

Quin corredor català va perdre, per desgràcia, la final dels 100 metres de Barcelona 92?

‘Which Catalan athlete lost the 100 meters final in Barcelona’s 1992 games? + If the Catalan athlete lost the final, this is unfortunate.’

In this situation, the EA is acceptable because it is common ground that 103 holds. The fact that there is a proposition that yields a value of 1 when the speaker’s credence function applies to it formalizes the idea that in all of the worlds compatible with the conversational background and the speaker’s beliefs, there is one specific proposition in the set that holds.

- (103)  $\exists p \in \pi [C_{sp,c}(p) = 1]$

The content of the projective tier of an exam question is shown in 104. On the one hand, the force operator takes the WH-clause, and on the other hand, there is an outstanding proposition  $p$ , the true answer to the question, to which the EA applies.

- (104) Projective tier: QUESTION ( $\pi$ )  $\wedge p \rightarrow$  UNFORTUNATE( $p$ ), where  $p$  is the true answer and  $C_{sp,c}(p) = 1$ .

To sum up, the distribution of EAs in Catalan and Spanish is more restricted than in French. The EA, which is nonintegrated, has, in principle, scope over a set of propositions. However, this is not the right type for the EA, which can only take a proposition. Thus, an EA question will be acceptable only if there is a proposition toward which the speaker is biased. This greatly limits its distribution in question environments. However, EAs and questions are, in principle, not incompatible, as it may seem at first sight.

**5. DISCUSSION AND CONCLUSIONS.** This article has presented an analysis of evaluative adverbs in French, Catalan, and Spanish. We propose that EAs are semantically composed at the projective tier of meaning. This analysis elegantly explains why EAs cannot be directly denied, do not affect truth conditions, and are not factive. Crosslinguistically, EAs present interesting properties: while they are generally acceptable in questions in French, they are much more restricted in Catalan and Spanish. We have provided an account of the semantics of EAs in questions in French, based on the fact that they can appear prosodically integrated and, in that case, they take as argument the proposition to their right. In addition, given that EAs are composed at the projective tier, we can explain their peculiar interpretation in questions. For Catalan and Spanish, we have proposed that EAs’ appearance is constrained in two ways: first, since EAs can only be prosodically nonintegrated in those languages, they can only scope over a set of propositions, which is not the right type of argument for the EA, and second, EA questions will be acceptable only in biased questions because, in that case, there is an outstanding proposition that can be taken as argument by the adverb.

There are two issues that we believe are worth considering in further developments of the theory of at-issue vs. projective content that follow from this work. First, our proposal is that EA questions in Catalan and Spanish are possible if the speaker is biased toward one of the propositions in the set denoted by the question. An obvious question that arises is what the ontological status of biases is. They have to do with the epistemic or belief state of the speaker, but it is also not straightforward how they are triggered. They are clearly not at issue, because they are not part of the descriptive meaning, but are they projective in the same way that presuppositions and conventional implicatures are? This is not a trivial issue, since if we were to consider biases a kind of projective

meaning, our analysis for EAs in Catalan and Spanish would involve feeding the adverb, a projective item, an argument that is projective itself (a biased proposition). In other words, it should be decided whether our model should allow a projective item to modify not-at-issue content. Can we find other cases in which such composition between two not-at-issue contents is necessary?

Second, B&G bring out the notion of INCONGRUENCE to explain why (some) negative assertions are not possible in French; while at the at-issue tier we are conveying  $\neg p$ , at the projective tier we mean that  $p \rightarrow \text{UNFORTUNATE}(q)$ . In a nutshell, the meanings conveyed at the different levels go in opposite directions conversationally. This raises the question of what constrains more generally the compatibility of the meanings conveyed at different levels. A generalization could go as follows: a proposition at the at-issue tier that is taken as argument at the projective tier cannot have its polarity changed. Otherwise, the difference in polarity would incur in the incongruence problem due to a difference in discourse goals. A venue for future work would be to check the validity of this generalization for other projective items.

If we are on the right track, the semantic differences of EAs in French, on the one hand, and Catalan and Spanish, on the other, are tightly linked to their prosody and syntax. Based on this proposal, one could try to extend it and speculate on a stronger crosslinguistic hypothesis, shown in 105.<sup>25</sup>

(105) Strong hypothesis of EAs' prosody-syntax relationship:

- a. Nonintegrated EAs are constrained to appear in biased questions.
- b. Integrated EAs are not constrained and can freely appear in questions.

We believe that the first part of the strong hypothesis (105a) is very plausible and could easily extend to other languages. A first step to test it would be to check the behavior of nonintegrated EAs in French and see if they behave differently from their integrated counterparts. As for the second part of the hypothesis (105b), we are less sure that it can be maintained. Consider, for example, the case of English and German, which do have integrated EAs (see Liu 2011 for a recent work on EAs in German), but they still seem to be highly constrained in questions (although the data are far from being clear, as discussed in §2.2).

We have admittedly considered data from a small number of languages in one particular language family. Nevertheless, we believe that there are lessons we can learn from the study of EAs in French, Catalan, and Spanish. Specifically, we can put forward further factors that may play a role in the acceptability of EAs in questions, which may be useful for future research on EAs crosslinguistically.

- Syntax-prosody interface: One option could be that in certain languages prosodic integration does not correlate with a syntactic position of the adverb below the CP layer. As a consequence, the EA may never have a content of the right type in its scope in questions. Consequently, bias would always be a requirement and the presence of an EA in a WH-question would never yield an unconditional meaning.
- Semantics of the EA: Another option could be that EAs have a different semantics crosslinguistically. To be more precise, it might be the case that in some languages EAs are factive and hence do not have a conditional meaning at the projective tier. Even if they had the right syntax and could be applied to the right argument, they might always create an incongruent meaning in questions.

<sup>25</sup> We thank a referee for suggesting these broader implications.

A final remark concerns the collection of data and their interpretation. Our experimental study took into consideration parameters that are crucial in the elicitation of semantic data, namely the role of context and, more specifically, the speaker's biases. This has allowed us to extract data that had been considered ungrammatical before. This fact leads us to two more considerations. On the one hand, it sides with other works that vindicate rigor in data collection, even if it is triggered via introspection. On the other hand, the data that our experimental study provided also call into question the difference between GRAMMATICALITY, ACCEPTABILITY, and FELICITY. The data that we have put together in this article are not easy to classify in the domain of ill-formedness. Native speakers do not have strong feelings about how (un)natural these sentences are. Pinning down the exact scope of these terms is a worthwhile project for future research.

## APPENDIX: LIST OF EXPERIMENTAL ITEMS

- (A1) a. Condition 1: Biased  
 Juanjo desayuna en el café Gijón y suele hablar con el camarero. Hablan de Alberto, el hermano de Juanjo, que hace ya muchos meses que está en el paro. El camarero vio hace unos días a Alberto a las 8h trajeado y con maletín. Por eso le pregunta a Juanjo:  
 'Juanjo has breakfast at Gijon's Café and usually talks to the waiter. They talk about Alberto, Juanjo's brother, who has been unemployed for many months. The waiter saw Alberto a few days ago at 8 am, wearing a suit and carrying a briefcase. This is why he asks Juanjo.'
- b. Condition 2: Not biased  
 Juanjo desayuna en el café Gijón y suele hablar con el camarero. Hablan de Alberto, el hermano de Juanjo, que hace ya muchos meses que está en el paro. El camarero le pregunta a Juanjo:  
 'Juanjo has breakfast at Gijon's Café and usually talks to the waiter. They talk about Alberto, Juanjo's brother, who has been unemployed for many months. The waiter asks Juanjo.'
- c. ¿Ha encontrado trabajo, por suerte, tu hermano Alberto?  
 has found work fortunately your brother Alberto  
 'Has your brother found a job? + If your brother found a job, this is fortunate.'
- (A2) a. Condition 1: Biased  
 Dos amigas, Ana y Sonia, invitan a su amiga Isabel a cenar. Cuando empiezan a cenar, Ana recibe una llamada del trabajo y tiene que marcharse. Una hora mas tarde, Ana vuelve a casa y ve que Sonia está sola en el comedor. Ana pregunta:  
 'Two friends, Ana and Sonia, invite their friend Isabel to have dinner. When they start having dinner, Ana receives a phone call from work and has to go. An hour later, Ana returns home and sees that Sonia is alone in the living room. Ana asks.'
- b. Condition 2: Not biased  
 Dos amigas, Ana y Sonia, invitan a su amiga Isabel a cenar. Cuando empiezan a cenar, Ana recibe una llamada del trabajo y tiene que marcharse. Una hora mas tarde, Ana llama a Sonia y le pregunta:  
 'Two friends, Ana and Sonia, invite their friend Isabel to have dinner. When they start having dinner, Ana receives a phone call from work and has to go. An hour later, Ana calls Sonia and asks.'
- c. ¿Ya se ha tenido que marchar, por desgracia, Isabel?  
 already CL has had that leave unfortunately Isabel  
 'Has Isabel had to leave already? + If Isabel had to leave, this is unfortunate.'
- (A3) a. Condition 1: Biased  
 Paloma es vendedora en la teletienda. En la próxima emisión nos tiene que convencer que su nuevo producto para tapar goteras es infalible. Empieza su anuncio con la siguiente pregunta:  
 'Paloma works at the TV shopping channel. In her new ad, she has to convince us that her new product to repair leaks is infallible. She starts her ad with the following question.'
- b. Condition 2: Not biased  
 Paloma acaba de comprarse una casa y la primera noche de lluvia se da cuenta de que hay goteras. A la mañana siguiente, muy angustiada, necesita poder compartir su experiencia con

gente amiga para que la consuelen y la ayuden a solucionar su problema. Cuando en el ascensor del trabajo se encuentra a Miguel, le pregunta:

'Paloma has just bought a house and, on the first rainy night, she realizes there are leaks. Very distressed, she needs to share the experience to get some comfort and find a solution to her problem. When at the elevator of her work place she runs into Miguel, she asks:'

- c. ¿Tienes, por desgracia, goteras en tu apartamento?  
have unfortunately leaks in your apartment

'Do you have leaks in your apartment? + If you have leaks in your apartment, this is unfortunate.'

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Mayol  
Universitat Pompeu Fabra  
Departament de Traducció i Ciències del Llenguatge  
Carrer Roc Boronat, 138  
08018 Barcelona, Spain  
[laia.mayol@upf.edu]

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Castroviejo  
[elena.castroviejo@cchs.csic.es]