(Non-)integrated evaluative adverbs in questions: a cross-Romance study
Abstract

The goal of this paper 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 French allows EAs in questions, and we show that Catalan and Spanish, 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, non-integrated EAs in Catalan and Spanish have scope over a set of propositions, and are only acceptable in questions if the speaker is biased towards 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.
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 (1-a), the speaker conveys that it is unfortunate that she missed the train; with (1-b), that it is strange that the shop was closed. Other examples of EAs include luckily, happily and surprisingly. ¹

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 and Rossari 2004; Bonami and Godard 2008, henceforth BG, and Ernst 2009). Our goal in this paper is to examine these adverbs in a very particular context: questions in several languages of the Romance family.

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

(2) a. Qui est malheureusement venu ?
   Who is unfortunately come?
   ‘Who came? + Whoever came, it is unfortunate that s/he came.’³

b. Est-ce que Marie est malheureusement venue ?
   QM 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, (2-a) 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 the paper 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 micro-variation 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 speaker seeks to confirm the proposition which she believes 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 will show in section 4. This proposal is substantiated experimentally by a study that uses the magnitude estimation technique (see section 4.2).

(3)  
   a. #Qui ha vingut, *per desgràcia*?
        Who has come, unfortunately?
   
   b. #¿Quién ha venido, *por desgracia*?
        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*?
        CQM QM has come, the Maria, unfortunately?
   
   b. ¿Verdad que ha venido, María, *por desgracia*?
        true that has come, María, unfortunately?
        ‘Isn’t it true that Maria came? + If Maria came, it is unfortunate, that she did.’

(5)  
   a. #Que ha vingut, la Maria, *per desgràcia*?
        QM has come, the Maria, unfortunately?
   
   b. #¿Ha venido, María, *por desgracia*?
        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 hand, 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 non-integrated 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 prepositions), EAs in these languages can only occur in questions when they modify a proposition towards 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). 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 paper, 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 not only play a role in the interpretation of negated polar questions, but also in the felicity of questions that include EAs when they are non-integrated. Lastly, 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 paper is concerned with a puzzling locus of linguistic variation within the Romance family. The proposal in this paper 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 (2008)'s 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 of 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 make 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.

Our paper is structured as follows. Section 2 lays out the main properties of EAs, as well as a review of previous work on EAs. Section 3 presents our analysis for EAs in French. Section 4 accounts for the more restrictive behavior of EAs in Catalan and Spanish. Finally, section 5 discusses the main findings and issues raised by this paper, and concludes.
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.

1. 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

2. 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.

3. Syntactically, non-integrated 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 non-integrated. 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).
   unfortunately, Marie is come unfortunately.
   ‘Unfortunately, Marie came.’ French

   b. (Per desgrácia,) la Maria ha vingut, (per desgrácia).
   unfortunately the Maria has come, unfortunately.
   ‘María came, unfortunately.’ Catalan

   c. (Por desgracia), María ha venido, (por desgracia).
   unfortunately María has come, unfortunately.
   ‘María came, unfortunately.’ Spanish

(10) a. Marie a, heureusement, envoyé la lettre à Jean.
    Marie has fortunately sent the letter to Jean
    ‘Fortunately, Marie has sent the letter to Jean.’ French

   b. La Maria, per sort, ha enviat la carta a en Joan.
    Maria fortunately has sent the letter to Joan
    ‘Fortunately, Maria has sent the letter to Joan.’ Catalan

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

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
(11-a) 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 (cf. (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 e.g. Espinal
(1991), Cinque (1999), Pollock (1989) and Ernst (2002) for a more fine grained analysis of the
syntax of adverbs.

(11) a. Marie est bizarrement venue.
    Marie is strangely come.
    ‘Marie strangely came.’ French

   b. *La Maria ha estranyament vingut.
    The Maria has strangely come.
    ‘María strangely came.’ Catalan

(12) $\begin{array}{l}
        [CP Marie, est, [TP bizarrement [TP t_i [TP t_j [VP venue]]]]]
\end{array}$

4. In French, negative declarative sentences are not allowed when the EA is prosodically integrated
and occurs to the right of negation, conveyed by pas. In contrast, they are possible either when
the EA is non-integrated 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.

‘Unfortunately, Marie did not come.’

The EA in (13-a) 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 will argue following BG, is responsible for the ill-formedness of the sentence.

5. The semantic contribution of EAs cannot be negated directly, as example (14) shows. The reply in (14) only negates 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 ((14)). If the addressee wants to object to the meaning conveyed by the EA, he must do it indirectly, as in (14).

(14) BG (examples (27-29) p. 285)

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.’

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), Potts (2005), Matthewson et al. (2007), Amaral et al. (2008) and Murray (2009)).

6. 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.
EAs are not factive, as shown by BG and Jayez and Rossari (2004) (contra Bellert (1977), Mata (2007) and López and Morant (2002) a.o.). While this is not easy to see for simple sentences because they entail the proposition they take as their argument (see property 6), 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 (17-a), 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 (17-b) should, thus, 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 déçue.
   If the mother of Marie knows that she is in delay, she will be very 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 déçue.
   If Marie is unfortunately in delay, her mother will be very 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 non-integrated. (18-a) presupposes that Maria is late, while this is not the case in (18-b).

(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 molt.
   if the Maria unfortunately arrives late the her mother will be mad 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, know is the presupposition trigger), the second does not.

(19) Jayez and Rossari (2004, p. 219)

   a. Est-ce que tu sais que Marie a raté son examen?
      QM 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?
   ‘Would Marie have failed her exam? + If Marie has failed her exam, it would be unfortunate.’

BG 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 ((20-a)), adjectives do presuppose their complement. Sentence (20-b) presupposes that Paul is late and, therefore, the presupposition carried by aussi (‘too’) is satisfied.

(20) BG (p. 281)

a. 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, this will be unfortunate.’

b. S’il est malheureux que Paul soit en retard, il l’est encore plus que le patron
   ‘If it is unfortunate that Paul is in delay, it is even more unfortunate that the boss
   is too.
   + If it is unfortunate that Paul is late, it is even more unfortunate that the boss is late too.’

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

(21) On espère, donc, qu’il arrive à l’heure.
   ‘Therefore, we hope that he will be on time.’

8. As mentioned in the introduction, although EAs are acceptable in questions in French, they have an unexpected meaning. In order to see that, 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 (22-a) has the expected interpretation under a standard analysis that takes questions to denote sets of propositions. The adverb is interpreted inside each proposition ((22-b)) and, as a consequence, the meaning of the question can be paraphrased as in (22-c). Therefore, in a context in which we know that Anne and Betty probably came, while we know that Charles and David did not come, (22-d) would be a possible answer to question (22-a).

(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 by an EA: that is, the denotation of (23-a) is not a set of propositions such as the one in (23-b) or, in other words, the meaning of the question cannot be paraphrased as in (23-c). In a context in which we like Anne and Betty, and deeply dislike Charles and David, and they all came to a party, (23-d) is not a possible answer to (23-a).

(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 (23-c) is not a correct paraphrase of (23-a), how can it be paraphrased and how can it be used? Let us illustrate a context in which sentence (23-a) 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, (23-a) 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 hand, she is making a side comment.

(24) Est-ce que Marie est malheureusement venue ?

QM 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 the speaker’s evaluation towards what she says, 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
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 ((25-a)), and one that contains the evaluation of the sentence ((25-b)).

(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.

Later on, Jayez and Rossari (2004); Bonami et al. (2004) and GB provide 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 cross-linguistically. Also, BG argue that EAs are not factive, which disputes Bellert’s suggested meaning for the two assertions. BG 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 and Godard, 2008, p. 285,286). According to them, there are two components of meaning in a sentence like...
The main assertion of the sentence is that Marie came ((28-a)), while the ancillary commitment consists in the conditional in (28-b): if Marie came, it is unfortunate that she did.

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

Main assertion: came(Marie)  
Ancillary commitment: came(Marie) $\rightarrow$ 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 section 3):

- EAs cannot be negated directly (property 5), 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 6). 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 7). Since the argument of the EA appears both in the antecedent and the consequent of the conditional in the ancillary commitment, it will not be presupposed.⁷

BG also propose an explanation for the unacceptability of negative sentences with prosodically integrated EAs to the right of negation (property 3). 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).

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 follows:

Main assertion: $\neg$came(Marie)  
Ancillary commitment: came(Marie) $\rightarrow$ UNFORTUNATE(came(Marie))

That is, on the one hand, the speaker is asserting that Marie did not come and, on the other hand, she is uttering a conditional (‘If Marie came, . . . ’), as if it was possible that she had come. As BG 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 2001; Ogihara 2002 and Ippolito 2006, a.o.) or, otherwise, the sentence becomes unacceptable. Therefore, a sentence like (29) is unacceptable for the same reasons as 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 BG’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). 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, p. 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)).

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

(33) Ernst (2009, p. 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):
Subjectivity (for Speaker-Orientation):

Where a speaker asserts $Q = \text{ADV}(p)$ (thus $Q$ is in the belief set of the speaker, which we call $M_B(s)$),

a. $\text{ADV}$ is \textit{subjective} iff all worlds by which $Q$ is evaluated are consistent with respect to $M_B(s)$ at the time of utterance.

b. otherwise $\text{ADV}$ is \textit{objective}.

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 $M$.

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, $\text{ADV}(p)$ 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, etc. Consider Ernst’s denotation of \textit{unfortunately} ($P$) and \textit{mysteriously} $P$ in (36) and (37) respectively.

(36) $[\text{unfortunately (}P\text{)}] =$

a. $[P] = 1$ in $M_B(s)$

b. $\forall w \in M_B(s)$, $[\text{it is unfortunate that } P] = 1$ in $w$

(i.e., $\text{ADV}(p)$ is true in all worlds in the speaker’s belief set)

(37) $[\text{mysteriously (}P\text{)}] =$

a. $[P] = 1$ in $M_B(s)$

b. $\forall w$ in some subset $W$ of $M \in \{M_B(s),M_B(h)\}$, $[\text{it is mysterious that } P] = 1$ in $w$

According to Ernst, evaluatives are “almost all factive, thus also representing a full commitment to the truth of $P$.” 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 $\text{ADV}(p)$ is true, whether it is the speaker’s belief model or a subset that also includes the hearer’s belief model. Note that this approach is at odds with the point made by BG 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 \textit{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 \textit{unfortunately} cannot occur in questions and conditionals, on the basis of data from English, French, Mandarin Chinese and Dutch.
gathered by interview or questionnaire. However, as we mentioned, EAs in French can appear in
questions and conditionals (see (19-b) and (20-a)).\textsuperscript{10} Thus, in Ernst’s model, \emph{malheureusement} should
be treated as a weak evaluative. However, he notes that weak evaluatives are only acceptable in
questions when “there is evidence to take this sentence’s proposition as true” (p. 522), where “this
sentence’s proposition” refers to the answer to the question. This is not the case for \emph{malheureusement},
which can occur in (positive) questions when the speaker has no preference for either of the alternatives
(cf. the context for (24)). Thus, the strategy of explaining cross-linguistic variation in terms of the
variation on a scale of subjectivity (i.e., \emph{malheureusement} being less subjective than \emph{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.

\begin{enumerate}
  \item 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)
  \item 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?
\end{enumerate}

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 BG’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 will not deal further with English data in this paper,
it seems clear that the data are more complex than what has been acknowledged in the literature (see
section 5 for some speculation about the broader cross-linguistic implications of our proposal).

3 Integrated EAs in French

In this section, we take BG’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
BG 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 \textit{projective} tier (borrowing the term \textit{projective} from Simons et al. (2010)).
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 BG 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 questions which are 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 using 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 world semantics to include different dimensions of meaning, along the lines of Potts (2005). We will consider two parallel tiers where meaning is delivered, the AT ISSUE tier and the PROJECTIVE tier, and at the PROJECTIVE tier we will not only include 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; Stalnaker 1979; Chierchia and McConnell-Ginet 1990/2000 and Han 2001 among many others). In this paper, 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 Pott’s (2005) at-issue vs. conventionally implicated meaning. Both at-issue and conventionally implicated meaning are entailments, in the sense that they can’t be denied by the speaker without incurring a contradiction, but only conventional implicatures (CIs) can’t be denied by the addressee by direct means. The idea behind the partition into two tiers is that certain expressions do not contribute to the main content of the sentence (i.e., in BG’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 does not convey 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., *damn*(machine)) percolates up to the root node without being touched. The at-issue composition runs in a parallel manner, and the sentence turns out true only if it is not the case that the machine is working properly.

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

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 for both the performative status of force operators and of their inability to be directly denied. Hence, in this model, words like *damn* are very similar to force operators. In this paper we deal with **assert** (cf. Krifka 1995) and **question**, to which we give an informal paraphrase inspired by Truckenbrodt (2006):

(42)  
(a. **assert**: I want *p* to become common ground.  

(b. **question**: I want the addressee to make the true *p* in \(\pi\) (i.e., the set of propositions denoted by the interrogative clause) common ground.

**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 set is generated differently.
Concerning *wh*-questions, we assume Hamblin (1973)’s claim that they denote sets of possible answers — rather than true answers as in Karttunen (1977). *Wh*-questions denote a set of proposition by virtue of them 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?*:

$$
\pi : \lambda p. \exists x [\text{human}(x)(w) \land p = \lambda w'. \text{loves}(j)(x)(w')] \\
\lambda P \lambda p. \exists x [\text{human}(x)(w) \land p = \lambda w'. P(x)(w')] \\
\lambda x \text{loves}(j)(x) \\
\text{loves John}
$$

(43)

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, ...}. Below is the schematic representation of the combination between $\pi$ and the force operator QUESTION:

$$
\pi \bullet \text{QUESTION} (\pi): t^p \\
\pi \text{ QUESTION: } \langle \pi, t^p \rangle
$$

(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):$^{13}$

$$
[Q] = \lambda p. \{p, \neg p\}
$$

(45)

We see the composition of polar questions schematically in (46).

$$
Q(p): \pi \bullet \text{QUESTION} (Q(p)): t^p \\
\text{QUESTION: } \langle \pi, t^p \rangle \\
\pi \text{ QUESTION: } \langle \pi, t^p \rangle \\
Q: \langle p, \pi \rangle \ t^p
$$

(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.$^{14}$ In sections 3.3 and 3.4, we will 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 in two tiers. The projective 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 projective tier. The projective tier also contains a conditional: if \( p \) holds, then it is unfortunate that \( p \) holds.\(^\text{15}\)

\[
\text{(47) Marie est malheureusement venue.} \\
\text{Marie is unfortunately come.} \\
\text{‘Unfortunately, Marie came.’}
\]

\[
\begin{align*}
\text{(48) a. AT ISSUE tier: } p &= \text{Marie came.} \\
\text{b. PROJECTIVE tier: assert } (p) &\land \forall^* [p \rightarrow \text{UNFORTUNATE}(p)], \text{ where } p = \text{‘Marie came’.}
\end{align*}
\]

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)).

\[
\text{(49) Marie came.} \\
\text{If Marie came, then it is unfortunate that she did.} \\
\therefore \text{It is unfortunate that Marie came.}
\]

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 will only use \( \forall^* \) 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 the one presented for declaratives, as already shown by BG. 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 non-integrated EA, which is adjoined to TP, as shown in the tree in (51), takes as argument the proposition to its right.\(^\text{16}\)
(50) Qui est malheureusement venu ?
Who is unfortunately come?
‘Who came? + Whoever came, it is unfortunate that s/he came.’

\[
\pi = \lambda p. \exists x [\text{human}(x) \land p \equiv \text{came}(x)] \bullet \text{question} (\pi) \land \text{[malheureusement](came}(x))
\]

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

(52) a. AT ISSUE tier: \( \pi = \lambda p. \exists x [\text{human}(x) \land p \equiv \text{came}(x)] \)

b. PROJECTIVE tier: \( \text{question} (\pi) \land [\text{malheureusement}(\text{came}(x))]) \)

Recall from (39) that at the PROJECTIVE tier we have placed a universal operator that binds any 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, BG’s universal closure operation \( \forall^* \) makes sure that at the end of the derivation the variable gets bound. The result is universal quantification over \( x \), as shown in (53). For all the relevant individuals (i.e., the ones that co-vary 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.\(^{17}\)

\[(55)\]

\begin{enumerate}
  \item **At Issue tier:** \(\pi = \lambda p. \exists x [WH(x) \land p = P(x)]\)
  \item **Projective tier:** QUESTION \(\pi\) \(\land \forall x [P(x) \rightarrow \text{unfortunate}(P(x))]\)
\end{enumerate}

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 \(P\) we obtain exhaustivization, which lies at the heart of the meaning conveyed by so-called *unconditional* sentences, illustrated below.

\[(56)\]

\begin{enumerate}
  \item Whoever comes to the party, it will be fun.
  \item Regardless of who comes to the party, it will be fun.
  \item No matter who comes to the party, it will be fun.
\end{enumerate}

As observed by Rawlins (2008), unconditioninals 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 kind of questions can be used in the canceled party scenario (see discussion at the end of section 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 below for convenience.

\[(57)\]

\begin{enumerate}
  \item Qui est *malheureusement* venu ?
  \item \{Un fortunately, Anne came, Unfortunately, Betty came, Unfortunately, Charles came, Unfortunately, David came\}
  \item Who is the \(x\) such that it is unfortunate that \(x\) came?
  \item #Charles and David.
\end{enumerate}

Finally, note that in the semantics of *wh*-interrogatives 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 (58-a). This straightforwardly explains why it does not follow that “if nobody came, it is unfortunate that nobody came” (cf. (58-b)). In the circumstances where an answer of the sort “\(x\) came” is unfortunate, nobody coming might be deemed as fortunate.

\[(58)\]

\begin{enumerate}
  \item Qui est *malheureusement* venu à la fête ?
\end{enumerate}
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. The sentence in (2-b), repeated in (59), is not interpreted as in (60-a), but as in (60-b).

(59) Est-ce que Marie est malheureusement venue ?
QM 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) $Q(p): \{\text{Marie came, Marie didn’t come}\} \bullet \text{QUESTION } (Q(p)) \land [\text{malheureusement}](\text{came}(m))$

(62) Est-ce que Marie est malheureusement venue ?

a. AT ISSUE tier: $Q(p) = \{\text{Marie came, Marie did not come}\}$
   b. PROJECTIVE tier: QUESTION $(Q(p)) \land p \rightarrow \text{UNFORTunate}(p)$, where $p = \text{‘Mary came’}$. 
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 (cf. (63-a)), while polar negative questions are acceptable if they appear in the appropriate context (cf. (63-b)).

(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 ?
   QM Marie NE is not unfortunately come?
   ‘Didn’t Marie come? + unfortunately’

Our line of explanation follows BG’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 which leads to unacceptability. First we examine negative wh-questions and then we turn to negative polar questions.

3.5.1 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: \( \pi = \{ \text{Marie did not come, Peter did not come, \ldots} \} \)

   b. projective tier: \text{QUESTION (\( \pi \)) \& \forall x [\text{came}(x) \rightarrow \text{UNFORTUNATE}(\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 the previous example, on the one hand, the speaker is 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.

### 3.5.2 Negative polar questions

Consider sentence (63-b), repeated 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 proposition. 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)  
\begin{align*}
\text{a. } & \#\text{Est-ce que Marie n’est pas malheureusement venue ?} \\
& \text{QM Marie NE is not unfortunately come?} \\
\text{b. } & \text{AT ISSUE tier: } Q(\neg p) = \{\text{Marie came, Marie did not come}\} \\
\text{c. } & \text{PROJECTIVE tier: QUESTION (}Q(\neg p)\text{) }\land\text{ p }\rightarrow\text{ UNFORTUNATE}(p), \text{ where } p = ‘\text{Marie came’}. \\
\end{align*}
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 questions should be fully acceptable regardless of the context, which is not the case. However, we have been assuming 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 works on negative polar questions. Some negative questions (for instance, those that have preposed negation in English) are not neutral and can only be used if the speaker is biased towards a particular answer (Romero and Han, 2004; Büring and Gunlogson, 2000). For instance, (67) is only acceptable if the speaker believed that the positive answer is correct; that is, if the speaker believed 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, the speaker wants to double-check the positive proposition $p$, while in the other, she wants 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 and Han (2004, p. 610)
   A: Ok, now that Stephan has come, we are all here. Let’s go!
   B: Isn’t Mary coming too/ * either?

(69) Romero and Han (2004, p. 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), the speaker believed that Mary is coming and uses a negative question to double-check this belief. In contrast, in (69), the speaker 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 “that Mary is not coming”. Summarizing, in a NI-question there is a change in the expectations of the speaker: she used to believe $p$, but after
receiving 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 will follow the proposal in Romero and Han (2004). They argue that negative questions contribute an epistemic operator \textit{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”.

\begin{equation}
\text{[verum]}[\text{gb/i}] = \lambda p_{(s,t)} \lambda w. \forall w' \in \text{Epi}_x(w) \left[ \forall w'' \in \text{Conv}_x(w') \left[ p \in \text{CG}_w \right] \right]
\end{equation}

According to them, the ambiguity between PI and NI readings is a scopal ambiguity between negation and the \textit{verum} operator. In a PI-question, negation scopes over \textit{verum} and the following partition is obtained.

\begin{equation}
\{ \text{“it is for sure that Mary is coming”, “it is not for sure that Mary is coming”} \}
\end{equation}

In contrast, in a NI-question, \textit{verum} scopes over negation and, as a consequence, we obtain a different partition:

\begin{equation}
\{ \text{“it is for sure that Mary is not coming”, “it is not for sure that Mary is not coming”} \}
\end{equation}

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. (73) is a PI question (it contains the positive polarity item \textit{too}) and is acceptable. In contrast, (74) is an NI question (it contains the negative polarity item \textit{either}) and it is not acceptable.

\begin{enumerate}
\item[(73)]
\begin{enumerate}
\item A wants to talk to some phonologist. She asks whether B knows if some phonologist, besides John, will come to dinner. B, who dislikes Mary, says:
\item Marie n’est-elle pas malheureusement venue aussi ?
Marie NE is she not unfortunately come too?
\end{enumerate}
\item[(74)]
\begin{enumerate}
\item A mentions that there won’t be any phonologists at the dinner because John will not come. B, who dislikes Mary, says:
\item #Marie n’est-elle pas non plus malheureusement venue ?
Marie NE is she not either unfortunately come.
‘Didn’t Marie come either? + unfortunately’
\end{enumerate}
\end{enumerate}

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., ‘that 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) PI-question: Marie n’est-elle pas malheureusement venue ?

a. at issue tier: $Q(\neg \text{verum}(p)) = \{ \text{“it is for sure that Marie is coming”, “it is not for sure that Marie is coming”} \}

b. projective tier: question $(Q(\neg \text{verum}(p))) \land p \rightarrow \text{unfortunate}(p)$, 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 $\neg p$, 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”, “it is not for sure that Marie is not coming”} \}

b. projective tier: question $(Q(\text{verum}(\neg p))) \land p \rightarrow \text{unfortunate}(p)$, 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 (3)), 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.

INSERT TABLE 1 ABOUT THERE
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 Non-integrated EAs in Catalan and Spanish

4.1 Data

We turn now to Catalan and Spanish, two closely related languages 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 non-integrated. 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 and 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 will be preceded by the context within which it must be interpreted.

(77) a. 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:

b. #Qui ha hagut de marxar, per desgràcia?
   Who has had to leave, unfortunately?

   Catalán

c. ¿Quién ha tenido que irse, por desgracia?
   Who has had that leave, unfortunately?
   ‘Who had to leave? + unfortunately.’

   Spanish

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) a. 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:
   b. #Que ja ha hagut de marxar, per desgràcia, la Maria?
      Catalan QM already has had of leave, unfortunately, the Maria?
   c. ¿Ya ha tenido que irse, por desgracia, María?
      Spanish Already has had that leave, unfortunately, María?
      ‘Did María have to go already? + unfortunately.’

This said, it is not true that all EA questions are unacceptable; there exist instances of EA questions which 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?
      CQM 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?
      CQM 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) a. 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 noone in the living room, other than Betty. She asks:
   b. Ostres, que ja ha hagut de marxar, per desgràcia, la Maria?
      Catalan QM already has had of leave, unfortunately, the Maria?
Ostras, ¿ya se ha tenido que ir, por desgracia, María?

‘Gosh, did María have to go already? + If María 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)).

(82) a. Scenario: the speaker is the quizmaster of “Who wants to be a millionaire?”

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

Which runner catalan lost, unfortunately, the final of the 100 meters of Barcelona 92?

92?

Catalan

c. ¿Què corredor catalán perdió, per desgracia, la final de los 100 metros de Barcelona?

Which runner catalan lost, unfortunately, the final of the 100 meters of Barcelona 92?

92?

Spanish

‘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 non-integrated EAs are acceptable in questions only if the speaker is biased towards a particular proposition of the set denoted by the question. That is, non-integrated EAs are only acceptable in biased questions. Further discussion of the analysis of bias and EAs in Spanish and Catalan is presented in section 4.3.

All the judgments reported for Spanish and Catalan in this section correspond to our intuitions as native speakers. Admittedly, these are subtle judgments given that special care that needs to be put on constructing the contexts in which these questions are acceptable. It is, thus, not surprising that studies which 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.

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 which incorporate
experimental techniques in order to obtain reliable and robust judgments. The details of the experiment are spelled out in what follows.

**Materials**: All 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 making 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: (a) shows the (biased) context for Condition 1, (b) shows the (non-biased) context for Condition 2 is shown and (c) 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 you been admitted to medical school? + If you have been admitted to medical school, this is fortunate.’
The conditions for each item set were counterbalanced and incorporated into a questionnaire experiment together with 8 filler items and 2 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 web and uses the technique of magnitude estimation (see Bard et al. (1996); Sorace and 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, etc. Second, a set of linguistic practice items were 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, etc. Finally, they had to judge the experimental items.

(84) a. Hace un día muy caluroso de verano. Andrés y Silvia estan 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 simple 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.

Thus, biased questions get a higher rating than not-biased 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 significantly different from the ratings of the non-biased 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. Our proposal is presented in more detail in the next section.

### 4.3 Proposal

In a nutshell, our account to explain the distribution of EAs in questions is the following: (i) Since EAs in Catalan and Spanish are non-integrated, 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 only be saved if the speaker is biased towards 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.

\[
\text{CP} \\
\text{EA} \quad \text{CP: } \langle \pi \rangle \\
\vdots
\]

(85)

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 only be acceptable if there is a proposition towards which the speaker is biased.\textsuperscript{21} 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.”\textsuperscript{22} (Eilam and 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 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 follows (where $\phi$ is $\pi$ or $p$ depending on the content of the AT issue tier):

\[(86)\quad \text{PROJECTIVE tier: FORCE OPERATOR}(\phi) \land p \rightarrow \text{UNFORTUNATE}(p),\] where $p$ is the proposition the speaker is biased towards.

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 $p$ into $A$’s degree of belief in $p$ in context $c$. A proposition $\text{Dox}_{A,c}$ represents the epistemic state of an agent $A$ in a context $c$, and the function $C_{A,c}$ takes a propositions $p$ and yields the conditional probability of $p$ given the epistemic state of the speaker (that is, given $\text{Dox}_{A,c}$).

\[(87)\quad C_{A,c}(p) = \frac{P(p \cap \text{Dox}_{A,c})}{P(\text{Dox}_{A,c})}\]

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.\(^\text{23}\)

\[(88)\quad \text{From Davis et al. (2007, p. 7)}\]

a. $C_{A,c}(p) = 1$ \quad A fully believes $p$.

b. $C_{A,c}(p) = 0.5$ \quad A is unbiased about $p$.

c. $C_{A,c}(p) = 0.98$ \quad A strongly suspects $p$.

d. $C_{A,c}(p) = 0$ \quad A disbelieves $p$.

As we just mentioned, a speaker is biased towards 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:

\[(89)\quad \text{PROJECTIVE tier: FORCE OPERATOR}(\phi) \land p \rightarrow \text{UNFORTUNATE}(p),\] where $p$ is such that $C_{sp,c}(p(w')) > 0.5$.

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 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 manifestedly 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) a. 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 noone in the living room, other than Betty. She asks:

\[ \#\text{Que ja ha hagut de marxar la Maria o no?} \]
\[ \text{QM already has had to leave the Mary or not?} \]
\[ \text{‘Did Mary have to leave or not?’} \]

(91) a. \[ \#\text{Que ha perdut el tren, per desgràcia, en Joan o no?} \]
\[ \text{QM has lost the train, unfortunately, the Joan or not?} \]
\[ \text{Catalan} \]

b. \[ \#\¿Ha perdido el tren, por desgracia, Juan o no? \]
\[ \text{has lost the train, unfortunately, Juan or not?} \]
\[ \text{Spanish} \]
\[ \text{‘Did John miss his train or not? + unfortunately.’} \]

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 towards 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 either be polarity items, such as \( no \), \( oi \) (‘isn’t it’), or a noun, such as \( veritat \) (‘truth’) or a particle, such as \( eh \) (‘huh’) (Prieto and Rigau, 2007; Hernanz and Rigau, 2006).

(92) a. \[ \text{Oi que la Maria ha vingut, per desgràcia?} \]
\[ \text{CQM QM the Maria has come, unfortunately?} \]
b. Eh que la Maria ha vingut, per desgràcia?
   CQM QM the Maria has come, unfortunately?
   ‘Isn’t it true that Maria came? + If Maria came, this is unfortunate.’

(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 towards 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: QUESTION \( (Q(p)) \land p \rightarrow \text{UNFORTUNATE}(p) \), where \( p = \text{‘Maria came’ and } C_{sp,c}(p) > 0.5. \)

In (94) we show the semantic composition of this example. Note that 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).

\[
Q(p) \bullet \text{QUESTION } (Q(p)) \land [\text{per desgràcia}](\text{came(m)})
\]

\[
\text{per desgràcia} \quad \text{CP}
\]

\[
Q(p) = \{\text{Maria came, Maria didn’t come}\} \bullet \text{came(m)}
\]

(94)

Since all EAs in Catalan and Spanish are non-integrated, they can take scope over the whole sentence,
even if negation precedes them. Recall that, in French, integrated adverbs 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 only be acceptable
if the speaker is biased towards \( \neg p \) and, thus, we 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?
   CQM QM the Maria not has come, unfortunately?

   b. Eh que la Maria no ha vingut, per desgràcia?
   CQM QM the Maria not has come, unfortunately?
   ‘Isn’t it true that Maria didn’t come? + If Maria didn’t come, this is unfortunate.’
(96) shows the denotation of the two tiers of meaning of (95): the \textit{at issue} tier contains the plain question denotation, and the \textit{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?

\begin{enumerate}
\item \textbf{at issue tier:} \(Q(p) = \{\text{Maria came, Maria did not come}\}\)
\item \textbf{projective tier:} \(\text{QUESTION}(Q(p)) \land \neg p \rightarrow \text{UNFORTUNATE}(\neg p)\), where \(p = \text{‘Maria came’}\) and \(C_{sp,c}(\neg p) > 0.5\).
\end{enumerate}

\textbf{Antiexpectational questions:} Consider again example (81), repeated below.

(97) a. 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:

\begin{enumerate}
\item Ostres, que ja ha hagut de marxar, per desgràcia, la Maria?
\end{enumerate}

‘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 (97-b), it conveys that if Maria had to leave, it is unfortunate that she had to leave.

The difference between the question in (78) and the question in (97) is that, in the former, the speaker is not biased towards 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.

\textbf{Biased negative questions:} As in French, biased negative questions provide a good set of data with which to test our analysis. As mentioned before, in Catalan and Spanish, EAs are prosodically
non-integrated 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, therefore, we 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 \( p \), and 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)  a. Scenario: You are waiting at the train station for Peter and Maria to arrive. When the train comes, only Peter gets off.
   b. 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 “that 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) \[
\text{PROJECTIVE tier: QUESTION} \left( Q(\text{VERUM}(\neg p)) \right) \land \neg p \rightarrow \text{UNFORTUNATE}(\neg p), \text{ where } p = \text{‘Maria came’ and } C_{sp,c}(\neg p) > 0.5.
\]

By contrast, in a PI-question, there is no change in the speaker’s epistemic state: the speaker believed \( p \) and is still biased towards \( p \) at the moment of utterance. As a consequence, \( p \) is the outstanding proposition and the proposition that will serve as argument to the EA. (100) illustrates a PI-question: the speaker, 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 that 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 “that 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)):

\[
(101) \text{PROJECTIVE tier: question } (Q(\neg(\text{VERUM}))) \land p \rightarrow \text{UNFORTUNATE}(p),
\]

where \( p = ‘\text{Maria came}’ \) and \( C_{sp,c}(p) \succ 0.5 \).

Exam questions: Exam questions are the ones 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 the example in (102).

\[
(102) \quad \begin{align*}
\text{a. Scenario: the speaker is the quizmaster of “Who wants to be a millionaire?”} \\
\text{b. Quin corredor català va perdre, per desgràcia, la final dels 100 metres de Barcelona 92?} \\
‘Which Catalan athlete lost the 100 meters final in Barcelona’s 1992 games? + If the Catalan athlete lost the final, this is unfortunate.’
\end{align*}
\]

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.

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

(104) shows the content of the PROJECTIVE tier of an exam question. On the one hand, the force operator takes the \textit{wh}-clause, and on the other hand, there is an outstanding proposition \( p \), the true answer to the question, to which the EA applies.

\[
(104) \quad \text{PROJECTIVE tier: question } (\pi) \land p \rightarrow \text{UNFORTUNATE}(p),
\]

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 non-integrated, 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 only be acceptable if there is a proposition towards 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 paper 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. Cross-linguistically, 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 EA’s appearance is constrained in two ways: first, since EAs can only be prosodically non-integrated 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 only be acceptable 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 towards 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 as 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 that a projective item modifies non-at-issue content. Can we find other cases in which such composition between two non-at-issue contents is necessary?
Second, BG 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 ¬p, at the *projective* tier we mean that p → 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 hand, are tightly linked to their prosody and syntax. Based on this proposal, one could try to extend it and speculate on a stronger cross-linguistic hypothesis, shown in (105).

\[(105)\]  
Strong hypothesis of EAs’s prosody-syntax relationship:

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

We have admittedly considered data from a small amount 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 cross-linguistically:

- 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 cross-linguistically. 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.

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 calls into question the difference between grammaticality, acceptability and felicity. The data that we have put together in this paper is not easy to classify in the domain of ill-formedness. Native speakers do not have strong feelings regarding how (un)natural these sentences are. Pinning down the exact scope of these terms is a worthwhile project for future research.
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Notes

1 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.

2 The following abbreviations are used in the glosses: QM (Question Marker), CQM (Confirmation Question Marker), and CL (verb clitic). Unless otherwise noted, the examples are ours and correspond to our native speaker intuitions.

3 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.

4 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 reviewer points out that, in fact, this sentence is marginally acceptable under a metalinguistic interpretation of negation.

6 As pointed out to us by Lisa Matthewson (p.c.), since “unfortunately” can be taken to mean “unfortunately, according to me”, (106) is a better example of denial (also unacceptable as (14)).

(106) C’est faux, tu trouves que c’est une très bonne nouvelle.

‘That’s not true, you think it is very good news.’

7 This is the classical context of a presupposition filter, in which a presupposition in the consequent of a conditional projects unless it also appears in the antecedent, as in (107) (Karttunen, 1973).

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

8 For a previous polarity account of EAs see Nilsen (2004).

9 Recall that in BG, p is asserted and p → ADJ(p) is an ancillary commitment. Both meanings are entailments and, thus, the speaker is committed to them.

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

11 The need for this unselective binder, which we take from BG, is justified when we deal with
wh-interrogatives that include an EA.

\textsuperscript{12}For instance, the dialog in (108) would be infelicitous.

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

\textsuperscript{13}Other works that assume the presence of a $Q$ operator in polar questions include Romero and Han (2004), where $Q$ has the semantics in (109):

\begin{equation}
\llbracket Q \rrbracket = \lambda p \llbracket s, t \rrbracket \lambda w \llbracket s \rrbracket \lambda q \llbracket s, t \rrbracket [q = p \lor q = \neg p]
\end{equation}

\textsuperscript{14}When the negative operator does not affect the proposition directly but it affects a null sentential operator, then the polarity of the proposition remains positive. This is going to be relevant in section 3.5.2 when we discuss cases where the \textsc{verum} operator plays a role.

\textsuperscript{15}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.

\textsuperscript{16}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.

\textsuperscript{17}BG note that universal closure alone is not going to be able to explain sentences such as (110), where the information in the restrictor of the \textit{wh}-expression, should also be in the restriction of the universal quantifier:

(110) \textsuperscript{BG (page 284, fn 8)}

a. Quels étudiants sont bizarrement arrivés à l’heure?
   ‘Which students oddly arrived on time?’
   b. $\forall x[[\text{student}(x) \land \text{arrive-on-time}(x)] \rightarrow \text{odd}((\text{arrive-on-time}(x))]$
   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 (110-c) instead of the desirable (110-b). We refer the reader to BG for a syntactic fix to this problem.

\textsuperscript{18}$\ Ep_k(x)(w)$ is the set of worlds that conform to $x$’s knowledge in $w$, $\ Conv_k(w')$ is the set of worlds where all the conversational goals of $x$ in $w'$ are fulfilled, and $CG_{w'}$ is the Common Ground.

\textsuperscript{19}It may very well be that the \textsc{verum} operator actually operates at the \textsc{projective} tier and not at the \textsc{at issue} tier (see Gutzmann and Castroviejo (2011) for a proposal along these lines). This issue is
beyond the scope of this paper, so we stick to Romero and Han’s (2004) original proposal for the at-issue denotation of negative biased questions.

20EAs are also acceptable in *wh*-questions such as the one in (111). In these cases, the EA is not modifying a proposition in the question denotation, but an embedded proposition. We thank an anonymous reviewer for pointing this out.

(111)  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.’

21This 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.

22The adverb in brackets is our addition.

23The notion of bias that we need could also be captured in a Hintikka (1969) style semantics in the following way:

(112) a. \( \forall w' \) compatible with A’s beliefs in \( w \): \( p(w') = 1 \) \quad A fully believes \( p \).

b. \( |\{ w' \) compatible with A’s beliefs in \( w \mid p(w') = 1 \}| = |\{ w'' \) not compatible with A’s beliefs in \( w \mid p(w'') = 1 \}| \) \quad A is unbiased about \( p \).

c. MOST \( w' \) compatible with A’s beliefs in \( w \): \( p(w') = 1 \) \quad A is biased about \( p \).

24We thank an anonymous reviewer for suggesting these broader implications.
<table>
<thead>
<tr>
<th>Type of question</th>
<th>Speaker’s beliefs</th>
<th>Double check</th>
<th>Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI-question</td>
<td>speaker believes that $p$</td>
<td>double-check $p$</td>
<td>$\checkmark$</td>
</tr>
<tr>
<td>NI-question</td>
<td>speaker believes that $\neg p$</td>
<td>double-check $\neg p$</td>
<td>$#$</td>
</tr>
</tbody>
</table>

Table 1: Malheureusement in negative polar questions

<table>
<thead>
<tr>
<th>Mean normalized rating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biased</td>
<td>0.15</td>
</tr>
<tr>
<td>Not-biased</td>
<td>-0.15</td>
</tr>
</tbody>
</table>

Table 2: Results By Condition

<table>
<thead>
<tr>
<th>Item</th>
<th>Cond</th>
<th>Mean normalized rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biased</td>
<td>-0.10</td>
</tr>
<tr>
<td>1</td>
<td>Not-biased</td>
<td>-0.24</td>
</tr>
<tr>
<td>2</td>
<td>Biased</td>
<td>0.52</td>
</tr>
<tr>
<td>2</td>
<td>Not-biased</td>
<td>0.14</td>
</tr>
<tr>
<td>3</td>
<td>Biased</td>
<td>0.20</td>
</tr>
<tr>
<td>3</td>
<td>Not-biased</td>
<td>0.16</td>
</tr>
<tr>
<td>4</td>
<td>Biased</td>
<td>-0.02</td>
</tr>
<tr>
<td>4</td>
<td>Not-biased</td>
<td>-0.66</td>
</tr>
</tbody>
</table>

Table 3: Results By Item and Condition
Appendix

List of experimental items:

(113) 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 Cafe 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 8am, 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 Cafe 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 your brother found a job + If your brother found a job, this is fortunate.’

(114) 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 más 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 más 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?
Has Isabel had to leave already? + If Isabel had to leave, this is unfortunate.'

(115) 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 add, she has to convince us that her new product to repair leaks is infallible. She starts her add 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?
Do you have leaks in your apartment + If you have leaks in your apartment, this is unfortunate.'