

# How to cancel an implicature

---

## Abstract

Cancelability is one of the main tests to identify conversational implicature in general, and scalar implicatures in particular. Despite this fact, cancelability itself is a phenomenon rarely looked at. This paper presents an account of when the cancellation of a scalar implicature is an acceptable discourse move and provides experimental evidence to support our proposal. Our main claim is that the felicity of a scalar implicature cancellation depends on the discourse structure. More specifically, cancellation is acceptable only if it addresses a Question Under Discussion that differs from the previous one. As will be shown, this proposal has the additional benefit of permitting us to tease apart cancellations from self-repairs.

*Keywords:* Conversational Implicatures, Scalar Implicatures, Cancellation, Question Under Discussion, Projective Meaning, Experimental pragmatics

---

## 1. Introduction

This paper is concerned with the phenomenon of *scalar implicature cancellation*, an example of which can be seen in (1).

(1) John passed some of his exams. In fact, he passed all of them.

In Grice's (1989) terms, by using *some* in the first sentence of (1), the speaker is implying *not most* and *not all*, because if he were able to utter

something stronger (i.e., if he believed that John passed most or all of his exams), he would have done so. We can thus reason that the stronger statements do not hold. This intended meaning, however, is not an entailment, it's something weaker: a conversational implicature.

Horn (1972) provides an analysis of a particular type of implicatures, namely those that arise from the Maxim of Quality and involve scales, which we will refer to as *scalar implicatures* (henceforth SIs) throughout this paper. (1) showed an example of a SI. According to Horn, quantifiers such as *some* evoke a scale of the sort  $\langle \text{all, most, many, some} \rangle$ , where – in upward entailing contexts – each item entails the items to their right and conversationally implicates the negation of the ones to their left. That is, while *all* entails *most*, *most* conversationally implicates *not all*. The latter is treated as a conversational implicature because (among other things) it can be canceled via a sentence introduced by *in fact*, as shown in the second sentence in (1).<sup>1</sup> Precisely, cancellation is taken to be as one of the defining properties of implicatures. In Grice's words:

“[...] a putative conversational implicature that *p* is explicitly cancelable if, to the form of words the utterance of which putatively implicates that *p*, it is admissible to add *but not p*, or *I do not mean to imply that p*, and it is contextually cancelable if one can find situations in which the utterance of the form of

---

<sup>1</sup>In this paper we are concerned with the phenomenon of cancellation, and we will ignore the debate between conventionalists and globalists regarding the pragmatic or syntactic/semantic nature of the exact reading of scalar expressions. We refer the interested reader to Geurts (2011§7.2 and 7.3), Chierchia et al. (2012) and references therein.

words would simply not carry the implicature” (Grice, 1989, p. 44).

And he goes on to saying: “I think that all conversational implicatures are cancelable” (Grice, 1989, p. 44).

Although cancellation has been widely used as a test to identify implicatures, it has been hardly studied in itself. It is, nevertheless, an interesting phenomenon as such, which can help us understand the nature of conversational implicature. Moreover, it is far from being an unconstrained process.

A first contrast that strikes us as surprising is that while in (2-a), repeated from above, the cancellation is possible, the minimal change in (2-b) renders the cancellation highly infelicitous. Given that, as shown by Grice’s quote above, conversational implicatures are usually regarded as constituting a very weak meaning, highly dependent on contextual factors, why should they resist cancellation in some cases?

- (2) a. John passed some of his exams. In fact, he passed all of them.  
b. #John passed some of his exams. In fact, it’s amazing he passed all of them.

What changes in (2-b) is that the intended cancellation is embedded under an emotive factive predicate (i.e., a verb that presupposes the truth of its sentential complement), so the question arises: Why isn’t it possible to cancel a conversational implicature with a presupposition?

A second contrast has to do with the *raison d’être* of cancellations. Why do they exist at all if, within the Gricean program, they should be viewed as uncooperative? That is, how can we make sense of a discourse where

the same speaker first utters a weaker statement and, immediately after, a stronger one? Why didn't he utter the stronger statement to begin with?

Related to this, (3) shows that not only presuppositions are bad cancelers; even assertions exhibit restrictions on implicature cancellation. The following attempt at canceling the conversational implicature has the flavor of a contradiction or a correction.

- (3) A: How many exams did John pass?  
B: #Some. In fact, he passed all of them.

Even though the *not all* implicature was cancelable in (2-a), once we take into account the broader picture of dialog, cancellations pose constraints that need to be studied.

Our research questions in this paper are the following:

1. When is it possible to cancel a SI?
2. How do contents at different levels of meaning (i.e., at-issue vs. projective) interact with each other?

The first goal we attempt to accomplish here is to explain the constraints SI cancellation is subject to and why it is constrained at all. Secondly, we aim to provide experimental evidence of such constraints.

This paper is organized as follows: in the remaining subsections of the introduction, we go over the relevant data in detail and discuss previous work; in section 2 we spell out the main contribution of this paper, namely the QUD constraint on canceling, and in sections 3 and 4 we provide experimental support for this constraint. Section 5 concludes with further discussion and

a summary.

### 1.1. Data

Examples such as the ones in (4) illustrate the fact that SIs can be canceled by a subsequent assertion:

- (4)
- a. At the party I met a pretty tall boy. In fact, he was extremely tall.
  - b. Some of the students came to the party. In fact, I believe all of them came.
  - c. Yeah, I admit I do find Putin quite interesting. In fact very interesting.

By contrast, non-assertions cannot cancel, as shown in (5).

- (5)
- a. #That pretty tall boy I met, who in fact was extremely tall, took a trip to Venice.
  - b. #Some of my students came to the party. In fact, I regret that all of them came.

Example (5-a) includes an attempt of cancellation within a non-restrictive relative clause, which we treat as contributing a Conventional Implicature (CI), following Potts (2005). In (5-b), similar to (2-b), the attempt of cancellation is embedded under an emotive factive, so the content is a presupposition.

Besides presuppositions and CIs, cancellations made with assertions might make infelicitous dialogs, as was mentioned above when discussing examples (3). Consider (6) and (7).

- (6) A: How many cars do you have?  
B: #Two. In fact, I have three.
- (7) A: How many exams did John pass?  
B: #He passed some of his exams. In fact, he passed them all.

In these examples, assertions that are meant to answer the question posed by A sound uncooperative. We only make sense out of them under the assumption that they constitute a correction or an after-thought.

### *1.2. Previous work*

Before providing the details of our proposal, we need to make a few assumptions and mention the previous related work on the topic.

To begin with, we assume a typology of meanings that includes at-issue content, projective meaning, and conversational implicatures:

- At-issue content (Potts, 2005) is the descriptive meaning contributed by an assertion, the one that can be directly denied because it is truth-conditional.
- Projective meaning (Simons et al., 2010) is called like this because it survives as an utterance implication even when the utterance occurs under the syntactic scope of an entailment-canceling operator. Projective meaning does not address the current Question Under Discussion (QUD)<sup>2</sup> (Roberts, 1996), and it comprises both presuppositions (understood as preconditions on the successful update of the context) as

---

<sup>2</sup>See section 2.1 for a more detailed explanation of this concept.

well as CIs (which, unlike presuppositions, are not backgrounded and which convey a side-comment by the speaker).

- Conversational implicatures are at-issue strengtheners, in the sense that, unlike projective meaning, they can address the QUD, and they do so by making the proffered meaning more informative. This is clearly so with SIs, which are the class of conversational implicatures that we use as object of study in this article.

Moving on to the literature on implicature cancellation, we find Gazdar (1979)'s seminal work on the interaction between types of meaning. Gazdar claims that conversational implicatures are added to the meaning computation before presuppositions, the result being that only presuppositions compatible with the existing conversational implicatures survive. The ones that are not compatible, get suspended. This is intended to account for sentences such as (8).

(8) If John is married, his wife is on holidays.

In this sentence, the if-clause is supposed to trigger the conversational implicature that the speaker doesn't know if John is married. But if we look at the consequent of the conditional, it presupposes that John has a wife. This presupposition is suspended at the level of the complex construction (Karttunen, 1973). Since Gazdar argues that conversational implicatures enter the computation before presuppositions, this should explain why the presupposition doesn't project: not knowing if John is married and presupposing that he is is incompatible.

Gazdar’s account is problematic in at least two respects; first, it does not account for the behavior of CIs, which pattern with presuppositions as far as cancellation is concerned. Second, as pointed out by Beaver (2001), it is counter-intuitive that presuppositions be the last things added to the computation, since they are usually thought as preconditions for utterance interpretation. After all, this ordering is stipulated, and we would rather have a principled account of the interactions between conversational implicatures and projective meaning. Moreover, the cases Gazdar aims to account for are not the same as we do. Note that we do not discuss examples where the output is presupposition suspension, but rather instances where the interaction between presuppositions and conversational implicatures yields a marked discourse because of an infelicitous cancellation.

Matsumoto’s (1997) work is quite relevant to the topic of this paper. While he is mainly concerned with the properties of different sorts of scales and with a variety of canceling connectors, he has some discussion about the appropriateness of cancellations. On the one hand, he claims that it is “uncooperative” to make a statement followed by a stronger version of this statement, given that the former implicates that the speaker does not believe that (or know if) the latter holds. That is, as we mentioned above, it doesn’t seem reasonable to make a statement that you will subsequently make stronger. It would make more sense to proffer the stronger claim to begin with. But then he goes on to saying that there are occasions in which such structure is appropriate, as in (9).

- (9) A: Did Aaron hit *forty* home runs last year?  
B: Of course, he hit *forty*, in fact he hit *forty-two*.



In our proposal, we elaborate on the properties of contexts like (9) and present an account that derives the interactions between levels of meaning that we have illustrated in this section. In §5.2 we discuss the works by Kuppevelt (1996); Van Rooij and Schulz (2004) and Zondervan (2007), which represent a competing theory to the one we put forth in this paper.

## 2. Proposal

The main claim that we will argue for in this article is that canceling requires addressing a new question under discussion (QUD henceforth). As we will see, this has two important consequences. First, only at-issue meaning (but not projective meaning) can be a meaning canceler. Second, cancellations are restricted to contexts where adding a new QUD is the right discourse move.

### 2.1. *The QUD constraint on focus*

Throughout this paper we assume, along with Roberts (1996, 2004), a model of discourse that cashes out the interlocutor's intentions based on the notion of Question Under Discussion. Roughly, a QUD is the discourse topic at a certain moment in discourse. Questions get stacked as a partially ordered set, the one on the top being the one that is currently being discussed. We assume for convenience that before a conversation takes place, the set of QUDs is empty, and when a speaker starts a conversation, a first QUD is added to the stack. Questions are manifestations of the interlocutor's goals and intentions. Interlocutors can have in mind a very general question (e.g., how do I find my way to school?), but as a strategy, other subquestions

(entailed by the big one) can be asked first (e.g., is there a metro I can take?). Hence, we have a set of related questions in a stack. Once the top question gets resolved, it disappears from the set of QUDs. This way, “the goal of discourse is to conduct inquiry by answering the QUDs.” (Roberts, 2004, p. 208)

Roberts (1996) establishes a direct link between the focus of a sentence and the discourse topic viewed as the QUD. In particular, she argues that any utterance B has the presupposition that its focus semantic value corresponds to the last QUD the utterance is addressing. Kadmon (2001) expresses this idea under the name of *The Question-Under-Discussion constraint on Focus* (cf. (10)):

- (10) The Question-Under-Discussion constraint on Focus  
(Kadmon (2001) based on Roberts (1996))

An utterance B whose logical translation is of the form  $\beta$  or  $?\beta$ , where  $\beta$  is a formula, is felicitous only if  $\llbracket \beta \rrbracket^f = \text{last}(\text{QUD}[\llbracket B \rrbracket^o])$ .

If we implement this constraint into particular examples, the result is very intuitive. In (11-a) the focus is on the subject *I*. This means that its focus semantic value is of the form  $\{p: p = \lambda w. \exists x[x \text{ has two cars in } w]\}$ . Note that this corresponds to the denotation of the question in (11-b).

- (11) a.  $[I_F]$  have two cars.  
b. QUD: Who has two cars?

Likewise, in (12-a), prosody indicates that the focus is on the entire direct object. From the QUD constraint on Focus, it follows that the last QUD is

the set of propositions of the shape  $\{p: p = \lambda w. \exists x[\text{you have } x \text{ in } w]\}$ , which is what (12-b) denotes. And the same goes for (13-a) and (13-b), where the focused element is not the entire direct object but just the numeral.

- (12) a. I have [two cars<sub>F</sub>].  
 b. QUD: What do you have?
- (13) a. I have [two<sub>F</sub>] cars.  
 b. QUD: How many cars do you have?

## 2.2. The QUD constraint on canceling

Equipped with this assumption that relates the focus of the sentence and the structure of discourse, we are able to move forward and define an SI cancellation introduced by *in fact*: it consists in a context update of  $c + q$  ( $c$  being the context and  $q$ , the most embedded proposition that contains the scalar item), where  $q$  entails the previous proposition  $p$  ( $q \subseteq p$ ), but not the SIs of the utterance of  $p$  ( $q \not\subseteq \text{SI}(p)$ ).

Additionally, we argue that cancellations are compliant with the following constraint, which we have named *The QUD Constraint on Canceling*:

- (14) The QUD Constraint on Canceling  
 The operation of canceling presupposes a QUD  $?q$ , such that QUD  $?q \neq \text{last}(\text{QUD})$ .

In what follows, we elaborate on both the definition and the constraint by implementing this piece of theory onto particular examples.

### 2.3. *At-issue cancellations*

We start out by looking at asserted meaning and, thus, figuring out when an assertion can be a good canceler. Essentially, our theory should be able to explain why (15-c) is a felicitous cancellation.

- (15)    a. Who has two cars?  
          b. [ $I_F$ ] have two cars.  
          c. In fact, I have [ $three_F$ ].

From the QUD Constraint on Focus, we can predict that the QUD that (15-b) is addressing is effectively (15-a) (i.e., its semantic focus value corresponds to the set of propositions such that  $x$  has two cars). The *in fact* clause in (15-c) is the felicitous cancellation of (15-b).

As proposed in the definition above, the cancellation entails the previous assertion, since having three cars logically implies also having two. However, it does not entail the SI of the previous assertion. In this case, the SI of (15-b) would be its stronger meaning, that is, its exact meaning.<sup>3</sup> In other words, having exactly three cars does not entail having exactly two.

---

<sup>3</sup>It is a matter of debate what is the proper analysis of numerals. The classic analysis put forward in Horn (1972) proposes that a numeral  $x$  entails ‘at least  $x$ ’ and implicates ‘exactly  $x$ ’. This approach runs into trouble for predicative uses of numerals, such as ‘These are five cows’, in which the “exactly five” reading cannot be canceled. Many analyses have been proposed to capture these facts (we refer the reader to Geurts (2006) and Breheny (2005) and references therein). In this paper, since we only use numerals non-predicatively, we assume that numerals convey a conversational implicature. See footnote 5 for further comments.

As far as the QUD Constraint on Canceling is concerned, the focal structure of (15-c) indicates that the QUD it is addressing is something along the lines of *How many cars do you have?*. Importantly, this QUD differs from the QUD that (15-b) is addressing. This satisfies the proposed constraint, so the result is a felicitous dialog.

Let us now turn to a case of an infelicitous cancellation, as the example in (16) illustrates.

- (16) a. How many cars do you have?  
b. I have [two<sub>F</sub>] cars.  
c. #In fact, I have [three<sub>F</sub>].

In comparison with the paradigm that (15) illustrates, (16-b) and the cancellation in (16-c) both address the same QUD, namely (16-a). There is no change of QUD and this violates the QUD Constraint on Canceling. Hence, we expect (16-c) to make an infelicitous cancellation, which is borne out. A similar account would also apply to examples (3), (6) and (7).

Admittedly, one might argue that (16-c) is not an unnatural follow-up as long as it is interpreted as an afterthought or a correction of the previous assertion, which is considered to be a mistake. We devote next subsection to discuss this issue.

#### 2.4. *Cancellations vs. self-repairs*

In this subsection we want to draw a difference between cancellations and so-called *self-repairs*. Ginzburg et al. (2007) define a self-repair as a “self-editing process by which the alteration replaces the *reparandum*”. Consider

the examples below:

- (17) I am going to Paris on Tuesday.
- a. I mean, on Thursdsay.
  - b. In fact, on Thursday.

*Tuesday* is the reparandum and *Thursday* is the alteration. Ginzburg et al. (2007) show that self-repair is not a random process, and study what rules it abides to. What matters for our purposes is that it has different properties from cancellations. Most importantly, the self-repairs exemplified in (17) all target at-issue content (not conversationally implicated content, as in cancellations). Certainly, *in fact* in (17-b) is taking back at-issue content and replaces it with new at-issue content. Hence, *in fact* can introduce both a cancellation or a self-repair. However, *I mean* erases only at-issue content, so it can introduce a repair, but not a cancellation. We have tested this contrast experimentally, as will be shown in §4.

### 2.5. Impossible projective meaning cancellations

So far we have made a proposal that can explain when an assertion can make a good canceler. In this subsection we account for projective meaning's inability to introduce a cancellation.

As shown in the examples below, presuppositions and CIs do not address the current QUD. This follows from Simons et al. (2010)'s idea that projective meaning is not relevant to the discourse topic. Not only this, presuppositions and CIs cannot be the target of a question, just like they are not the target of operators (Simons et al., 2010, p. 315).

- (18) A: Who came to the party?  
B: #It's odd that John came.
- (19) A: What do you think about John?  
B: #I just saw that bastard John.

In (18), that John came is a presupposition, because the *that*-clause is the sentential complement of the factive predicate *it's odd*. Although the content of the presupposition is the meaning required by the question that is uttered by A, this is not enough for B to be a felicitous answer, as already pointed out by Grimshaw (1979).

In (19), following Potts (2007) we treat the epithet *bastard* as a so-called *expressive* and, as such, as a CI. Roughly, when using this epithet, the speaker makes the side comment that John is a bastard. But this is a side comment and not the main assertion, as shown by the fact that this meaning cannot be the target of A's question.

Furthermore, observe that presuppositions and CIs cannot raise new QUDs. Consider the dialog in (20).

- (20) A: Who came to the party?  
B: (That bastard) John.

B's reply may or may not contain the epithet *bastard*, but this does not divert the course of conversation, in the sense that the QUD is the same in both cases, the one that is raised by the question uttered by A. Similarly, in (21), the presence of the epithet is not a factor when it comes to figuring out what is the implicit QUD being addressed. The epithet cannot turn the sentence

into presupposing the QUD *What do you think about John?*:

(21) [(That bastard) John came to the party<sub>F</sub>]

Instead, it is the assertion that presupposes the implicit QUD. In this particular example, if we treat the whole sentence as being in focus, the derived QUD would be *What happened?*.

Summarizing, we agree with Simons et al. (2010) that projective meaning is not relevant to the QUD, and hence, cannot address the current QUD or generate a QUD by itself. Thus, projective meaning is not able to change the current QUD. From this, it follows that projective meaning can never satisfy the QUD Constraint on Canceling and, therefore, we can conclude that presuppositions and CIs cannot be used to cancel a SI, as we showed with examples (2b) and (5).

The further question that we want to resolve is *why* projective meaning can't generate a new QUD. Our reasoning goes as follows: first, conversation is a dynamic process where interlocutors make set-up moves (pose questions) and pay-off moves (resolve them) (Roberts, 2004). Second, the at-issue content always addresses a QUD. This has to do with Stalnaker (1978)'s approach to assertions as being moves that are meant to reduce the context set (or equivalently increase the common ground). Simons et al. (2010) cash out this idea by saying that at-issue meaning is relevant to the current QUD; that is, it entails a partial or complete answer to the topmost QUD. Third, projective meaning always runs parallel to the at-issue content. Yet, it piggy-backs on the at-issue meaning, in the sense that the former is triggered when the latter is conveyed. Since conversation proceeds via raising



and addressing one single QUD at a time, the at-issue content will always be the one in charge of that.

In this section, we have presented a proposal of what it takes for an SI cancellation to be a felicitous discourse move. We have offered a unitary account that explains the discourse structure required for a successful cancellation, and which also solves the puzzle of why projective meaning can never cancel SIs. In the next two sections, we present evidence that confirm both our intuitions and the predictions of our proposal. Experiment 1 shows that presuppositions, as opposed to assertions, are bad SI cancelers, while experiment 2 shows that there needs to be a change of QUD for there to be an acceptable SI cancellation.

### **3. Experiment 1: presuppositions vs. at-issue**

The goal of the first experiment is to test whether there are any differences between assertions and presuppositions when they act as SI cancelers, that is, to test the robustness of the contrast presented in (2), which follows from our proposal. The details of the experiment are explained in the following subsections.

#### *3.1. Materials and participants*

The materials consist of 16 items in Catalan (see the complete set in appendix A). Each item is structured as a question-answer pair. The answer has two sentences; the first one contains an SI trigger, while the second cancels the SI and contains the cancellation marker *de fet* ('in fact'). We use four types of scales that trigger conversational implicatures: numeral scales, quantifier scales (<everyone, most people, someone>), modal scales (<sure,

probable, possible>), and geographical scales in superlative constructions (<world, Europe, Italy>).<sup>4</sup>

The items are constructed in two conditions. In condition 1, the cancellation is within an assertion; in condition 2, the cancellation is within a presupposition (triggered by an emotive factive verb, such as *regret* and *it's surprising*). Both conditions comply with the QUD Constraint on Cancellation (that is, there is a change of QUD), since this experiment only wants to test the differences between presuppositions and assertions (the effect of discourse structure is tested in experiment 2).

An example item for each condition is shown in (22) and (23).

(22) Condition 1: At-issue

- a. Qui té tres germans?  
'Who has three brothers?'
- b. El Pere. De fet, en té quatre.  
'Peter. In fact, he has four.'

(23) Condition 2: Presupposition

- a. Qui té tres germans?  
'Who has three brothers?'
- b. El Pere. De fet, em sorprèn que en tingui quatre.  
'Peter. In fact, I'm surprised he has four.'

---

<sup>4</sup>For instance, the sentence 'Teide is the highest mountain in Spain' may implicate that it is not the highest mountain in Europe or in the world. We address the interested reader to Heim (1999) for an account of superlatives.

The conditions for each item set were counterbalanced and incorporated into a questionnaire experiment together with 48 filler items, 16 items for experiment 2 and 4 practice items (similar to the experimental items). The target items were combined with the 48 fillers, such that all target items were separated by at least one filler. Two counterbalanced lists were constructed, so that each participant would only see each item in one of the conditions, and each list was also reversed to control for trial order.

Forty Catalan speakers participated in this experiment.

### *3.2. Procedure*

We have used the technique of magnitude estimation. This technique was originally used to measure judgments of sensory stimuli (brightness, loudness, etc.) and since the mid-nineties it has been successfully applied to elicit grammaticality and acceptability judgments (Bard et al., 1996; Sorace and Keller, 2005). Participants are presented with several linguistic items and are asked to assign a numerical value to each item proportional to its perceived acceptability.

The experiment was administered through the web using WebExp (Keller et al., 2009). 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. The reference line was given a rating of 100 and participants were asked to assign a number to the other 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 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 reference discourse, given in (24), which is acceptable given the context and had a fixed rating of 100. Participants were asked to provide comparative judgments: if they felt that the target discourse was twice as good as the reference discourse, 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. In addition, after some of the items, participants had to answer a comprehension question.

- (24) a. Què has comprat per berenar?  
‘What did you buy for the evening snack?’
- b. Deu brioixos i set ensaimades. Serem força colla.  
‘Ten bagels and seven Danish pastries. We’re expecting quite a turnout.’

After the experiment, participants were asked to answer a feedback question about what they thought the experiment was about. The great majority of the participants did not show any awareness of the goal of the experiment.

One of the advantage of this technique is that, since participants are free to use any positive number they wish, no fixed scale is imposed on them and linguistic acceptability is treated as a continuum. As a result, participants are able to produce judgments which distinguish all and only the differences they perceive. This avoids one of the problems of fixed scale ratings, which is

that if the scale is too small they may fail to distinguish genuine differences, and if the scale is too big they may generate spurious differences.

### *3.3. Predictions*

If presuppositions, unlike assertions, cannot cancel an SI, as follows from the QUD Constraint on Cancellation, Condition 1 (At-issue) should receive higher ratings than Condition 2 (presuppositions).

### *3.4. 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. A  $z$ -score is achieved by taking each rating and subtracting the mean of the sample and then dividing it by its standard deviation, so that the mean of the whole sample is 0 and its standard deviation is 1. Thus, each rating indicates how many standard deviations it is above or below the mean; if the number is positive the rating is above the mean, if it is negative it is below the mean.

In order to give some intuition of the range of transformed ratings, let us give some descriptive data of the transformed sample. Any item which received a rating of 100 (the same as our reference item) received a transformed rating of 0.69. The maximum value of the sample was 2.11, while the minimum was -2.16. The mean normalized ratings assigned to each condition can be seen in Table 1.

As can be seen both from Table 1, cancellations carried out by assertions get better ratings than cancellations carried out by presuppositions. To test the statistical significance of these patterns, a  $t$ -test was performed. The

	Mean normalized rating
1. At-issue	0.36
2. presupposition	-0.36

Table 1: Results By Condition

effect of type of canceler (assertion vs. presupposition) is significant ( $t_1(78) = 5.81$ ,  $p < 0.001$ ;  $t_2(30) = 5.41$ ,  $p < 0.001$ ).<sup>5</sup>

Experiment 1, thus, confirms that the contrast in (2) is a robust one. While assertions can cancel an SI, presuppositions cannot. In section 2 we proposed an explanation of such a contrast: the QUD Constraint on Cancellation requires that there be a change of QUD. Since presuppositions do not address the current QUD and cannot generate a new one, they cannot change it either and, therefore, the constraint will never be satisfied. The next experiment tests the constraint by using only assertions as meaning cancelers while manipulating the QUD structure.

#### 4. Experiment 2: QUD structure

The goal of the experiment 2 is to test whether discourse structure affects SI cancellation: that is, whether it is really the case that there needs to be a

---

<sup>5</sup>If the items that contain numerals are excluded (see the discussion in footnote 2), there is still a significant difference in the ratings for assertions (mean=0.33) and presuppositions (mean=-0.32) conditions ( $t_1(78) = 5.19$ ,  $p < 0.001$ ;  $t_2(28) = 3.51$ ,  $p < 0.005$ ). Therefore, the same basic contrast is obtained regardless of whether we consider items with numerals or not.

change of QUD in order for a felicitous SI cancellation to obtain.

In addition, the experiment is also aimed at testing whether it is possible to distinguish cancellations from self-repairs (recall the discussion in 2.4). In order to do that, we use both the connector *de fet* ('in fact'), which can be used to introduce both cancellations and self-repairs, and the connector *vull dir* ('I mean'), which can only introduce self-repairs.

#### 4.1. Materials and participants

The materials consist of 16 items in Catalan (see the complete set in appendix B). The structure of the items is similar to the items in experiment 1: all items consist of a question and an answer, which contains an SI cancellation. In conditions 1 and 3, there is no change of QUD, while in conditions 2 and 4, there is a change of QUD. In conditions 1 and 2, the connector is *de fet* ('in fact'), so they can be interpreted as an SI cancellation, while in conditions 3 and 4 the connector is *vull dir* ('I mean'), so they must be interpreted as a self-repair.

(25) Condition 1: QUD change + *de fet*

- a. Qui té dos fills?  
'Who has two children?'
- b. La Maria. De fet, en té tres.  
'Maria. In fact, she has three.'

(26) Condition 2: No QUD change + *de fet*

- a. Quants fills té la Maria?  
'How many children does Mary have?'

- b. Dos. De fet, en té tres.  
‘Two. In fact, she has three.’
- (27) Condition 3: QUD change + *vull dir*
- a. Qui té dos fills?  
‘Who has two children?’
  - b. La Maria. Vull dir, en té tres.  
‘Maria. I mean, she has three.’
- (28) Condition 4: No QUD change + *vull dir*
- a. Quants fills té la Maria?  
‘How many children does Mary have?’
  - b. Dos. Vull dir, en té tres.  
‘Two. I mean, she has three.’

As we did for experiment 1, the conditions for each item set were counterbalanced and incorporated into a questionnaire experiment together with 48 filler items, 16 items for experiment 1 and 4 practice items (similar to the experimental items). Four counterbalanced lists were constructed, so that each participant would only see each item in one of the conditions, and each list was also reversed to control for trial order.

Forty Catalan speakers, who also took part in experiment 1, participated in this experiment. The procedure was the same explained for experiment 1.

#### 4.2. Predictions

We make the following three predictions:

1. If SI cancellation is subject to the QUD Constraint on Cancellation,



Condition 1 (change + *de fet*) should receive better ratings than Condition 2 (no change + *de fet*). This is the main prediction we make, since it is the one that directly follows from the proposal presented in section 2.

2. Our items contain both self-repairs and SI cancellation. If repairs are more marked than SI cancellations, Condition 1 (change + *de fet*) should receive better ratings than Conditions 3 and 4 (no change + *vull dir*). This is a plausible prediction because a self-repair involves a speaker making a mistake and taking back asserted meaning. Therefore, it is likely that it is a more marked discourse move than a cancellation, in which the speaker is merely canceling a potential inference.
3. If repairs always address the current QUD, Condition 4 (no change + *vull dir*) should receive better ratings than Condition 3 (change + *vull dir*). This prediction entertains the possibility that cancellation and self-repairs are mirror images of each other, as far as the QUD is concerned. If this is so, a self-repair would be preferred when there is no change of QUD, but just a correction of the previous answer to the same QUD.

To summarize, we would expect the order shown in (29). Condition 1, with an SI cancellation that complies with the QUD Constraint on Cancellation, should receive higher ratings. Next should come Condition 4, with a repair which does not change the QUD. Finally, the SI cancellation and the repair which appear in their disfavored context (no QUD change and QUD change, respectively) should come last and receive equally low ratings.

(29) Condition 1 > Condition 4 > Condition 2, Condition 3

### 4.3. Results

The ratings obtained were normalized, as we did for experiment 1, by taking the log of the item rating by the reference rating (i.e., 100) and then transforming it to a  $z$ -score (the log minus the mean of the sample divided by the standard deviation).

Again let us give some descriptive data of the transformed sample. Any item which received a rating of 100 (the same as our reference item), received a transformed rating of 0.65. The maximum value of the sample was 2.21, while the minimum was -2.46. The mean normalized ratings assigned to each condition can be seen in Table 2.

	Mean normalized rating
1. Change + <i>de fet</i>	0.42
2. No Change + <i>de fet</i>	-0.25
3. Change + <i>vull dir</i>	-0.03
4. No Change + <i>vull dir</i>	-0.13

Table 2: Results By Condition

An ANOVA analysis gives that the two factors are significant both by items and subjects. QUD Change is significant ( $F(1,39) = 30.90$ ,  $p < 0.001$ ;  $F(1,15)=14.3$ ,  $p < 0.01$ ), and Connector is significant ( $F(1,39) = 3.94$ ,  $p = 0.05$ ;  $F(1,15)= 5.10$ ,  $p < 0.05$ ). In addition, the interaction between QUD Change and Connector is also significant ( $F(1,39) = 31.21$ ,  $p < 0.001$ ;  $F(1,15) = 7.73$ ,  $p < 0.01$ ). The fact that QUD Change and Connector

interacts means that the impact of QUD Change to the ratings depends on which connector was present in the item.

The results show that our first two predictions are borne out. SI cancellations with QUD change (Condition 1) get better ratings than SI cancellations without QUD change (Condition 2), supporting the QUD Constraint on Cancellation. Also, Condition 1 is the best rated of the four conditions. That is, felicitous cancellations of Condition 1 get better ratings than repairs (Conditions 3 and 4). This confirms that repairs are more marked than cancellations. In contrast, our last prediction is not borne out: Condition 4 does not get better ratings than Condition 3. In fact, a post-hoc t-test to the two repair conditions (Condition 3 and 4) show that they are not significantly different (p-value = 0.39). Therefore our results indicate that repair does not care about whether there is QUD change or not, while SI cancellation does.

Since our main goal is to account for SI cancellation, it is outside the scope of this paper to give an account of repair. However, we believe that existing accounts of repair are fully compatible with the data resulting from experiment 2. For instance, Ginzburg (2011) considers repair as a type of clarification move, and in his account “a clarification question calculated from an utterance  $u$ ,  $CQ(u)$ , updates QUD ( $CG(u)$  becomes discourse topic)”. In other words, Ginzburg proposes that a repair is a move that puts a new question in the stack of the QUD. Hence, a repair triggers its own discourse move which becomes the current QUD, no matter whether it is the same or different from the previous one.

To sum up, both experiments support the QUD Constraint on Cancellation: presuppositions are not good SI cancelers and SI cancellation requires

a change of QUD. In the next section, we discuss why it is the case that such constraint is operative, while examining several naturally-occurring examples and considering a potential counter-theory.

## 5. Discussion and conclusions

Consider the example in (30), coming from an interview to a painter.

- (30) a. La textura era molt important en aquells primers quadres  
‘Texture was very important in those first paintings’
- b. i, de fet, sempre ho ha estat dins la meva obra quan el que he intentat ha estat captar la natura.  
‘and, actually, it has always been so in my work when I try to capture nature.’
- (<http://www.ub.edu/geocrit/b3w-329.htm>)

In the paragraph previous to the sentence in (30), the speaker is talking about his first paintings. Thus, when he utters (30-a), he is answering to the QUD shown in (31-a). The utterance (30-a) contains a temporal scalar item (the scale could be reconstructed as <in all of my paintings, in most of my paintings, in my first paintings>). The speaker has not uttered an utterance U’ with a stronger item on the scale because it was not relevant to the current QUD (which was only about his first paintings and not about his work in general). However, the speaker realizes that the addressee could still calculate a SI (i.e., that texture was not important in most of his paintings). Since he is not committed to the truth of the SI, he cancels the SI by changing the QUD and addressing the QUD in (31-b)

- (31) a. QUD<sub>1</sub>: How were your first paintings?  
b. QUD<sub>2</sub>: When has texture been important?

In general, we propose that felicitous cooperative cancellations will have this type of structure, schematized in (32).

- (32) a. The speaker S is addressing the current QUD.  
b. S's utterance U contains a scalar expression.  
c. S did not utter U' containing a stronger item because it was not relevant to the current QUD.  
d. S realizes that the addressee could still calculate a SI, while S is not committed to the truth of the SI.  
e. S denies the truth of the SI (but not of the at-issue content) and changes the QUD by doing so.

In contrast, consider what happens if a cancellation does not follow this structure and the scalar expression is the answer to the previous QUD, as in example (6), repeated below for convenience.

- (33) A: How many cars do you have?  
B: #Two. In fact, I have three.

Since the scalar item is addressing the QUD, speaker B is expected to be committed to the SI that the scalar item generates. If, in fact, B is not committed to the SI and tries to cancel the SI, B is not being cooperative and the addressee A is left wondering why B did not use the strong item ('three' in the example) to begin with. The only way for such a discourse

to be felicitous is interpreting B's second utterance as a repair, and not as a cancellation.

### 5.1. Some naturally-occurring examples

Let us discuss now several examples of SI cancellation in English which follow the schema outlined in (32) and comply with the QUD Constraint on Cancellation.

Consider first the example in (34).

- (34) a. The “Everest Base Camp” trek as well as the “Around Annapurna” trek are regarded as some of the best trekking routes in Nepal  
b. and actually all over the world.  
(<http://guyshachar.com/content/blog/1997/trekking-in-nepal/>)

This example comes from a blog entry entitled “Some things about trekking in Nepal”. The utterance in (34-a) is addressing the QUD in (35-a), that is, it is clear that the author is only talking about trekking routes *in Nepal*. However, when he realizes the potential implicature the utterance has, he cancels it with the utterance in (34-b), which is answering a different QUD, namely (35-b).

- (35) a. QUD<sub>1</sub>: What are the best trekking routes in Nepal?  
b. QUD<sub>2</sub>: Are these treks considered the best only in Nepal?

In example (36), the *in fact* clause cancels a possible exact reading of the phrase “quite interesting”.

- (36) Yeah, I admit I do find Putin quite interesting.. in fact very interesting.  
(<http://www.russianwomendiscussion.com/Forum/index.php?topic=8091.905;wap2>)

The first clause is clearly the answer to a yes/no question. From the context of this utterance, which appears in an internet forum, we learn that it is an answer to (37-a). On the other hand, the *in fact* clause is not replying the same QUD, but rather (37-b). This makes this sentence a proper SI cancellation.

- (37) a. QUD<sub>1</sub>: Do you (admit that you) find Putin interesting?  
b. QUD<sub>2</sub>: How much interesting?

Finally, consider example (38). We have an explicit question that is answered by a complex sentence that contains a cancellation.

- (38) a. What are some baroque, classical, and romantic compositions that are dark and moody?  
b. Mahler Symphony No. 10 – actually, all of the Mahler symphonies have dark sections.  
(<http://answers.yahoo.com/question/index?qid=20100630180022AAtmG3w>)

Hence, we know that the first clause is answering the QUD in (39-a). Crucially, the second clause is not a reply to (39-a) but to a different, implicit, QUD that could have the shape of (39-b). Since the original question was clearly a mention-some question (Van Rooy, 2003), the speaker did not intend to convey that only Malher's 10 Symphony is dark. However, the speaker

realizes the potential implicature of his utterance and changes the QUD to be able to cancel it.

- (39) a. QUD<sub>1</sub>: What are some baroque, classical, and romantic compositions that are dark and moody?  
b. QUD<sub>2</sub>: How many of Mahler's symphonies have dark sections?

### 5.2. A competing theory

Before concluding the paper, we would like to briefly consider a competing theory to the QUD Constraint on Cancellation, which we will call the *Focus Constraint on Cancellation*.<sup>6</sup> This theory could be summarized as in (40):

- (40) The Focus Constraint on Cancellation  
Linguistic material in focus position cannot be canceled.

This theory simply states that the SI triggered by a scalar item in a focus position cannot be canceled. An equivalent way of expressing this idea would be to say that an item on focus does not trigger SIs, but only asserted content, which, by definition, cannot be canceled. This idea has been argued for in slightly different ways in Kuppevelt (1996) and Van Rooij and Schulz (2004), and has been experimentally tested by Zondervan (2007).

This theory can explain the contrast between (15) and (16), repeated below for convenience:

---

<sup>6</sup>We thank Maribel Romero for bringing to our attention this other plausible approach to the cancellation data.



- (41) a. Who has two cars?  
 b. [ $I_F$ ] have two cars.  
 c. In fact, I have [ $three_F$ ].
- (42) a. How many cars do you have?  
 b. I have [ $two_F$ ] cars.  
 c. #In fact, I have [ $three_F$ ].

In (41) the SI associated with the numeral *two* can be canceled because the numeral is not in focus position, while in (42), since the numeral is in focus position, its SI either cannot be canceled or this meaning is asserted to begin with (and is, therefore, not cancelable).

To be able to compare the QUD Constraint on Cancellation with the Focus Constraint on Cancellation, and show that the former fares better than the latter, we would need either to find (i) a case of a felicitous cancellation in which the SI is triggered by material in focus and there is a change of QUD or (ii) a case of an infelicitous cancellation in which the SI is not triggered by material in focus and there is no change of QUD.

The first type of examples are, unfortunately, impossible to construct: we cannot have a discourse in which there is both a change of QUD and a cancellation of an SI triggered by material in focus. To mention a specific case, consider the SI triggered by a numeral (i.e., the exact reading). If the numeral is focused, by the QUD Constraint on Focus, the first QUD will be of the shape “how many *x*?”. If the assertion is followed by a cancellation of the exact-reading implicature (such as “In fact, I have three” (cf. (41-c))), the QUD of this utterance will also necessarily be of the shape “how many

$x?$ ". Thus, the two QUDs are the same, there is no change of QUD and, therefore, the QUD Constraint on Cancellation will never be satisfied.

Fortunately, it is possible to construct the second type of discourses. In fact, the Focus constraint on cancellation seems to run into problems precisely with cancellations carried out by projective meaning. That is, this theory would predict that if the item that triggers the SI is not on focus, it can be canceled, regardless of whether the canceler is at-issue or projective meaning. However, this does not seem to be borne out, as shown in (43). Although the numeral is not part of the focus (which falls on the subject), it cannot be canceled by presupposed content, since presuppositions cannot trigger a QUD change.

- (43) a. Who has two cars?  
b. #[I<sub>F</sub>] have two cars. In fact, I regret having three.

To recap, although both the QUD Constraint on Cancellation and the Focus Constraint on Cancellation make the same predictions to a certain extent, the former can readily explain why it is not possible to cancel non-focal material when the meaning canceler consists in projective meaning, while the latter cannot.

Now, let us assume, as Kuppevelt (1996) and Van Rooij and Schulz (2004) do, that scalars on focus position cannot be canceled, because in fact the exact reading is a semantic (rather than pragmatic) kind of meaning. In Van Rooij and Schulz (2004), for instance, scalars have an *at least* reading, but on focus position, an exhaustive operator yields the exact interpretation. However, when the scalar item is not on focus, the *at least* reading obtains,

and so the *in fact* clause conveys a more specific meaning rather than a cancellation. Thus, strictly speaking, in their account, cancellation is not an issue. Zondervan (2007), who establishes a connection between QUD and SI generation, tests Van Rooij & Schultz's (2004) account experimentally using Truth Value Judgment Tasks (Crain and Thornton, 1998), and concludes that SIs are significantly more often generated when the scalar item is not on focus position (and thus is not addressing the QUD). In this account, where exhaustification is triggered by a null operator in the syntax, the categorical prediction is that whenever the scalar item does not occur on focus, the SI will not be generated. And yet, in Zondervan's experiments, when the scalar item is not on focus, the ratio of SI generation ranges from 41% to 55%. This is clearly not expected given the adopted theoretical proposal.

Recall that in the present proposal, where SIs are pragmatic rather than semantic, we do not expect categorical results, but rather a preference ranking that favors cancellations when a new QUD has been introduced, which is borne out.

### 5.3. Summary

In this paper we have taken a close look at the phenomenon of scalar implicature cancellation: we have discussed what properties it has and what restrictions it obeys. We have proposed that scalar implicature cancellation is subject to the Question-Under-Discussion constraint on Cancellation. In a nutshell, a cancellation is carried out by a sentence that presupposes (and answers) a different QUD from the previous utterance. The intuition behind this proposal is that a cancellation is a legitimate move only if the canceled content was not really the main point of the speaker's previous move. Oth-

erwise, why would the speaker have chosen to produce an implicature only to cancel it in the next utterance? In contrast, if the speaker's main goal was something else, he can later change the orientation of the discourse to challenge the implicated meaning.

In addition, we have pointed out that since projective meaning (presuppositions and Conventional Implicatures) does not have the potential to address the QUD (Simons et al. (2010)), it cannot presuppose a new QUD and, thus, cannot cancel SIs.

We have supported our theoretical claims with experimental data as well as naturally-occurring examples.

## **Acknowledgments**

We are very grateful for the comments of two anonymous reviewers and to the audiences at the 21st Generative Grammar Colloquium, the ESS-LLI 2011 Workshop on Projective Meaning and the Seminar of the Glif at Universitat Pompeu Fabra, where previous versions of this paper were presented. This research has been funded by research projects FFI2011-23356, FFI2011-23046, JDC-2009-3922, RYC-2010-06070 and FFI2009-07114.

## **References**

- Bard, E., Robertson, D., Sorace, A., 1996. Magnitude estimation of linguistic acceptability. *Language*, 32–68.
- Beaver, D., 2001. Presupposition and assertion in dynamic semantics. CSLI publications.

- Breheny, R., 2005. Some scalar implications really aren't quantity implicatures-but *Some* are. In: Proceedings of Sinn & Bedeutung. Vol. 9.
- Chierchia, G., Fox, D., Spector, B., 2012. The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. In: Maienborn, C., von Stechow, K., Portner, P. (Eds.), Semantics. An international handbook of natural language meaning. Vol. 3.
- Crain, S., Thornton, R., 1998. Investigations in Universal Grammar: A guide to experiments on the acquisition of syntax and semantics. The MIT Press, Cambridge, MA.
- Gazdar, G., 1979. Pragmatics: Implicature, Presupposition, and Logical Form. Academic Press, New York.
- Geurts, B., 2006. Take five. In: Vogeleer, S., Tasmowski, L. (Eds.), Non-definiteness and plurality. Benjamins, Amsterdam/Philadelphia, pp. 311–329.
- Geurts, B., 2011. Quantity implicatures. Cambridge Univ Pr.
- Ginzburg, J., 2011. Disfluencies as intra-utterance dialogue moves, talk at the Workshop Constraints in Discourse 2011 held in Saint Raphael, France.
- Ginzburg, J., Fernandez, R., Schlangen, D., 2007. Unifying self- and other-repair. In: Proceedings of Decalog 2007. Rovereto.
- Grice, P., 1989. Studies in the way of words. Harvard University Press, Cambridge, MA.

- Grimshaw, J., 1979. Complement selection and the lexicon. *Linguistic Inquiry* 10 (2), 279–326.
- Heim, I., 1999. Notes on superlatives<sup>1</sup>, ms, MIT.
- Horn, L., 1972. On the semantic properties of logical operators in english. Ph.D. thesis, University of California, Los Angeles.
- Kadmon, N., 2001. Formal pragmatics. Blackwell London.
- Karttunen, L., 1973. Presuppositions of compound sentences. *Linguistic Inquiry* 4 (2), 169–193.
- Keller, F., Gunasekharan, S., Mayo, N., Corley, M., 2009. Timing accuracy of web experiments: A case study using the webexp software package. *Behavior Research Methods* 41 (1), 1–12.
- Kuppevelt, J., 1996. Inferring from topics. *Linguistics and Philosophy* 19 (4), 393–443.
- Matsumoto, Y., 1997. Scales, implicatures, and *in fact*, *if not*, and *let alone* constructions. In: *Studies in English: Festschrift for professor Akira Ota on the occasion of his eightieth birthday*. pp. 685–699.
- Potts, C., 2005. *The Logic of Conventional Implicatures*. Oxford University Press, Oxford.
- Potts, C., 2007. The expressive dimension. *Theoretical Linguistics* 33 (2), 165–197.

- Roberts, C., 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics. OSUWPL Volume 49: Papers in Semantics, 91–136.
- Roberts, C., 2004. Context in dynamic interpretation. *The handbook of pragmatics*, 197–220.
- Simons, M., Tonhauser, J., Roberts, C., Beaver, D., 2010. What projects and why. In: *SALT XX*.
- Sorace, A., Keller, F., 2005. Gradience in linguistic data. *Lingua* 115 (11), 1497–1524.
- Stalnaker, R., 1978. Assertion. in (p. cole, ed.). *Syntax and Semantics: Pragmatics* 9.
- Van Rooij, R., Schulz, K., 2004. Exhaustive interpretation of complex sentences. *Journal of logic, language and information* 13 (4), 491–519.
- Van Rooy, R., 2003. Questioning to resolve decision problems. *Linguistics and Philosophy* 26 (6), 727–763.
- Zondervan, A., 2007. Experiments on *qud* and focus as a contextual constraint on scalar implicature calculation. In: *From Experiment to Theory, Proceedings of Experimental Pragmatics*.

## **Appendix A. List of items for Experiment 1**

Each item appears in the two conditions: the answer B1 belongs to Condition 1, while B2 to Condition 2.

- (1) A: Com va anar la festa?  
'How was the party?'
- B1: Hi va venir força gent. De fet, hi era tothom.  
'It was quite a turnout. In fact, everyone came.'
- B2: Hi va venir força gent. De fet, me'n penedeixo que hi fos tothom.  
'It was quite a turnout. In fact, I regret that everyone came.'
- (2) A: Què en penses del Justin Bieber?  
'What do you think about Justin Beaver?'
- B1: La majoria d'adolescent n'estan enamorades. De fet, ho estan totes.  
'Most teenage girls are in love with him. In fact, all of them are.'
- B2: La majoria d'adolescent n'estan enamorades. De fet, és increïble que ho estiguin totes.  
'Most teenage girls are in love with him. In fact, it's unbelievable that all of them are.'
- (3) A: Qui té tres germans?  
'Who has three brothers?'
- B1: El Pere. De fet, en té quatre.  
'Peter. In fact, he has four brothers.'
- B2: El Pere. De fet, em sorprèn que en tingui quatre.  
'Peter. In fact, I'm surprised that he has four brothers.'
- (4) A: És possible aprendre a escriure àrab en un mes?  
'Is it possible to learn to write in Arabic in one month?'
- B1: Sí. De fet, segur que tothom ho pot fer.



‘Yes. In fact, I’m sure that everyone can do it.’

B2: Sí. De fet, és genial que sigui segur que tothom ho pugui fer.

‘Yes. In fact, it’s great that for sure everyone can do it.’

(5) A: Com va anar la Diada de Sant Jordi?

‘How was St. George’s day?’

B1: Em van firmar llibres els millors escriptors de Barcelona. De fet, vaig aconseguir la signatura dels millors escriptors catalans.

‘I got my books autographed by the best writers in Barcelona.

In fact, I got the signatures of the best Catalan writers.’

B2: Em van firmar llibres els millors escriptors de Barcelona. De fet, és fantàstic haver aconseguit la signatura dels millors escriptors catalans.

‘I got my books autographed by the best writers in Barcelona.

In fact, it’s fantastic that I got the signatures of the best Catalan writers.’

(6) A: Creus que la gent compra responsablement?

‘Do you think people shops responsibly?’

B1: La majoria de gent compra més del que necessita. De fet, això ho fa tothom.

‘Most people buy more stuff than they need. In fact, all the people do that.’

B2: La majoria de gent compra més del que necessita. De fet, lamento que això ho faci tothom.

‘Most people buy more stuff than they need. In fact, I regret that all the people do that.’

- (7) A: Qui ha suspès la teòrica de conduir dos cops?  
‘Who has failed the drivers tests twice?’  
B1: Jo. De fet, l’he suspès tres cops.  
‘I have. In fact, I have failed them three times.’  
B2: Jo. De fet, és una merda que l’hagi suspès tres cops.  
‘I have. In fact, it sucks that I have failed them three times.’
- (8) A: Quin és el país més pobre de l’Àfrica?  
‘Which is the poorest country of Africa?’  
B1: Sierra Leone. De fet, és el país més pobre del món.  
‘Sierra Leone. In fact, it’s the poorest country of the world.’  
B2: Sierra Leone. De fet, és espantós que sigui el país més pobre del món.  
‘Sierra Leone. In fact, it’s horrible that it’s the poorest country of the world.’
- (9) A: Creus que és possible que la Lady Gaga vingui a la festa?  
‘Do you think it’s possible that Lady Gaga shows up at the party?’  
B1: Sí. De fet, és força probable que vingui.  
‘Yes. In fact, it’s quite likely that she’ll come.’  
B2: Sí. De fet, em sap greu que sigui força probable que vingui.  
‘Yes. In fact, I’m sorry that it’s quite likely that she’ll come.’
- (10) A: Qui va tenir dos fills abans de fer els 20 anys?  
‘Who had two children before turning 20?’  
B1: La Rosa. De fet, en va tenir tres.

- ‘Rose did. In fact, she had three children.’
- B2: La Rosa. De fet, em va deixar amb la boca oberta que en tingués tres.
- ‘Rose did. In fact, I was astonished that she had three children.’
- (11) A: Qui ha trencat els aparadors d’aquells dos bars de la Rambla?  
 ‘Who broke the windows of those two bars in la Rambla?’
- B1: Uns brètols. De fet, han trencat els aparadors de tres bars.  
 ‘A bunch of hooligans. In fact, they broke the windows of three bars.’
- B2: Uns brètols. De fet, trobo repugnant que hagin trencat els aparadors de tres bars.  
 ‘A bunch of hooligans. In fact, I think it’s outrageous that they broke the windows of three bars.’
- (12) A: Què en pensen els americans de la pena de mort?  
 ‘What do Americans think about capital punishment?’
- B1: Alguns troben que és una bona mesura. De fet, això ho pensa la majoria.  
 ‘Some think it’s a good action. In fact, most of them think so.’
- B2: Alguns troben que és una bona mesura. De fet, me’n faig creus que això ho pensi la majoria.  
 ‘Some think it’s a good action. In fact, it’s incredible that most of them think so.’
- (13) A: Qui va ser el primer americà que va arribar a la lluna?  
 ‘Who has the first American to arrive at the moon?’

B1: Va ser el gran Armstrong. De fet, va ser el primer humà a arribar-hi.

‘It was the great Armstrong. In fact, he was the first human being to arrive there.’

B2: Va ser el gran Armstrong. De fet, és magnífic que fos el primer humà a arribar-hi.

‘It was the great Armstrong. In fact, it’s magnificent that he was the first human being to arrive there.’

(14) A: Per què va deixar l’empresa el director general?

‘Why did the general manager leave the company?’

B1: Perquè uns quants treballadors li feien boicot. De fet, tots n’hi feien.

‘Because he was boycotted by a few co-workers. In fact, by all of them.’

B2: Perquè uns quants treballadors li feien boicot. De fet, al·lucino que tots n’hi fessin.

‘Because he was boycotted by a few co-workers. In fact, I can’t believe that he was boycotted by all of them.’

(15) A: Creus que és possible trobar vida intel·ligent a Mart?

‘Do you think it’s possible to find intelligent life in Mars?’

B1: Sí. De fet, segur que se’n troba.

‘Yes. In fact, it’s certain that we can find it.’

B2: Sí. De fet, sembla mentida que sigui segur que se’n trobi.

‘Yes. In fact, it’s unbelievable that it’s certain that we can find it.’

- (16) A: Qui ha guanyat un milió de dòlars a la borsa?  
‘Who won \$1,000,000 at the stock market?’  
B1: El Pere. De fet, ha guanyat un milió i mig.  
‘Peter did. In fact, he won \$1,500,000.’  
B2: El Pere. De fet, és fabulós que hagi guanyat un milió i mig.  
‘Peter did. In fact, it’s fabulous that he won \$1,500,000.’

### **Appendix B. List of items for Experiment 2**

Each item appears in the four conditions: A belongs to Condition 1, B belongs to Condition 3, C belongs to Condition 2 and D belongs to Conditions 4.

- (1) A a: Quants fills té la Maria?  
‘How many children does Mary have?’  
b: Dos. De fet, en té tres.  
‘Two. In fact, she has three children.’  
B a: Qui té dos fills?  
‘Who has two children?’  
b: La Maria. De fet, en té tres.  
‘Mary. In fact, she has three children.’  
C a: Quants fills té la Maria?  
‘How many children does Mary have?’  
b: Dos. Vull dir, en té tres.  
‘Two. I mean she has three children.’  
D a: Qui té dos fills?  
‘Who has two children?’

- b: La Maria. Vull dir, en té tres.  
 ‘Maria. I mean, she has three children.’
- (2) A a: Quina probabilitat hi ha que guanyi el Schalke 04?  
 ‘How likely is it that Schalke 04 wins?’  
 b: Pot ser que guanyi. De fet, segur que guanya.  
 ‘It might win. In fact, it’s certain that it will win.’
- B a: Creus que el Schalke 04 té possibilitats de guanyar?  
 ‘Do you think it’s likely that Schalke 04 will win?’  
 b: Sí que en té. De fet, segur que guanya.  
 ‘Yes, it is. In fact, it’s certain that it will win.’
- C a: Quina probabilitat hi ha que guanyi el Schalke 04?  
 ‘How likely is it that Schalke 04 wins?’  
 b: Pot ser que guanyi. Vull dir, segur que guanya.  
 ‘It might win. I mean, it’s certain that it will win.’
- D a: Creus que el Schalke 04 té possibilitats de guanyar?  
 ‘Do you think it’s likely that Schalke 04 will win?’  
 b: Sí que en té. Vull dir, segur que guanya.  
 ‘Yes, it is. I mean, it’s certain that it will win.’
- (3) A a: Qui opina que el Messi és un geni?  
 ‘Who thinks Messi is a genius?’  
 b: Ho pensen alguns barcelonistes. De fet, això ho pensen tots  
 els barcelonistes.  
 ‘Some F.C. Barcelona fans think that. In fact, all of them  
 think that.’
- B a: Què n’opinen del Messi els barcelonistes? ‘What do the

- F.C. Barcelona fans think about Messi?’
- b: Alguns opinen que és un geni. De fet, això ho pensen tots els barcelonistes.  
‘Some think he’s a genius. In fact, all of them think that.’
- C a: Qui opina que el Messi és un geni?  
‘Who thinks Messi is a genius?’
- b: Ho pensen alguns barcelonistes. Vull dir, això ho pensen tots els barcelonistes.  
‘Some F.C. Barcelona fans think that. I mean, all of them think that.’
- D a: Què n’opinen del Messi els barcelonistes?  
‘What do the F.C. Barcelona fans think about Messi?’
- b: Alguns opinen que és un geni. Vull dir, això ho pensen tots els barcelonistes.  
‘Some think he’s a genius. I mean, all of them think that.’
- (4) A a: En quina posició del rànkning de millors pel·lis posaries “Ciutadà Kane”?  
‘How would you rank “Citizen Kane”?’
- b: Crec que és la millor pel·lícula americana. De fet, és la millor pel·lícula que s’hagi fet mai a tot el món.  
‘I believe it’s the best American movie. In fact, it’s the best movie ever made in the world.’
- B a: Quina creus que és la millor pel·lícula americana?  
‘Which do you think is the best American movie?’
- b: “Ciutadà Kane”. De fet, és la millor pel·lícula que s’hagi

fet mai a tot el món.

“Citizen Kane”. In fact, it’s the best movie ever made in the world.’

C a: En quina posició del rànking de millors pel·lis posaries “Ciudadà Kane”?

‘How would you rank “Citizen Kane”?’

b: Crec que és la millor pel·lícula americana. Vull dir, és la millor pel·lícula que s’hagi fet mai a tot el món.

‘I believe it’s the best American movie. I mean, it’s the best movie ever made in the world.’

D a: Quina creus que és la millor pel·lícula americana?

‘Which do you think is the best American movie?’

b: “Ciudadà Kane”. Vull dir, és la millor pel·lícula que s’hagi fet mai a tot el món.

“Citizen Kane”. I mean, it’s the best movie ever made in the world.’

(5) A a: Del repertori de Mahler, quines peces són tristes?

‘Of Mahler’s repertoire, which pieces are sad?’

b: Algunes simfonies ho són. De fet, totes les simfonies de Malher són tristes.

‘Some symphonies are. In fact, all of Mahler’s symphonies are sad.’

B a: Em podries dir composicions romàntiques que siguin tristes?

‘Can you tell me some romantic compositions that are sad?’

b: Algunes simfonies de Malher ho són. De fet, totes totes les



simfonies de Malher són tristes.

‘Some symphonies by Mahler are sad. In fact, all of Mahler’s symphonies are sad.’

C a: Del repertori de Mahler, quines peces són tristes?

‘Of Mahler’s repertoire, which pieces are sad?’

b: Algunes simfonies ho són. Vull dir, totes les simfonies de Malher són tristes.

‘Some symphonies are. I mean, all of Mahler’s symphonies are sad.’

D a: Em podries dir composicions romàntiques que siguin tristes?

‘Can you tell me some romantic compositions that are sad?’

b: Algunes simfonies de Malher ho són. Vull dir, totes les simfonies de Malher són tristes.

‘Some symphonies by Mahler are sad. I mean, all of Mahler’s symphonies are sad.’

(6) A a: Quantes vegades has estat a la Xina?

‘How many times have you been in China?’

b: Dues. De fet, hi he estat tres vegades.

‘Two. In fact, I’ve been there three times.’

B a: Qui ha estat a la Xina dues vegades?

‘Who has been in China twice?’

b: Jo. De fet, hi he estat tres vegades.

‘I have. In fact, I’ve been there three times.’

C a: Quantes vegades has estat a la Xina?

‘How many times have you been in China?’

- b: Dues. Vull dir, hi he estat tres vegades.  
‘Two. I mean, I’ve been there three times.’
- D a: Qui ha estat a la Xina dues vegades?  
‘Who has been in China twice?’
- b: Jo. Vull dir, hi he estat tres vegades.  
‘I have. I mean, I’ve been there three times.’
- (7) A a: Qui pensa que l’energia nuclear és perillosa?  
‘Who thinks that nuclear energy is dangerous?’
- b: Ho pensen alguns alemanys. De fet, això ho pensen la majoria d’alemanys.  
‘Some Germans do. In fact, most of them do.’
- B a: Què en pensen els alemanys de l’energia nuclear?  
‘What do Germans think about nuclear energy?’
- b: Alguns opinen que és perillosa. De fet, això ho pensen la majoria d’alemanys.  
‘Some think it’s dangerous. In fact, most Germans think that.’
- C a: Qui pensa que l’energia nuclear és perillosa?  
‘Who thinks that nuclear energy is dangerous?’
- b: Ho pensen alguns alemanys. Vull dir, això ho pensen la majoria d’alemanys.  
‘Some Germans do. I mean, most of them do.’
- D a: Què en pensen els alemanys de l’energia nuclear?  
‘What do Germans think about nuclear energy?’
- b: Alguns opinen que és perillosa. Vull dir, això ho pensen la

majoria d'alemanys.

'Some think it's dangerous. I mean, most Germans think that.'

- (8) A a: Quina probabilitat hi ha que plogui aquest cap de setmana?  
'How likely is it that it rains over the weekend?'  
b: Pot ser que plogui. De fet, segur que plou.  
'It might rain. In fact, it's certain that it will rain.'
- B a: Creus que és possible que plogui aquest cap de setmana?  
'Do you think it's possible that it will rain over the weekend?'  
b: Sí. De fet, segur que plou.  
'Yes. In fact, it's certain that it will rain.'
- C a: Quina probabilitat hi ha que plogui aquest cap de setmana?  
'How likely is it that it rains over the weekend?'  
b: Pot ser que plogui. Vull dir, segur que plou.  
'It might rain. I mean, it's certain that it will rain.'
- D a: Creus que és possible que plogui aquest cap de setmana?  
'Do you think it's possible that it will rain over the weekend?'  
b: Sí. Vull dir, segur que plou.  
'Yes. I mean, it's certain that it will rain.'
- (9) A a: Quants queixals del seny em quedaran després que me n'extregui aquest, doctora?  
'How many wisdom teeth will I have left when you pull this one out, Dr.?'  
b: Potser no t'has de preocupar. Els queixals són una cosa que tothom té.  
'You probably don't need to worry. Wisdom teeth are something everyone has.'

- b: Dos, te'n quedaran. De fet, tres.  
 'You will have two left. In fact, three.'
- B a: A qui li queden dos queixals del seny?  
 'Who has two wisdom teeth left?'
- b: A mi. De fet, me'n queden tres.  
 'I do. In fact, I have three left.'
- C a: Quants queixals del seny em quedaran després que me n'extregui aquest, doctora?  
 'How many wisdom teeth will I have left when you pull this one out, Dr.?'  
 b: Dos, te'n quedaran. Vull dir, tres.  
 'You will have two left. I mean, three.'
- D a: A qui li queden dos queixals del seny?  
 'Who has two wisdom teeth left?'
- b: A mi. Vull dir, me'n queden tres.  
 'I do. I mean, I have three left.'
- (10) A a: Quines possibilitats tinc de trobar feina en el futur immediat, senyora pitonissa?  
 'Miss fortuneteller, how likely is it that I find a job in the near future?'
- b: És possible que en trobis. De fet, és segur que en trobaràs.  
 'It's possible that you find one. In fact, it's certain that you will find one.'
- B a: Tinc possibilitats de trobar feina en el futur immediat, senyora pitonissa?

- ‘Miss fortuneteller, is it possible that I find a job in the near future?’
- b: Sí que en tens, sí. De fet, és segur que en trobaràs.  
‘Yes, it is. In fact, it’s certain that you will find one.’
- C a: Quines possibilitats tinc de trobar feina en el futur immediat, senyora pitonissa?  
‘Miss fortuneteller, how likely is it that I find a job in the near future?’
- b: És possible que en trobis. Vull dir, és segur que en trobaràs.  
‘It’s possible that you find one. I mean, it’s certain that you will find one.’
- D a: Tinc possibilitats de trobar feina en el futur immediat, senyora pitonissa?  
‘Miss fortuneteller, is it possible that I find a job in the near future?’
- b: Sí que en tens, sí. Vull dir, és segur que en trobaràs.  
‘Yes, it is. I mean, it’s certain that you will find one.’
- (11) A a: Senyor diputat, quants escons té el parlament de Catalunya?  
‘Mr. Congressman, how many seats does the Parliament of Catalonia have?’
- b: En té 130. De fet, 135.  
‘It has 130 seats. In fact, 135.’
- B a: Quin parlament europeu té 130 escons?  
‘Which European parliament has 130 seats?’

- b: El català. De fet, en té 135.  
‘The Catalan parliament. In fact, it has 135 seats.’
- C a: Senyor diputat, quants escons té el parlament de Catalunya?  
‘Mr. Congressman, how many seats does the Parliament of Catalonia have?’
- b: En té 130. Vull dir, 135.  
‘It has 130 seats. I mean, 135.’
- D a: Quin parlament europeu té 130 escons?  
‘Which European parliament has 130 seats?’
- b: El català. Vull dir, en té 135.  
‘The Catalan parliament. I mean, it has 135 seats.’
- (12) A a: Com és de fons aquest pou?  
‘How deep is this well?’
- b: Fa tres metres de fondària. De fet, en fa quatre.  
‘It’s three meters deep. In fact, four meters deep.’
- B a: Hi ha pous que facin tres metres de fondària en aquest poble?  
‘Are there any wells in town that are three meters deep?’
- b: Sí, el nostre. De fet, en fa quatre.  
‘Yes, ours. In fact, it is four meters deep.’
- C a: Com és de fons aquest pou?  
‘How deep is this well?’
- b: Fa tres metres de fondària. Vull dir, en fa quatre.  
‘It’s three meters deep. I mean, four meters deep.’
- D a: Hi ha pous que facin tres metres de fondària en aquest

poble?

‘Are there any wells in town that are three meters deep?’

b: Sí, el nostre. Vull dir, en fa quatre.

‘Yes, ours. I mean, it is four meters deep.’

(13) A a: Doctor, tal com tinc el turmell, quines probabilitats tinc de tornar a caminar amb normalitat?

‘Dr., the way my ankle looks like, how likely is it that I can walk as I used to?’

b: És possible que puguis. De fet, és molt probable.

‘It’s possible that you can. In fact, it’s quite probable.’

B a: Doctor, tal com tinc el turmell, és possible que torni a caminar amb normalitat?

‘Dr., the way my ankle looks like, is it possible that I can walk as I used to?’

b: Sí que és possible. De fet, és molt probable.

‘Yes, it is possible. In fact, it’s quite probable.’

C a: Doctor, tal com tinc el turmell, quines probabilitats tinc de tornar a caminar amb normalitat?

‘Dr., the way my ankle looks like, how likely is it that I can walk as I used to?’

b: És possible que puguis. Vull dir, és molt probable.

‘It’s possible that you can. I mean, it’s quite probable.’

D a: Doctor, tal com tinc el turmell, és possible que torni a caminar amb normalitat?

‘Dr., the way my ankle looks like, is it possible that I can

- walk as I used to?’
- b: Sí que és possible. Vull dir, és molt probable.  
‘Yes, it is possible. I mean, it’s quite probable.’
- (14) A a: Avui dia, qui creu en Déu?  
‘Nowadays, who believes in God?’
- b: Alguna gent. De fet, tothom.  
‘Some people. In fact, everyone.’
- B a: Creus que hi ha algú que cregui en Déu?  
‘Do you think there is someone who believes in God?’
- b: Sí. De fet, tothom.  
‘Yes. In fact, everyone.’
- C a: Avui dia, qui creu en Déu?  
‘Nowadays, who believes in God?’
- b: Alguna gent. Vull dir, tothom.  
‘Some people. I mean, everyone.’
- D a: Creus que hi ha algú que cregui en Déu?  
‘Do you think there is someone who believes in God?’
- b: Sí. Vull dir, tothom.  
‘Yes. I mean, everyone.’
- (15) A a: De la teva escola, qui ha anat a esquiar durant la set-  
mana blanca?  
‘From your school who went skiing over the holidays?’
- b: Alguns nens de sisè. De fet, tots.  
‘Some kids from 6th grade. In fact, all of them.’
- B a: Algun nen de la teva classe anat a esquiar durant la set-



- mana blanca?  
 ‘Did any kids from your class go skiing over the holiday?’
- b: Sí. De fet, tots.  
 ‘Yes. In fact, all of them.’
- C a: De la teva escola, qui ha anat a esquiar durant la setmana blanca?  
 ‘From your school who went skiing over the holidays?’
- b: Alguns nens de sisè. Vull dir, tots.  
 ‘Some kids from 6th grade. I mean, all of them.’
- D a: Algun nen de la teva classe anat a esquiar durant la setmana blanca?  
 ‘Did any kids from your class go skiing over the holiday?’
- b: Sí. Vull dir, tots.  
 ‘Yes. I mean, all of them.’
- (16) A a: El Mont Blanc és gaire alt?  
 ‘Is Mont Blanc any high?’
- b: És la muntanya més alta de França. De fet, és la muntanya més alta d’Europa.  
 ‘It’s the highest mountain in France. In fact, it’s the highest in Europe.’
- B a: Quina és la muntanya més alta de França?  
 ‘Which one is the highest mountain in France?’
- b: El Mont Blanc. De fet, és la muntanya més alta d’Europa.  
 ‘Mont Blanc. In fact, it’s the highest mountain in Europe.’
- C a: El Mont Blanc és gaire alt?

‘Is Mont Blanc any high?’

b: És la muntanya més alta de França. Vull dir, és la muntanya més alta d’Europa.

‘It’s the highest mountain in France. I mean, it’s the highest in Europe.’

D a: Quina és la muntanya més alta de França?

‘Which one is the highest mountain in France?’

b: El Mont Blanc. Vull dir, és la muntanya més alta d’Europa.

‘Mont Blanc. I mean, it’s the highest mountain in Europe.’

### **Bio-note**

Laia Mayol is a postdoctoral researcher (Juan de la Cierva program) at the Departament de Traducció i Ciències del Llenguatge and member of the GLiF at the Universitat Pompeu Fabra. Her doctoral thesis (University of Pennsylvania, 2009) was devoted to the discourse function and information value of pronouns in Catalan. Her research is focused on the following topics: information and discourse structure, non-truth conditional meaning, anaphora choice and resolution, and experimental and game theoretical approaches to pragmatics, on which she has published in international journals, like *Lingua* and *Journal of Pragmatics*.

Elena Castroviejo is a “Ramón y Cajal” postdoctoral researcher at the Center for Social Sciences and Humanities from the Spanish National Research Council (CCHS-CSIC) in Madrid. The topic of her dissertation was Wh-exclamatives in Catalan (Universitat de Barcelona, 2006), and her research interests include the semantics of gradability phenomena, the inter-

action of meanings at different dimensions and, more generally, Romance linguistics.