Rising Declarative Questions

Christine Gunlogson, UCSC

1   Introduction

1.1 Overview

This paper analyzes syntactic declaratives with final rising intonation, exemplified in (1):

(1)   a. The play starts at 8?
      b. That's a persimmon?
      c. The alarm's on?

The rise is indicated with a question mark, following ordinary orthographic conventions; see Section 1.2 for phonological assumptions.

A familiar use of rising declaratives is as a kind of yes-no (polar) question, superficially similar in effect to the corresponding syntactic interrogative:

(2)   a. That's a persimmon?   ≈   Is that a persimmon?
      b. You're leaving for vacation today?   ≈   Are you leaving for vacation today?

Intuitively, the rise imparts the force of a question to what would otherwise be as a statement. But the story cannot be that simple. It turns out that rising declarative questions are subject to contextual restrictions that do not apply to their interrogative counterparts. For example, rising declarative questions are not appropriate in situations where the questioner is supposed to be neutral or ignorant, as in a courtroom or committee hearing:

(3)   [at a committee hearing]
      a. Are you a member of the Communist party?
      b. #You're a member of the Communist party?
      c. #You're a member of the Communist party.

Furthermore, rising declarative questions cannot be used "out of the blue", without any relevant preceding context, as interrogatives can be. The interrogative in (4a) is felicitous as an initial remark, without any preceding discussion of persimmons, while the rising declarative in (4b) is odd in the same circumstances.

(4)   [to coworker eating a piece of fruit]
      a. Is that a persimmon?
      b. #That's a persimmon?
      c. #That's a persimmon.

The falling declaratives in (3c)-(4c) (where the final fall is indicated with a period) are also unacceptable as questions in these circumstances, a fact which is intuitively unsurprising but nonetheless significant. Given that rising declaratives pattern with their falling declarative counterparts in the above examples, and not with interrogatives, it is reasonable to look to declarative form for an explanation of the constraints on distribution, and that is the approach I will take here.

At the same time, the intuition that rising declaratives are more suited to questioning than falling ones is undeniable. Evidence supporting that intuition can be found in examples like (5), where the rising declarative patterns with the interrogative:

(5)   A: The king of France is bald.
      B's response:
      a. Is France a monarchy?
      b. France is a monarchy?
      c. #France is a monarchy.

Since (5b) and (5c) differ only in their intonational contour, we must look to the difference between the rise and the fall for an explanation of the question-like behavior of rising declaratives. In the account to be given here, the explanation will crucially depend not just upon the meaning of the rise but on the interaction of the rise with the meaning proposed for declarative form.

The goal of the paper is to characterize the distribution of rising declaratives as questions and provide a compositional analysis from which both the restrictions and the questioning use follow. I use the minimal pair methodology exemplified in (3)-(5) throughout the paper: rising declaratives are compared with rising interrogatives on the one hand and with falling declaratives on the other, holding constant the lexical content and location of the nuclear accent. Interrogatives, too, can have either rising or falling intonation, but I restrict attention for present purposes to the rising variety. The terms (*polar*) *interrogative* and *declarative* are understood as referring to syntactic sentence types, while (*polar*) *question* is used for the name of a pragmatic category to which utterances of both interrogatives and declaratives can belong.

The analysis proceeds as follows. Section 2 is descriptive, introducing data bearing on the distribution of rising declarative questions and formulating in intuitive terms two of the empirical generalizations on which the analysis is based, as follows:

(6)   Declaratives, rising and falling, are not neutral; they convey a bias lacking in the use of syntactic interrogatives.

(7)   Rising declaratives, like syntactic interrogatives, fail to commit the Speaker to their propositional content.

Section 3 proposes a semantic analysis of rising and falling declaratives from which the above generalizations follow. The analysis gives formal substance to the intuitive notions of commitment and bias, using an articulated version of Stalnaker's (1978) Common Ground that tracks each participant's commitments individually. I model the effects of discourse moves as context updates, proposing that rising declaratives have the effect of committing the Addressee to their propositional content. Such a move results in contextual bias, consistent with (6), but does not commit the Speaker one way or another, as required for (7).

The analysis of declarative bias offered in Section 3 accounts for examples like (3) and (5) above. However, the restriction illustrated in (4), which demands preceding context of a particular sort for declarative questions, does not follow in any immediately obvious way from the account of declarative bias. In Section 4 I argue for characterizing the restriction descriptively as in (8):

(8)   The Contextual Bias Condition: Rising declaratives can only be used as questions in contexts where the Addressee is already publicly committed to the proposition expressed.

The Contextual Bias Condition is derived from a more general principle governing the interpretation of utterances as polar questions: I claim that uninformativeness is a necessary condition for the interpretation of a move as a question. Interrogatives are uninformative by nature and thus can meet the condition in any context. Rising declaratives, however, can count as questions only if the Addressee is understood to be publicly committed to the proposition expressed by the declarative – that is, only if the Contextual Bias Condition is met. The analysis predicts, correctly, that in addition to their familiar "echoing" function, rising declaratives may be used to question presuppositions and inferences taken to be logical consequences of the Addressee's public position, whether or not such inference finds its basis in a preceding utterance.

The notion of "question" to be explicated in this paper is a broad one, not limited to the prototypical case of an "information question". In keeping with the empirical orientation of the paper, I approach the task of characterizing the category of polar questions in a distributional way. Section 5 makes explicit the overlap between rising declaratives and interrogatives that I claim underlies the questioning use of rising declaratives. The contrast between rising and falling declaratives as questions also follows.

1.2 Phonological assumptions

As mentioned, I indicate final rising and final falling intonation with the standard orthographic devices of the question mark and the period, respectively. For investigative purposes I will count as a "rise" any contour whose tail (i.e., post-nuclear portion) is non-falling throughout its length and which ends at a point higher than the nuclear accent (which is assumed to be simplex, i.e., not bitonal). Similarly, a "fall" is non-rising throughout its tail and ends at a point lower than the nuclear accent. These descriptions are adapted from Gussenhoven 1983 but can be expressed in other systems as well. For example, the above description of the rise fits the tunes H* H L%, L* H H%, L* H L%, L* L H% in the system of Pierrehumbert 1980, as modified in Beckman and Pierrehumbert 1986.

Gussenhoven's system postulates three fundamental contour shapes, the rise, the fall, and the fall-rise, with variations expressed in terms of modifications to each type. The above descriptions correspond closely (though not exactly) to Gussenhoven's for the categories of rise and fall; I ignore the fall-rise and the inventory of modifications to the basic contours.

2 Distributional generalizations

2.1 Declarative bias

In this section I will document ways in which rising declaratives pattern with their falling declarative counterparts, differing from syntactic interrogatives. The central observation is that declaratives are unsuitable in contexts where the Speaker is expected to maintain an attitude of neutrality or ignorance. First, as noted in the introduction, rising declaratives do not work to elicit information in an unbiased way, as (9)-(10) show.

(9) [in a courtroom or committee hearing]
    a. Are you a member of the Communist party?
    b. #You're a member of the Communist party?
    c. #You're a member of the Communist party.

(10) [as an exam question]
    a. Is the empty set a member of itself?
    b. #The empty set is a member of itself?
    c. #The empty set is a member of itself.

In a similar vein, (11) shows that the issue raised by a declarative question cannot be regarded as open or unsettled, liable to go either way. In fact, in (12) the rising declarative cannot be described as a *question* at all, even though the construction is one that accepts a root clause, as (12a) demonstrates.

(11) It's an open question.
    a. Did she lie to the grand jury?
    b. #She lied to the grand jury?
    c. #She lied to the grand jury.

(12) a. The question is, does he have the money?
    b. The question is, #he has the money?
    c. The question is, #he has the money.

Interrogatives can be used to initiate a line of inquiry and hypothetically extend it using *if so* and *if not*. For example, (13a) is the sort of question that might appear on a health insurance form. Rising declarative questions cannot be used in this way.

(13) Are you married?
    a. If so, does your spouse have health insurance?
    b. #If so, your spouse has health insurance?
    c. #If so, your spouse has health insurance.

(14) demonstrates that rising declaratives, unlike interrogatives, don't work well to solicit advice or an opinion – what Huddleston 1994 calls "direction" questions.

(14) What do you think?
    a. Should I cut my hair?
    b. #I should cut my hair?
    c. #I should cut my hair.

Rising declaratives make poor speculative questions, i.e., questions designed to instigate thought and/or discussion without necessarily being answered or answerable. (16a), for example, might lead into a discussion of the JFK assassination without committing the Speaker to any particular view; (16b) cannot be used for the same effect.

(15) a. Does God exist?
    b. #God exists?
    c. #God exists.

(16) a. Did Oswald act alone?
       b. #Oswald acted alone?
       c. #Oswald acted alone.

As is already evident, the patterns involving restrictions on declaratives as questions are not limited to standard "information question" contexts, i.e., requests for information from an uninformed Speaker to an Addressee assumed to be informed and willing to provide the information. The point becomes even clearer when we look at examples like (17), in which interrogatives function as polite requests for action rather than for information. Declaratives do not share this function, as the (b) and (c) cases show.

(17) a. Can you (please) pass the salt?
       b. #You can (please) pass the salt?
       c. #You can (please) pass the salt.

The sarcastic question in (18) provides another illustration of the reduced rhetorical range of declarative questions compared to interrogatives.

(18) a. Is the Pope Catholic?
       b. #The Pope's Catholic?
       c. #The Pope's Catholic.

The descriptive generalization I advance for the examples considered so far is given in (19):

(19) Declaratives, rising and falling, are not neutral; they convey a bias lacking in the use of syntactic interrogatives.

In offering (19) as a descriptive generalization for the data so far I also offer an implicit hypothesis about the use of interrogatives in the contexts illustrated — namely, that certain functions of interrogatives, such as direction questions, polite requests, etc., involve at least the appearance of neutrality. I won't attempt to justify this hypothesis explicitly, which would require case-by-case study of the various uses seen above. Rather, I will take (19) as a reasonable working descriptive generalization and seek a characterization of the notions of neutrality and bias, with the expectation that such notions will ultimately be useful in understanding the range of discourse functions available for interrogatives as well as declaratives.

      The flip side to the patterns seen so far is that declaratives, differing from interrogatives, are useful in situations where bias rather than neutrality is called for. When it comes to contributing new information, for example, bias is a good thing. This is a given for falling declaratives, which are the prototypical way to offer a piece of news. But rising declaratives, too, have this potential for many speakers. The use of rising declaratives as a routine way to offer new information is exemplified in (20)-(21). Note that rising interrogatives do not share this function.

(20) Radio station DJ: Good morning Susan. Where are you calling from?
      Caller:
       a. #Am I from Skokie?
       b. I'm from Skokie?
       c. I'm from Skokie.   [adapted from Hirschberg and Ward 1995]

(21) a. #Is my name Carl? #Will I be your waiter tonight?
       b. My name is Carl? I'll be your waiter tonight?
       c. My name is Carl. I'll be your waiter tonight.

The main concern of this paper is the use of rising declaratives as questions; but the possibility of informative use must be allowed for by the analysis.

      The examples given throughout this section distinguishing the use of declaratives from that of interrogatives tally with other systematic differences between the two categories. For example, interrogatives, but not declaratives, support polarity items like *any* and *ever* (Huddleston 1994):

(22) a. Is anybody home?
       b. #Anybody's home?
       c. #Anybody's home.

The facts about sentence type and polarity marking do not fit in any obvious way under the generalization in (19), but they support the general view defended here – namely, that rising

declarative questions are not interchangeable with rising interrogatives, but acquire their questioning function in a more complex way that is true to their essentially declarative nature.

2.2 Lack of Speaker commitment

A second crucial observation about the distribution of rising declaratives is that they are far more natural as questions than their falling declarative counterparts. In this section I support that intuition empirically by showing that rising declaratives pattern in certain ways with the corresponding rising interrogatives, differing from falling declaratives. The generalization advanced is that rising declaratives, like interrogatives, fail to commit the Speaker to their propositional content. This point will emerge in comparisons with falling declaratives, which evidently do commit the Speaker.

First note that rising declaratives, like interrogatives, allow for readings in which the Speaker is understood to be skeptical of the proposition expressed. In (23), either an interrogative or a declarative may be used to acknowledge and/or elliptically reiterate A's utterance; but only (a) and (b) are compatible with B's follow-up remark, which implies that B remains doubtful about the alleged improvement. The falling declarative in (23c) seems to express overt agreement with A's opinion, and thus has the effect of inconsistency with the skeptical follow-up.

(23) [A&B are looking at a co-worker's much-dented car]
A: His driving has gotten a lot better.
B's response:
a. Has it? I don't see much evidence of that.
b. It has? I don't see much evidence of that.
c. It has. #I don't see much evidence of that.

The skeptical reading of rising declaratives is well-known, and is often connected with their "echoing" function. But it would be a mistake to assume that rising declaratives are inherently skeptical (or inherently echoing, for that matter). Rising declaratives, like interrogatives, also allow for readings in which the Speaker is understood as routinely accepting the proposition expressed, as illustrated in (24)-(25). Falling declaratives are acceptable in these cases as well.

(24) A: That copier is broken. B's response:
a. Is it? Thanks, I'll use a different one.
b. It is? Thanks, I'll use a different one.
c. (Oh), it is. Thanks, I'll use a different one.

(25) A: Jake's here. B's response:
a. Is Jake here? Then let's get started.
b. Jake's here? Then let's get started.
c. (Oh), Jake's here. Then let's get started.

An example that does not involve echoing (in a strict sense, at least) is given in (26). Here the question raised concerns a presupposition of A's utterance, rather than the main proposition expressed. Again, both the interrogative and the rising declarative are fine, while the falling declarative is unacceptable. (We will see other examples of acceptable non-echoing uses of rising declaratives, along with limitations on such uses, in Section 4.2.)

(26) A: The king of France is bald.
B's response:
a. Is France a monarchy?
b. France is a monarchy?
c. #France is a monarchy.

Like the earlier examples, (26a-b) are compatible with either skepticism (*France is a monarchy? Since when?*) or acceptance (*France is a monarchy? I didn't realize that.*) by the Speaker. It is the follow-up remark that provides the clue to the Speaker's attitude. (26a-b) by themselves are noncommittal, imposing no constraints on interpretation of the Speaker's position. What all such readings have in common, however, is the sense that the proposition expressed is newsworthy, from the Speaker's point of view – something not known before.

In fact, rising declaratives, like interrogatives, may be used to make the point that the Addressee, rather than the Speaker, is in a position to know whether the proposition expressed is true. Consider (27):

(27) a. Is shoplifting fun?
      b. Shoplifting's fun?
      c. #Shoplifting's fun.   [# as an attempt to insinuate that the Addressee
                                                  has shoplifted]

Given appropriate circumstances, asking *Is shoplifting fun?* or *Shoplifting's fun?*, as in (27a-b), can be a not-so-innocent way to communicate that the Addressee is known to be a shoplifter. Note that for this effect, the answer given by the Addressee is immaterial; the damage is done by the question itself. Asking a question seems to carry an assumption on the level of a presupposition that the person to whom a question is addressed is knowledgeable on the subject. What makes the insinuation work so well in the above examples is the presence of a predicate like *fun* or *good*, which calls for subjective evaluation. (Compare *Is shoplifting a crime?/Shoplifting's a crime?*, which lack the effect.) It generally takes personal experience to judge whether an activity is fun or not. Thus, if the Addressee is assumed to be knowledgeable about whether shoplifting is fun, it will also be assumed (in the usual case) that the Addressee has shoplifted.

The important point at present is that the (a) and (b) examples of (27) do not convey anything about the *Speaker's* criminal habits, consistent with the hypothesis that rising declaratives and interrogatives fail to commit the Speaker to their propositional content. By comparison, the most natural reading of the falling declarative in (27c) portrays the Speaker as the source of information, suggesting that it is the Speaker who has shoplifted.

The twin generalizations that emerge from the observations in this section are given in (28)-(29):

(28) Rising declaratives, like syntactic interrogatives, fail to commit the Speaker to their
      propositional content.
(29) Falling declaratives do commit the Speaker to their propositional content.

It follows from (28) that rising declaratives, like interrogatives, allow for a range of Speaker attitudes to be attributed. Falling declaratives, on the other hand, are compatible only with attitudes consistent with commitment.

In the next section I take up the problem of how the lack of commitment illustrated for rising declaratives in this section can be squared with the observations about declarative bias given in Section 2.1. Before moving on, however, there is an additional point to be made about the data in this section. It is noteworthy that in all of the above examples, the acceptability of a rising declarative as a question is paralleled by the acceptability of the corresponding interrogative. Furthermore, the interrogative and rising declarative versions are intuitively very similar in effect, whatever that effect happens to be in a particular case. This is especially striking since the "questions" exemplified in (23)-(27) are atypical in at least one important respect – they ask a question the answer to which has already been given or implied by the Addressee. To find rising declaratives used in this way is nothing new, since their function as echo questions is well known. But the fact that an interrogative can be used in the same context to much the same effect is significant. As I will discuss in Section 5, the overlap between rising declaratives and interrogatives provides a important clue to the puzzle of rising declarative questions.

3   Modeling Bias and Neutrality

3.1 Reconciling bias with lack of commitment

The data and descriptive generalizations advanced so far seem to lead naturally to an understanding of rising declaratives in terms of their defining components, the rise and declarative form. The outline suggested by the data is as follows:

(30) Understanding the bias
      The intuition: A declarative question expresses (some degree of) commitment to P, consistent
      with interpretation of the sentence as having an element of 'assertiveness' or 'bias'. (See, e.g.,
      Bolinger (1957), Bartels (1997), Huddleston (1994).)

(31) Understanding the questioning use of rising declaratives
The intuition: The rise expresses lack of commitment to P, consistent with interpretation as a question.

Equally intuitively, these two generalizations seem contradictory as stated. The challenge to be addressed in this section is how to reconcile them, and thus integrate the explanations of the observations in Sections 2.1 and 2.2, in a principled way.

The hypothesis I will implement is given informally in (32):

(32) Rising declaratives commit the Addressee to the proposition expressed.

In compositional terms, I will take declaratives to express *commitment* to their propositional content p by some discourse participant, where commitment is understood as ruling out the alternative, ¬p. The intonational component will specify which participant is committed: the Addressee in the case of the rise, the Speaker in the case of a fall. Alongside the main hypothesis, then, there is a supplementary hypothesis:

(33) Falling declaratives commit the Speaker to the proposition expressed.

The above proposal resolves the tension between lack of commitment and bias in the following way. Rising declaratives do fail to commit the *Speaker* to p, as (31) suggests. But rising declaratives do express commitment to p on the part of the *Addressee*, allowing for an understanding of the bias.

In the account to follow, bias will be characterized in contextual terms. The use of either a rising or a falling declarative expressing p ensures that the context is one in which the participants cannot easily come to agreement on ¬p. By committing one participant to p, the declarative rules out ¬p as a mutual assumption, effectively conveying a bias toward p. The contrast with interrogatives also follows in a natural way: I propose that interrogatives, unlike declaratives, commit nobody to their content and thus have the capacity to be neutral.

The idea that rising declaratives are associated with the attribution of their content (or related content) to the Addressee can be found in Noh's (1998) Relevance-Theoretic discussion of 'echo questions' and their kin. The proposal of Merin and Bartels 1997 that the rise "alienates choice to Alter" [vs. Ego] offers a related idea as well. The present account is not incompatible with these, but differs in emphasizing the explicit contribution of declarative form and its interaction with the intonational element.

3.2 The discourse context

I begin with the familiar notion of the Common Ground (Stalnaker 1978). Under Stalnaker's classic treatment, the Common Ground (hereafter CG) is a set of propositions representing what the participants in a discourse take to be mutually believed, or at least mutually assumed for the purposes of the discourse. For present purposes I will restrict attention to contexts in which mutual assumptions represent mutual beliefs. I assume, as Stalnaker does, a framework in which a proposition is construed as a set of worlds, the worlds of which the proposition is true. The CG can be defined in propositional terms as follows:

(34) CG of a discourse = { p∈ ℘(W): p is a mutual belief of the participants in the discourse }

Equivalently, the context can be treated as a set of worlds, ∩CG, the worlds of which all of the propositions representing mutually held beliefs of the participants are true. In Stalnaker's terminology, this set of worlds is the *context set* of the discourse.

(35) context set of a discourse = { w∈ W: the mutual beliefs of the discourse participants are true of w }

The mutual beliefs constituting the CG are, crucially, *mutual* and not just shared. That is, for each p in the CG, each participant is not only taken to believe p but to be aware that other participants believe p as well; and they, likewise, not only share the belief but recognize that the belief is shared. In other words, mutuality involves beliefs about one's own and others' beliefs.[1] Beliefs that remain private,

---

[1] How to characterize mutual knowledge/belief, in a way that captures its recursive nature and yet is cognitively plausible is a matter of some debate, which I do not enter into here. I will simply assume that the kind of mutual belief context required for communication can be represented in some way consistent with the proposal outlined.

and beliefs that the participants happen to have in common without mutually realizing it, are not part of the CG.

Although the CG is typically employed, as it will be here, to theorize about linguistic contributions to the discourse, it is important to remember that it typically contains much more than the propositional content of statements. The participants come to the discourse, even if they are strangers to each other, with mutual beliefs of a general sort, including the expectation of their use of a shared language, assumptions relating to their membership in a particular culture and speech community, and mutual observations relating to the physical environment of the discourse (time, place, communicative medium, etc.) If the participants know each other, slightly or well, they will also have mutual beliefs relating to their personal histories and previous interactions. In addition to these preexisting beliefs, a multitude of mutual beliefs will be formed about salient events occurring as the discourse progresses. These salient events predictably include, at a minimum, the speech events that make up the discourse proper; the participants can be expected to form mutual beliefs about the *facts* of these events – that they took place at a given time or in a certain sequence, which participant uttered what, etc. More exotic events, such as a goat unexpectedly entering the room where the discourse is taking place, will also result in additions to the CG.

The content of the CG thus depends on who the discourse participants are, as well as the circumstances of the discourse. Indeed, the participants must be mentioned, as they are in (34)-(35), to give any sort of characterization of the context in terms of mutual beliefs or assumptions. As an indicator of this dependency, I will use the notation $CG_{\{A,B\}}$ for a CG in which A and B are the discourse participants. I assume two discourse participants throughout.

The step needed to implement the hypothesis in (32) in a straightforward way is to separate out the beliefs publicly attributed to each participant, as is done in (36).

(36) Let $CG_{\{A,B\}}$ be the Common Ground of a discourse in which A and B are the individual discourse participants.
    a. DC_A of $CG_{\{A,B\}}$ = { p: 'A believes p' $\in CG_{\{A,B\}}$}
    b. DC_B of $CG_{\{A,B\}}$ = { p: 'B believes p' $\in CG_{\{A,B\}}$ }

(36) defines a more articulated version of the CG, without making any essential changes to the conception. The set of propositions associated with each participant represents what we may think of as their *public beliefs*, or *discourse commitments* (DC) – public in the sense that the participant is mutually recognized as committed to them. All mutual beliefs are public in this sense, but a public belief of an individual does not have to be mutual; an illustration will be given below.

The definition in (36) takes $CG_{\{A,B\}}$ as the basic structure and defines DC_A and DC_B in terms of $CG_{\{A,B\}}$. But we can just as easily take DC_A and DC_B as basic, deriving $CG_{\{A,B\}}$. And since I am concerned here with public beliefs of individual participants and not just mutual beliefs, the latter orientation, as spelled out in (37), will be more convenient.

(37) Let DC_A and DC_B be sets of propositions representing the public beliefs of A and B, respectively, with respect to a discourse in which A and B are the participants, where:
    a. p is a public belief of A iff 'A believes p' is a mutual belief of A and B
    b. p is a public belief of B iff 'B believes p' is a mutual belief of A and B

In light of (37), the context of the discourse can be represented as an ordered pair $<DC_A, DC_B>$, replacing $CG_{\{A,B\}}$ (which is still derivable as { p: p $\in DC_A$ & p $\in DC_B$ }.) Or, equivalently and more conveniently, the context can be construed as an ordered pair of sets of worlds, analogous to Stalnaker's notion of the context set. I adopt the latter construal as the representation of the context, as shown in (38). Here the abbreviation *cs* stands for the *commitment set* of an individual, the set of worlds of which that individual's public beliefs are true.

(38) Let a discourse context $C_{\{A,B\}}$ be $< cs_A, cs_B >$, where:
    a. A and B are the discourse participants
    b. cs_A of $C_{\{A,B\}}$ = { w$\in$W: the propositions representing A's public beliefs are all true of w}
    c. cs_B of $C_{\{A,B\}}$ = { w$\in$W: the propositions representing B's public beliefs are all true of w}

Just as the original Stalnakerian concept of the Common Ground is recoverable given DC_A and DC_B, the context set is recoverable from $<cs_A, cs_B>$: it is the set of worlds of which all *mutual* beliefs of A and B are true, namely $cs_A \cup cs_B$.

As an illustration, consider a discourse in which A and B publicly disagree on some point. Suppose, for example, that A has said that cats make better pets than dogs, while B has argued in favor of dogs. Let q stand for the proposition expressed by *Cats make better pets than dogs*. Clearly q is not a mutual belief of A and B, since A and B are in disagreement on this point. Of course W-q (the set of worlds of which ¬q is true) is not a mutually held proposition either, since A's belief is in conflict with it. Still, q does figure indirectly in the Common Ground, which still records their mutual beliefs about each other's positions. That is, the fact that A believes q itself has the status of a mutual belief, as does the fact that B believes a proposition entailing W-q (assuming, as I do here, that the participants' statements can be taken as an index to their beliefs). The situation differs crucially from one in which the opinions of A and B on the matter remain private, and this difference is reflected in the representation of the context.

The formalism just introduced makes the descriptive task easy in situations like the one described above : we can say that q is a discourse commitment (a public belief) of A's (that is, $cs_A \subseteq$ q), and W-q is a discourse commitment of B's ($cs_B \subseteq$ W-q). Clearly neither q nor W-q can become a mutual belief of A and B in this context, at least not without one participant revising their position. Let us call this sort of situation one in which both q and W-q are *controversial* with respect to the context. The relevant notions are characterized in (39)-(42) below. For notational ease, I will henceforth drop the subscript of $C_{\{A,B\}}$; references to C are to be understood as references to contexts in which A and B are the participants.

Status of a proposition p with respect to a discourse context C:
(39)   p is a *commitment* in C of an individual discourse participant X iff $cs_X \subseteq$ p.
(40)   p is a *joint commitment* in C iff both discourse participants are committed to p.
(41)   p is *unresolved* in C iff neither p nor W-p is a joint commitment.
(42)   p is *controversial* in C iff W-p is a commitment of at least one discourse participant and p is unresolved in C.

A second, and more directly relevant, type of situation in which q is a public belief without being a mutual one is the following. Suppose A has said, as before, that cats make better pets than dogs. Then q is a commitment of A, according to (39). Consider the state of the discourse before B makes any response indicating agreement or disagreement (i.e., neither q nor W-q is a commitment of B). q is not a mutual belief in this situation, though it may become one without further ado if B indicates acceptance. W-q is not a mutual belief, either, but its status is different from that of q. While q just needs ratification by B to become a mutual commitment, W-q is not eligible as a mutual belief at all, given that A has already expressed commitment to q. In an obvious way the context is *biased toward q*; only q can be admitted as a mutual belief without requiring (non-monotonic) revision.

This simple and intuitive notion of contextual bias is what I will build upon in accounting for the bias of declaratives. The relevant definitions are given in (43)–(45).

Status of a context C with respect to a proposition p:
(43)   C is *empty* iff there is at least one cs_X in C such that $cs_X = \varnothing$, where X stands for A or B.
(44)   C is *biased toward p* iff C is not empty, W-p is controversial, and p is not controversial.
(45)   C is *neutral with respect to p* iff C is not empty and neither p nor W-p is controversial.

These definitions are quite straightforward. (43) specifies that a context is empty if the cs of any participant is the null set. The key definitions for the present account are (44)-(45), which say what it means for a context to be biased and neutral, respectively. Contextual bias exists if mutual agreement on p is possible (without revision) while mutual agreement on W-p is ruled out due to an existing commitment to p by at least one discourse participant. If the context is in a neutral state with respect to p, then mutual agreement on either p or W-p is possible in principle.

The contextual states introduced here are not particular to the analysis of rising declaratives. They offer a general way to talk about bias and neutrality that is potentially useful for the analysis of other phenomena as well, such as tag questions, negative polar interrogatives, and discourse particles. The next step in the present analysis, however, is to specify the contribution of rising and falling declaratives in terms of their context change potential and link their effects to the above contextual states.

3.3 Declarative meaning and locution meaning

The basic idea to be implemented in this section, following the tradition of update semantics, is that the meaning of a sentence is its context change potential, its CCP (Heim 1982, Kamp 1981, and others). The modification made here is that the CCP of a sentence is defined in terms of an update to a substructure of the context, the commitment set (cs) of an individual participant. Consistent with the guiding hypotheses in (32) and (33), the rise and fall will serve to identify the individual cs to be updated, given an utterance context, i.e., a context in which individual participants can be identified in the roles of Speaker and Addressee.

I will use the term *locution*, abbreviated L or $\updownarrow$S, to designate the linguistic expression comprised of a sentence of a given type plus the rise or fall, retaining the more traditional usage of the term *sentence* for expressions not specified for intonational contour. This and other notational conventions are summarized in (46).

(46) a. $\uparrow$S$_{decl}$: rising declarative locution
　　　b. $\downarrow$S$_{decl}$: falling declarative locution
　　　c. $\uparrow$S$_{interr}$: rising polar interrogative locution
　　　d. S: ranges over { S$_{decl}$, S$_{interr}$ }
　　　e. L: ranges over { $\uparrow$S$_{decl}$, $\downarrow$S$_{decl}$, $\uparrow$S$_{interr}$ }
　　　f. $\updownarrow$: ranges over { $\uparrow$, $\downarrow$ }
　　　g. cs$_X$: ranges over { cs$_A$, cs$_B$ }

The CCP of a declarative sentence is defined with respect to an individual cs$_X$, as in (47), without regard to the identity of X. The descriptive content corresponds to the proposition expressed by the declarative.

(47) cs$_X$ + S$_{decl}$ = {w $\in$ cs$_X$: the descriptive content of S$_{decl}$ is true of w}

The CCPs associated with rising and falling locutions are represented in (48) and (49), respectively:

(48) C + $\uparrow$S = C' such that:
　　　a. cs$_{Addr}$ (C') = cs$_{Addr}$ (C) + S
　　　b. cs$_{Spkr}$(C') = cs$_{Spkr}$ (C)

(49) C + $\downarrow$S = C' such that:
　　　a. cs$_{Spkr}$ (C') = cs$_{Spkr}$(C) + S
　　　b. cs$_{Addr}$(C') = cs$_{Addr}$ (C)

Here, cs$_{Addr}$ is a function from an utterance context C to either cs$_A$ or cs$_B$, depending on who is in the role of Addressee when the locution is uttered. Similarly, cs$_{Spkr}$ is the function picking out either cs$_A$ or cs$_B$ based on who is in the role of Speaker.[2] The contribution of the intonation is to identify the target commitment set for the substantive update.

Combining the elements above, we arrive at the result in (50) for a rising declarative locution, applying the declarative update to the Addressee's cs:

CCP of rising declarative

(50) C + $\uparrow$S$_{decl}$ = C' such that:
　　　a. cs$_{Spkr}$(C') = cs$_{Spkr}$ (C)
　　　b. cs$_{Addr}$(C') = cs$_{Addr}$ (C) + S$_{decl}$

The counterpart to (50) for falling declaratives is:

(51) C + $\downarrow$S$_{decl}$ = C' such that:
　　　a. cs$_{Spkr}$(C') = cs$_{Spkr}$ (C) + S$_{decl}$
　　　b. cs$_{Addr}$(C') = cs$_{Addr}$ (C)

The only difference between the two CCPs is the target of the substantive update – the Addressee cs in (50), the Speaker cs in (51). In each case the declarative component makes the same contribution: eliminating worlds from the target cs of which the descriptive content is not true.

---

[2] It should be clear that the meaning I posit for the rise and fall is indexical in nature, on a par with the meaning of expressions such as *I, you*, *the Speaker*, and *the Addressee* and amenable (I assume) to the same sort of analytical treatment.

The compositional nature of the above approach emerges more clearly when the individual functions corresponding to each element are sorted out. A sentence meaning is an update function on commitment sets (sets of worlds), as summarized in (52). As stated in (53), a rise or fall is interpreted as a function taking a sentence meaning and mapping it to a context update function that applies the sentence meaning function to an individual commitment set of the context, leaving the other commitment sets unchanged. Locution meaning follows compositionally, as shown in (54), by applying the intonational function to the sentence meaning.

(52) $|S|$ = function from cs_X to cs_X'

(53) $|\Updownarrow|$ = function from sentence meanings (functions from cs_X to cs_X') to functions from C to C' such that cs_X of C' = $|S|(cs_X)$ and C' is otherwise identical to C.

(54) $|L| = |\Updownarrow|(|S|)$ = function from C to C' such that cs_X of C' = $|S|(cs_X)$ and C' is otherwise identical to C

I use the + notation for both kinds of update (cs and C), so that the following equivalences hold:

(55) a. $C + L = |L|(C)$
      b. $cs_X + S = |S|(cs_X)$

I make the following provisional assumptions about presuppositions in this framework. Following Heim 1983, I assume that updates are partial functions, defined only for contexts in which presuppositions are satisfied. A context is said to *admit* a sentence only if the presuppositions of the sentence are met in that context, which means, in effect, that the presuppositions must be already entailed (or in practice, accommodatable). I extend the notion of admittance to apply to locutions and contexts as well as to sentences and commitment sets, as defined in (56)-(57). I assume that the locution inherits the presuppositions of the sentence. Finally, I assume that presuppositions must be satisfied with respect to *joint* commitments rather than individual sets, as (57) provides.

(56) cs_X admits S iff for all propositions r such that r is a presupposition of S, $cs_X \subseteq r$.

(57) C admits $\Updownarrow$S iff for all cs_X in C, cs_X admits S.

The operations $cs_X + S$ and $C + L$ are defined only if cs_X admits S and C admits L, respectively. Rising and falling intonation are assumed to carry no additional presuppositions themselves (although there is no reason why they could not). The treatment of presupposition suggested here distinguishes between presuppositional content and primary descriptive content in a way that seems correct: presuppositions cannot be controversial with respect to the context, as the propositional content proper of a declarative can be.

Changes to the context effected by updates can be classified in various useful ways. A basic notion is that of *consistency*, as defined in (58). A declarative is consistent with a context only if the update will not result in an empty cs (and therefore an empty context).

Consistency:

(58) L is consistent with a context C iff C admits L and C + L is not empty.

A locution L with descriptive content p evaluated with respect to a context C is:

(59) *uninformative* with respect to C iff L is consistent with C and C + L = C.

(60) *neutral* iff L is consistent with C and C + L is neutral with respect to p.

(61) *biasing* iff L is consistent with C, C is neutral with respect to p, and C + L is biased toward p.

It follows from the definition of the CCP of declaratives, together with the definitions in (59)-(61), that no use of a declarative can be neutral. There are two types of outcome when a declarative is uttered in a context with which it is consistent. Either the declarative will eliminate worlds of which its content is not true from the cs of some participant, resulting in a state of controversy or contextual bias; or the declarative will be uninformative. A declarative can only be uninformative, however, if the context is already non-neutral, that is, if worlds of which the content is not true are already absent from the targeted cs. (62) and (63) thus have the status of theorems.

Declarative bias:

(62) No declarative is neutral with respect to any context.

Declarative uninformativeness:

(63) S_{decl} with descriptive content p is uninformative with respect to C only if C is not neutral with respect to p.

The unacceptability of declaratives in the contexts illustrated in Section 2.1 follows directly from (62). By hypothesis, those examples involved discourse situations requiring the Speaker to maintain (at least the appearance of) a neutral context with respect to the issue raised by the question. Use of a declarative to express the question, whatever the intended function of the move, is guaranteed to result in a non-neutral context, in violation of the expectation of neutrality.

The examples given in Section 2.2 are also accounted for. Since the Speaker uttering a rising declarative does not commit herself to the content uttered, the range of attitudes shown to be possible is perfectly consistent with the proposal. In particular, she may go on to express skepticism or disagreement without inconsistency. On the other hand, since the speaker uttering a falling declarative does commit herself, the contrast between the two is understandable. The speaker uttering (23c) is behaving inconsistently, whereas the speaker of (23b) is not.

The notion of an *informative* locution is not characterized directly above, though it could easily be done. In this paper, which focuses on questions, the property of uninformativeness is of more concern. To preview the argument, the claim I will defend with respect to rising declaratives is that they are interpretable as questions *only when uninformative*. If this claim is correct, rising declaratives should be interpretable as questions only when the Addressee is already publicly committed to the content of the declarative. The data to be introduced in Section 4.2 will show that this generalization is correct.

Restricting attention to uninformative rising declaratives allows me to sidestep the issue of what it means for a speaker to make a move that has the effect of modifying the Addressee's public commitments, as would be the case for an informative rising declarative. I do assume that such moves are possible, and that a coherent account can be given of them. (In fact standard accounts of assertion in terms of the effect on mutual beliefs implicitly incorporate similar modification.) This is the door I will leave open to account for the informative uses exemplified in (20) and (21), without, however, pursuing the topic further in this paper.

3.4 Interrogative meaning and neutrality

To frame the contrast between interrogatives and rising declaratives, I will now give a proposal for the meaning of rising interrogatives in context update terms. Consistent with the general hypotheses about the rise given in (48), I assume that an interrogative sentence with rising intonation operates on the commitment set of the Addressee. Interrogatives, however, do not commit the Addressee to their content, or the Speaker either. In fact, interrogatives seem to differ crucially from declaratives in not expressing commitment at all. The CCP of an interrogative is thus very simple – it makes no change to the targeted commitment set. The definition is given in (64); (65) shows the compositional result for the CCP of a rising interrogative.

(64) $cs_X + S_{interr} = cs_X$

(65) $C + \uparrow S_{interr} = C'$ such that:
   a. $cs_{Addr}(C') = cs_{Addr}(C) + S_{interr}$
   b. $cs_{Spkr}(C') = cs_{Spkr}(C)$

Effectively, $C + \uparrow S_{interr} = C$ (ignoring effects of any accommodated presuppositions). A significant advantage to treating interrogative updates in the same manner as declarative ones is that the assumptions about presuppositions made in (56)-(57) apply straightforwardly to interrogatives. Since polar interrogatives carry the same presuppositions as their declarative counterparts, this is a desirable result.

The above definitions do not do full justice to our intuitions about interrogatives. Intuitively, a context in which an interrogative has been uttered is not identical to one lacking the interrogative utterance. I assume that polar interrogatives do have non-trivial effects on aspects of the discourse context not represented here. For example, Büring 1995 and Roberts 1996, following Carlson 1983, explicate the effect of interrogatives in terms of the Discourse Topic, or Question Under Discussion (QUD), a structure paralleling the CG. Groenendijk 1999 represents the non-trivial update effects of interrogatives with a more complex representation of the context using pairs of worlds. Proposals agree, however, on the point that matters to the present discussion — polar interrogatives do not commit any participant to their descriptive content.

By the *descriptive content of an interrogative* I mean just the proposition expressed, in an obvious way — e.g., *It is raining* for the interrogative *Is it raining*. A negative polar interrogative will thus have different descriptive content than its positive counterpart. Most semantic theories do not

give polar interrogatives a representation that distinguishes between *Is it raining* and *Isn't it raining*, as this assumption requires. However, the failure to distinguish between the two in a way that allows the pragmatics access to the difference is a shortcoming that needs a remedy independently of any proposal made here, given that the effects of positive vs. negative polar interrogatives are manifestly not identical. I will therefore continue to refer to the descriptive content of interrogatives, assuming that the original proposition expressed is accessible in some way.

We can now classify the effects of interrogative utterances just as we did earlier for declaratives. Since interrogatives by hypothesis do not change the context, the definition of consistency given in (58) ensures that they are trivially consistent with any context that is non-empty to begin with.[3] Of particular interest for present purposes is the observation that a rising interrogative with descriptive content p is consistent with a (non-empty) context in which the Addressee is already committed to p. Intuitively, an interrogative is redundant in such circumstances. Given that the Addressee's commitment to p is already a matter of public record, the interrogative seems to be calling for a response that is bound to be uninformative. It is common practice in modeling discourse to focus on informativeness in terms of the literal content of utterances. Hence, many models of discourse (including those mentioned above) incorporate rules that prohibit uninformative statements, along with barring interrogatives whose answers would be uninformative. For the present account, however, it is crucial that the uninformativeness (or redundancy) of an utterance be understood as distinct from its felicity. The fact is that what we may think of as 'confirming questions', i.e., questions to which an answer has already been given, *are* felicitous. Examples (23)-(25) demonstrate that, and Section 4.2 will provide more examples in the same category.

It follows from the definitions of the CCP for rising interrogatives, together with the definitions in (59)-(61), that interrogatives are inherently uninformative – they can't change the context. It also follows that interrogatives are inherently non-biasing. These two generalizations are stated in (66) and (67), which, like (62)-(63), have the status of theorems:

(66) If an interrogative is consistent with respect to C, it is uninformative with respect to C.
(67) No interrogative is biasing with respect to any context.

It does not follow, however, that all utterances of interrogatives are neutral. According to (60), interrogatives count as neutral only when uttered in a neutral context. This is stated in (68):

Interrogative neutrality:
(68) S_{interr} with descriptive content p is neutral with respect to a context C only if C is neutral with respect to p.

An interrogative used in a biased context preserves the bias, and thus does not count as neutral. But an interrogative, unlike a declarative, has the capacity to preserve neutrality as well. It is thus possible for an interrogative to be neutral, whereas a declarative does not have that potential.

The capacity for interrogatives to be neutral accounts for their acceptability in the examples of Section 2.1, which by hypothesis required neutrality on the part of the Speaker. The noncommittal nature of interrogatives is also supported by the examples in Section 2.2, which showed that interrogatives as well as rising declaratives failed to commit the Speaker to their content.

4   Restrictions on questioning

4.1 Uninformativeness and questions

So far we have reached an understanding of the non-neutrality of declaratives that accounts for important aspects of their interpretation. The challenge that remains is accounting for the questioning use of rising declaratives. Under the proposal advanced in the previous section, rising declaratives update the Addressee's commitment set. Although the bias of rising declaratives becomes understandable on this view, it is not obvious on the face of it why a move by the Speaker to update to the Addressee's commitments should naturally be interpreted as questioning. Nor, it turns out, is

---

[3]The consistency condition may be too liberal in allowing interrogatives to be consistent with any non-empty context at all. As Gunlogson and Büring 2000 note, there seem to be restrictions on the use of polar interrogatives in contexts biased *against* p. However, such contexts will not concern us here, and motivating revisions for interrogatives would take us too far afield from the analysis of rising declaratives.

the characterization of declarative bias sufficient to account for all the restrictions on their use as questions. In this section of the paper I'll document the additional restrictions on use and connect them to the questioning use of rising declaratives.

The position I defend is that declaratives, even rising ones, are not inherently questions, a position compatible with the account so far. Rather, as will be shown in Section 4.2, they operate as questions only in certain restricted contexts. The contextual requirement is that the proposition expressed by the declarative must already be known to the Addressee, and mutually known to be known – i.e., it must be a public commitment of the Addressee. Intuitively, for declarative questions, the idea is that the context must provide some crucial information about how the Speaker expects his use of the declarative to be interpreted. Declaratives can be interpreted as questioning moves only if they *can't* be interpreted as telling. The phenomenon of rising declarative questions thus arises as an interaction between locution meaning and context. Interrogatives, on the other hand, *are* inherently questions and need no special contextual support to acquire this function.

The hypothesis I will use to guide the analysis is that uninformativeness is a necessary, though not sufficient, condition for an utterance of a rising declarative to qualify as a question. An interrogative will meet the condition in any non-empty context, since interrogatives are uninformative by definition. In fact, it is really the category of interrogatives that supplies the hypothesis. I take it that there is a very general sense in which we consider the use of an interrogative, whatever the intent behind the use, to constitute a question. The examples of interrogatives throughout Section 2, for example, all are questions in this general sense, although many of them are not (sincere) requests for information.

Let us say, then, that to function as a question in the broad sense, an utterance must minimally have the relevant property of a (rising) interrogative: it must be uninformative with respect to the context. This amounts to the condition on polar questions expressed in (69):

Uninformativeness Condition
(69)   An utterance of a locution L is a polar question in C only if $C + L = C + \uparrow S_{interr}$.

A rising interrogative, of course, satisfies (69) trivially. Declaratives are a different matter. Since a declarative is *potentially* informative, whether a particular utterance is informative or not crucially depends on the context in which it is uttered. In particular, a rising declarative is uninformative only in certain contexts – the contexts in which the Addressee's public commitments already include the proposition expressed by the declarative. In such contexts, since the Addressee is mutually assumed to be committed to p already, the Speaker using the rising declarative cannot be construed (by the Addressee) as intending to *tell* the Addressee that p holds. The claim is that this public clue to the Speaker's intentions is prerequisite for the success of a rising declarative question.

In the next section I will support the claim by showing that rising declaratives can function as questions *only* where they meet the criterion of uninformativeness. I call the version of the Uninformativeness Condition tailored to rising declarative questions the *Contextual Bias Condition* and state it in (70):

Contextual Bias Condition on rising declarative questions
(70)   An utterance of $\uparrow S_{decl}$ is interpretable as a question in a context C only if it can be mutually understood as uninformative, that is, only if $cs_{Addr}(C + \uparrow S_{decl}) = cs_{Addr}(C)$.

As we will see, (70) is independently motivated by the observations to be introduced in the next section.

4.2 The Contextual Bias Condition on rising declarative questions

The data and the empirical generalization advanced in this section center around the observation that rising declaratives cannot readily be used as questions 'out of the blue', with no particular context, as interrogatives can be. The first indication is that interrogatives may be used to initiate discourses in ways that the corresponding declaratives may not be. (71a) can be used to strike up a conversation with a stranger about his dog, while (71b) is awkward to impossible in the same setting. An interrogative like (72a) may be uttered in the mere hope of an affirmative response, but (72b) seems to presume the hope is justified, which is odd under the circumstances. Similarly, (73a), but not (73b) or (73c), is a standard way of beginning a telephone conversation in the hopes of speaking to Laura.

(71) [to passerby walking a dog]
Pardon me, but…
   a. Is that a Weimaraner?
   b. #That's a Weimaraner?
   c. #That's a Weimaraner.

(72) [to passerby in a parking lot]
Excuse me, but my battery's dead.
   a. Do you (by chance) have jumper cables?
   b. #You've (by chance) got jumper cables?
   c. #You've (by chance) got jumper cables.

(73) [initiating a phone conversation]
   a. Is Laura there?
   b. #Laura's there?
   c. #Laura's there.

It is important to see that the awkwardness of the above rising declaratives does not follow from the account of declarative bias given in Section 3. We expect, in light of that account, that a question asked via a declarative will be non-neutral. But here, unlike the cases exemplified in Section 2, there does not seem to be any plausible expectation of neutrality from the Speaker that is violated by the declarative question. Suppose, for instance, that the Speaker of (71b) privately knows or suspects that the dog in question is a Weimaraner. In fact, it is difficult to avoid making that assumption, even for the interrogative in (71a), given that the Speaker has chosen to ask a polar question about a particular breed rather than simply asking what kind of dog it is. Why should it be so odd for the Speaker to ask a non-neutral declarative question in that case, in effect conveying her own positive bias by way of conveying an expectation that the Addressee will agree? Similarly, assume that the Speaker in (73b) has good reason to believe that Laura is indeed home (perhaps he is parked outside Laura's house and calls from his cell phone after he has seen her arrive). Adding this assumption makes it reasonable from the Speaker's point of view to ask a non-neutral question – the Speaker has reason to expect a *yes* from the Addressee, or at least to object to a *no* – but the assumption does not suffice to make the rising declarative acceptable.

The examples of felicitous rising declarative questions we saw in Section 2.2 also provide evidence against the idea that the contextual requirement involves the *Speaker's* propositional attitude toward the content of the declarative. Recall that Section 2.2 established the compatibility of rising declarative questions with Speaker attitudes ranging from disbelief to neutrality to positive acceptance, concluding that rising declaratives fail to commit the Speaker to their propositional content. Any attempt to frame the contextual condition on rising declarative questions in terms that require a particular attitude on the part of the Speaker will immediately fall afoul of those data.

A solution that *is* compatible with the examples in Section 2.2, however, is that the requirement involves the Addressee's attitude. In all of the cases of felicitous rising declarative questions we have seen so far, the Addressee may reasonably be taken to be committed to the proposition expressed, even when the Speaker is not. Example (23) is repeated below to illustrate.

(23) [A&B are looking at a co-worker's much-dented car.
A: His driving has gotten a lot better.
B's response:
   a. Has it? I don't see much evidence of that.
   b. It has? I don't see much evidence of that.
   c. It has. #I don't see much evidence of that.

Intuitively, it seems as though the Speaker must have some evidence to support the belief that the Addressee is committed to the proposition expressed – which evidence comes in the above examples from the Addressee's own statements to that effect. But this view of the situation, though not exactly wrong, is somewhat deceptive. As we will see later in this section, a preceding utterance by the Addressee is not strictly necessary. On the other hand, not just any sort of evidence for the Addressee's belief will suffice. In particular, it is not sufficient for the Speaker to have a private reason for believing that the Addressee believes p. To see this, return to example (71) and suppose, as was suggested earlier, that the Speaker has good reason to think, based on her own personal experience and knowledge, that the dog is a Weimaraner. She also has good reason to suspect that the

owner knows what kind of dog it is; owners of purebred dogs usually do. It seems to follow that the Speaker can reasonably assume that the Addressee believes the dog to be a Weimaraner (though nothing in the context allows the Addressee to reconstruct that reasoning.) The problem is that adding these background suppositions about the Speaker's private assumptions fails to improve the rising declarative. What *does* improve (71b) is imagining it to be spoken in a situation such as a dog show,[4] where it is more plausible for the Speaker and Addressee to assume a *mutual* knowledgeability about dog breeds.

These considerations support the Contextual Bias Condition introduced in Section 4.1, which makes reference to the Addressee's and not the Speaker's commitments, and crucially, the Addressee's *public* commitments. I repeat the condition below for reference:

(70) An utterance of $\uparrow S_{decl}$ is interpretable as a question in a context C only if it can be mutually understood as uninformative, that is, only if $cs_{Addr}(C + \uparrow S_{decl}) = cs_{Addr}(C)$.

One of the agreeable consequences of (70) is that the "echo" uses of rising declaratives fall out naturally. The situation where the Addressee has already stated the content presented by the declarative question is just a special case subsumed under the more general condition given in (70). "Echoes" can range from utterances having every word in common with the original, as in (74), to elliptical echoes such as (23) (shown above) and other examples in Section 2.2, to entailments of the content as in (75), which has no word in common with the original.

(74) A: There's a leopard in the living room. B's response:
    a. ? Is there a leopard in the living room?
    b. There's a leopard in the living room?
    c. There's a leopard in the living room.

(75) A: Gina went skydiving yesterday.
    B: You're kidding!
    a. ? Did she jump out of an airplane?
    b. She jumped out of an airplane?
    c. #She jumped out of an airplane.

Whether or not all of these repetitions are properly called "echoes" is, fortunately, a point of little importance to the present discussion, since that notion plays no formal role in the account. What's important is that the definition in (70) is general enough to cover all of the cases that might reasonably be called echoes, and some additional ones besides.

Examples of rising declaratives that question presuppositions appear in (26) and in (76) below.

(76) A: Maria's husband was at the party. B's response:
    a. Is Maria married?
    b. Maria's married?
    c. #Maria's married.

The Speaker can also use a rising declarative to present an inference interpretable as a consequence of the Addressee's position, as shown in (77)-(78). In these examples all three locutions are acceptable, and all suggest that the A's preceding speech act has led the Speaker to the hypothesis or conclusion expressed by the descriptive content of the sentence.

(77) A: Jon has to leave early.
    B's response:
    a. Will he miss the party then?
    b. He'll miss the party then?
    c. He'll miss the party then.

(78) A to caller: Mom, I'll call you back tomorrow, OK?
    Caller:
    a. Are you too busy to talk to your mother?
    b. You're too busy to talk to your mother?
    c. (I see.) You're too busy to talk to your mother.

---

[4] This observation is due to Line Mikkelsen.

More examples of the type shown in (77b)-(78b) can be found in Bartels 1997 and Noh 1998, who also make the point that sentences functioning as 'echoes' are not limited to repeating previously uttered content.

A difficulty arises here with the Contextual Bias Condition, which is formulated in terms of entailment. The propositions expressed by the Speaker in (77)-(78) clearly are not logical entailments of the sentence uttered previously. They're not even (necessarily) conversational implicatures, given that the preceding sentence may not ordinarily be taken to imply what the Speaker has chosen to represent as mutually inferrable from its utterance. The ideal solution would be to state the Contextual Bias Condition in terms of a relation weaker than logical entailment, and/or adopt a richer representation of the context that allows for mutual inferrability as well as mutual belief. For the purposes of working through the present hypotheses about questioning, however, it is not necessary to embark on these projects. Instead I will assume that (77)-(78) represent cases where the rising declaratives are *accommodated* as questions by making the necessary contextual adjustment to meet the Contextual Bias Condition. The adjustment required is the portrayal of the proposition expressed by the declarative as following from the Addressee's commitments. If we take p to be the content of the declarative question, what must be accommodated as a joint commitment of the participants is q $\rightarrow$ p, where q is a relevant public commitment of the Addressee's that serves as the basis for the inference.

In (78), for instance, A conversationally implicates that he intends to cut short the conversation with his mother at the present time. His mother's response assumes that the reason for this intended action is that A is too busy to talk to her. In the rising declarative version (by hypothesis), she presents this assumption as a public commitment of A's. The form of q $\rightarrow$ p that must be accommodated is as follows:

(79) If *A intends to cut short the conversation with his mother* (q), *he is too busy to talk to her* (p).

The plaintive air of the mother's response is shared by all three versions and has to do, we may assume, with the descriptive content being presented rather than the locution type.

The clearest evidence that rising declaratives are not inherently echoes comes from contexts in which there is no preceding utterance to echo at all. Consider (80)-(81). Here the rising declarative questions are infelicitous – a reasonable result, seemingly, since in the situations as described there is no reason for the Speaker to think that the Addressee is committed to the proposition expressed. In particular, there is no preceding utterance by the Addressee, as there has been in all the felicitous cases so far.

(80) Robin is sitting in a windowless computer room with no information about current weather conditions when another person enters.
      Robin says to the newcomer:
      a. Is it raining?
      b. #It's raining?
      c. #It's raining.

(81) Julia and Max have just left a movie and are discussing it. Julia interjects:
      a. Are you hungry? (Let's get something to eat.)
      b. #You're hungry?
      c. #You're hungry.

The revised versions shown in (82)-(83), where the rising declaratives are felicitous, demonstrates that the absence of an appropriate utterance cannot be the decisive factor in the infelicity of (80b)-(81b). In the altered situations there *is* reason to think that the Addressee is committed to p, and the rising declaratives are accordingly improved. The pertinent evidence, however, is extra-linguistic – the wet raincoat in (82), the noisy stomach in (83).

[cf. (80)]

(82) Robin is sitting, as before, in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots. Robin says:
      a. Is it raining?
      b. It's raining?
      c. (I see that/So) It's raining.

[cf. (81)]

(83) In the middle of Julia and Max's discussion, Max's stomach rumbles audibly, providing evidence of his hunger. Julia interjects:

    a. Are you hungry? Let's get something to eat.
    b. You're hungry? Let's get something to eat.
    c. You're hungry. Let's get something to eat.

The contrast between (80)-(81) and (82)-(83) is clear, and it establishes decisively that rising declarative questions do not require a *linguistic* antecedent.

How do (82b)-(83b) manage to satisfy the Contextual Bias Condition? The explanation goes like this. In (82)-(83), but not the earlier cases, the Speaker is provided with evidence that the proposition expressed by the declarative is in fact true. Furthermore, the evidence is public – it is accessible to the Addressee as well. The public nature of the evidence is important, but the evidence plays a different role for the Addressee than for the Speaker. The Addressee is already in a position to know whether or not the proposition is true and need not rely on the public evidence to decide that. After all, in (82) the Addressee has just been outside and presumably knows whether it's raining without having to reason from the state of her raincoat. The same point holds for Max's hunger in (83). The crucial contribution made by the public evidence from the point of view of the Addressee is that it enables the Addressee to recognize that the Speaker is being intentionally uninformative. That is, the Addressee is able to recognize that the Speaker assumes that the Addressee knows that the proposition expressed is true. Moreover, the Speaker, knowing that the Addressee can see the basis of the inference that the proposition is true, can count on the Addressee recognizing the intention to be uninformative. From the Speaker's point of view, the Addressee can be regarded as publicly committed to the proposition expressed – the Speaker believes it to be true, believes the Addressee to believe it, and believes the fact of the Addressee's belief to be mutual knowledge (or at least accommodatable as such). As for the Addressee, the public evidence ensures that she is in a position to appreciate the Speaker's point of view, even if the inference turns out to be wrong and the proposition is *not* true (and hence not truly believed by the Addressee).

In short, the facts show that no amount of tinkering with assumptions about private knowledge, private belief, or private evidence will render a rising declarative question felicitous in the absence of relevant *public* evidence. In its most obvious manifestation, the public evidence for the Addressee's belief is the Addressee's own utterance. But as (82)-(83) show, the evidence need not be linguistic in nature, as long as the Contextual Bias Condition can be met (or accommodated). The result arrived at empirically in this section is thus in agreement with the hypothesis advanced on more conceptual grounds in Section 4.1.

Throughout the examples in this section we can see once again the significant generalization pointed out at the end of Section 2.2: generally speaking, wherever a rising declarative is acceptable as a question, the corresponding interrogative is as well; and the effect produced is very similar.

5   What counts as a polar question?

In the last section I defended the claim that only rising declaratives understood as uninformative can be interpreted as questions. So far, however, I have not said much about what a "question" is, instead relying implicitly on our strong intuitions about rising declaratives in various contexts. It is now time to ask what underlies those intuitions of questionhood. The rising declarative questions exemplified throughout this paper, as well as the interrogatives that accompany them, are compatible with a variety of attitudes, intentions, and discourse effects. In some uses, these questions seem to fit the paradigm of requesting a yes/no response from the Addressee, with the Speaker motivated by a desire to confirm that the proposition in question is true. But in others, for example the expression of doubt exemplified in (23), the declarative question seems to be used in a more expressive way to register the Speaker's reaction, with the response of the Addressee being a secondary consideration. Furthermore, given the Contextual Bias Condition, the Addressee's expected response to a rising declarative question is already available in the context, if not already stated. All of these considerations might lead us to wonder in what sense rising declaratives constitute questions at all. Nevertheless, it is perfectly natural and commonplace to describe them that way in the uses we have seen.

The key to this puzzle in the present account is located in the nature of the overlap between rising declaratives and interrogatives. Recall that rising declaratives, in contexts where they function in ways we are inclined to call *questioning*, are interpretable in the same ways as their interrogative counterparts in the same contexts. This was pointed out in Sections 2.2 and 4.2, where it was also noted that interrogatives can generally be used wherever rising declaratives are felicitous as questions. The solution suggested by this distributional pattern is a simple one: rising declaratives count as polar questions when (and because) their contextual requirements and effects overlap with those of polar interrogatives with the same content. As was remarked in Section 4.1, there is a general sense in which we are inclined to regard any use of a polar interrogative as a question, regardless of what it is used to accomplish in a particular context. Accepting this general sense as the appropriate one, understanding why rising declaratives function naturally as questions is a matter of understanding their distribution across contexts vis-à-vis the distribution of interrogatives. In similar fashion, the contrast with falling declaratives as questions can be characterized in distributional terms: the distribution of falling declaratives does not overlap with that of interrogatives to the same extent that the distribution of rising declaratives does.

As the Uninformativeness Condition (repeated below) provides, a rising declarative is interpretable as a question only if it has the same effect as the corresponding rising interrogative in the same context.

(69) An utterance of a locution L is a polar question in C only if $C + L = C + \uparrow S_{interr}$.

The Contextual Bias Condition on rising declarative questions derives from (69); it specifies what it takes for a rising declarative to satisfy that condition:

(70) An utterance of $\uparrow S_{decl}$ is interpretable as a question in a context C only if it can be mutually understood as uninformative, that is, only if $cs_{Addr}(C + \uparrow S_{decl}) = cs_{Addr}(C)$.

Being uninformative with respect to the context, as demanded by (69), is, by hypothesis, a necessary condition for an utterance to serve as a question. It cannot, however, be a sufficient one, once we include falling declaratives in the picture. A falling declarative is uninformative with respect to the context when the *Speaker* is already publicly committed to the proposition expressed. It is clear with a moment's reflection that not all such falling declarative utterances function as questions (if indeed any do).

It seems, then, that the *nature* of the uninformativeness exhibited by rising declaratives is important to the difference between rising and falling declaratives as questions. And the discussion in 3.2 and 3.3 already suggests why that should be so. When the Addressee is publicly committed to the proposition, as is the case with an uninformative *rising* declarative, the Speaker cannot be interpreted as intending to make the proposition known to the Addressee – that situation is already mutually understood to obtain. The inference that the Speaker utters the declarative with the primary intention of making the proposition known to the Addressee (i.e., of *telling* the Addressee that it holds) is thus blocked in the case of the uninformative rising declarative. This factor, it was claimed, is crucial to the functioning of a declarative as a question. In the case of an uninformative *falling* declarative, on the other hand, there is no guarantee about the Addressee's state at all. An uninformative falling declarative differs from an uninformative rising declarative in failing to block (across all cases) the inference that the Speaker intends to be interpreted as notifying the Addressee that the proposition holds.

With the realization that the Addressee's state is crucial, the Contextual Bias Condition can be subsumed under the more general condition for polar questionhood stated in (84), which applies across sentence types:

(84) An utterance of S is interpretable as a polar question in C only if $cs_{Addr}(C) + S = cs_{Addr}(C)$.

As desired, only uninformative rising declaratives can satisfy (84), while any interrogative satisfies it by definition. Whether or not a falling declarative satisfies (84) is independent of its uninformativeness with respect to C; what matters is whether the proposition expressed is already publicly attributed to the Addressee.

(84) is stated as a necessary condition for polar questionhood, not a sufficient one, and I will leave it with that status in this paper. As it stands, it accomplishes the task of identifying a property associated with questioning that rising declaratives and interrogatives have in common and falling declaratives lack. That property is the property of being uninformative with respect to the context

anywhere that (84) is met. That is, as far as rising declaratives and interrogatives are concerned, (69) and (84) are interchangeable – a rising declarative has the effect of a rising interrogative, satisfying (69), if and only if (84) is met. And rising interrogatives satisfy both conditions trivially. But for falling declaratives, the two conditions are distinct. To meet both, a falling declarative must express a proposition that is already a public commitment of both participants (and such a proposition seems pragmatically to be an unlikely candidate for questioning). The set of contexts in which some proposition p is a *joint* commitment of the participants is a subset of the set of contexts in which the Addressee is publicly committed to p. Graphically, the picture looks like this:

Figure 1:Distribution of declarative questions
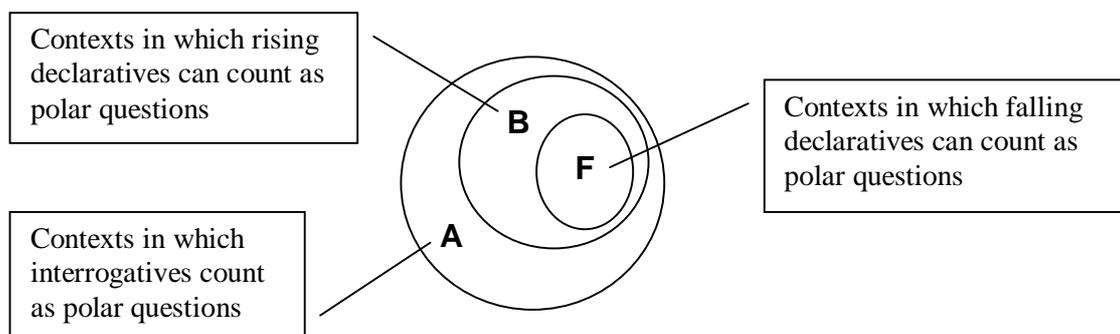
As Figure 1 illustrates, the intuition that rising declaratives are more natural as questions than falling ones is expressible as a distributional generalization: there is no context in which a falling declarative is interpretable as a polar question and the corresponding rising declarative is not. On the other hand there are plenty of contexts that allow a rising declarative as a question while excluding the falling version. In short, the distribution of rising declaratives as questions is broader than that of falling declaratives – just as the distribution of interrogatives as questions is broader than that of rising declarative questions.

This distributional relationship remains unaffected by adjustments to the requirements for polar questions that vary the exact membership of the F set in Figure 1. The relative ease of using rising declaratives as questions, compared to falling declaratives, is accounted for distributionally by the adoption of (84), regardless of whether (69) is also enforced. As for the issue of whether falling declaratives should be able to qualify as questions at all, and if so, under what conditions, there is not really a "right" answer to be given. The characterization of polar questions offered in this section is simply a classification of the properties of utterances in context, where the properties derive from the interaction of locution meaning and context in the manner laid out in Section 3. Different classifications may be appropriate for different investigative purposes. The present classification is intended to illuminate (a) the source of the "questioning" sense of rising declaratives; (b) the distributional idiosyncrasies of rising declarative questions; and (c) the intuitive differences (and similarities) between rising and falling declaratives as questions. Whether or not a particular instance of a falling declarative is to be called a polar question is insignificant, as long as its effects and their relationship to the effects of rising declaratives are understood.

Finally, an important feature of the approach to declarative questions taken here is that the contextual restrictions are peculiar to the use of declaratives *as questions*. We do not expect to find declaratives intended as *statements* to be subject to them. The point is abundantly clear for falling declaratives, whose uses are obviously not confined to questioning. The importance for rising declaratives is that it makes the existence of informative uses, like those exemplified in (20)-(21), less mysterious. The current analysis cannot be said to predict the existence of those uses, but at least it doesn't predict their nonexistence. In this respect it has a head start on any account in which the rise is directly associated with a questioning function or an attitude of uncertainty on the part of the Speaker.

References

Bartels, Christine 1997. Towards a Compositional Interpretation of English Statement and Question Intonation. Ph.D. dissertation, University of Massachusetts Amherst.

Beckman, M., and J. Pierrehumbert 1986. Intonational structure in Japanese and English. *Phonology Yearbook* 3, 15-70.

Bolinger, Dwight L. 1957. *Interrogative Structures of American English: The Direct Question*. American Dialect Society No. 28. University of Alabama Press, Birmingham.

Büring, Daniel. 1995. *The 59th Street Bridge Accent*. Ph.D. dissertation, Tübingen. (Published 1997, Routledge.)

Büring, Daniel. 1999. "Topic", in P. Bosch and R. van der Sandt, eds., *Focus*. Cambridge: Cambridge University Press.

Carlson, L. 1983. Dialogue Games: An Approach to Discourse Analysis. Dordrecht: Reidel.

Gunlogson, Christine 1999. Rising Declaratives. Proceedings of the Western Conference on Linguistics.

Gunlogson, Christine 2001. Declarative Questions. Presented at LSA Annual Meeting, Washington, D.C.

Gunlogson, Christine. In prep. *True to Form: Rising and Falling Declaratives in English*. Ph.D. dissertation, UCSC.

Gunlogson, Christine and Daniel Büring 2000. Aren't positive and negative polar questions the same? Presented at the LSA Annual Meeting, Chicago.

Gussenhoven, Carlos 1983. *A semantic analysis of the nuclear tones of English.* Reproduced by the Indiana University Linguistics Club.

Groenendijk, Jeroen. 1999. The Logic of Interrogation (Classical Version). In Tanya Matthews and Devon Strolovitch, eds., *SALT IX* 109-126, Ithaca, NY: Cornell University.

Heim, Irene 1982. The Semantics of Definite and Indefinite Noun Phrases. Ph.D. dissertation, MIT.

Heim, Irene 1983. On the Projection Problem for Presuppositions. In Flickinger, D.., et al., eds., *Proceedings of the Second West Coast Conference on Formal Linguistics*. Stanford: Stanford University Press.

Hirschberg, J. and G. Ward 1995. The interpretation of the high-rise question contour in English. *Journal of Pragmatics* 24, 407-412.

Huddleston, Rodney 1994. The contrast between interrogatives and questions. *J. Linguistics* 30, 411-439.

Kamp, Hans 1981. A theory of truth and semantic representation. In J. Groenendijk, T. Janssen, and M. Stokhof, eds., *Formal methods in the study of language*. Amsterdam: Mathematisch Centrum.

Merin, Arthur and Christine Bartels 1997. Decision-Theoretic Semantics for Intonation. *Arbeitspapiere des SFB 340, Bericht Nr. 88, Juni 1997.*

Noh, Eun-Ju 1998. Echo Questions: Metarepresentation and Pragmatic Enrichment. *Linguistics and Philosophy* 21:603-628.

Pierrehumbert, J.B. 1980. *The phonology and phonetics of English intonation*. Ph.D. dissertation, MIT.

Pierrehumbert, Janet B. and Julia Hirschberg 1990. The meaning of intonational contours in the interpretation of discourse. In P.R. Cohen, J. Morgan, and M.E. Pollack, eds., *Intentions in communication*. Cambridge, MA: MIT Press, pp. 271-311.

Roberts, Craige. 1996. "Informative Structure in Discourse: Towards an Integrated Formal Theory of Pragmatics", in J.H. Yoon and A. Kathol, eds., *OSU Working Papers in Linguistics 49: Papers in Semantics*.

Stalnaker, R. 1978. Assertion. In P. Cole (ed.) *Pragmatics: Syntax and Semantics, Volume 9*. New York: Academic Press.

gunlogson@ling.ucsc.edu

Linguistics Dept., UCSC
Santa Cruz, CA 95064