‘Attention, I’m violating a maxim!’ A unifying account of the final rise

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Abstract

Declarative sentences that end with a rising pitch in English (among other languages) have many uses. I single out several prominent uses that the literature so far has treated mostly independently. I present a compositional, unifying analysis, where the final rising pitch marks the violation of a conversational maxim, and its steepness indicates the speaker’s emotional activation. Existing theories are reproduced from these basic assumptions. I believe it contributes to a solid theoretical foundation for future work on the semantics and pragmatics of intonation.

1 Introduction

Declarative sentences in English (among various languages) can end with a rising pitch (as defined, very liberally, in section 2.1). This final rise has at least three prominent uses, which I will conveniently name by the Kantian categories (notably used, of course, by Grice (1975)):

1. **Quality reading:** that the speaker is uncertain whether what she is asserting is true;
2. **Quantity reading:** that she is about to say more, or at least knows more, on the present topic, than what she is asserting; and
3. **Relation reading:** that she is uncertain about (how her response relates to) some alternative answer to the question.

These readings are illustrated in the following examples, where ↗ marks the relevant final rises.

(1) **Quality reading:**
   a. A: John has to pick up his sister.
      B: John has a sister↗.
      (Trinh & Crnič, 2011)
   b. A: Guess which colours John likes!
      B: He likes blue↗.

(2) **Quantity reading:** (or ‘list intonation’)
   a. A: Who was at the party?
      B: Mary↗, Bob↗, and Sue.
   b. A: What did you do today?
      B: I sat in on a history class↗.
      I learned about housing prices↗.
      And I watched a cool documentary.
      (Tyler, 2012)

(3) **Relation reading:**
   a. A: Was John at the party?
      B: (Well,) it was raining↗.
   b. A: Of John, Mary and Bob, who came to the party?
      B: (Well,) John was there↗.

This is a remarkable combination of readings. For instance, the Quality and Relation readings suggest that the final rise conveys speaker uncertainty (as has been proposed in the literature, e.g., Gunlogson, 2003; Truckenbrodt, 2006; Ward & Hirschberg, 1992; Constant, 2012), but this is at odds with the Quantity reading. And while the Quantity and Relation readings pertain to what has not (yet) been asserted, the Quality reading pertains to the asserted proposition itself. In addition to this semantic variation, there exist intonational differences between the readings, in particular in the steepness of the rise (as discussed in section 2.1). For these reasons, one might think that to try and give a unified analysis of the three readings would be a misguided and hopeless attempt.

Nevertheless, I will show that a unified analysis is possible. I present a compositional analysis, where the final rise (whether high or low) marks **the violation of a conversational maxim** (hence the Kantian/Gricean labels), and its steepness indicates **the speaker’s emotional activation**. The main burden of my account is carried by a precise formulation of the maxims, which I adopt from the literature. In section 2 I present the main ingredients of my approach. In section 3 I show how

it predicts the three readings (and one more) and compare it to existing accounts proposed for each reading in isolation. Section 4 discusses the predictive power of the theory. In section 5 I conclude, and identify directions for future research.

2 Ingredients

2.1 What is a final rise

In the literature, what I call the Quality reading has been assigned primarily to a *high* (or steep) final rise (Gunlogson, 2003), while the Quantity and Relation readings have been assigned to a *low* final rise, with the Relation reading being associated in particular with the entire *rise-fall-rise* contour (Constant, 2012). To give a unified account, we therefore need a very liberal definition of 'final rise', as well as an explanation of the phonological differences between the readings.

I consider as a 'final rise' any contour whose tail (the part after the nuclear stress) is non-falling throughout its end. This is a more liberal notion of 'final rise' than that employed by Gunlogson (2003), who follows Gussenhoven (1983) in requiring that the final pitch is higher than the nuclear accent (a requirement we drop, crucially, because we claim that the final pitch has an indepedent semantic contribution). Gunlogson also excludes contours with bitonal (rising) accents, such as rise-fall-rise. However, I believe that bitonal accents have an independent semantic contribution, one that is orthogonal to our discussion. Although the literature associates the rising accent with the Relation reading, it seems to me that a rising accent is neither necessary nor sufficient for it. That is, (2a,b) can be read with a simplex accent, and, conversely, (1a,b) can be read with a rising accent, i.e., with a rise-fall-rise contour (perhaps conveying extra surprise). Indeed, Ward and Hirschberg (1992) show for the rise-fall-rise contour that a lower rise triggers a Relation reading (their '(scalar) uncertainty'), while a higher rise triggers a Quality reading (their 'incredulity').

Gunlogson's (2003) notion of 'final rise' is already quite liberal, and ignores a lot of variation.[1] The null-hypothesis, I think, is that all variation is due to the stacking of several intonational components, each with its own, independent semantic contribution. Hence, distilling two components to study independently - the final rise and its steepness - is methodologically sound.[2]

2.2 Semantics and pragmatics

Following, e.g., Gussenhoven (1983), I treat the final contour as an independent meaning-carrying component. For concreteness, I assume that its semantic contribution is *non-at issue content* (following, e.g., Ward and Hirschberg (1985); Constant (2012) for rise-fall-rise). I assume that the final rise semantically takes an *expression* as its argument.[3] I assume that, on declarative sentences:

- the final rise conveys that uttering the expression in the present context would violate a conversational maxim;[4] and
- the relative height of the final pitch indicates the speaker's emotional activation.

The first assumption is perhaps novel in its generality (as pertaining to *any* maxim), but certainly not in spirit. For instance, Ward and Hirschberg (1985) already write that 'intuitively, [rise-fall-rise] seems to indicate that a speaker is uncertain about whether his utterance is relevant to the discourse'. The second assumption also appears to go far back, but we base it in particular on Banziger and Scherer (2005), who found specifically that the steepness of a final rise (as well as a final fall) correlates with higher emotional activation.

What the violation of a maxim amounts to depends, of course, on which maxims there are, and what they require. The following set of maxims is generally accepted as the minimal backbone, where the *QUD* is taken to be an explicit or implicit *question under discussion*:

- **Quality**: Only say what you think is true. (Grice, 1975)
- **Quantity**: Give the most informative answer to the QUD that you think is true.

[1] Gunlogson (2003) defends this on the grounds that not all phonological distinctions need to be semantically relevant. I disagree, though perhaps only on her use of the word 'semantic'. I think assigning a semantic distinction to every phonological one would simply require a much richer semantics.

[2] Probably more subtle intonational features may disambiguate among the various readings - or non-intonational features, for that matter, such as shrugging one's shoulders (to exclude the Quantity reading) or counting on one's fingers (to trigger it). Discourse particles or hesitation markers (like 'well' in (3)) may provide additional cues.

[3] It takes an expression as its argument, rather than its meaning, because the semantic contribution of the final rise, as argued below, may also pertain to *how* something is said.

[4] The careful formulation 'uttering the expression' is necessary because the maxims pertain not to expressions, but to utterances. Alternatively, one would have to treat the final rise as a *speech act modifier*, a possibility that is left unexplored in the present paper.

(Groenendijk & Stokhof, 1984; Schulz & Van Rooij, 2006)

- **Relation**: Let your utterance, relative to your information state, entail the QUD.[5]
  (cf. Groenendijk & Stokhof, 1984; Roberts, 1996; Westera, 2013)
- **Manner**: Only utter what you think is clear, concise, etcetera. (Grice, 1975)

For the present purposes only the Maxim of Relation will require some further formalisation. This formalisation is postponed to section 3.3.

Although the final rise conveys that uttering the expression would violate a maxim, examples (1) to (3) above do not seem to involve any true non-cooperativity. This is because a speaker may have a good *reason* for violating a maxim, namely that not doing so would have violated another maxim (for instance, left implicit here, that one should at least *try* to make a useful contribution, even if one is uncertain). That is, the kinds of violations that occur when a cooperative speaker uses the final rise are of the Gricean (1975) 'group B'-type, involving a clash between two maxims. Presumably, only those maxim violations have to be marked by a final rise that might otherwise mislead the hearer (cf. Grice's 'silently violating a maxim').

Since Grice (1975) it has been assumed that a violation of the Maxim of Quality is more dramatic (more non-cooperative) than a violation of the Maxim of Quantity or the Maxim of Relation. I assume that the speaker's emotional activation, in the presence of such violations, reflects this. Therefore, if a final rise marks the violation of a maxim, then typically a *high* rise will mark a violation of the Maxim of Quality, while a *low* rise indicates a less dramatic violation, i.e., the Maxim of Quantity or the Maxim of Relation. Note that this predicted correlation is only *typical*, because (i) the relative importance of the maxims may vary across contexts, and (ii) contextual sources of emotional activation can interfere. For instance, when B in (1b) is completely uninterested in the truth of her guess, the rise for a Quality reading is predicted to be less steep than usual; and when a speaker is very excited about the party guests on the list she is reading in (2a), the rises in her list intonation may be much higher than usual.

[5]Groenendijk and Stokhof (1984) require that the utterance entails (an answer to) the question relative to the *hearer's* information state, and Roberts (1996) relative to the *common ground*. Westera (2013) argues that these requirements are too strict.

3 Deriving the readings

3.1 The Quality reading

The Maxim of Quality requires that the speaker thinks that what she says is true. Therefore, if a final rise conveys a violation of the Maxim of Quality, it conveys that the speaker *lacks the belief* that what she says is true. I assume that this lack of belief lies at the core of the Quality reading, illustrated by the examples in (1). Because a violation of Quality is quite dramatic, it is predicted that this reading typically occurs with a high final pitch, as seen in the literature (cf. section 2.1).

On top of this, additional pragmatic reasoning may shape what exactly the Quality reading amounts to. For instance, as mentioned, Ward and Hirschberg (1992) discern an *incredulity* reading for cases like (1a). This can be analysed as an implicature: if B conveys (by means of the final rise) that she lacks the belief that John has a sister, even though A just said so, that might plausibly be because B finds it hard to believe.

An implicature of the Quality reading that has received the most attention in the literature, is the *contextual bias* in favour of the proposition expressed (e.g. Gunlogson, 2003; Truckenbrodt, 2006; Trinh & Crnič, 2011). The following example illustrates this (one of many by Gunlogson):

(4) Windowless room
  a. Is it raining? (OK without evidence)
  b. # Its raining↗. (OK only if the addressee just entered with an umbrella)

Space does not permit a discussion of all approaches to capture this bias. I will discuss only Truckenbrodt's (2006), which is closest to mine.

Truckenbrodt's (2006) account

The main ingredient of Truckenbrodt's account of the final rise is that it indicates the speaker's *lack of belief* in the proposition expressed. In addition, he assumes that in uttering a declarative (whether rising or falling), a speaker conveys her intention to make the expressed proposition common ground. Hence, with the latter assumption, which I am happy to make, my account of the Quality reading amounts exactly to Truckenbrodt's.

With this, Truckenbrodt explains the bias as follows: a speaker who, by uttering a declarative φ, expresses her desire to make φ common ground, implies that she considers it possible that it will be common ground. If, at the same time, with the

final rise, she conveys that her information state does not support φ, this implies that she considers it possible that the addressee's information state *will* support it (for otherwise, it would not be possible for φ to become common ground). This explains why, in the absense of evidence that the addressee might know φ, as in (4), a declarative with a final rise is strange (at least for obtaining the Quality reading). Note that in examples (1a) and (1b), the context makes it clear that A should know something about what B says.

Truckenbrodt's account is the most minimalist among existing approaches to the Quality reading of the final rise (for instance, Gunlogson's (2003) account is formulated in terms of *discourse commitments*, and recently Trinh and Crnič (2011) propose that rising declaratives are *second-person speech acts*, a concept that I have some difficulty grasping). To my awareness, Truckenbrodt's account is also empirically adequate.[6] I think that the fact that the core of Truckenbrodt's account is predicted by my unified analysis of the final rise provides additional support to both.

3.2 The Quantity reading

The Maxim of Quantity requires that the speaker gives the most informative answer that she thinks is true. Therefore, if a speaker indicates, by means of a final rise, that she is violating the Maxim of Quantity, this implies that she, with her final-rising utterance, does not give the most informative answer that she thinks is true, i.e., *that she knows more than she says*. I assume that this lies at the core of the Quantity reading, as typically used in (conjunctive) lists, illustrated by (2).[7,8] At each pre-final list item, the speaker indicates by means of the final rise that she knows more than she has told us so far.[9] Because a violation of Quantity is not very dramatic, the present account predicts that this reading typically occurs with a low final pitch, as seen in the literature (cf. section 2.1).

Just like the Quality reading, the Quantity reading may license additional inferences. Saying less than you know, i.e., violating Quantity, must have a reason. A reason could be that the conversation is between a teacher and a student, where the teacher is not saying everything she knows. For the Quantity violations in a list, a typical reason may be that the speaker is breaking up what she knows into several pieces, giving one at a time, to facilitate reader comprehension: one violates Quantity because it *clashes* with Manner.[10] Alternatively, if no comprehension facilitation is necessary (for instance if the list of people has already been given before), the list in (2a) could be pronounced in a more manner-of-factly way, in a single, falling contour, without any rises:

(5) A: Who came to the party?
B: Mary [high], Bob [mid] and Sue [low]↘.

Existing work on the Quantity reading

To my awareness, regarding the Quantity reading, nothing has been published that goes much beyond the idea that the final rise in lists indicates 'unfinishedness' (e.g., Bolinger, 1982, reiterated in Bartels, 1999; Gunlogson, 2008); I briefly return to this characterisation in section 4). My result suggests how this can be made more precise: list intonation conveys that the speaker knows more (regarding the QUD) than what she has said.

[6] Trinh and Crnič say that Truckenbrodt cannot explain why rising declaratives elicit a response while falling declaratives don't. However, as Trinh and Crnič themselves suggest, 'Truckenbrodt could claim that the ability of rising declaratives to elicit a response follows from the speaker not believing that φ and her expressed desire that φ be made common ground: this desire would not be satisfied if the addressee does not utter φ' (p.8). I do not see what they think would be wrong with this suggestion, and I believe nothing is.

[7] I thank in particular Alysson Ettinger and Joseph Tyler for extensive discussion on list intonation.

[8] An anonymous reviewer suggested that lists may have a particular syntactic form with its own intonational norms. However, one would then have to explain why the treatment of the final rise I advocate seems to apply to lists just as well. This need not be hard, but in my view it is unnecessary.

[9] Note that the Quantity reading cannot be what underlies *disjunctive* lists, if such creatures exist at all:

(I) I saw Mary↗. I saw Bob↗. Or I saw Sue↘.

After all, in disjunctive lists, each additional disjunct would *decrease*, rather than increase, the information provided by the speaker. However, the status of the utterance in (I) is unclear to me. It seems somewhat natural only with hesitation markers in between and a puzzled look on the speaker's face, but even then the late occurrence of 'or' rather than 'and' feels slightly surprising. I trust that this can be independently explained in terms of the rhetorical structure of a discourse: the default discourse relation between two subsequent sentences seems to be conjunctive (cf. work on dynamic semantics, in particular SDRT). For this reason, perhaps, a more natural way to express (I) is in a single breath, with a falling contour (no intermediate rises):

(II) I saw Mary [high], Bob [mid], or Sue [low]↘.

In any case, my account of the final rise would predict that a disjunctive list, if a valid discourse strategy at all, requires higher rises than a conjunctive list, indicating (at least) violations of Quality, rather than Quantity. Whether this prediction is borne out is left to future research.

[10] I should emphasize that this implicature, that the speaker is *facilitating* comprehension, does not yet explain why the final rise can be used also for *checking* comprehension, as discussed below in section 3.4.

3.3 The Relation reading

The Maxim of Relation, recall, requires that the speaker's utterance, relative to her information state, entails the QUD. What exactly this implies depends on the meanings assigned to the utterance and the QUD, and the notion of entailment used. Hence, the success of my approach depends in this respect on the *semantics* we assume: it must be such that a violation of the Maxim of Relation yields exactly what I called the 'Relation reading'.

For inspiration, let us consider a pragmatic phenomenon that is intimately connected to what I called the Relation reading: *exhaustivity implicatures*, exemplified in (6).

(6) A: Of John, Mary and Bob, who came?
B: John was there↘. ⇝ *not Mary, not Bob*.

Note that this example is, aside from the final contour, identical to example (3b) of the Relation reading. Where (6), with a final fall, implicates that Mary and Bob weren't at the party, (3b), with a final rise, implies uncertainty about precisely that. (This close connection between exhaustivity and the Relation reading is observed also by Constant (2012), who contrasts rise-fall-rise with 'only'.) This suggests that the Maxim of Relation will be suitable for an account of the Relation reading *if and only if the maxim is strict enough to derive exhaustivity implicatures*. I therefore build on my own recent work on exhaustivity, (Westera, 2013), that derives exhaustivity implicatures via the Maxim of Relation, as discussed next. Afterwards, I show that this indeed accounts for the Relation reading of the final rise.

Westera's (2013) Maxim of Relation

Westera (2013) argues that, for an account of exhaustivity implicatures that solves the problematic 'epistemic step' (Sauerland, 2004) in a wholly Gricean way, the Maxim of Relation must be sensitive to the possibilities that an utterance *draws attention to*. Intuitively, the question in (6) draws attention to the possibility that John came, the possibility that Mary came, and the possibility that Bob came (as well as combinations of these). The response, however, draws attention only to the possibility that John came; it leaves the other possibilities *unattended*, and it is in that sense *not entirely related* to the question. Westera shows that if the Maxim of Relation is sensitive to this, exhaustivity implicatures can be accounted for.

To turn this idea into a formal theory, Westera employs Roelofsen's (2011) *attentive semantics*, which builds on Ciardelli's (2009) *possibility semantics* and subsequent work, in which the meaning of a sentence, called a *proposition*, is a *set of sets of worlds*, i.e., a set of classical propositions. The proposition $[\varphi]$ expressed by a sentence φ is conceived of as the set of possibilities that the sentence *draws attention to*. The union of these possibilities corresponds to the sentence's *informative content*, i.e., the information provided by the sentence, which is treated wholly classically. I adopt the following notions and notations:

- *Informative content*: $|\varphi| := \bigcup[\varphi]$
- A *restricted to* a set of worlds s: $A_s := \{\alpha \cap s \mid \alpha \in A, \alpha \cap s \neq \varnothing\}$

For the relevant fragment of propositional logic, the semantics is defined recursively as follows:

1. $[p] = \{\{w \in \textbf{Worlds} \mid w(p) = \mathsf{true}\}\}$
2. $[\neg\varphi] = \{\overline{\bigcup[\varphi]} \mid \overline{\bigcup[\varphi]} \neq \varnothing\}$
3. $[\varphi \vee \psi] = ([\varphi] \cup [\psi])_{|\varphi| \cup |\psi|}$ $(= [\varphi] \cup [\psi])$
4. $[\varphi \wedge \psi] = ([\varphi] \cup [\psi])_{|\varphi| \cap |\psi|}$

With this richer-than-usual semantics, entailment becomes sparser than usual:

(7) A *entails* Q, $A \vDash Q$, iff:
a. $\bigcup A \subseteq \bigcup Q$; and
b. $Q_{\bigcup A} \subseteq A$.

Item a. requires, just like classical entailment, that A is *at least as informative* as Q. Item b. requires that A is, in addition, *at least as attentive* as Q. That means that every possibility that Q draws attention to, must be a possibility that A draws attention to, insofar as this is compatible with the information provided by A.

This notion of entailment is plugged into the Maxim of Relation, as assumed in section 2.2:

(8) For a cooperative speaker with information s, responding A to Q:
Relation: $A_s \vDash Q$.

From (7) it follows that this maxim requires that every possibility in Q that is not in A, i.e., every possibility that A *leaves unattended*, must, given the speaker's information s, either be incompatible with A, or coincide with a possibility in A.[11]

[11] Westera (2013) gives equally formal implementations of the maxims of Quality and Quantity, based on attentive semantics, which would have derived exactly the Quality and Quantity readings discussed above. For the present purposes, however, such formal rigour was unnecessary, because for the maxims of Quality and Quantity, the step from intuition to formalisation is much more direct.

Deriving the Relation reading

Now, example (3a) is accounted for as follows. Let the question (whether John was at the party) translate as $p \vee \neg p$, and the response (that it was raining) as r. These have the following meanings:

(9) $[p \vee \neg p] = \{|p|, \overline{|p|}\}; \qquad [r] = \{|r|\}$

For the response to be related to the question, both $|p|$ and $|\neg p|$ must, relative to the speaker's information and the information that r, either coincide with $|r|$ or be incompatible with it, i.e., be included in $|\neg r|$. This requirement can be met in two ways:

- The speaker thinks that if it rained, John was there ($s \subseteq \overline{|r|} \cup |p|$; the response restricted to this information yields $\{|r| \cap |p|\}$, which entails $\{|p|, \overline{|p|}\}$); or
- The speaker thinks that if it rained, John wasn't there ($s \subseteq \overline{|r|} \cup \overline{|p|}$; the response restricted to this information yields $\{|r| \cap \overline{|p|}\}$, which entails $\{|p|, \overline{|p|}\}$).

If the final rise conveys a violation of the Maxim of Relation, that means neither of these requirements can be met, i.e., that the speaker does not know how John's attendance depended on the rain ($s \nsubseteq \overline{|r|} \cup |p|$ and $s \nsubseteq \overline{|r|} \cup \overline{|p|}$). This is the Relation reading for example (3a). Recall from section 2 that, despite the maxim violation, the speaker is still presumed to be cooperative. That explains why (3a) is odd unless the responder suspects that the hearer may know of a dependency between the weather and John's attendance.[12]

Example (3b) is also accounted for. As in (Westera, 2013), I assume that the question, for each combination of individuals, draws attention to the possibility that they came, as well as the possibility that no one came. For simplicity, and without loss of generality, I consider only the possibilities that John came, that Mary came, that Bob came, and that no one came. Let p, q and r translate that John, Mary and Bob came, respectively. The question and response then become:

(10) $[p \vee q \vee r \vee (\neg p \wedge \neg q \wedge \neg r)]$
$= \{|p|, |q|, |r|, \overline{|p|} \cap \overline{|q|} \cap \overline{|r|}\}; \qquad [p] = \{|p|\}$

For the response to be related to the question, each of the question's possibilities must, relative to the speaker's information and the information that p, either coincide with $|p|$ or be incompatible with it. For $|p|$ as well as $\overline{|p|} \cap \overline{|q|} \cap \overline{|r|}$, this is already complied with. For Mary ($|q|$), however, which is 'left unattended' by the response, this means that:

- The speaker thinks that if John was there, Mary was there ($s \subseteq \overline{|p|} \cup |q|$); or
- The speaker thinks that if John was there, Mary wasn't there ($s \subseteq \overline{|p|} \cup \overline{|q|}$)

And likewise for Bob ($|r|$). If for each of Mary and Bob, one of these requirements would be met, then the response, together with this information, would entail the question, i.e., it would comply with the Maxim of Relation. In 'normal' circumstances, i.e., where no maxim is violated, these requirements would enable one to take the *epistemic step* and derive exhaustivity implicatures (Westera, 2013). In the present case, if the final rise conveys a *violation* of the Maxim of Relation, this means that for either Mary or Bob, and possibly both, neither of these requirements can be met. This implies that for Mary or Bob, the speaker does not know how their presence depended on John's presence. Since the speaker thinks John was present ($s \subseteq |p|$), she must not know whether Mary came or she must not know whether Bob came ($s \nsubseteq |q|$ and $s \nsubseteq \overline{|q|}$, or $s \nsubseteq |r|$ and $s \nsubseteq \overline{|r|}$). This is the Relation reading for example (3b).

Summing up: if an utterance leaves one of the QUD's possibilities unattended, the Maxim of Relation requires that the speaker knows how it depends on the information that the speaker did provide. A *violation* of the Maxim of Relation thus entails that there is at least one possibility in the question, of which the speaker does *not* know how it depends on the information she provided. Together with the usual Quality implicature this yields the Relation reading: that there is some possibility in the QUD about which the speaker is uncertain. Finally, because a violation of the Maxim of Relation isn't grave, it is predicted that the Relation reading typically occurs with a low rise, as observed in the literature (section 2.1).

Existing work on the Relation reading

I will compare my account of the Relation reading to two theories of rise-fall-rise, old and new, namely Ward and Hirschberg's (1985) (which is very close to the present approach) and Constant's (2012) (which criticizes the former).

[12] I thank an anonymous reviewer for pointing out that this had to be made more explicit. She says that in (3a), 'B must be uncertain about whether it really has something to do with the question, but must suspect that for A it might have.'

Ward and Hirschberg (1985) For Ward and Hirschberg, rise-fall-rise intuitively conveys uncertain relevance. They make this more precise by assuming that rise-fall-rise conveys one of three types of 'scalar uncertainty', about (i) whether it is appropriate to evoke a scale at all, (ii) which scale to choose, given that some scale is appropriate, and (iii) given some scale, uncertainty about the choice of some value on that scale. Now, we find their distinction between type (ii) and type (iii) rather moot; both are illustrated with examples like (3a), except that for type (iii) the examples they use are more evidently scalar.[13] For instance, while they use an example like (3a) for type (ii), they present (11) as an example of type (iii) (adapted from their (60)):

(11) A: Does your friend live far away?
B: In suburban Philadelphia↗.

Here, B is unsure whether suburban Philadephia corresponds to 'far' on the distance scale. However, Ward and Hirschberg use the word 'scale' rather liberally, meaning, roughly, 'QUD'. Hence, it is easy to frame example (3a) in exactly the same way: B is unsure whether that it was raining corresponds to 'yes' on John's attendance scale. Hence, I believe that their type (ii) and type (iii) readings can be conflated. Indeed, my account derives the Relation reading for both examples alike.

As for their type (i) uncertainty, I think this is genuinely a different reading. They illustrate it with the following example (their (52)):

(12) A: Do you speak Ladino?
B: I speak Spanish↗.

As Ward and Hirschberg explain, here B conveys uncertainty about whether A is interested only in Ladino, or whether other Iberian languages are also relevant. Keeping in mind Ward and Hirschberg's liberal use of 'scale' as meaning 'QUD', I understand this as a case in which B conveys that she is uncertain about *what the QUD is*. Now, in my derivation of the Relation reading, I have, so far, implicitly assumed that the speaker knows what the QUD is. But of course, one way of failing to know how one's utterance relates to the current QUD, is to not know what the current QUD is to begin with. Hence, the present account already predicts that the final rise, if it conveys a violation of the Maxim of Relation, can convey this kind of uncertainty, too.[14]

Constant (2012) Constant assumes that rise-fall-rise is a 'universal quantifier of assertable alternative unclaimability' (p.39). That is, rise-fall-rise on a sentence φ universally quantifies over φ's alternatives (say, answers to the QUD) that are neither entailed nor excluded by φ itself, of which there must be at least one, and says of these that the speaker lacks the information to support them. Before evaluating this approach, it is worth noting, as Constant himself does, that it solves most puzzles he discusses purely due to the requirement that the quantification is non-vacuous, i.e., that there is at least one non-excluded, non-entailed alternative. Since my account predicts that the Relation reading has existential force (e.g., in (3b), the speaker is unsure about *someone* of Mary and Bob), it inherits from Constant those solutions.

Crucially, Constant assumes that rise-fall-rise signifies not uncertainty but, merely, a lack of belief that the alternatives are true. This would mean that rise-fall-rise would be compatible with the speaker believing that all alternatives are false, i.e., with an exhaustivity implicature - which it isn't.[15] Indeed, the contribution of rise-fall-rise according to Constant would be *equivalent to the standard Quantity implicature*. Since exhaustivity as a conversational implicature is derived through the Maxim of Quantity, promoting the Quantity implicature to a semantic entailment should, if anything, make the exhaustivity implicature *more* salient. For this reason, I believe that Constant's account of the final rise is too weak.

Nevertheless, let us consider the example used by Constant to motivate this weakness (his (60), adapted from Oshima, 2005):

[13] In addition, Ward and Hirschberg classify certain examples as type (ii) that Constant (2012) argues are in fact 'metalinguistic'. I will not discuss those at present.

[14] Another example of this kind of Relation violation is the following, where, as pointed out to me by an anonymous reviewer, the final rise is taken to contribute a query as to what exactly the receptionist's question is, i.e., along which properties the question should be taken to divide the logical space:

(III) (Customer approaches hotel receptionist)
Receptionist: Who are you?
Customer: I'm John Smith↗.

[15] If one assumes, instead, that exhaustivity is not a conversational implicature at all, but, rather, due to a 'silent only' operator (e.g. Chierchia, Fox, & Spector, 2012), this objection would not necessarily hold, because rise-fall-rise, for Constant, requires that there are non-dispelled alternatives - and *grammatical* exhaustivity would dispel them all. I will not explore this option, for reasons discussed by Westera (2013).

(13) A: Did your friends pass the test?
B: John passed↗. Bob and Sue flunked.

Here, Constant says, rise-fall-rise occurs despite B not being uncertain about Bob and Sue, and this would be problematic for Ward and Hirschberg (1985). But in defence of Ward and Hirschberg (and myself), I object that the alternatives to which the final rise pertains here are not Bob and Sue, but, rather, whether B's friends passed the test or not (i.e., the answers to the QUD). Now, it is known of plural indefinites that, when some-but-not-all of B's friends passed, the sentence 'B's friends passed' is judged neither true nor false (e.g. Landman, 1989). Hence B, in uttering that John passed while knowing that Bob and Sue flunked, can be genuinely uncertain as to whether this corresponds to a 'yes'-answer or a 'no'-answer. This is what licenses the rise in (13).[16]

In sum, I think that Constant's (2012) account is too weak, and that the example he uses in favour of this weakness may have a different explanation.

3.4 A 'Manner' reading

So far I have discussed *three* readings, whereas I distinguished *four* maxims. This suggests that a fourth reading, a 'Manner reading', should exist. The Maxim of Manner requires that the speaker thinks she is making herself understood, hence its *violation* would imply that the speaker *lacks this belief*. This suggests that the final rise can be used for *comprehension checking*, a use which indeed surfaces in the literature, linked to features such as politeness (e.g., Gussenhoven, 2004).

However, the Manner reading is difficult to isolate. For instance, does mispronouncing a name or technical term make a statement false (Quality), or unclear (Manner)? And if one is uncertain about the particular wording of one's answer, is this uncertainty about Manner, or about what exactly the QUD is (Relation)? Despite this blurriness, I think the following example may succeed at isolating a pure Manner reading:

(14) (English tourist in a French café.)
I'd like... err... je veux... black coffee↗.

Given that the tourist knows what she wants, and that it is available, the final rise cannot convey uncertainty about the proposition expressed (Quality). She also cannot be uncertain about what question she is addressing (Relation). If we assume that black coffee is all she wants (and that she is alone), a Quantity (list) reading is also ruled out, and the rise can really only pertain to her uncertainty as to whether she made herself understood: Manner. If she considers it likely that she was understood, a low rise is predicted. However, Manner violations could in principle be as dramatic as Quality violations, given that making oneself understood is a precondition for conveying any kind of content at all.

4 Predictive power

I wish to discuss, and hope to dispel, three worries regarding the predictive power of my proposal. First, one might wonder whether my theory is not *too general*. Since the set of maxims is in principle open-ended, it may seem that there are practically no constraints on what a final rise may be used to convey. However, this lack of constraints is only apparent. Any maxim must be thoroughly motivated as a general principle of rational communication. Hence, while my theory does not constrain the *number* of different readings a final rise may have, it does very rigidly constrain the *kinds* of readings that it may have: any reading should be understandable in terms of the violation of some rule of rational communication. This enforces a particular *mode of explanation* for any new use of the final rise that might be discovered (just like Grice's theory of pragmatics invites a particular mode of explanation for implicated content). My theory would be falsified (or its generality challenged) if some use of the final rise is found that cannot be understood as the violation of a maxim (or, conversely, if some maxim violation is discovered that cannot be conveyed by a final rise).

Second, one might wonder whether my account can predict, for a given utterance, which of the many uses of the final rise is intended. The answer is 'no, not on its own'. However, it does make very specific predictions as to what each of the readings exactly pertains to. If we add to these predictions a bit of contextual knowledge, then the ambiguity is easily resolved. Consider the following example (suggested to me by an anonymous reviewer; it is similar to many examples discussed by Ward and

[16] To test this explanation, one may compare (13) to (IV):

(IV) A: Did *all* of your friends pass the test?
B: ?? John passed↗. Bob and Sue flunked.

It seems to me that the final rise is strange here (if we rule out a Quality or Quantity reading), because the speaker *does* know how to answer the question: with a clear 'no'.

Hirschberg (1985); Constant (2012)):

(15) A: Are you rich?
B: I'm a millionaire↗. (low rise)

The following readings are predicted:

- **Quality:** B is uncertain about her being a millionaire, and either depressed or very uninterested in finding out the truth of this proposition (because the rise is low).
- **Quantity:** B knows more about A's question than she said. Perhaps B is giving A a very obvious hint; or perhaps B happens to be a *billion*aire reluctant to reveal it.
- **Relation:** B is unsure about how this resolves A's question. This can only be if B is unsure about A's intended interpretation of 'rich' (say, because A is a *billion*aire).
- **Manner:** B is unsure how to pronounce 'millionaire', or whether A knows the word.

Now, each of these readings is indeed *possible*, which shows that a theory as general as the present one is really necessary. But let us now add some plausible assumptions about the context. If A and B are both native speakers of English, the Manner reading is ruled out. If, in addition, B knows approximately how rich she is, which is likely, then the Quality reading is ruled out. Furthermore, if neither A nor B is a *billion*aire, then the only reading that makes sense is the Quantity reading, explained as B giving A a very obvious hint, perhaps because B is slightly annoyed by A's stupid question. In sum, the ambiguity is quite easily resolved by contextual knowledge. Should context prove insufficient, then various linguistic (including gestural) tools may aid in disambiguating the final rise, as mentioned in footnote 2 (section 2).[17]

The third and final worry I wish to discuss is whether the theory outlined here is even *general enough*. Since my theory leaves a lot of disambiguating to be done anyway, why not say that the final rise conveys a general, underspecified 'unfinishedness', as proposed for instance by Bolinger (1982), and let other intonational, contextual, or gestural features fill in the blanks? The reason is that, for this alternative theory to yield any testable predictions, one would have to specify in what sense or senses an utterance might be 'unfinished'. I am confident that, if one attemps this in an empirically accurate way, one will end up defining 'unfinishedness' as something like 'by itself not a cooperative contribution to the discourse' - and this is not at all different from what I have proposed.

[17]There is quite a salient, humorous 'pretense' Relation reading for (15): B would be jokingly pretending not to know whether millionaires are considered rich. Probably, what disambiguates between this humorous reading and the 'obvious hint' Quantity reading, is a wink or a smirk.

5 Conclusion and outlook

I have analysed the final rise on declaratives in English as indicating that a maxim is being violated; i.e., it negates exactly that which, according to Grice, is supposed in conversation. This analysis is *unifying*, in the sense that (i) it captures intuitions found in existing work, (ii) it relies on machinery (e.g., the conversational maxims) that comes straight from the literature; and (iii) existing but thus far disconnected accounts of different uses of the final rise were reproduced, predicting four salient readings: Quality, Quantity, Relation and Manner. Crucial for the Relation reading was the Maxim of Relation's sensitivity to attentive content, motivated by the link between the Relation reading and exhaustivity implicatures.

Given the importance of marking the violation of a maxim (so as not to mislead), the function carried in English by the final rise is expected to be realized cross-linguistically, whether by intonation, discourse particles (especially in *tonal* languages where, as an anonymous reviewer remarks, the intonation channel is unavailable), or other means. I suspect that the same method of using pragmatic notions within a semantic specification is also applicable there. It will be interesting to see to what extent, cross-linguistically, the four readings are expressed by a single construction, as in English, or whether they are subdivided in particular ways. This would provide a window on whether the four Gricean maxims reflect in any way how language users decompose the notion of cooperativity.

In the future I hope to extend the present theory to the domain of rising and falling *interrogatives*. But first, current work in progress is aimed at extending the theory to the notion of *contrastive topic* (Büring, 2003). Contrastive topic, associated with a pitch accent in a rising intonation phrase, is generally thought to indicate that the speaker targets only a subquestion of some overarching QUD. This can be analysed as a violation of Quantity or Relation regarding the overarching QUD, while, as far as the subquestion is concerned, the speaker may fully comply with the maxims.

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