



Rise-fall-rise as a marker of secondary QUDs

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In the literature, English rise-fall-rise (RFR) intonation is known both as a marker of secondary information and as a marker of topics. This paper aims to make plausible that these two uses can be derived from a common core, which in turn can be derived from a recent theory of intonational meaning more generally, according to which rises and falls indicate (non-)compliance with the maxims (Westera 2013, 2014, 2017). The core meaning of RFR, I propose, is that the main question under discussion (QUD) is not compliantly addressed, while some secondary QUD is. Several more concrete predictions are derived from this core meaning, pertaining to secondary information, topic marking, exhaustivity, and discourse strategies. The resulting account is shown to generate certain ingredients of existing accounts, while also doing some things differently in ways that may be empirically accurate. If the proposed account is on the right track, it provides an important new intonational window on QUDs.

Keywords: Rise-fall-rise, topic, secondary information, Question Under Discussion, discourse strategy, Intonational Compliance Marking

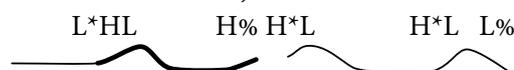
1 Introduction

A well-known marker of secondary information, in English and related languages, is rise-fall-rise intonation (RFR; e.g., Gussenhoven 1984; Potts 2005; Wagner 2012). It can occur for instance on appositive relative clauses (1), on interjections (2), and on material that contributes ancillary information, say, about the pragmatic status of the utterance (3):

- (1) B: John, who is a vegetarian, envies Fred.
 $L^*H H\%$ $L^*HL H\%$ $H^*L L\%$
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- (2) B: John – he’s a vegetarian – envies Fred.
 $L^*H H\%$ $L^*HL H\%$ $H^*L L\%$
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- (3) B: On an unrelated note, Fred ate the beans.

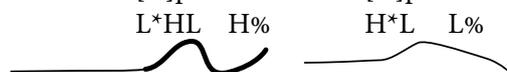


I use the phonological theory of Gussenhoven (2004), and transcribe RFR as “L*HL H%” (see Section 2); the manual traces underneath each example show what a reasonably natural pitch contour for these examples could look like, with the bold parts tracing RFR. For this paper an intuitive understanding of “secondary information” will suffice, say, as information that is part of what a speaker means to communicate but which can be omitted without really changing the main point. That RFR can mark secondary information in this sense, as in the above examples, was noted for instance by Gussenhoven (1984, p.211), who paraphrases this use of RFR as “You with me so far? Now for the main point”. Note that this understanding of “secondary information” excludes information that was not meant to be communicated but merely implied (\neq implicated) or presupposed; in this regard it is more narrow than the label “non-at-issue content” in the literature (e.g., Simons, Tonhauser, Beaver & Roberts 2010).

A treatment of RFR as a marker of secondary information is plausible also for certain other uses of RFR that have been discussed in the literature, e.g., cases like (4) from Constant 2012:

- (4) A: So I guess you like [æ]pricots then?

B: I don't like [æ]pricots – I like [ei]pricots!



Plausibly, negating an incorrect piece of information could be subservient to asserting the correct alternative. Of course, this claim is difficult to evaluate unless it is embedded in a broader pragmatic theory. More generally, to obtain precise predictions from the assumption that RFR would be a marker of secondary information, one would need a pragmatic theory that constrains which kinds of information can be secondary and when, and how one may tell the difference between secondary and primary information in ways other than the observed marking by RFR. Altogether though, pending such details, a characterization of RFR as a marker of secondary information appears to have a considerable empirical coverage.

A different characterization of RFR in the literature is that it would mark the “(contrastive) topic” of the utterance, in contrast to plain falling contours which would mark the “focus”. For instance, the following examples would differ only in which entity is the topic and which is the focus (from Jackendoff 1972):

- (5) A: What about Fred, what did he eat?

B: Fred, ate the beans.



(6) A: What about the beans, who had those?

B: Fred ate the beans...

H*L L*HL H%



In (5) Fred would be the topic and the beans the focus, and the other way around in (6); for accounts that make this more precise see, e.g., Roberts 1996; Büring 2003.

The above range of examples of RFR raises the following important question:

- **Research question:** Can the view of RFR as a marker of topics be reconciled with a treatment of RFR as a marker of secondary information?

A particular challenge in this regard is that, whereas examples (1), (2), (3) and (4) each seem to explicate two pieces of information, with one plausibly being subservient to the other and hence “secondary”, this is not obviously the case in examples (5) and (6), which contain only a single proposition-sized expression.

In this paper I aim to make plausible that the above question can be answered affirmatively.¹ Section 2 summarizes my assumptions about the phonology of RFR. In Section 3 I summarize a general theory of intonational meaning from Westera 2013, 2014, 2017 and show that it predicts a particular meaning for RFR: that the utterance relates in a certain way to two questions under discussion, or QUDs. In Section 4 I derive a handful of more detailed predictions from this core meaning with regard to the examples of interest, primarily (5) and (6). In Section 5 I zoom in on the latter, and propose that it involves a secondary QUD that is part of a strategy for some prior QUD. Altogether, I hope to show that the proposed core meaning of RFR affords plausible analyses of the various usages of RFR – though in certain respects these will inevitably rely on certain assumptions about pragmatics, notably about QUDs, that will require further investigation. Section 6 provides a detailed comparison to the literature. Section 7 concludes.

2 The phonology of rise-fall-rise

I will adopt without argument the analysis of English intonational phonology in Gussenhoven 2004, which can be conceived, roughly, as a streamlined version of the more commonly used ToBI transcription of the tonal tier (e.g., Beckman, Hirschberg & Shattuck-Hufnagel 2005). The relevant ingredients are the following. An intonation phrase is assumed to start and end with *boundaries*, containing any number of *pitch accents* in between. The final boundary can be toneless (%), high (H%) or low (L%). Accents can be high (H*) or low (L*), and they can lack a trailing tone (plain H* or L*), have a high trailing tone (L*H) or have a low trailing tone (H*L). Optionally, a high accent can be delayed by prefixing a low tone, for instance turning a falling

¹This paper is based on a chapter from my dissertation, *Exhaustivity and Intonation: A Unified Theory* (Westera 2017).

accent (H*L) into a rise-fall (L*HL). The rise-fall-rise contour corresponds to such a delayed falling accent (L*HL) followed by a high boundary (H%), i.e., L*HL H%.

Perhaps not all of the foregoing examples of (supposedly) RFR feature exactly the same intonation contour. For instance, Pierrehumbert & Steele (1987) find what seems to be a phonological difference between cases like (7) where RFR conveys uncertain relevance and cases like (8) where it conveys incredulity (examples from Ward & Hirschberg 1985, 1986):

(7) A: Have you ever been West of the Mississippi?

B: I've been to Missouri...

L*HL H%



(8) A: I'd like you here tomorrow morning at eleven.

B: Eleven in the morning?!

H*L H%



Pierrehumbert & Steele find that the high peak of RFR tends to be delayed in cases like (7), such that it falls *after* the stressed syllable “sour”, compared to cases like (8), where it falls *on* the stressed syllable “lev”. This suggests a categorical difference, namely between RFR (L*HL H%) for uncertain relevance, as in (7), and its non-delayed variant fall-rise (FR; H*L H%) for incredulity, as in (8) – and I have transcribed the above examples accordingly.

The theory of intonational meaning that I will adopt below is silent about the semantic contribution of delaying an accent, hence it treats RFR and FR alike, and for present purposes this is unproblematic. But let me tentatively suggest that the delay may indicate *extra significance*, in line with Gussenhoven 1984, of a sort that would be adequate only on material that is new to the discourse – this could potentially account for the purported contrast while being compatible with my main proposal.

Another difference between the uncertain relevance and incredulity uses is that the pitch excursions appear to be greater for the latter. For instance, Ward & Hirschberg (1992) presented participants with an utterance with RFR and found that a surprise interpretation was favored if the final rise of RFR was higher, and an uncertain relevance interpretation if it was lower. In Gussenhoven's theory of intonational phonology (as in ToBI) the height of a high boundary tone is a paralinguistic dimension, hence the greater pitch excursions in case of incredulity could be blamed, following Banziger & Scherer 2005, on the higher emotional activation associated with being surprised, compared to the more reserved attitude that will generally accompany uncertain relevance. While acknowledging the importance of paralinguistic cues, for reasons of scope I will set them aside in this paper.

3 The core meaning of rise-fall-rise

I will derive my treatment of RFR from the theory of *Intonational Compliance Marking* (ICM; Westera 2013, 2014, 2017). The starting point, in Westera 2013, was that final rises and falls – or high and low boundary tones (H%, L%) – are used in English for indicating (non-)compliance with the conversational maxims. Indeed, examples of rising declaratives can be found or constructed suspending each of the Gricean (1975) maxims:

- (9) (To someone seen entering with an umbrella.) It's raining? (H%)
 (10) (To a receptionist) Hello, my name is Mark Liberman. (H%)
 (11) (English tourist in France.) I'd like... err... je veux... a black coffee? (H%)
 (12) (A isn't sure if B wants to know about neighborliness or suitability for dating.)
 B: What do you think of your new neighbor?
 A: He's attractive? (H%)

Example (9) is from Gunlogson 2008; (10) is discussed in Pierrehumbert 1980; (11) is a constructed example from Westera 2013; (12) is from Malamud & Stephenson 2015. In (9) the suspended maxim is Quality: the speaker is unsure whether the proposition expressed is true. In (10) the suspended maxim appears to be Quantity: the speaker is unsure whether his name alone is sufficient for the receptionist to be able to help him. In (11) the suspended maxim is plausibly Manner, and in particular its submaxim of Clarity: the tourist is unsure whether they made themselves understood. In (12) the suspended maxim is Relation: speaker A is unsure about the relevance of the neighbor's attractiveness. More generally, that final rises and falls would indicate (non-)compliance with the maxims in fact aligns with much of the literature. Final rises or high right boundary tones are often taken to indicate that the utterance is "unfinished", "forward-looking", "continuation-dependent", or "contingent" on some subsequent discourse move (e.g., Bolinger 1982; Pierrehumbert & Hirschberg 1990; Bartels 1999; Gunlogson 2008; Lai 2012). The ICM theory can be understood as making these characterizations slightly more precise: the maxims would spell out the various ways in which an utterance may relevantly count as unfinished, forward-looking, contingent and so on.

In Westera 2014 it is proposed that not just boundary tones but also trailing tones are used for compliance marking, following a similar generalization in Hobbs 1990. More precisely, both boundary tones (H% and L%) and trailing tones (-H and -L) indicate (non-)compliance, but relative to potentially different *questions under discussion*, or QUDs:

Assumption 1. (From Westera 2014, 2017)

- L% / H%: the speaker {takes / doesn't take} the utterance (up to this boundary) to comply with the maxims with respect to the main QUD.

- -L / -H: the speaker {takes / doesn't take} the utterance (up to the first subsequent boundary tone) to comply with the maxims w.r.t. to some focus-congruent QUD.

The parenthesized qualifications “up to this boundary” and “up to the first subsequent boundary tone” will be clarified and illustrated shortly, in the next section. Let me first clarify some of the other ingredients, namely the notion of QUD, the maxims and focus congruence.

I conceive of QUDs as an organizing principle of discourse: rather than pursuing each potentially interesting piece of information separately, or pursuing such pieces together all at once, speakers organize these pieces into different sets – different QUDs – based on things like subject matter, discourse function and rhetorical strategy, and pursue with their utterance only one or a handful of these QUDs at a time. (To call these organizational units of discourse “questions” is potentially confusing, given that the same term is used for a type of speech act and for the purported denotations of interrogative sentences; but these three notions of “question” are as distinct as the notions of goal, action, and convention.) Assumption 1 presupposes that, among the various QUDs an utterance may pursue, one of these is the most central or “main” one; we may call “secondary” any other QUD that is pursued by the same utterance, for instance by means of secondary information.

With the assumption of QUDs comes a division of pragmatic labor, namely between choosing which QUDs to pursue and selecting the communicative means for pursuing them. Some rationality constraints will govern the former, while other rationality constraints – which following Grice 1975 I call “maxims” – will govern the latter. Assumption 1 asserts that boundary tones and trailing tones indicate (non-)compliance only with the maxims, i.e., only relative to a certain choice of QUD. This is a non-vacuous restriction on the type of pragmatic constraints to which intonation is deemed sensitive. This restriction, and the division of pragmatic labor, can be illustrated for instance by means of (3): since it ends low (L%), it must be taken to comply with the maxims relative to the main QUD, and this means that its prefix “on an unrelated note” must be understood not as signaling a maxim violation (say, Relation) relative to the current main QUD, but rather (as an anonymous reviewer notes) as a device for indicating that the utterance’s main QUD is different from what the preceding discourse might have led one to expect it would be. Thus, since the assumption of QUDs entails a division of pragmatic labor, it leads one to expect also a division of labor among metapragmatic signals, with some commenting on the choice of QUDs and others – such as boundary tones and trailing tones – on the choice of utterance *given* a certain QUD.

Focus congruence is intended to be understood along the lines of Roberts 1996; Beaver & Clark 2008 (cf. Rooth 1992); for the purposes of this paper nothing will depend on its precise implementation. Roughly, let the focus of an utterance be some constituent containing a pitch accent, and let a focus-congruent QUD for an utterance be one whose basic answers can be obtained by replacing the utterance’s focus (or foci) by alternatives. The main QUD and the focus-congruent QUD of an utterance

may in principle be one and the same – perhaps many utterances address only a single QUD. However, in case of RFR there must be (at least) two QUDs, since an utterance cannot both comply and not comply with the maxims relative to the same QUD. The high boundary tone indicates a maxim suspension relative to the main QUD while the low trailing tone of the accent indicates compliance relative to some focus-congruent QUD:

Prediction 1. An utterance with RFR must address at least two QUDs, of which only a focus-congruent QUD compliantly (according to the speaker).

This prediction, a consequence of the ICM theory, forms the core of my treatment of RFR in this paper.

4 Further predictions

In this section I show how prediction 1 applies to cases like (1), (2), (3) and (4), where RFR marks secondary information, and to cases like (5) and (6), where it purportedly marks a topic. I will also very briefly suggest an analysis of the incredulity use of RFR, illustrated by (8), but for reasons of space I must leave this type of case for another occasion. Afterwards, in section 5, I will zoom in on (6) (as well as the uncertain relevance use in (7)).

Prediction 1 explains why RFR can be used as a marker of secondary information: after all, any piece of information that the speaker meant to convey, but which doesn't serve the main QUD, must be serving some other purpose, i.e., some secondary QUD. (Recall from the introduction that my notion of “secondary information” is narrower than “non-at-issue content” (Simons, Tonhauser, Beaver & Roberts 2010), which covers also certain kinds of information that aren't part of what the speaker meant to convey, i.e., which do not address any QUD.) To illustrate, consider (2), repeated here:

- (2) B: John – he's a vegetarian – envies Fred.
 L*H H% L*HL H% H*L L%

According to the ICM theory, the intonation contour conveys that (i) the utterance up to the first boundary tone (i.e., “John”) is not taken to comply with the maxims relative to the main QUD (nor relative to some congruent QUD, which may be the same); (ii) the utterance up to the second boundary tone (up to and including the interjection) is taken to comply with the maxims relative to some congruent QUD but not the main QUD; and (iii) the utterance as a whole (also including the interjection) is taken to comply with the maxims relative to the main QUD (and a congruent QUD, but this may be the same). Because the maxims of Quality, Relation and Quantity apply not to what is uttered but to what is meant, which normally remains the same throughout an utterance (unless the speaker changes her mind halfway), the two high boundary tones in (2) can be due only to a suspension of the maxim of Manner, and in particular its submaxim of Clarity: the utterance up to that point does not

yet clearly communicate the information aimed at the main QUD. The falling accent in the interjection, however, conveys that the utterance up to the second boundary does clearly communicate some information aimed at a congruent QUD. Given what is uttered up to that point, this information can only reasonably be that John is a vegetarian, and the congruent QUD something like “which properties does John have (that are relevant, e.g., that may explain why he envies Fred)?”. The final low boundary tone indicates that, ultimately, some piece of information is clearly communicated that compliantly addresses the main QUD, and this piece can only reasonably be the proposition that John envies Fred, for otherwise the last two words would have served no purpose. Now, the foregoing is sketchy in various respects – e.g., what exactly the QUDs are and why it is rational to address both in a single utterance – but we can say with reasonable certainty that the following is predicted:

Prediction 2. Prefinal RFR in an utterance that ends low (L%), as in (2), marks material that communicates information that is not the main point of the utterance.

This aligns with earlier characterizations of RFR as a marker of secondary information (e.g., Gussenhoven 1984; Potts 2005), and I assume that examples (1), (2), (3) and (4) can all be understood along these lines.

Turning now to the first example of purported topic marking, i.e., (5), repeated below, an important feature of the proposed treatment of RFR, and the ICM theory more generally, is that intonation is sensitive primarily to the information that the speaker means to convey, not to the literal meanings of the expressions involved. This helps overcome the challenge posed by (5):

- (5) A: What about Fred, what did he eat?
 B: Fred, ate the beans.
 L*HL H% H*L L%

Although the name “Fred” on its own does not literally express a proposition, it may well serve to communicate a proposition, especially when it is intonationally marked as doing so, as in (5) by means of RFR (the low trailing tone communicating that some compliant piece of information has been clearly communicated). In particular, it seems plausible that mentioning “Fred” at the start of one’s utterance could very well communicate *that the utterance will be about Fred*, and in the absence of a special context this may even be the only proposition that the name “Fred” on its own could successfully communicate. That the utterance will be about Fred, then, must be the information communicated in (5) that compliantly addresses a congruent QUD, as indicated by the low trailing tone in the first intonation phrase of (5). The congruent QUD could be, say, “who/what is the topic of this utterance?”. The subsequent high boundary tone indicates that uttering the name “Fred” does not suffice to compliantly address the main QUD, which is arguably (given the context, the rest of the utterance and the low final boundary tone) the question “What did Fred eat?”. Altogether, it is predicted that “Fred” with RFR can behave as a topic marker, not unlike the more explicit variant in (13):

- (13) B: As for Fred, he ate the beans.
 L*HL H% H*L L%

However, such more verbose topic markers appear to indicate not just the topic but also how it relates to the prior discourse, e.g., “as for Fred” may convey that it is a prior topic that is newly activated, whereas, say, “speaking of Fred” may signal that it is a more direct continuation. As a consequence, as an anonymous reviewer notes, (13) is rather strange in response to a question like (5)A, unlike the more neutral topic marker in (5)B.

Summing up, RFR is sometimes predicted to be used as a topic marker:

Prediction 3. RFR serves as a topic-marker if (but not necessarily only if) it occurs on a prefinal constituent that, on its own, cannot convey anything except what the ensuing utterance will be about.

This aligns with characterizations in the literature of RFR as a topic marker (e.g., Büring 2003), but only in part: prediction 3 pertains only to certain prefinal occurrences of RFR, not to RFR in general. In particular, it doesn’t pertain to the mirror image of (5), i.e., (6), which I will indeed treat slightly differently below. Moreover, prediction 3 doesn’t say anything about what a topic *is*, i.e., when an utterance is “about” something, and when it would be required or desirable to indicate this – what I predict is only *that* RFR can be used for marking the topic of an utterance, leaving a independent specification of topichood for another occasion. I will discuss a number of compatible characterizations of topic from the literature in section 6. But for the sake of concreteness: a typical reason why a speaker may choose to indicate the topic could be to clarify the intended discourse structure after a change in topic; another could be to signal awareness of the prior or intended availability of alternative topics, which is how (5) is often construed in the literature (see Section 6).

Let me turn now to the other example of purported topic marking, i.e., (6), repeated here:

- (6) A: What about the beans, who had those?
 B: Fred ate the beans...
 H*L L*HL H%

A challenge posed by this example, recall, is that RFR occurs utterance-finally, on what appears to be the “primary” (because only) information – so the information is not “secondary” in some intuitive sense. The same holds with regard to the uncertain relevance case (7) and the incredulity case (8) given earlier, where RFR likewise occurs utterance-finally. Fortunately, my account is compatible in principle with these uses of RFR: strictly speaking, according to prediction 1, RFR is a marker not of secondary information, but of information aimed at a secondary QUD, and the information itself may well be the only and hence in some sense “primary” information of the utterance. More generally:

Prediction 4. When RFR occurs utterance-finally, it indicates that the utterance as a whole, including its in some sense “primary” information, complies with the maxims not relative to the main QUD but relative to a secondary QUD. (Hence, although secondary information must address a secondary QUD, primary information does not necessarily address the main QUD.)

Of course, it remains to be explained why the relevant examples should involve a secondary QUD, what the nature of these QUDs is, and why the main QUD is not compliantly addressed – and I will address such questions with regard to (6) (and also (7)) in Section 5. For now, what matters is that the proposed account, based on prediction 1, predicts that RFR can be used to mark secondary information in a strict sense (prediction 2) – of which prefinal topic marking as in (5) would be a special case (prediction 3) – but also when *primary* information happens to be aimed at a secondary QUD (prediction 4).

Lastly, let me briefly discuss (8), repeated here, where RFR seems to indicate incredulity:

- (8) A: I'd like you here tomorrow morning at eleven.
 B: Eleven in the morning?!
 H*L H%

This use of RFR is not directly relevant to the main aims of this paper, and space is limited, but since the proposed core meaning of RFR (and the ICM theory) is intended to be fully general I must at least sketch how (8) could fit in. I propose that (8) is in a certain sense a counterpart of (4), repeated here:

- (4) A: So I guess you like [æ]pricots then?
 B: I don't like [æ]pricots – I like [ei]pricots!
 L*HL H% H*L L%

In section 1 I proposed that the material marked by RFR in (4) serves to deny a previous contribution (or in this case a metalinguistic pragmatic implication of that contribution) prior to providing the correct information. The purpose of the secondary QUD, then, is common ground maintenance, and it could be paraphrased as “is this information (whether asserted or implied), that seems to enter the common ground, really true?”. Similarly, I propose that (8) is aimed at common ground maintenance. An important difference, however, is that (4) but not (8) contains a negation; hence whereas (4) is a case of denial, i.e., preventing something from entering the common ground, (8) must rather be a case of acceptance, i.e., affirming that something is indeed entering the common ground (in both cases the falling accent indicates compliance with Quality, so the speaker must believe that the proposition expressed is true). This may be counterintuitive, since examples like (8) often feel more like cases of denial than acceptance, and indeed an explicitly denying continuation like “I can't meet at eleven, I have to pick up the kids.” would be fine. To explain this, I follow Constant (2012) in assuming that such cases must be metalinguistic, i.e.,

that when (8) seems to function like a denial, the proposition expressed is not “we’re meeting at eleven”, but rather something like “we’re meeting at eleven *is what you say*” – and speaker B may well accept the latter whilst denying the former. Indeed, accepting *that* something was said could plausibly be used as a rhetorical device to convey denial of the truth of *what* was said. Now, clearly this type of analysis involves many assumptions, and generates various further predictions that require testing, but this must be left for another occasion. Let me end by noting that, if I set aside the added complexity of metalinguisticness, my proposal is to treat (4) and (8) essentially like (14)a and (14)b, which are more plain cases of denial and acceptance:

- (14) A: John was at the party.
 a. B: John wasn’t there... He was at his parents’ that weekend.
 H*L H%
 b. B: (Right,) John was there... Anyone else we may know?
 H*L H%

In each case the secondary QUD would be one that serves common ground maintenance. Comparing these more plain, non-metalinguistic examples with the originals (8) and (4) also reveals that the emotion of surprise or incredulity is not expressed by the RFR contour as such; it is expressed, rather, by paralinguistic cues such as greater intensity or larger pitch excursions (and, in written text, exclamation marks).

5 Strategic secondary QUDs (example (6))

I have already explained how RFR can be used both as a marked of secondary information (prediction 2) and as a marker of topics (prediction 3) – but the latter only when RFR is used prefinally on a sub-propositional constituent, as in (5). The other purported case of topic marking, (6), where RFR occurs utterance-finally on what appears to be the main (because only) assertion, is compatible with the current treatment (prediction 4), but it does raise the issue of what the QUDs are in the relevant examples, and why the utterance complies with the maxims relative to the secondary QUD but not relative to the main QUD. In the current section I address this remaining issue. My proposal will be somewhat tentative, though: any claim to the effect that a particular example would involve a certain combination of QUDs would require an overview of the various combinations of QUDs that might in principle be jointly pursued, and an explanation of why, in the relevant examples, only the strategic relationship makes sense. No sufficiently general and precise theory of that sort currently exists.

With that disclaimer in mind, let me consider (6), repeated here:

- (6) A: What about the beans, who had those?
 B: Fred ate the beans...
 H*L L*HL H%

When RFR occurs at the end of an utterance, the secondary QUD is in some sense

addressed *instead of* the main QUD, as opposed to utterances where RFR marks secondary information and the main QUD is ultimately compliantly addressed as well, like (2) and, I proposed, (5). A typical circumstance in which this may be a reasonable choice is if the main QUD could not be compliantly addressed directly, and the secondary QUD is part of a *strategy* for resolving the main QUD. This type of analysis is particularly natural in cases where RFR conveys uncertain relevance, as in (7), repeated here:

(7) A: Have you ever been West of the Mississippi?

B: I've been to Missouri...

L*HL H%

Here, according to Ward & Hirschberg (1985), speaker B is unsure if she has been West of the Mississippi, so she addresses the question of which states she has visited that might be West of the Mississippi, hoping that speaker A might know whether indeed they are. In what follows I advance a similar understanding of (6):

Assumption 2. In (6), (7) and similar cases of utterance-final RFR (but not (8)), the propositions in the secondary QUD are part of a strategy for establishing propositions of the main QUD.

In Section 6 I will explain why an alternative type of secondary QUD for (6), more along the lines of Büring 2003, would be less adequate (within the ICM theory). Other than that, as announced, I leave a motivation of assumption 2 for another occasion.

Let me fix what I mean by a strategy:

Assumption 3. A set S of propositions is a *strategy* for a proposition p (in a given context) if, and only if, establishing (i.e., making common ground) all of the propositions in S entails (in the given context) establishing the original proposition p .

This is a rather minimal assumption, and it can easily be generalized to problem-solving and planning more generally (e.g., Russell & Norvig 2003, ch.11). As such, it is not very restrictive, e.g., $\{p\}$ counts as a strategy for p ; and if S is a strategy for p then so is any superset of S , even if it also contains completely unrelated goals. Moreover, assumption 3 does not say anything about when a strategy can rationally be pursued, and how the various strategic propositions are to be organized into QUDs. To curb this unrestrictiveness I need some additional assumptions:

Assumption 4.

Given a prior QUD Q , a strategic QUD Q' may be pursued if and only if:

- (i) the speaker considers it unlikely that any proposition $p \in Q$ can be directly established by any of the interlocutors;
- (ii) any proposition $p' \in Q'$ is part of a strategy for some proposition $p \in Q$ (in the sense of assumption 3);

- (iii) these strategies must be deemed sufficiently likely to succeed (where a strategy succeeds if and only if at least some proposition $p \in Q$ for which it is a strategy ends up in the common ground);
- (iv) Q' contains all propositions permitted by (ii) and (iii);
- (v) Q remains in place as the main QUD; Q' is pursued only as a secondary QUD.

I do not intend these rules to be exceptionless, but I do intend them to hold at least typically and, hence, that any exception would call for an independent explanation of why the given situation was not a typical one. Item (i) entails that speakers prefer to establish as many propositions of the main QUD directly as possible, before pursuing a strategy for the remainder. Item (ii) simply ensures that the QUD is part of a strategy. Item (iii) seems to me uncontroversial, at least with the important qualification that what counts as sufficiently likely will depend on the importance of the information sought and on the availability of alternative strategies for obtaining it. Item (iv) serves to ensure, primarily, that if a speaker shares a certain strategic piece of information, the speaker can be expected to have given any information that is deemed at least as likely to be useful. Item (v), finally, ensures that, should the strategy based on Q' fail, the original QUD Q is not lost – empirically it serves to predict that strategic QUDs are normally pursued with RFR, the high boundary tone (H%) reflecting the continued presence of the original QUD.

Let me briefly compare my notion of strategy to the notion advanced in Roberts 1996, which has been quite prominent in the literature. The two notions are quite close overall, but my notion is more restrictive than Roberts's in one respect, and less restrictive in other respects. My notion is more restrictive due to item (i) of assumption 4: for Roberts, a strategy may be pursued not only in case of a lack of information, but also for the sake of clarity or transparency: a speaker who is in principle able to directly resolve the prior QUD may still decide to divide it into several sub-QUDs in order to resolve it one piece at a time. This might be called a “presentational” or “cosmetic” strategy, in contrast to my notion which exclusively covers what may be called “information-seeking” strategies. While I acknowledge that “presentational” strategies exist as well, they are not needed for present purposes – although in Section 6 I will briefly discuss them again when comparing my approach to Büring's (2003) characterization of topichood. My notion of strategy is less restrictive than Roberts's notion in two main ways, neither of which is essential for present purposes: first, Roberts's definition effectively closes the notion of relevance under negation – if a proposition p is relevant, so is its negation *not p* – a constraint that I think is implausible (e.g., Leech 1983; Horn 1989) and problematic (e.g., Kroch 1972), although for present purposes nothing hinges on this. Second, Roberts's definition entails that a QUD Q' can be part of a strategy for a QUD Q only if any complete answer to Q' contextually entails (or negates) a proposition p of the original QUD Q . This constraint prevents strategies from proceeding in smaller increments than the propositions of the original QUD, which seems neither necessary nor plausible to us.

The foregoing assumptions yield predictions regarding the circumstances in which speakers may pursue a strategy and in which, hence, we may expect utterance-final RFR. I will concentrate here on predictions with regard to implications of *exhaustivity*, which have received substantial attention in the literature on RFR (see Section 6) and elsewhere. It is predicted that utterances with strategic RFR cannot exhaustively resolve the main QUD: some proposition in the main QUD must be considered possible, or no strategy could succeed (contrary to item (iii) of assumption 4), but not known with certainty, or no strategy would have been necessary (contrary to item (i)). Hence:

Prediction 5. In case of strategic RFR, the main QUD must not be exhaustively resolved.

I take this to explain why the strategic use of RFR tends to be strange on utterances that are in some sense maximally informative (e.g., Ladd 1980; Ward & Hirschberg 1985; Horn 1989; Constant 2012), as illustrated by the following example from Ward & Hirschberg (their (25)):

- (15) A: Did you read (at least) the first chapter?
 B: ? I read the whole dissertation...
 L*HL H%

Seemingly contrary to prediction 5, de Marneffe & Tonhauser (2016) report experimental results that seem to show that RFR *strengthens* exhaustivity implications rather than weakening them. They investigated pairs of a polar question and an answer where the question predicate is stronger on some conceivable scale than the answer, and found that the answer was more likely to be interpreted as meaning “not beautiful” with RFR than with a plain falling contour:

- (16) A: Is your sister beautiful?
 B: She’s attractive...
 L*HL H%

I must leave a detailed discussion of examples such as this for another occasion, but let me briefly remark that de Marneffe & Tonhauser’s results are not necessarily incompatible with prediction 5. The main reason is that the exhaustivity effects in (16) could in principle be due to the trailing tone rather than the boundary tone, namely if the strategic, secondary QUD of B’s answer happens to correspond to A’s question, the main QUD being some prior question that is left implicit, e.g., “Do you know anyone who could be a model?”; or perhaps B is compliantly addressing the question “Is she beautiful/attractive *according to B?*” as a strategy for resolving the main QUD of “Is she beautiful/attractive *in a more objective sense?*”. And these options do not exhaust the ways in which de Marneffe & Tonhauser’s may be reconciled with prediction 5. Of course, such escape hatches must not be used without proper motivation, say, independent evidence that the purported combinations of QUDs are indeed sometimes used; but they must not be sealed shut without due motivation

either, especially if they might be used to maintain an otherwise widely accepted prediction, derived from an independently motivated theory of intonational meaning.

As Wagner (2012) notes, the non-exhaustivity conveyed by RFR pertains only to the main QUD; the strategic, focus-congruent QUD may well be completely resolved. In support of this, Wagner cites the following example from Ward & Hirschberg 1985:

- (17) A: Do you take credit cards?
 B: Visa and Mastercard...
 (L*HL) L*HL H%

As Wagner (2012) notes, B's response seems to imply that she accepts no other types of credit cards, but that it is unclear whether this resolves the QUD underlying A's request, say, whether B takes any credit cards that A possesses. In current terms, exhaustivity is implied relative to the strategic secondary QUD of which credit cards B accepts, and something like non-exhaustivity is implied with regard to the main QUD of whether B takes any credit cards that A possesses. If exhaustivity implications normally derive from compliance with the maxims, as I will assume in this paper, then the exhaustivity implication relative to the secondary QUD is predicted by my proposal, as follows. The low trailing tone in (17) indicates compliance with the maxims relative to the secondary QUD, and hence that any proposition other than B's accepting Visa and Mastercard must be either considered false, or not contained in the secondary QUD. The second disjunct would entail that the proposition was not deemed sufficiently likely to be of strategic use – this is because according to item (iv) in assumption 4 the secondary QUD must contain all propositions that are sufficiently likely to be of strategic use. Hence, B's response in (17) is predicted to imply that B does not accept any other credit cards, except perhaps some obscure type of card that she considers unlikely to be in A's possession. (In this way, which of the two QUDs in (17) is the main one and which is the secondary one is constrained not only by item v. of assumption 4; it is also constrained, through the exhaustivity implications, by my account of intonational meaning.) Summing up:

Prediction 6. In case of strategic RFR, something like exhaustivity is implied relative to the strategic secondary QUD, namely that no alternative proposition is considered to be both true and sufficiently likely to be of strategic use.

Predictions (5) and (6) will be a useful point of comparison to existing approaches in Section 6.

Now, let us see how all of the foregoing applies to the example of primary interest, i.e., (6). This example has accents (with low trailing tones) both on “Fred” and on “beans”, which according to the ICM theory and a standard account of prosodic focus suggests that either there is a single secondary QUD responsible for both accents – such as “Who ate what?” or “Who did what?” or even, perhaps depending on one's theory of focus, simply “What happened?” – or there are two secondary QUDs, such as “Who ate the beans?” and “What did Fred eat” (among other possible combinations). I assume what seems to me a reasonable constraint on interpretation, a sort of Occam's Razor:

Assumption 5. An audience should assume only as many QUDs for a given utterance as strictly required to make sense of the intonation contour (in the given context).

This entails that, if there are multiple falling accents (or multiple rising accents) within the same intonation phrase, these will normally be interpreted as marking (non-)compliance relative to one and the same congruent QUD, i.e., a single QUD that is responsible for the various foci. For (6), then, I assume a single secondary QUD, and I assume for the sake of concreteness that this secondary QUD is of the form “Who ate what?”. As a strategic QUD, it should contain only propositions that are part of a sufficiently promising strategy, hence a better paraphrase of the secondary QUD would be “Who ate what, insofar as this may help resolve the prior QUD?”. Given the context in (6), this appears to have been the type of QUD that speaker A was considering as well, suggesting that the main QUD, for which this would be a strategy, must have been introduced earlier – it could be “Did everyone enjoy their meal?”, for instance, or “Who farted?”. The (non-)exhaustivity implications of (6), according to prediction 6, are that this prior QUD, whatever it is, is not completely resolved, whereas Fred’s having had the beans exhausts the information that A and B deem sufficiently likely to be relevant (though if this strategy fails they may of course lower their likelihood standard and try again).

Summing up, I have proposed, tentatively in certain respects, that the purported case of topic-marking in (6) in fact involves a secondary QUD that is part of a strategy for the main QUD. I have explicated some minimal assumptions about what strategies are and when they may be pursued, in order for my treatment to yield predictions about, foremost, implications of exhaustivity and non-exhaustivity. If these assumptions and predictions are on the right track, then my treatment of RFR applies not only to its uses as a marker of secondary information, as in (1), (2), (3) and (4), and to its use as a genuine topic marker, as in (5), but also to what has been regarded in the literature as a case of topic marking, as in (6), which, I proposed, may in fact involve a strategic secondary QUD.

6 Comparison to existing work

The main contribution of this paper, I think, is a new understanding of what different uses of RFR may have in common. My predictions have inevitably remained somewhat coarse – more detailed predictions can be obtained only by explicating more assumptions about the maxims and about the pragmatics of QUDs. In the current section I will compare my account to the literature at a similarly general level, concentrating on the main ingredients of the various approaches rather than on their precise implementations. Still, because different accounts in the literature have concentrated on different uses of RFR, and because even among accounts that concentrate on the same uses there is considerable variation, this comparison will be rather long – it occupies the remainder of this paper.

According to several accounts in the literature, as announced in the introduction, the (R)FR contour would serve to mark the material on which it occurs as the “topic” of the utterance, in contrast to plain falling contours which would mark the “focus”. Examples (5) and (6), repeated here, would differ only in which constituent is the topic and which is the focus:

- (5) A: What about Fred, what did he eat?
 B: Fred, ate the beans.
 L*HL H% H*L L%
- (6) A: What about the beans, who had those?
 B: Fred ate the beans...
 H*L L*HL H%

Several authors dispute that a straightforward mapping would exist between, on the one hand, types of contours such as RFR vs. plain falls, and, on the other, information-structural categories such as topic vs. focus (e.g., Hedberg & Sosa 2008; Calhoun 2007; Wagner 2012). For instance, Wagner (2012) notes that the contours in (5) and (6) are not as symmetrical as many following Jackendoff take them to be. This is shown by the following contrast (Wagner’s (44) and (45)), corroborated experimentally in Meyer, Fedorenko & Gibson 2011:

- (18) A: Did John insult Mary?
 B: ? No! Mary insulted John...
 H*L L*HL H%
- (19) A: Did John insult Mary?
 B: No! Mary, insulted John.
 L*HL H% H*L L%

The reason why (18) is somewhat strange, according to Wagner, is that RFR at the end of an utterance indicates that some QUD is left unresolved, and this does not seem to be the case in the context at hand. I refer to Wagner 2012 for additional arguments against the purported symmetry of (5) and (6), e.g., that the former but not the latter may occur as a final list item.

Interestingly, the current approach predicts that (5) and (6) are indeed not symmetrical. After all, (5) but not (6) must in the end address the main QUD compliantly – in line with Wagner’s observation. Moreover, whereas the low trailing tones in (6) both indicate compliance relative to a secondary QUD for the utterance as a whole – which in Section 5 I proposed is a strategic QUD – the low trailing tone of the RFR contour in (5) instead indicates that the word “Fred” on its own must serve to compliantly address some secondary QUD – and in Section 4 I proposed that this can only reasonably a QUD like “Whom is this utterance about?”. According to my proposal, then, only the RFR contour in (5) is predicted to be a genuine topic marker – though recall that my proposal has nothing to say about what a topic *is* (independently of the presence of RFR), or when a topic would be worth marking.

The observed and predicted asymmetry between (5) and (6) notwithstanding, it will be insightful to relate the current theory to three strands of approaches to RFR as a marker of topics:

1. accounts based on non-exhaustivity (Hara & Van Rooij 2007; Tomioka 2010; Constant 2012; Wagner 2012; though the latter two are not intended as accounts of topichood necessarily but only as accounts of RFR);
2. characterizations of topic in terms of givenness (Brazil 1975; Gussenhoven 1984; Steedman 2014); or
3. accounts of topics as keys in a discourse strategy (Jackendoff 1972; Roberts 1996; Büring 2003).

I will discuss each in turn. Subsequently, for the sake of completeness, I will briefly discuss an account of RFR that is not framed in terms of topics but which has been quite prominent in the literature: Ward and Hirschberg's (1985; 1986) account of the uncertain relevance and incredulity uses of RFR. Overall, it will be shown that my account shares certain ingredients with existing theories – thereby retroactively motivating these ingredients – while also doing some things differently. A central difference is that my treatment of RFR derives from a more general theory of intonational meaning, i.e., the ICM theory, which benefits parsimony and explanatory potential.

6.1 Accounts centered on non-exhaustivity

Several accounts of the contribution of RFR center on its strangeness on complete answers, as illustrated earlier by (15), repeated here:

- (15) A: Did you read (at least) the first chapter?
 B: ? I read the whole dissertation...
 L*HL H%

Ladd (1980: p.153) proposes that RFR indicates “focus within a given set”, and accounts for the strangeness of (15) (or analogous examples) by noting that B's response in some sense covers the entire set, say, of dissertation chapters, rather than selecting a proper subset of them. Although Ladd's proposal is informal, several more recent accounts aim to formalize what I understand to be the same basic idea, or at least a consequence of it, namely that RFR conveys *non-exhaustivity*. I will discuss four accounts of this sort, namely Hara & Van Rooij 2007, Tomioka 2010, Constant 2012 and Wagner 2012 – although the latter two are not necessarily intended as accounts of topichood, but only as accounts of RFR.

Hara & Van Rooij (2007) propose that RFR conveys that some proposition, contained in a focus-congruent QUD, is not believed to be true. This falls short of accounting for any non-exhaustivity conveyed by RFR: that a proposition is not believed to be true is compatible with it being taken to be false, which is what

exhaustivity amounts to, hence it does not suffice to prevent an exhaustivity inference. Indeed, the contribution of RFR according to Hara and Van Rooij is just the sort of implication that is normally derived from the conversational maxim of Quantity, so RFR wouldn't really add anything, from this perspective.

According to Tomioka (2010) RFR indicates that the utterance should not be interpreted exhaustively with regard to a focus-congruent QUD. This approach appears to be the most direct: RFR would simply block an exhaustive interpretation. He proposes to derive additional effects of RFR pragmatically, say, that the non-excluded propositions must be considered possible, by reasoning about why a speaker would not intend their utterance to be interpreted exhaustively (just as in my approach additional effects follow from reasoning about when a speaker could rationally pursue a strategy). This may be feasible, but since his proposal is not embedded within a more general pragmatic theory it is difficult to evaluate. It is important to note that Tomioka, unlike us, assumes that exhaustivity is normally obtained by means of a grammatical exhaustivity operator (e.g., Chierchia, Fox & Spector 2012; for criticism see Geurts 2013). Tomioka proposes that a constituent marked by RFR somehow escapes the scope of this exhaustivity operator. While this may indeed render the semantic content of the uttered sentence non-exhaustive, it may not suffice to block a pragmatic exhaustive interpretation – after all, pragmatic accounts of exhaustivity always start from a non-exhaustive semantic content anyway.

Constant (2012) proposes that RFR conveys that every proposition, contained in the focus-congruent QUD, that is neither entailed nor excluded by speaker meaning of the utterance (including implicatures), is not believed to be true – and that there must exist such a proposition. This approach is similar to Hara and Van Rooij's in that there must be some proposition that the speaker does not take to be true. The difference is that according to Constant this should hold for *all* propositions of a certain sort, namely those that are neither entailed nor excluded by the speaker meaning (including implicatures). Constant then prevents exhaustivity by requiring that the relevant set of propositions (i.e., that are neither entailed nor excluded by the speaker meaning) is non-empty. Crucially, an exhaustivity implicature would exclude all propositions that are not entailed by the asserted content, and this would make the relevant set of propositions empty, contradicting the contribution of RFR. Constant stipulates that this contradiction is to be avoided by assuming that there is no exhaustivity implicature (rather than dropping the other side of the contradiction), and this would explain why RFR is strange on semantically exhaustive answers like (15). However, although Constant's account predicts non-exhaustivity, it does so relative to the wrong QUD. Like Hara and Van Rooij and Tomioka, Constant assumes that the non-exhaustivity of RFR pertains to a focus-congruent QUD. However, as I mentioned with regard to (17) in Section 5, Wagner notes that the non-exhaustivity of RFR is not tied to accent placement in this way. In line with Wagner's observation, and in contrast to the aforementioned accounts, my account predicts that RFR conveys non-exhaustivity relative to the main QUD, and something like exhaustivity relative to the congruent QUD (prediction 6).

Wagner (2012), finally, assumes that RFR conveys that some salient proposition,

not necessarily constrained by accent placement, should be considered possibly true. Unlike Hara and Van Rooij's assumption that RFR would indicate possible falsehood, Wagner's assumption that it indicates possible truth does block exhaustivity, and it predicts that RFR is strange on semantically exhaustive answers. Hara & Van Rooij argue against an account in terms of possible truth, on the basis that RFR can occur on "contrastive topics" even on the final list item of an exhaustive list. However, Wagner notes that this is the case only if RFR occurs at the start of the final list item, not at the end, i.e., final list items can be like (5) but not like (6). Indeed, my account predicts exhaustivity (i.e., prediction 6) only for the latter.

Summing up, Wagner's account is the only one that aligns with ours as far as the non-exhaustivity effects of RFR is concerned. An important difference, nevertheless, is that Wagner just stipulates that non-exhaustivity is part of the meaning of RFR based on considerations of descriptive adequacy, whereas I derived them from a deeper meaning, i.e., that RFR signals the presence of a secondary QUD (prediction 1), by combining this with certain plausible assumptions about discourse strategies. As a consequence, my treatment of RFR offers an explanation also of other features of RFR, e.g., that it is used as a marker of secondary information and as a marker of topics, about which Wagner's account is silent. Lastly, an important difference is that I derived my treatment of RFR from a more general and independently motivated theory of intonational meaning, i.e., the ICM theory (Westera 2013, 2014, 2017).

6.2 Accounts based on givenness/selection

It seems reasonable to assume that speakers tend to choose topics that are familiar to most of the interlocutors present; and that it's only what they say *about* those topics that will tend to be new. Moreover, a typical circumstance (though not the only one) in which it may be rational to indicate the topic of one's utterance is one where it is one of several potential topics from the preceding discourse (as in (5)). I take these two tendencies to explain in part why many authors have associated RFR with something's being given, or selected from the context, rather than introduced anew (e.g., Brazil 1975; Gussenhoven 1984; Steedman 2014). If my account of RFR is on the right track, this does not need to be assumed as part of the meaning of RFR, but can be derived for the topic-marking use of RFR by explicating an independent theory of how speakers choose their topics.

We can also understand why something like selection from the context may seem like a suitable common denominator for RFR more generally, i.e., not just for cases of (plausibly) genuine topic marking like (5), but also for cases of common ground maintenance like (4) and, I proposed, (8) – since whatever is accepted or denied must have been present in the prior context – as well as certain cases of uncertain relevance like (7) and, I proposed, (6). The reason for the latter is that if something is already known (hence 'given') it cannot be worth sharing, which means that uncertainty about what is and isn't known can entail uncertainty about what is and isn't worth sharing, or relevant in a certain sense. And since uncertainty about what is relevant may call for a strategy (cf. 6.4 below), this explains why RFR may be used to convey

that what is asserted may be already known, as noted by Gussenhoven (1984, p.205).

Altogether, the foregoing may explain why some authors consider something like selection from the context to be a suitable common denominator of all uses of RFR. But while this seems to me plausible for its topic-marking use, it may not extend to other uses of RFR. For instance, the information in (7) that B has been to Missouri may well be entirely new to the conversation, and be presented as such, e.g., B could have replied:

(20) B: Well, I've never told you this before, but I've been to Missouri...

Hedberg & Sosa (2008) likewise observe that RFR may occur on genuinely new material. But I will not try to develop this argument any further here, and conclude merely that the use of RFR as a marker of givenness or selection plausibly follows from my account as a special case.

6.3 Accounts based on presentational strategies

It seems reasonable to assume that a typical type of context in which multiple potential topics are available, hence in which one may expect topic marking, could be one where a prior QUD has just been divided into several new QUDs – this is what I referred to earlier as a “presentational” or “cosmetic” type of discourse strategy (as opposed to an “information-seeking” one). This may be the case in (5), where the complex QUD of who ate what is supposedly addressed *by individual* (what did Fred eat, what did John eat, etc.), and RFR on “Fred” is predicted (by my account) to be a genuine topic marker. I take this to explain why several authors have sought to characterize topichood and/or RFR in terms of such QUD-splits (Jackendoff 1972; Roberts 1996; Büring 2003). The adequacy of these accounts for cases like (5) depends on whether QUD-splits are the *only* circumstance in which indicating the topic of one's utterance is appropriate, or merely a typical one. The latter option seems more plausible; indeed, Vallduví (2016) proposes that indicating the topic (as in his “theme-containing utterances”) is appropriate when the speaker's choice of main QUD isn't a priori clear. QUD-splits are only a special case of this, another being, as Vallduví notes, the move from a specific to a more general QUD rather than vice versa.

The aforementioned accounts based on presentational strategies advance an analogous treatment for the supposed mirror image (6), with utterance-final RFR: this time the presentational strategy would be to address who ate what *by food item* (who ate the beans, who ate the pasta, etc.). In my account, in contrast, (6) is not predicted to involve topic marking at all; nor can it have as a secondary QUD the question “Who ate the beans?”, because such a QUD would leave the accent on “beans” (with low trailing tone) unaccounted for, contrary to assumption 5. Instead, I proposed, (6) involves a secondary QUD like “Who ate what, insofar as this may help resolve the prior QUD?”, as part not of a presentational strategy but of an information-seeking strategy for some prior QUD. That is, I treated (6) as an instance of the uncertain relevance use illustrated by (7). Presentational strategies and information-seeking strategies have been conflated in the literature, and I think that this may

have contributed to the intuitive appeal of basing the core meaning of RFR on a notion of “strategy”. But according to my account the two examples, (5) and (6), involve different types of strategies, which instantiate the core meaning of RFR in very different ways.

6.4 Ward and Hirschberg 1985, 1986

Ward & Hirschberg (1985) provide an account of the uncertain relevance use of RFR, illustrated by (7) given earlier. In a nutshell, Ward and Hirschberg note that RFR conveys three types of uncertain relevance, which they characterize in terms of the relation between the proposition expressed and a “scale”, roughly, a non-singleton QUD. A speaker may be uncertain about whether the QUD is non-singleton (their “type I”), about which potentially non-singleton QUD is appropriate (their “type II”), and about how the proposition expressed relates to a proposition in the QUD (their “type III”) – (7) would be of “type III”. These three circumstances are all ones in which a strategy would be called for, whether this is to find out which relevant propositions are true (“type III”) or to find out which true propositions are relevant (“type I” and “type II”). As such they can be covered by my approach – but for reasons of space I must leave the details of “type I” and “type II” cases for another occasion (having discussed “type III” cases, i.e., (7) and, supposedly, (6), in Section 5).

Ward & Hirschberg (1986) extend their (1985) account in order to deal with the incredulity use, illustrated by (8) given earlier. To that end, Ward and Hirschberg essentially weaken their “uncertain relevance” to “lack of speaker commitment to some aspect of (the appropriateness of) the utterance”. I think that the resulting meaning for RFR is too weak to distinguish RFR from a plain rise, which, recall, has also been characterized in terms of a lack of commitment about some aspect of the utterance – the latter is effectively explicated by the ICM theory in terms of maxim suspensions. In contrast, although I did not provide a detailed account of the incredulity use myself, I did sketch one in Section 4 that could in principle maintain the core meaning of RFR according to the ICM theory. And this core meaning sets RFR apart from a plain rise: for RFR there must be a secondary QUD.

7 Conclusion

I conclude that the notion that RFR is a topic marker can plausibly be reconciled with a treatment of RFR as a marker of secondary information: both uses of RFR appear to follow from its core meaning as predicted by the theory of Intonational Compliance Marking (Westera 2013, 2014, 2017), namely, that an utterance with RFR suspends a maxim relative to the main QUD while addressing a secondary (focus-congruent) QUD compliantly. An important qualification is that not all purported cases of topic marking are predicted to involve genuine topic marking; cases with utterance-final RFR, I argued, are more adequately analyzed as addressing a secondary QUD as part of an information-seeking strategy, rather than a secondary QUD like “what is the topic of this utterance?”, and also unlike a secondary QUD as part of a presentational

strategy (e.g., “What did Fred eat?”). But while the current account correctly predicts that (5) and (6) are not symmetrical, it also explains, at least in outline, what these different uses of RFR have been perceived to have in common. If my account is on the right track, then a more detailed understanding of RFR will require a more detailed theory of QUDs – and vice versa, RFR will provide an intonational window on QUDs that can inform such a theory, in particular with regard to the presence of multiple QUDs. Lastly, if (non-)compliance with the maxims relative to multiple QUDs is worth indicating in English and related languages (Dutch and German appear very similar in this regard), one would expect to find signals with a similar function cross-linguistically, whether these be realized intonationally, as discourse particles or otherwise. As such, I hope that this paper may inspire the future investigation of metapragmatic markers cross-linguistically, and markers of secondary information in particular.

References

- Banziger, T. & K. R. Scherer (2005). The role of intonation in emotional expressions. *Speech Communication* 46, 252–267.
- Bartels, C. (1999). *The intonation of English statements and questions: a compositional interpretation*. Routledge.
- Beaver, David I. & Brady Clark (2008). *Sense and sensitivity. How focus determines meaning*. Oxford: Blackwell.
- Beckman, M. E., J. Hirschberg & S. Shattuck-Hufnagel (2005). The original ToBI system and the evolution of the ToBI framework. In Sun-Ah Jun ed., *Prosodic typology: The phonology of intonation and phrasing*, 118–45. Oxford: Oxford University Press.
- Bolinger, Dwight L. (1982). Intonation and its parts. *Language* 58, 505–533.
- Brazil, D. C. (1975). *Discourse intonation*. (Discourse Analysis Monographs 1). Birmingham: University of Birmingham English Language Research.
- Büring, Daniel (2003). On D-trees, Beans, and Accents. *Linguistics and Philosophy* 26, 511–545.
- Calhoun, Sasha (2007). *Information structure and the prosodic structure of English: A probabilistic relationship*. PhD thesis. University of Edinburgh.
- Chierchia, Gennaro, Danny Fox & Benjamin Spector (2012). The Grammatical View of Scalar Implicatures and the Relationship between Semantics and Pragmatics. In Claudia Maienborn, Paul Portner & Klaus von Stechow eds., *Semantics: An International Handbook of Natural Language Meaning*. Vol. 2, 2297–2332. Boston, MA: Mouton de Gruyter.
- Constant, Noah (2012). English Rise-Fall-Rise: a study in the Semantics and Pragmatics of Intonation. *Linguistics and Philosophy* 35(5), 407–442.
- de Marneffe, Marie-Catherine & Judith Tonhauser (2016). Inferring meaning from indirect answers to polar questions: The contribution of the rise-fall-rise contour.

- In Edgar Onea, Malte Zimmermann & Klaus von Heusinger eds., *Questions in Discourse*. (Current Research in the Semantics/Pragmatics interface),
- Geurts, Bart (2013). A plea for covert operations. In M. Aloni, M. Franke & F. Roelofsen eds., *The dynamic, inquisitive, and visionary life of φ , $?\varphi$, and $\diamond\varphi$: a festschrift for Jeroen Groenendijk, Martin Stokhof, and Frank Veltman*, 105–107. ILLC Publications.
- Grice, H. Paul (1975). Logic and conversation. In Peter Cole & Jerry L. Morgan eds., *Syntax and Semantics 3. Speech Acts*, 41–58. New York: Academic Press.
- Gunlogson, Christine (2008). A question of commitment. *Belgian Journal of Linguistics* 22, 101–136.
- Gussenhoven, Carlos (1984). *On the grammar and semantics of sentence accents*. (Publications in Language Sciences 16). Walter de Gruyter.
- Gussenhoven, Carlos (2004). *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.
- Hara, Yurie & Robert van Rooij (2007). *Contrastive topics revisited: A simpler set of topic-alternatives*. Presentation given at the North East Linguistic Society (NELS) 38; retrieved from www2.lt.cityu.edu.hk/~yurihara/.
- Hedberg, Nancy & Juan M. Sosa (2008). The prosody of topic and focus in spontaneous English dialogue. In Chungmin Lee, Matthew Gordon & Daniel Büring eds., *Topic and Focus: Cross-Linguistic Perspectives on Meaning and Intonation*. Vol. 82, 101–120. Springer.
- Hobbs, Jerry R. (1990). The Pierrehumbert-Hirschberg Theory of Intonational Meaning Made Simple. In P. Cohen, J. Morgan & M. Pollack eds., *Intentions in Communication*, 313–324. Cambridge, Massachusetts: Bradford Books (MIT Press).
- Horn, Laurence R. (1989). *A Natural History of Negation*. Chicago: University of Chicago Press.
- Jackendoff, Ray (1972). *Semantic Interpretation in Generative Grammar*. Cambridge, MA: MIT Press.
- Kroch, Anthony (1972). Lexical and Inferred Meanings for Some Time Adverbs. *Quarterly Progress Reports of the Research Laboratory of Electronics* 104, 260–267.
- Ladd, D. Robert (1980). *The structure of intonational meaning: Evidence from English*. Indiana University Press.
- Lai, Catherine (2012). *Rises all the way up: The interpretation of prosody, discourse attitudes and dialogue structure*. PhD thesis. University of Pennsylvania.
- Leech, Geoffrey (1983). *Principles of Pragmatics*. London: Longman.
- Malamud, Sophia A & Tamina Stephenson (2015). Three ways to avoid commitments: Declarative force modifiers in the conversational scoreboard. *Journal of Semantics* 32 (2), 275–311.
- Meyer, Marie-Christine, Evelina Fedorenko & Edward Gibson (2011). *Contrastive topic intonation: an empirical evaluation*. Presented at Experimental and Theoretical Advances in Prosody; abstract retrieved from prosodylab.org/etap/.
- Pierrehumbert, Janet B. (1980). *The phonology and phonetics of English intonation*. PhD thesis. Massachusetts Institute of Technology.

- Pierrehumbert, Janet B. & Julia Hirschberg (1990). The meaning of intonational contours in the interpretation of discourse. In P. R. Cohen, J. Morgan & M. E. Pollack eds., *Intensions in communication*, 271–311. Cambridge, MA: MIT Press.
- Pierrehumbert, Janet B. & S. Steele (1987). How many rise-fall-rise contours? In Tamaz Volverionovich Gamkrelidze ed., *Proceedings of the International Congress of Phonetic Sciences*. Vol. 11, Academy of Sciences of the Estonian SSR.
- Potts, Christopher (2005). *The Logic of Conventional Implicature*. (Oxford Studies in Theoretical Linguistics 7). Oxford: Oxford University Press.
- Roberts, C. (1996). Information structure in discourse: Towards an integrated formal theory of pragmatics. *Working Papers in Linguistics–Ohio State University Department of Linguistics*, 91–136.
- Rooth, Mats (1992). A theory of focus interpretation. *Natural Language Semantics* 1 (1), 75–116.
- Russell, Stuart Jonathan & Peter Norvig (2003). *Artificial intelligence: a modern approach*. second. Upper Saddle River: Prentice Hall.
- Simons, Mandy, Judith Tonhauser, David I. Beaver & Craige Roberts (2010). What projects and why. *Proceedings of SALT* 20, 309–327. URL: <http://elanguage.net/journals/index.php/salt/article/viewFile/20.309/1326>.
- Steedman, Mark (2014). The Surface Compositional Semantics of English Intonation. *Language* 90, 2–57.
- Tomioka, Satoshi (2010). A scope theory of contrastive topics. *Iberia: An International Journal of Theoretical Linguistics* 2 (1), 113–130.
- Vallduví, Enric (2016). Information Structure. In *Information Structure*, 728–755. Cambridge University Press.
- Wagner, Michael (2012). Contrastive topics decomposed. *Semantics and Pragmatics* 5 (8), 1–54.
- Ward, Gregory & Julia Hirschberg (1985). Implicating uncertainty: the pragmatics of fall-rise intonation. *Language* 61.4, 747–776.
- Ward, Gregory & Julia Hirschberg (1986). *Reconciling Uncertainty with Incredulity: A Unified Account of the L*+H L H% Intonational Contour*. Paper presented at the Annual Meeting of the Linguistic Society of America.
- Ward, Gregory & Julia Hirschberg (1992). The Influence of Pitch Range, Duration, Amplitude and Spectral Features on the Interpretation of the Rise-Fall-Rise Intonation Contour in English. *Journal of Phonetics* 20, 241–251.
- Westera, Matthijs (2013). ‘Attention, I’m violating a maxim!’ A unifying account of the final rise. In Raquel Fernández & Amy Isard eds., *Proceedings of the Seventeenth Workshop on the Semantics and Pragmatics of Dialogue (SemDial 17)*,
- Westera, Matthijs (2014). Grounding topic and focus in biological codes. In C. Gussenhoven, Y. Chen & D. Dediu eds., *Proceedings of the Fourth International Symposium on Tonal Aspects of Languages (TAL 4)*,
- Westera, Matthijs (2017). *Exhaustivity and intonation: a unified theory*. PhD thesis. ILLC Dissertation Series, University of Amsterdam.