

Prosodic cues for expressivity and questioning force in a French reason question

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reason comment-questions

(1) Q: Comment peut-il lire le courrier de Marie?

how can he read the email of Marie

A1: Furtively. (manner)

A2: With a remote login. (means)

A3: He is a nosy person. (reason)

The question with the reading compatible with A3 :

shifted meaning of comment from 'standard' manner to reason.

reason comment-questions

prejacent (Fleury & Tovenà 2018)

(1) Q: Comment peut-il lire le courrier de Marie?

how can he read the email of Marie

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The question with the reading compatible with A3 :

shifted meaning of comment from 'standard' manner to reason.

reason *comment*-questions and *pourquoi*-questions

Another possible formulation of this question (with the same reading?):

(1') Q: Comment ça (se fait que) il lit le courrier de Marie?
how that is-done that il reads the email of Marie

reason *comment*-questions and *pourquoi*-questions

- ‘how’ and ‘why’ are said to alternate in various languages (Collins, 1991; Tsai, 2008; Hsiao, 2017).

(1'') Q: *Pourquoi* est-ce qu'il lit le courrier de Marie?

‘Why does he read Marie’s email?’

A: He is a nosy person.

BUT :

- *Comment* Qs cannot be used to inquire about the goal/purpose of the initiator of the event or the situation that would ensue (result).

reason *comment*-questions

- A reason-comment question is the expression of an attributional search, namely a search for explanation in reaction to an expectation disconfirmation. (Fleury and Tovenà 2018)
- The speaker's expectations are inconsistent with the possibility of the existence of the event described by the prejacent (=> effect of surprise)

(2) Anne : Did you read, Mrs Catherine? They want to build a highway in the middle of our village

Catherine : I think I just heard about it on the radio

Anne : **C'est incroyable**, comment peut-on faire une chose pareille ?

'It is unbelievable, how can one do such a thing?'

morphosyntactic and semantic properties

morphosyntactic and semantic properties

The reason reading is often facilitated by a special morpho-syntax.

- The presence of **modals** (mostly epistemic) or semi-modals facilitates reason readings

(3) a. Comment pouvez-vous vivre ainsi ? Desmets and Gautier 2009
 ‘How can you live like this?’

b. Comment veux-tu qu’une femme soit amoureuse du meurtrier de son père ?
 how want-you that a woman be in-love of-the murder of her father
 ‘How can a woman be in love with her father’s murder?’

(4) Comment Léa ose lire le courrier de Tom?
 ‘How dares Léa read Tom’s email?’

morphosyntactic and semantic properties

The reason reading is often facilitated by a special morpho-syntax.

- The **conditional** affects the commitment to the truth of the prejacent.

(5) Mais comment tu pourrais le quitter?! C'est l'amour de ta vie!
but how you could him leave
'How can you break up with him? He is the love of your life!'

morphosyntactic and semantic properties

The reason reading is often facilitated by a special morpho-syntax.

- The **absence of subj-aux inversion** facilitates the reason reading

(6) Mais comment tu voudrais la vendre?
but how you would-like-to it sell
'But how could you be willing to sell it?'

morphosyntactic and semantic properties

The reason reading is often facilitated by a special morpho-syntax.

- **Negation** is a factor facilitating reason readings

- (5) Comment n'avez-vous pas reçu ma lettre ?
how have-you not received my letter
'How come you did not receive my letter?'

morphosyntactic and semantic properties

The reason reading is often facilitated by a special morpho-syntax.

- High degree expressions (*un tel, aussi...etc.*)

(9) Comment peux-tu quitter un homme aussi adorable?
how can you leave a man so sweet
'How can you break up with such a sweet man?'

reason comment-questions and rhetorical questions

Rhetorical questions

- i) are assertions of opposite polarity (Sadock, 1971; Han, 2002);
- ii) have biased answers that belong in the Common Ground (Caponigro and Sprouse, 2007);
- iii) The answer is, in the speaker's mind, either perfectly obvious or perfectly obviously unknowable (Banuazizi & Creswell 1999:10).

reason *comment*-questions and rhetorical questions

Reason-comment Qs are defined as “biased questions” by Desmets & Gautier 2009:

- (12) - Comment peut-on dire une chose pareille ?
‘How can one say such a thing?’
- (biased ‘answer’:) One cannot say such a thing.

The possibility of saying such a thing is for the speaker beyond a tolerance threshold, which is suggested to be shared in (12). This favours a negative interpretation.

semantic/syntactic properties of *comment*

- Reason-*comment* does not bind a variable linked to a position inside the clause. (Indeed, the reasons for an event to occur are not part of the description of the event itself).
- We suggest that Reason-*comment* binds a variable of the semantic type of a proposition.

(13) a. Comment [he reads Mary's email x] ?



← Manner

b. Comment x [he reads Mary's email] ?



← Reason

See Fleury and Tovenà 2019 for arguments in favour of a high base generated position for *comment* (cf. Shlonsky and Soare 2011).

Research questions of our study

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- Is the prosody of a Manner-*comment* Q different from that of a Reason-*comment* Q?
- What can prosody tell us about the semantics of Reason-*comment* Qs?

Specifically:

- can prosody tell us about the presence of some questioning force ?
- can prosody tell us about the presence of surprise (due to expectation disconfirmation)?
- can prosody tell us about the presence of other emotions?

The prosody of rhetorical questions

German (Wochner et al 2015):

- Higher initial peak
- Longer duration of wh-word and sentence-final noun
- A breathier voice quality

French (Delais & Beyssade 2019):

- slower articulation rate
- longer duration of wh-word?
- falling final contour
- wh-word often followed by a boundary
- wh-word followed by pitch compression

Cf. Information Seeking Questions

- Both falling (Delattre 1966) and rising contours (Delais et al 2015, Beyssade et al 2006)
- Higher pitch range than statements (Caelen-Haumont 2005)
- Shorter duration than statements (Beyssade et al 2007)

Predictions

Prosodic cues differentiate *comment*-questions with **manner vs reason** interpretation.

1. Speech rate is longer for Reason interpretation
2. The duration of *comment* is longer for Reason interpretation
3. f0 contours present more variability in Reason interpretation because they express more expressivity (expectation disconfirmation/surprise).
4. The end of the utterance is (more often) associated to a falling contour (rhetorical intonation -> assertion)

Production experiment

Production experiment

Method :

Stimuli:

A total of 28 items:

14 **ambiguous** *comment*-questions and

14 **NON-ambiguous** *comment*-questions

each presented in a **manner**-reading or in a **reason**-reading **context**

x 2 different blocs (so that participants do not see the purpose of the study)

x **15 participants per bloc** (French native-speakers with no reported speech disorder)

x 3 repetitions => 2520 items

50 **fillers**

Task : read the written context then produce the target question, taking the context into account.

example of Ambiguous pair

Context

A friend of yours tells you that she is going to break up with her German boyfriend. You want to know in what manner she is going to do it, since he is in Germany at the moment. You tell her:

A friend of yours tells you that she is going to break up with her German boyfriend. You are very surprised, for she has always said that he was the love of her life. You say:

Manner

Et comment tu pourrais le quitter?
and how you could him leave
'And how could you break up with him?'
(C'est mieux si tu le lui dis en face)
'It's better if you tell him face to face'

Reason

Mais comment tu pourrais le quitter?!
but how you could him leave
'But how could you break up with him?!'
(C'est l'amour de ta vie!)
'He is the love of your life!'

example of NON-Ambiguous pair

Context

A friend of yours tells you that she is going to break up with her German boyfriend. You want to know in what manner she is going to do it, since he is in Germany at the moment. You tell her:

A friend of yours tells you that she is going to break up with her German boyfriend. You are very surprised, for she has always said that he was the love of her life. You say:

Manner

Comment vas-tu faire pour le quitter ?
how go-you to-do for him leave
'How are you going to do in order to
break up with him?'

Reason

Comment peux-tu quitter un homme aussi adorable?!
how can-you leave a man so sweet
'How can you break up with such a sweet man?'

quantitative results on overall prosodic cues

12 speakers

quantitative results on overall prosodic cues

12 speakers

R (R Core Team, 2012) and lme4(Bates, Maechler & Bolker, 2012) to perform a **generalized mixed effects analysis** of the relationship between

reading interpretation (Manner~Reason) and prosodic cues

separately for ambiguous and non ambiguous sentences.

Fixed effects : speech rate, Ratio of the WH-word in the sentence, Duration ratio between the two syll of *comment*, f0 difference between the two syllables of *comment*, F0Max-F0Min

Random effects: intercepts for participants and items.

quantitative results on overall prosodic cues

Ambiguous sentences

quantitative results on overall prosodic cues

Ambiguous sentences

Speech rate (syll/sec) ***

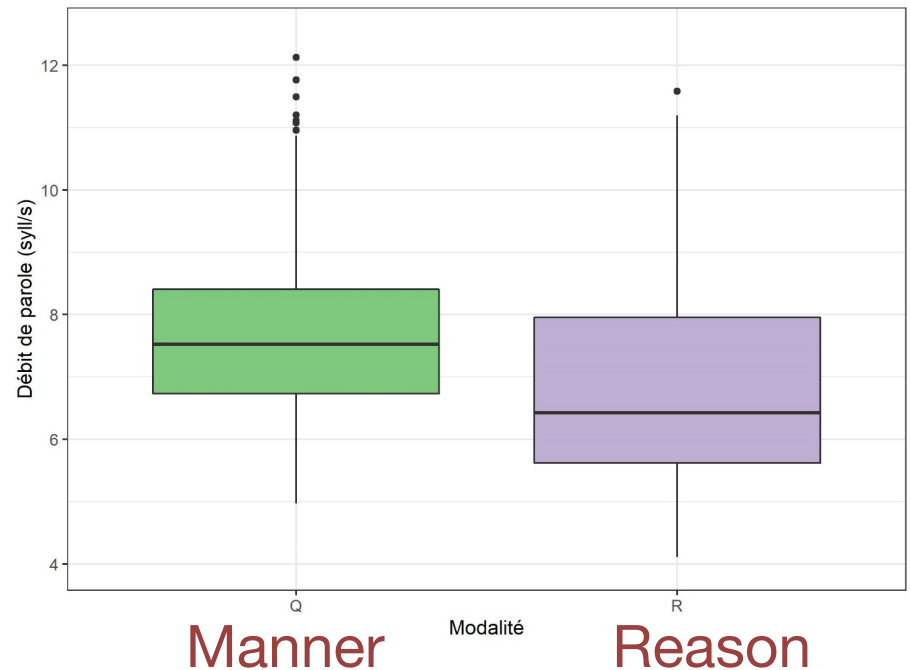
Significantly slower for Reason interpretation

Fixed effects:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -0.95199 1.54080 -0.618 0.5367

SpeechRate -1.931655 0.346126 -5.581 2.39e-08 ***

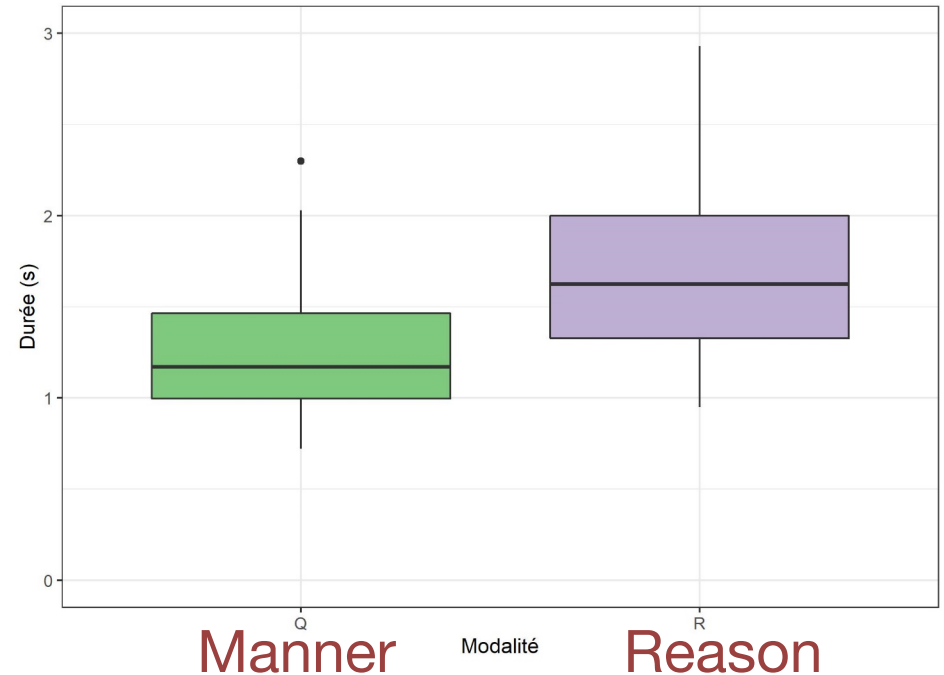


quantitative results on overall prosodic cues

Ambiguous sentences

Total duration ***

Significantly longer for reason interpretation



Fixed effects:

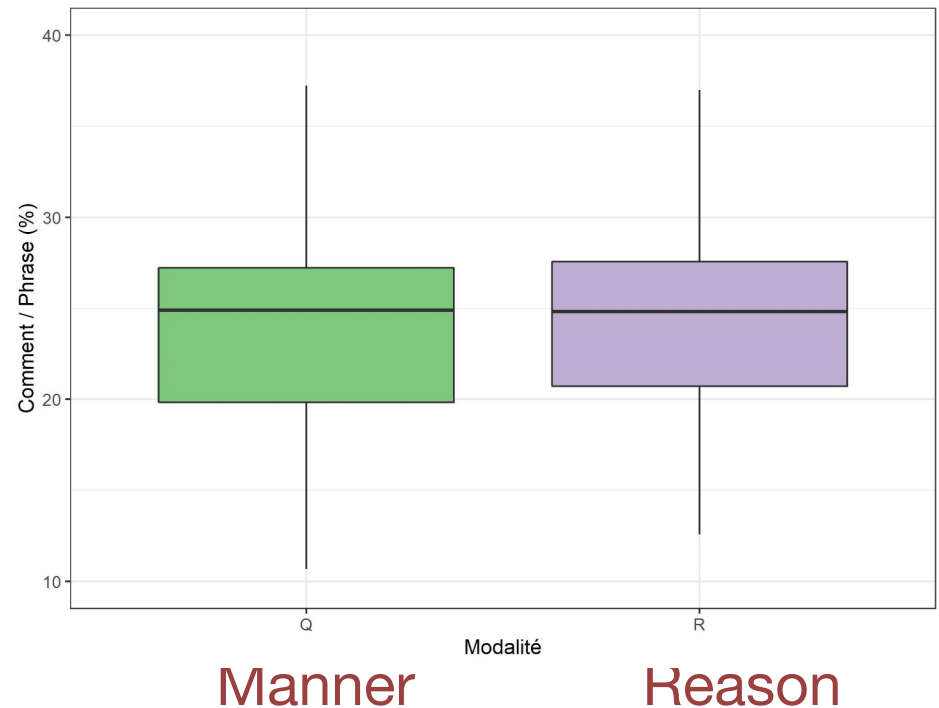
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.95199	1.54080	-0.618	0.5367
Total_Dur	21.410695	3.723471	5.750	8.91e-09 ***

quantitative results on overall prosodic cues

Ambiguous sentences

Ratio *wh*-word—sentence

The WH-word is present in both interpretations with the same proportions. There is no significant difference.



Fixed effects:

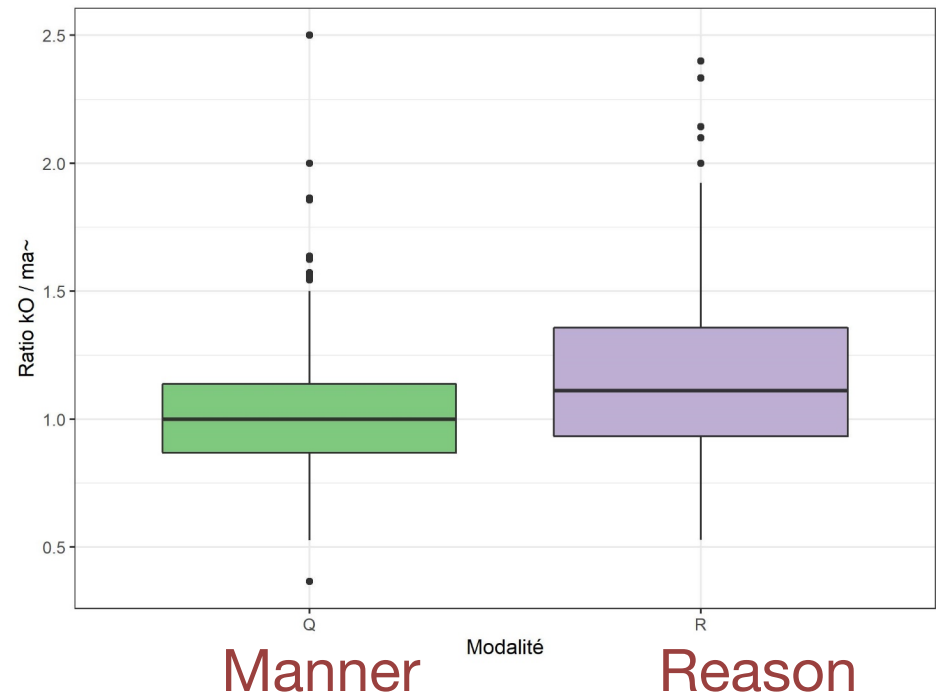
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.95199	1.54080	-0.618	0.5367
RatioComment	0.04196	0.05566	0.754	0.4509

quantitative results on overall prosodic cues

Ambiguous sentences

Duration ratio between the two syllables of *comment* *

For Reason interpretation, the first syllable is significantly longer, compared to the ratio found in Manner interpretation



Fixed effects:

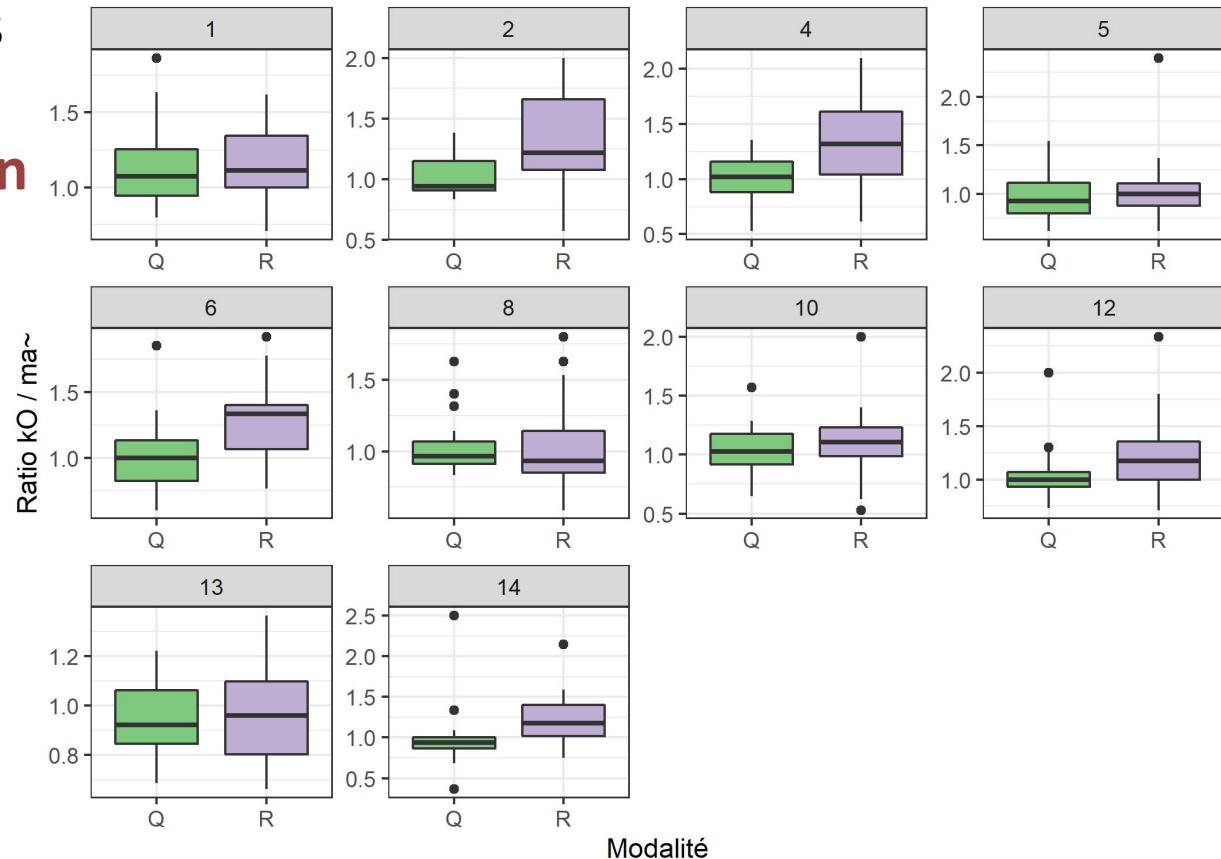
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.95199	1.54080	-0.618	0.5367
Ratio_syll	1.11476	0.51796	2.152	0.0314 *

quantitative results on overall prosodic cues

Ambiguous sentences

**Duration ratio between
the two syllables of
comment ***

This result is more
significant for some items



quantitative results on overall prosodic cues

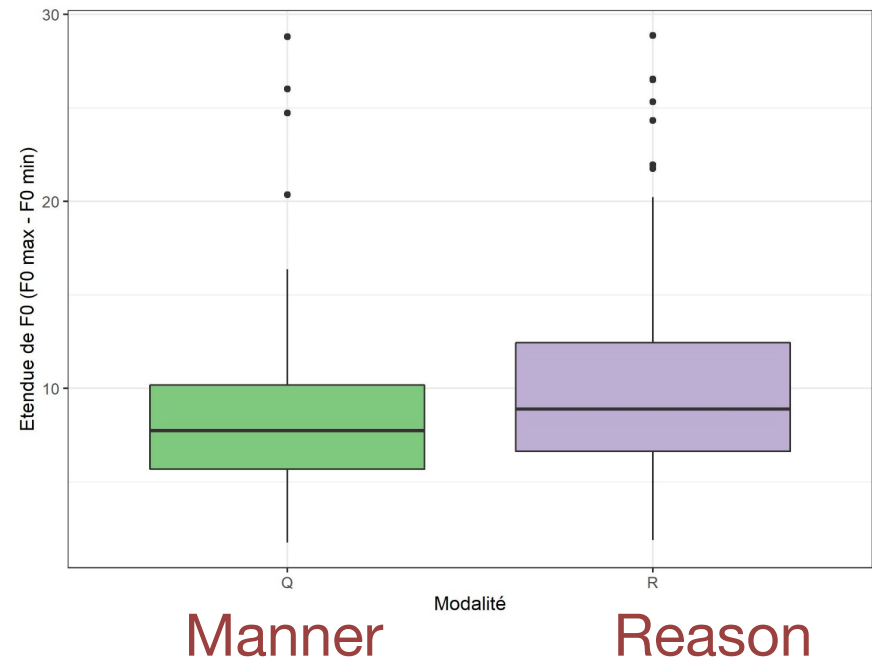
Ambiguous sentences

F0 span (F0 Max - F0 Min)

No significant results

Fixed effects:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.95199	1.54080	-0.618	0.5367
span	0.05020	0.03751	1.338	0.1808



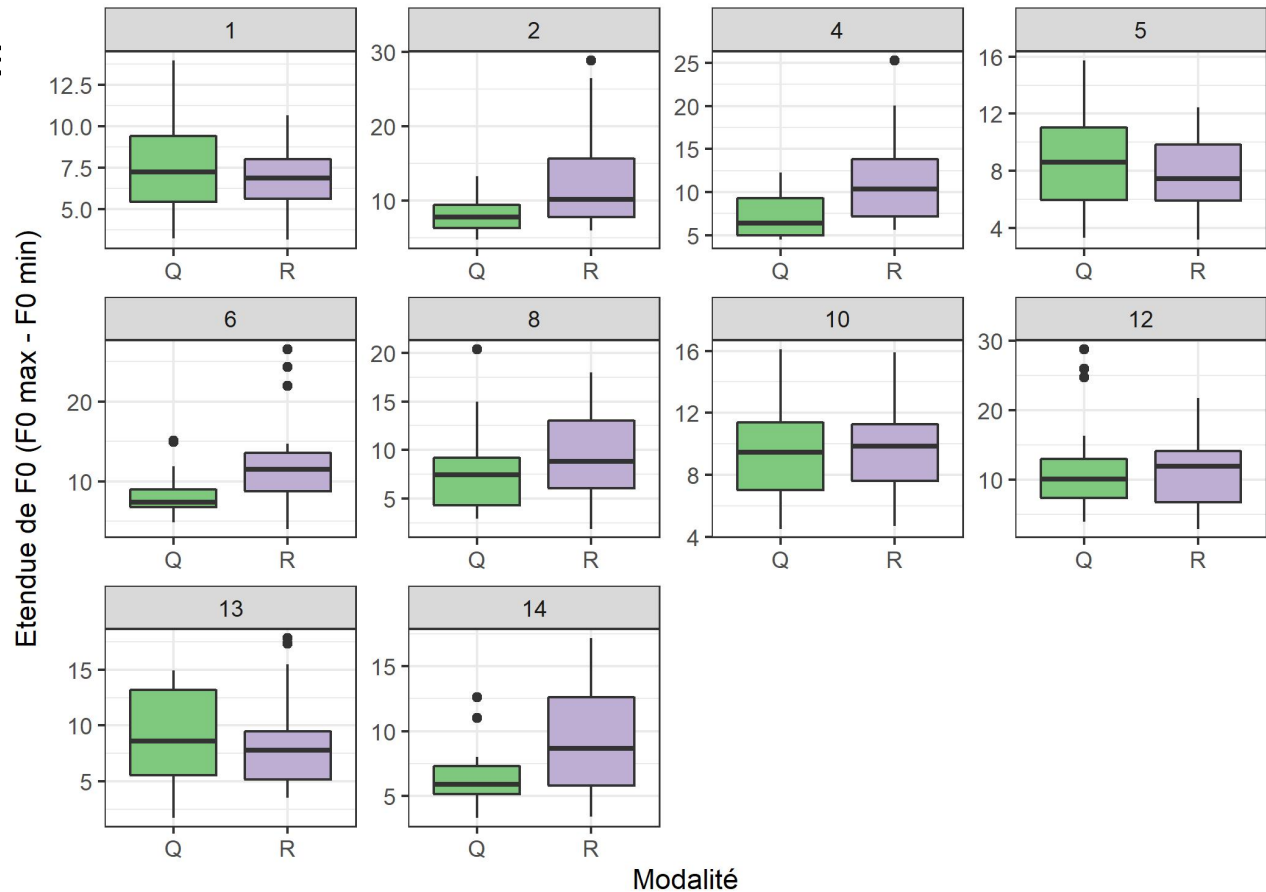
quantitative results on overall prosodic cues

Ambiguous sentence

F0 span / item

in some items (2, 4, 6, 8, 14)
the f0 span seems larger for
Reason interpretation.

More variability for **Reason**
interpretation

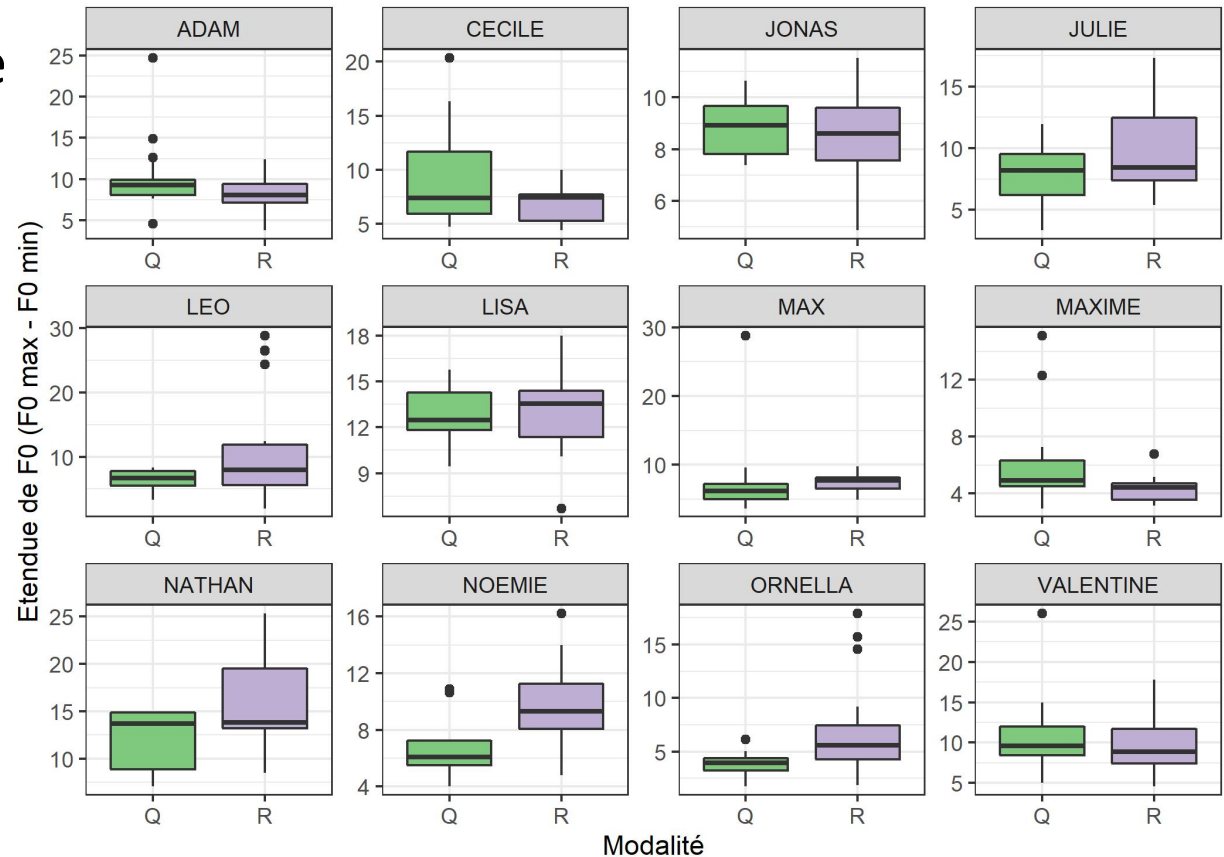


quantitative results on overall prosodic cues

Ambiguous sentence

F0 span / subject

Much variability, with
speakers that differentiate



quantitative results on overall prosodic cues

Non-Ambiguous sentences

quantitative results on overall prosodic cues

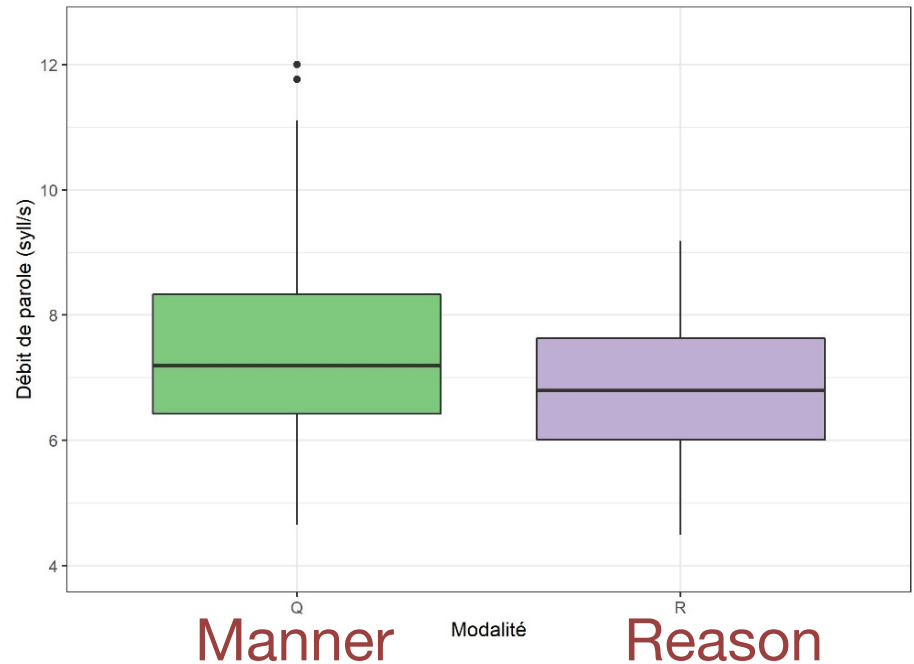
Non-Ambiguous sentences

Speech rate (syll/seconde)

slower for Reason interpretation

Fixed effects:

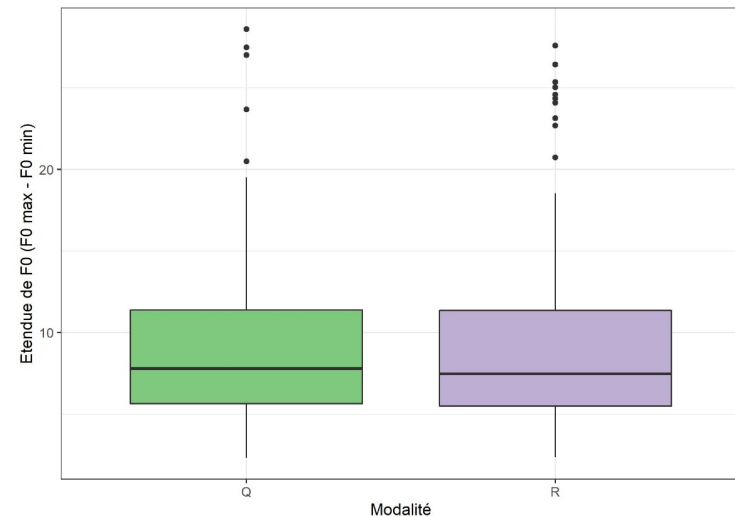
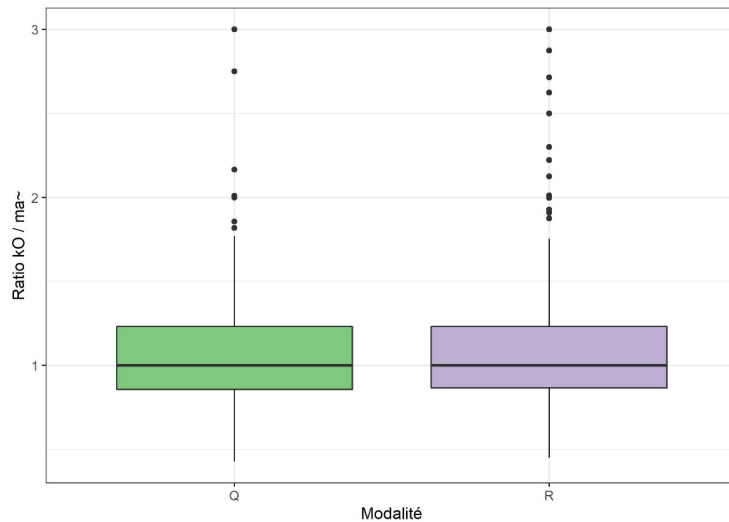
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	12.093283	2.073763	5.832	5.49e-09
SpeechRate	-1.849728	0.382360	-4.838	1.31e-06 ***



quantitative results on overall prosodic cues

Non-Ambiguous sentences

- No difference for the ratio inside the wh-word
- No difference for f0 span

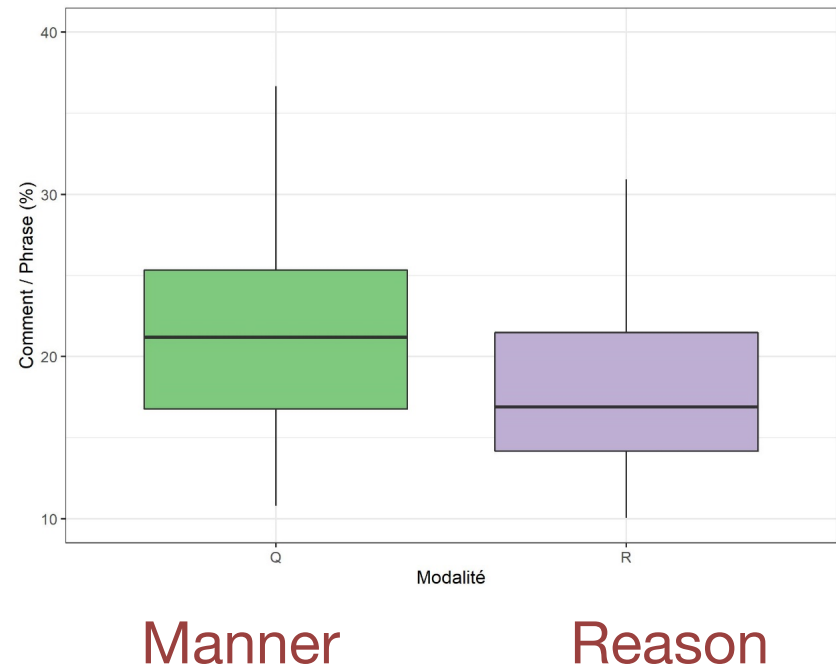


quantitative results on overall prosodic cues

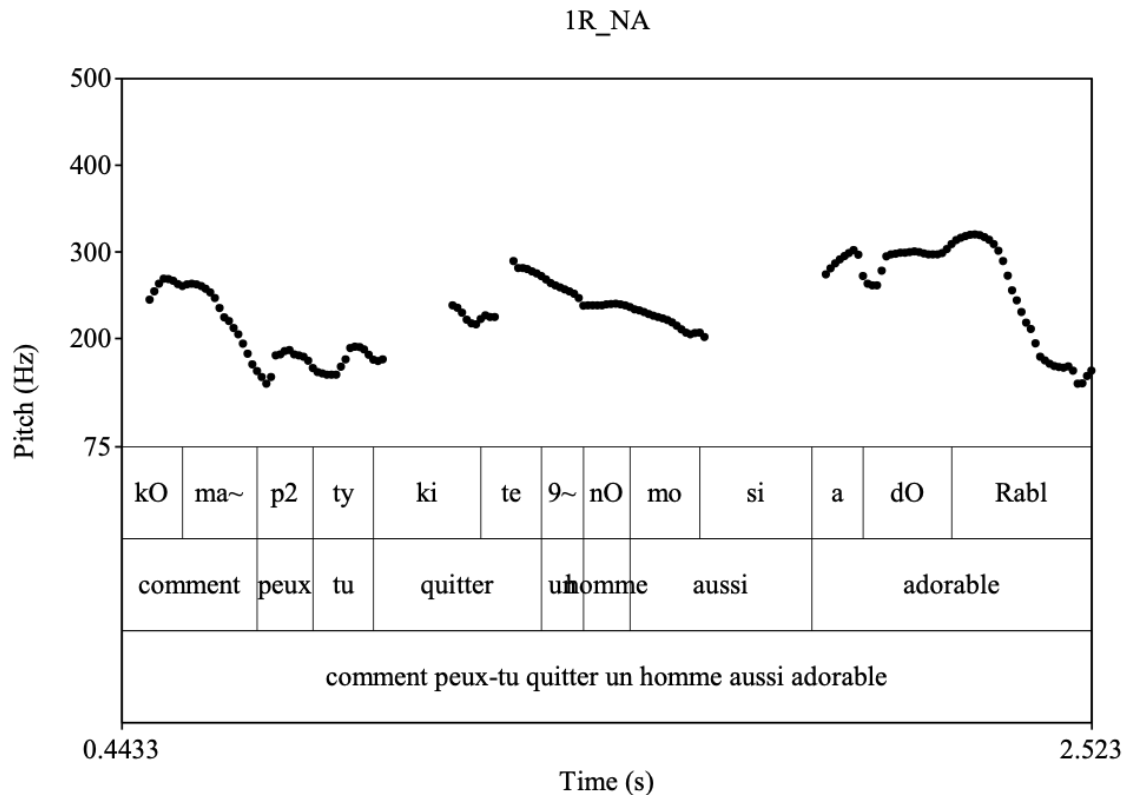
Non-Ambiguous sentences

Ratio *wh*-word—sentence

Significantly different, BUT
comment occupies more time
in Manner interpretation than
Reason interpretation!



qualitative analysis



Non-ambiguous Reason Q

- steep fall on *comment*
- F0 resetting
- “bell” contour
- plus final L% (absence of questioning)

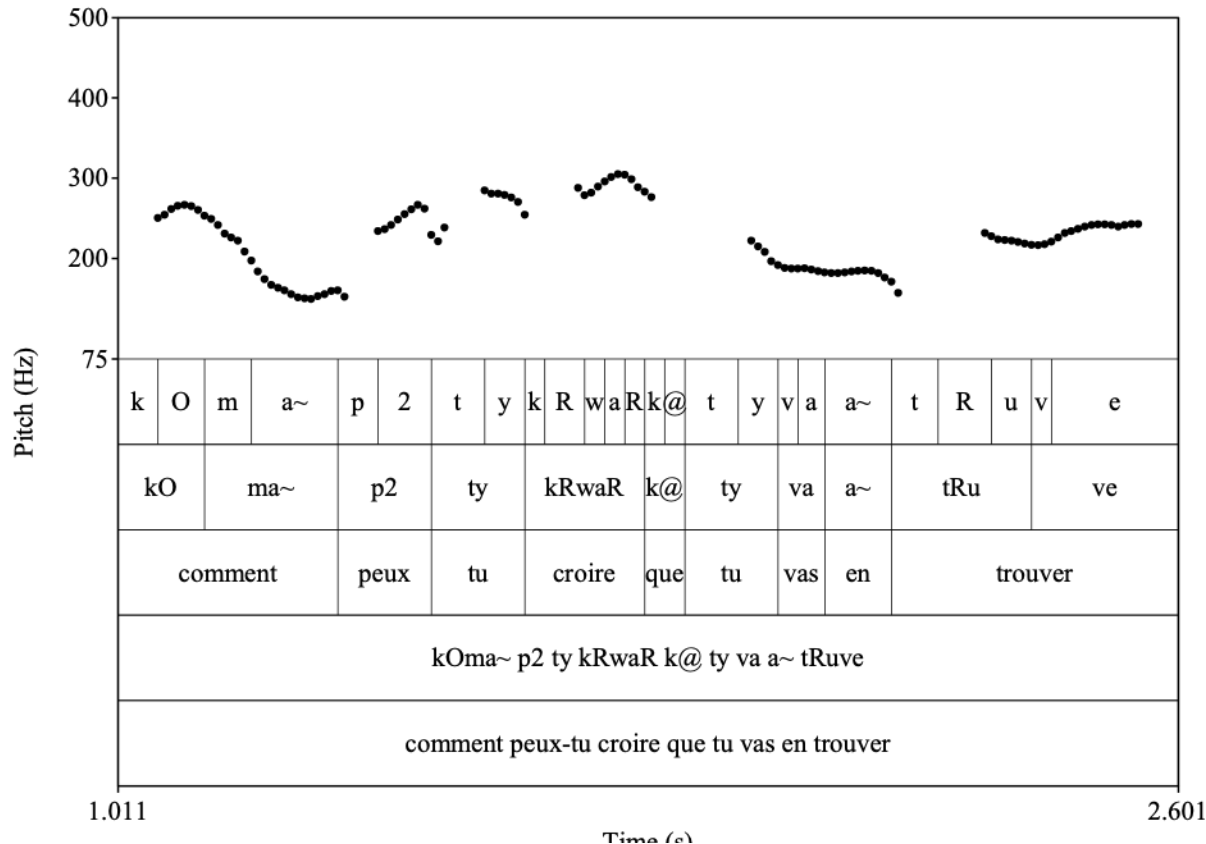
Comment peux-tu quitter un homme aussi adorable?

‘How can you break up with such a sweet man?’

1R_NA (Noé)

qualitative analysis

11R_NA



NON-Ambiguous REASON Q

- falling *comment* + accent on the **modal**
- final rise expressing emphasis

Comment peux-tu croire que tu vas en trouver?

How can you believe that you are going to find any?

11R_NA (Noé)

summary of results

Tempo

- Articulation rate IS longer for questions with Reason interpretation (cf. Delais & Beyssade 2019) but
- Duration of wh-word in the sentence is NOT longer (contrary to work on *qu'est-ce que / c'est quoi* by Agnès Celle and Maud Péliissier)

f0

Overall f0 analysis shows that f0 is a prosodic cue presenting a lot of variation.

Different strategies linked to the speaker seem possible.

Results seem also to be affected by items.

The contour analysis will (we hope) explain better the role played by this cue.

Predictions

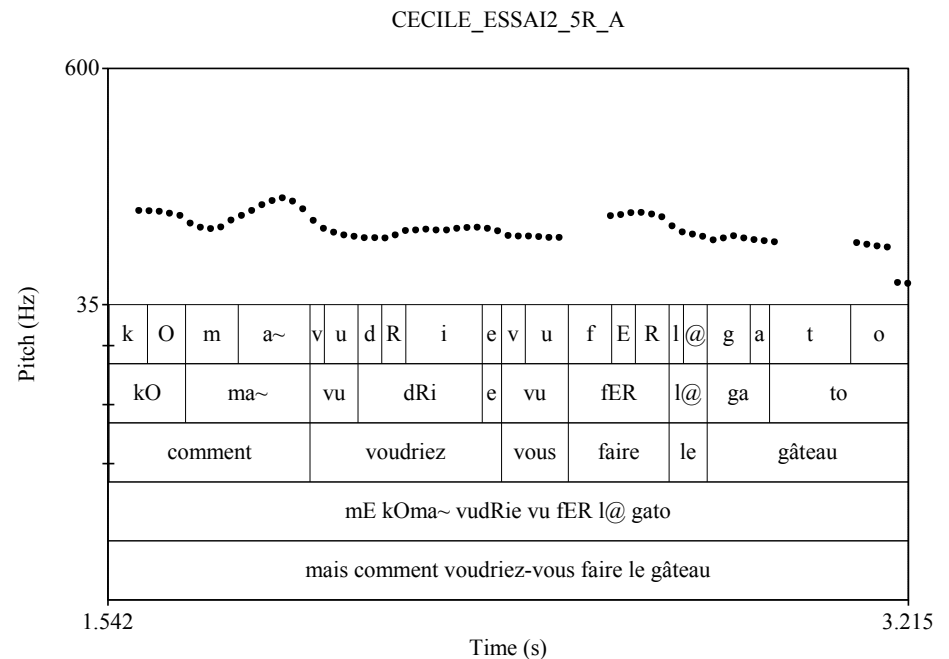
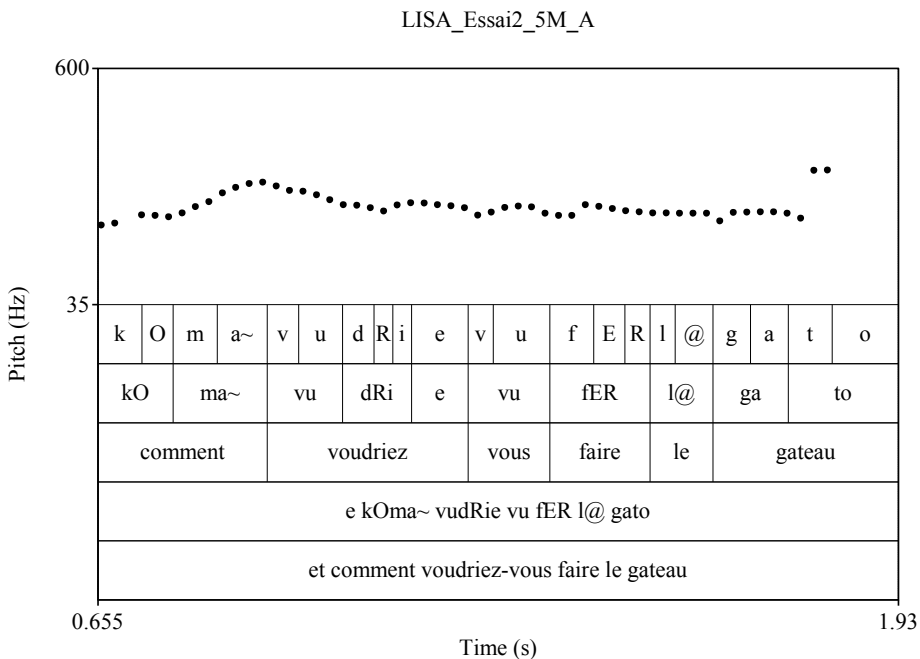
Prosodic cues differentiate *comment*-questions with **manner** vs **reason** interpretation. **YES**

1. Speech rate is longer for Reason interpretation **YES**
2. The duration of *comment* is longer for Reason interpretation **NO**
3. f0 contours present more variability in reason interpretation because they express more expressivity (expectation disconfirmation/surprise). **YES**
4. The end of the utterance is (more often) associated to a falling contour (rhetorical intonation -> assertion) => to do (contour analysis)

Qualitative analysis

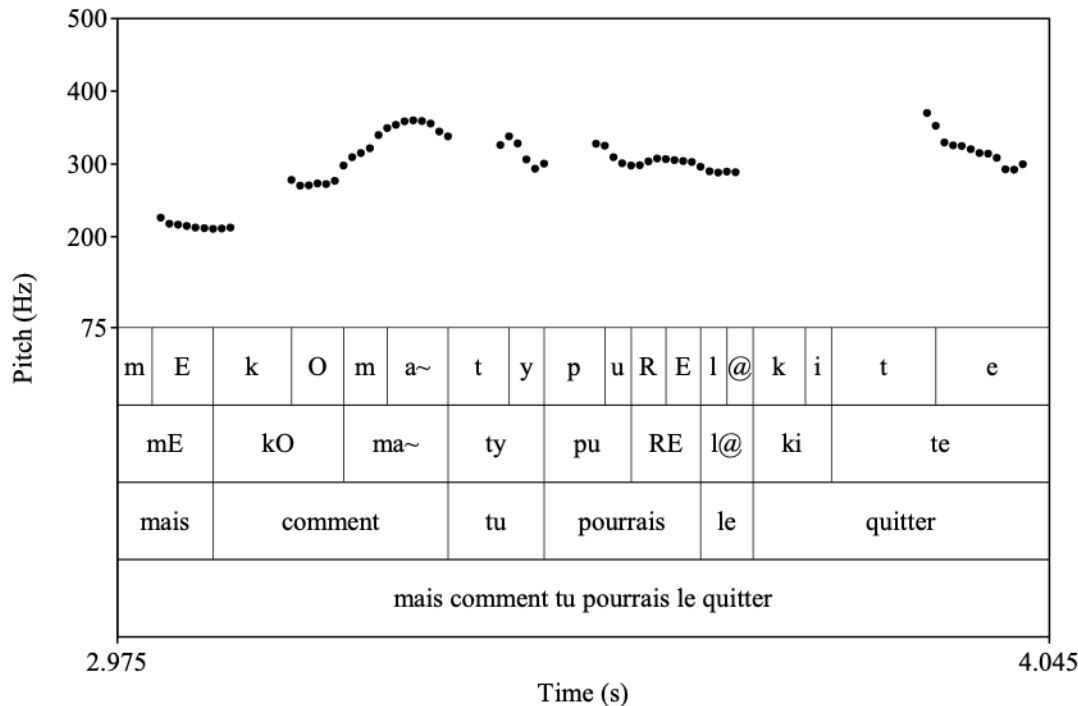
A qualitative analysis shows that a **falling contour** on Reason (vs a rising one on Manner) is attested in our data.

Manner and Reason realization of the same ambiguous sentence:



Qualitative analysis

1R_A



(Ambiguous) Reason Q

- steeper rise on *comment* and final lengthening
- overall high f0 values

Mais comment tu pourrais le quitter?
But how you could break up with him?

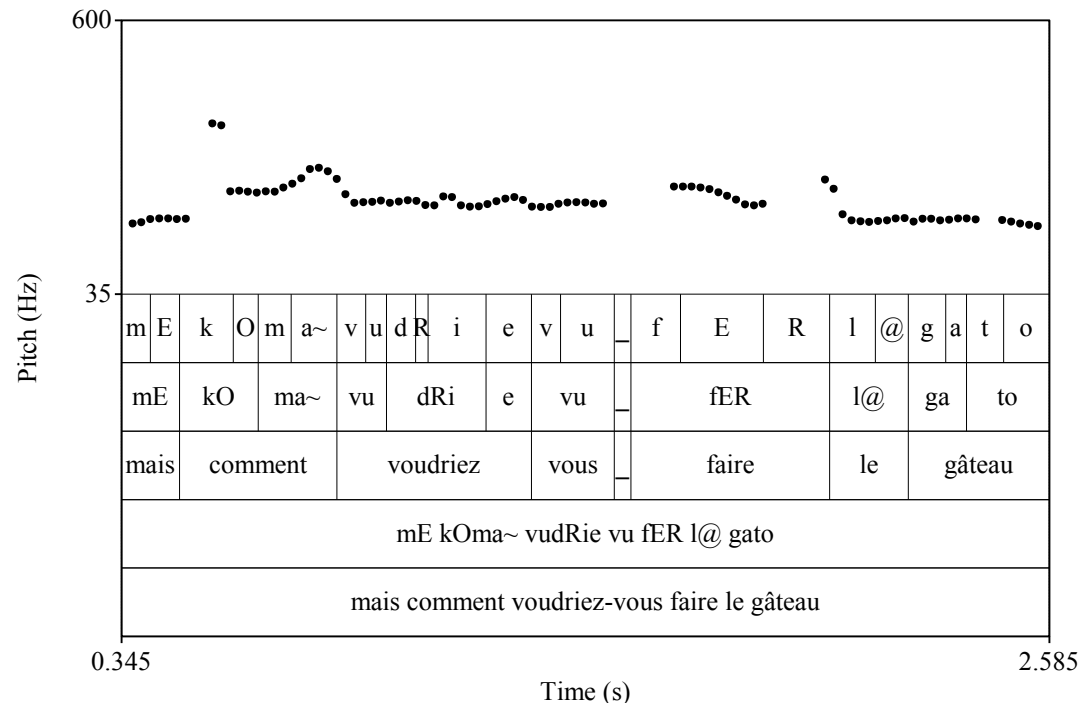
1R_A (Céc)

Qualitative analysis

Variation in the placement of focal stress.

Reason question with stress on the verb *faire*.

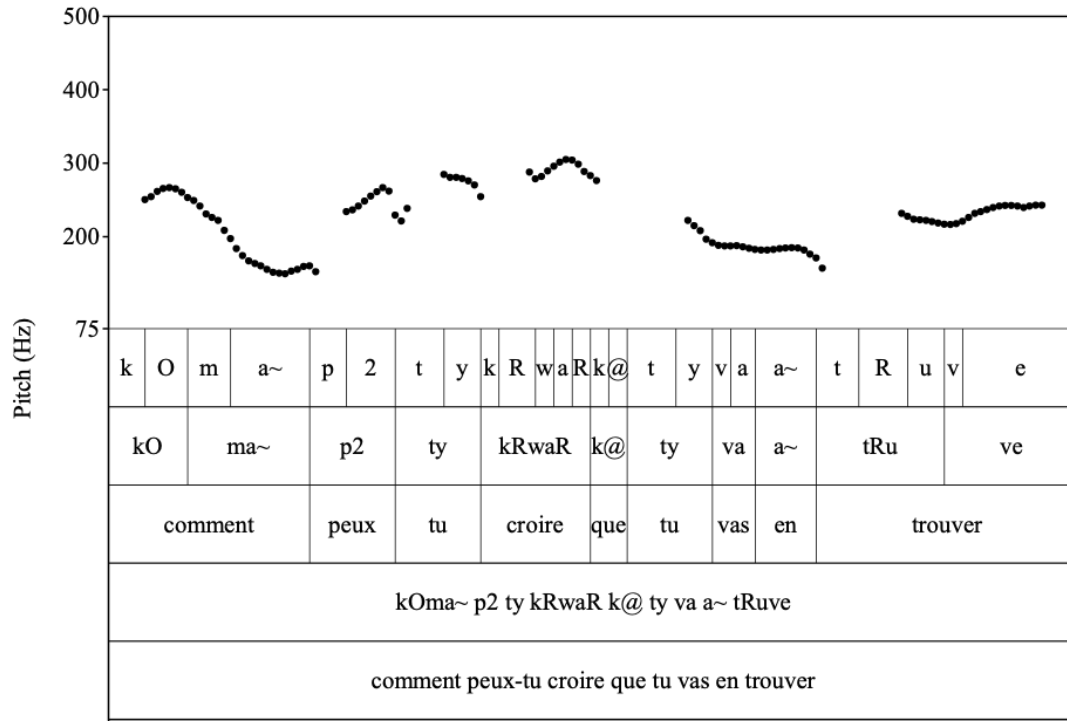
Strategy of “recreating” an information structure with focus on the verb, doubting the realisability of the action.



qualitative analysis

Variation in the placement of focal stress.

Reason question with stress on the verb *croire*



NON-Ambiguous REASON Q

- falling *comment* + accent on *croire*
- final rise expressing emphasis

Comment peux-tu croire que tu vas en trouver?

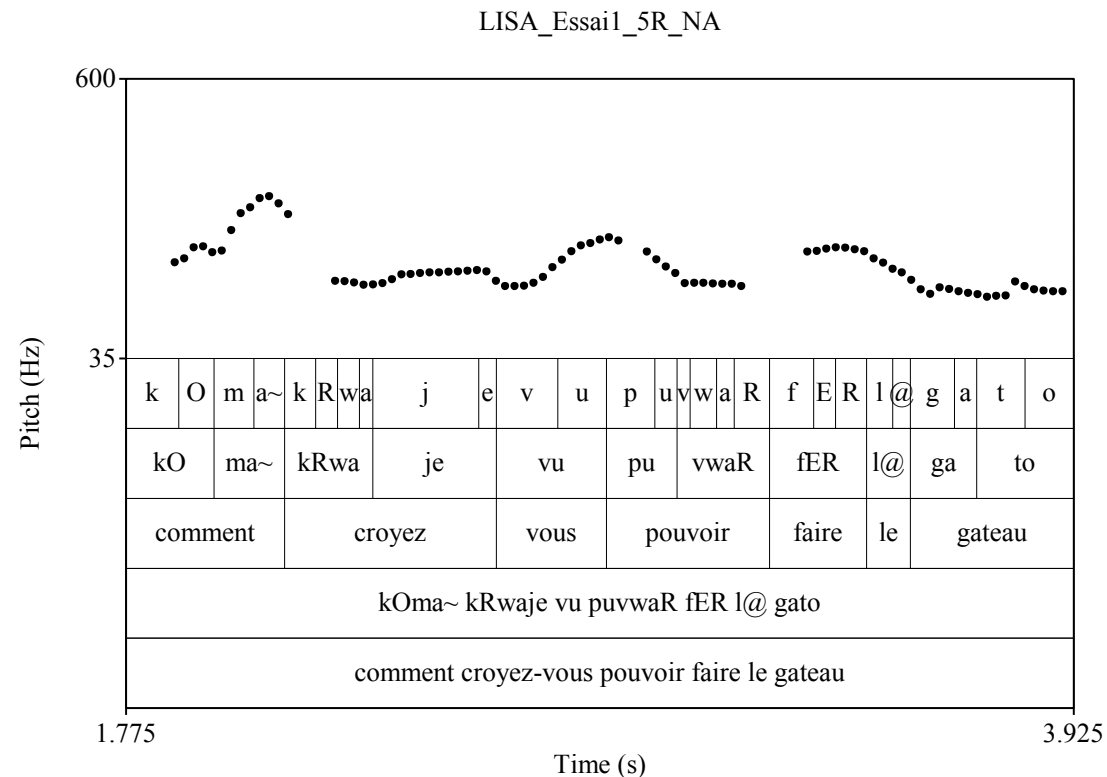
How can you believe that you are going to find any?

11R_NA (Noé)

qualitative analysis

Other factors other than the contour may play an important role.

Reason Q with overall pitch contour similar to Manner, but **laughing** is added.



summary of results

f0

Overall f0 analysis shows that f0 is a prosodic cue presenting a lot of variation.

Different strategies linked to the **speaker** seem possible.

Results seem also to be affected by **items**.

Questionnaire on questioning force and expressivity

Questionnaire on questioning force and expressivity

Manner and Reason contexts followed by ambiguous sentences were presented to different subjects than those involved in the production experiment.

Fillers (two times the number of target items)

Online questionnaire (google forms)

21 participants (14 female, 6 male)

Questionnaire on questioning force and expressivity

La personne qui dit cette phrase : *The person who says this sentence:*

cherche une information *is looking for some information*

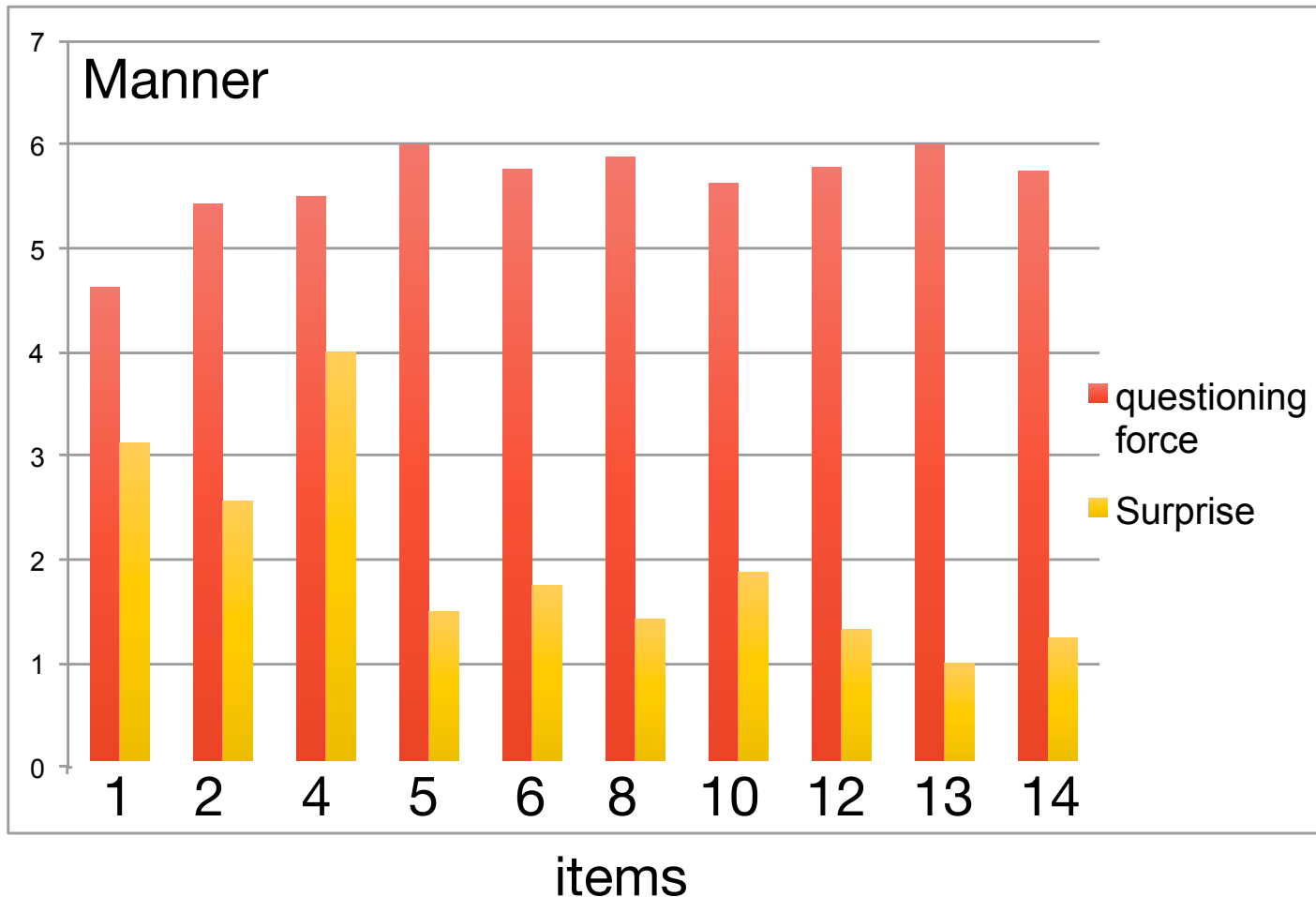
	1	2	3	4	5	6	
pas vraiment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	tout à fait
<i>not really</i>							<i>absolutely</i>

est surprise
is surprised

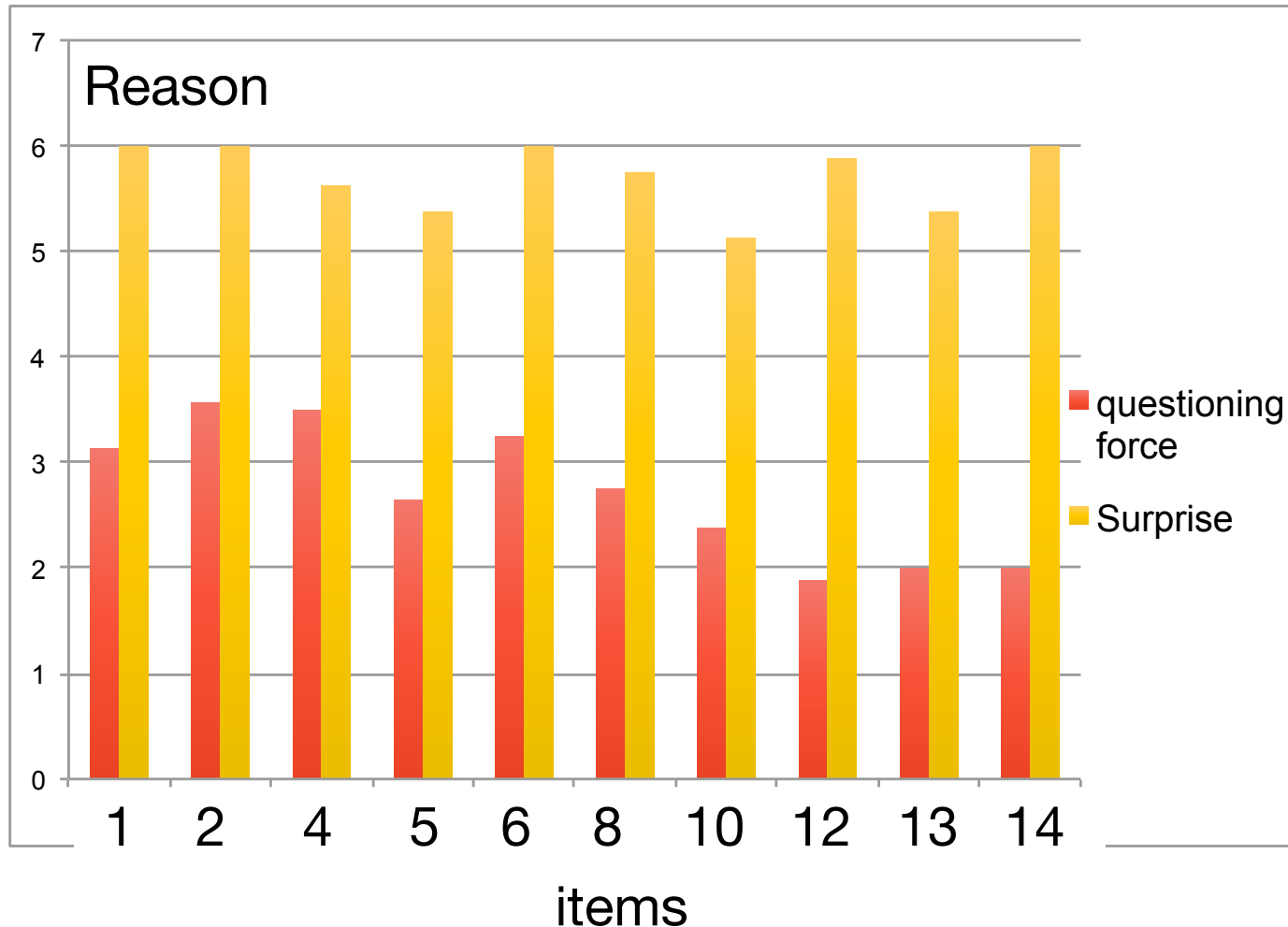
	1	2	3	4	5	6	
pas du tout surprise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	très surprise
<i>not at all surprised</i>							<i>very surprised</i>

éprouve une autre émotion. Si oui, laquelle ? *Feels another emotion. If yes, which one?*

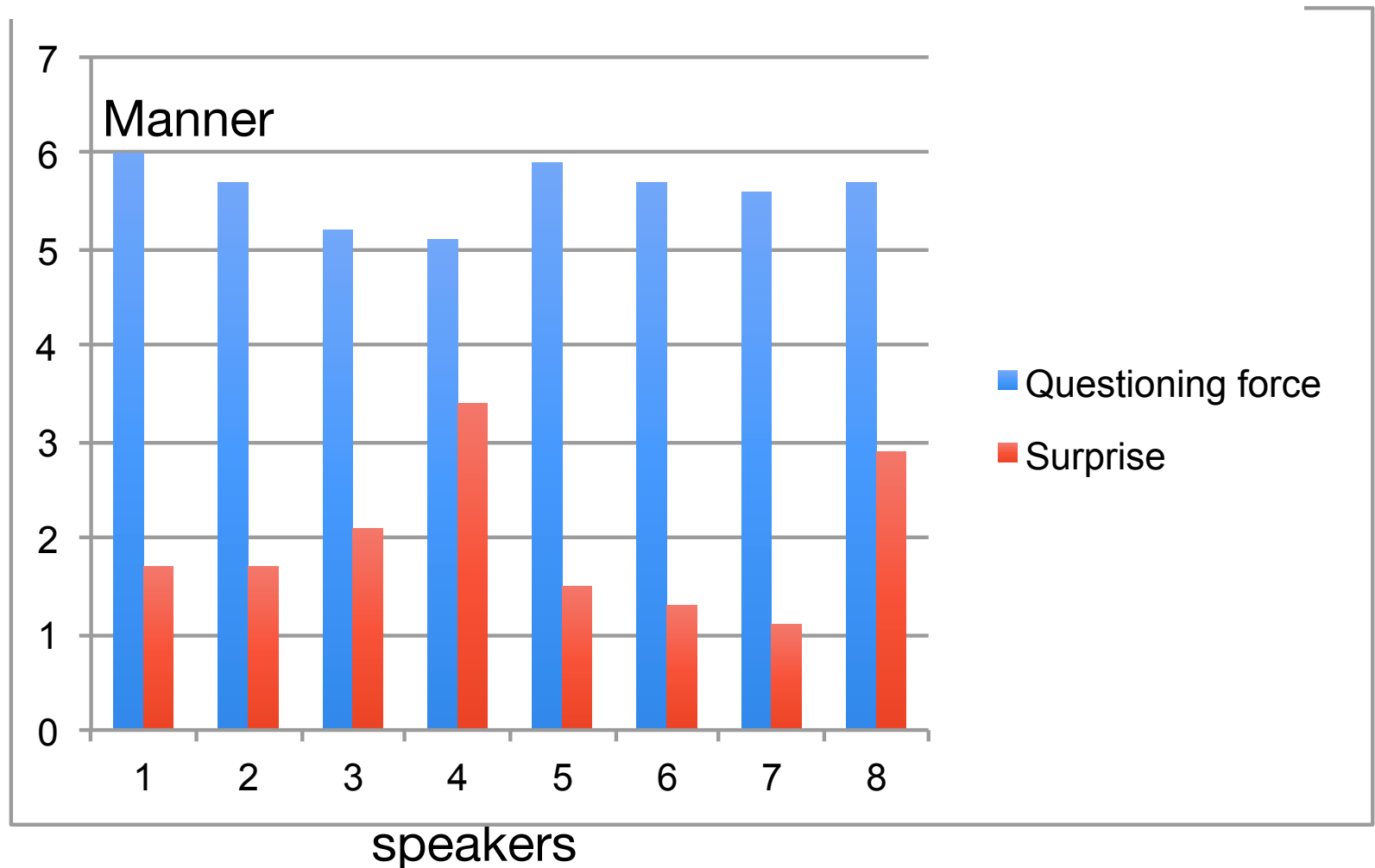
Questionnaire on questioning force and expressivity



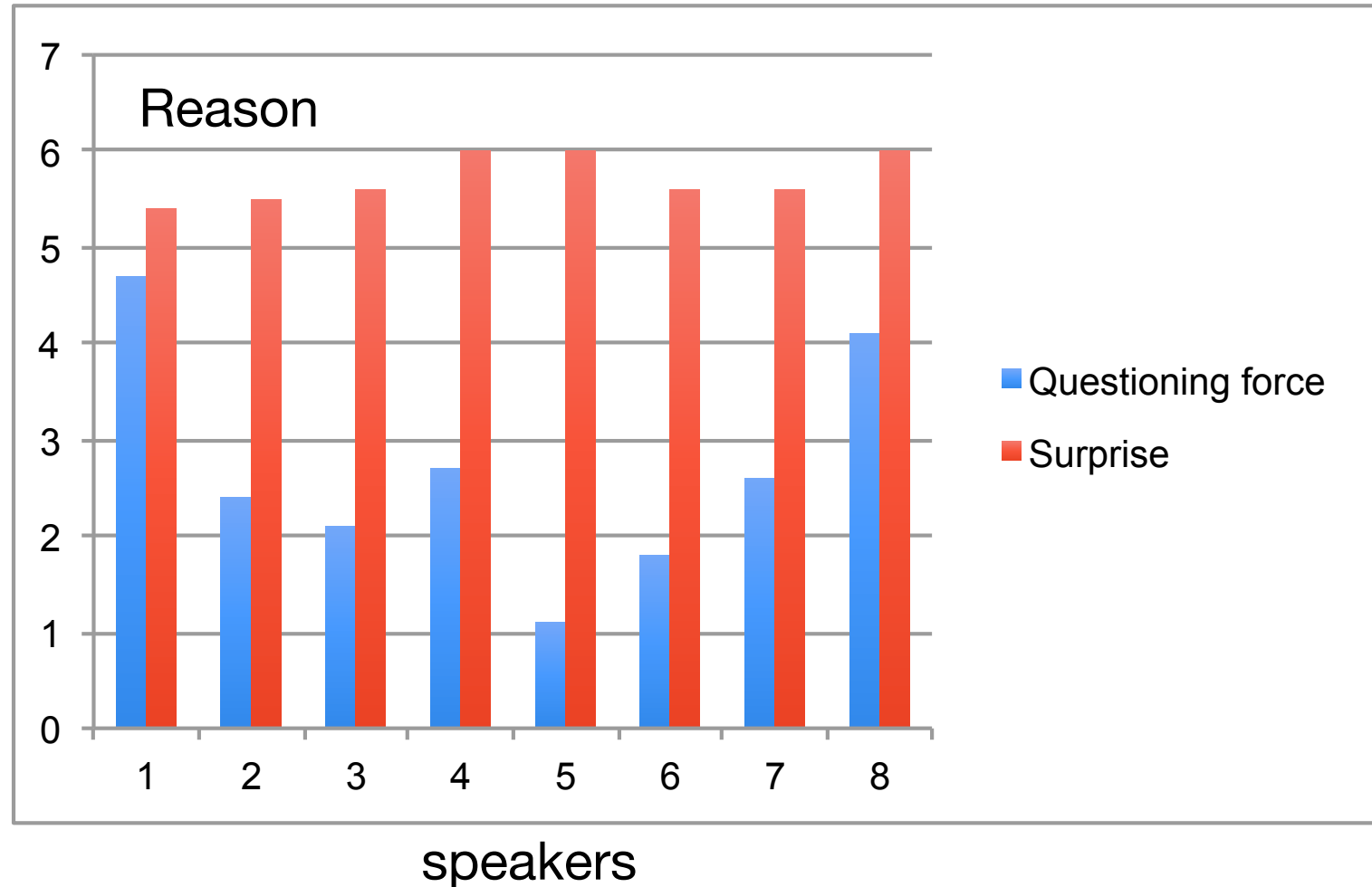
Questionnaire on questioning force and expressivity



Questionnaire on questioning force and expressivity



Questionnaire on questioning force and expressivity



Conclusions and future work

- Prosody can distinguish a Manner from a Reason interpretation
- A contour analysis is needed to better understand whether and to what extent Reason Qs have questioning force
- Prosodic cues of surprise are present at a qualitative analysis (bell contour, final high plateau...)
- Variability may account for the presence of expression of other emotions

Conclusions and future work

Variability is due to :

- variation in the strength of the speaker's belief in the possibility of existence of the event described by the prejacent (**=> different expression of questioning force**)
- variation in how great the incongruency is between the speaker's expectations and the existence of the event described by the prejacent (**=> different expression of surprise**)
- variation in some sort of performative act(s) coming with the illocutionary act as a consequence of the speaker's being affected by the expectation disconfirmation : indignation, disapproval, anger, concern, etc. (**=> variation in expressivity**)

Conclusions and future work

Future work:

- Contour analysis
- Matching the results of the questionnaire with the prosodic results
- Perception study

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Thank YOU!
Danke!
Merci!

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