



Intonation of alternative constructions and information structure

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Introduction and motivation (1)

- ▶ Analyzing the prosody associated with sentences which are similar at the surface level, but do convey distinct meanings is of interest (e.g. for processing)
 - ▶ Prosodic differences may be linked to meaning/ interpretation difference (e.g. an acoustic cue/a tonal form may be associated with a specific meaning, etc.);
 - ▶ When several cues come into play, it is important to see how they interact to guide interpretation.
- ▶ Alternative constructions are of interest in such perspective.

Introduction and motivation (2)

- ▶ In English, the prosody associated with alternative question is crucial for their interpretation (Pruitt & Roelofsen 2013)

(Is Marcia allergic to dairy or soy) ? Yes/ no polar
(H*/L*) (H*/L*) **H-H%**

(Is Marcia allergic to dairy) (or soy ?) Alternative
H*/L* H- H* **L-L%**

- ▶ Cues to distinguish the two interpretations (see, among others, Bartels 1999):
 - ▶ final contour (fall vs rise)
 - ▶ phrasing (each conjunct as a separate phrase)
 - ▶ Accent on each conjunct

Introduction and motivation (3)

- ▶ In French, a third dimension comes into play: alternative question/ disjunctive question have a similar form as a statement with a coordination/ disjunction.

Pierre parle anglais ou allemand ? Polar

Pierre parle anglais... ou allemand... ? Open list Q

Pierre parle anglais ou allemand ? Alternative

Pierre parle anglais ou allemand. Statement

- ▶ According to Di Cristo, the difference between alt_Q and statement with a disjunction occurs at the end of the sentence only.
 - ▶ Fall in statements vs. Plateau/ fall to mid in alternative questions
 - ▶ No difference in the realization of the first/ non final conjunct

Introduction and motivation (4)

- ▶ To our mind, it is doubtful that the hearer has to wait until the end of a sentence to interpret it as an assertion / a question
- ▶ Aim of our study was to evaluate :
 - ▶ What is crucial at the prosodic level for interpreting an alternative construction ?
 - ▶ Final contour as stated by Di Cristo
 - ▶ Several cues realized through the sentence (prenuclear domain)
 - ▶ Fine phonetic details
 - ▶ Some cues may indicate interrogativity, and occur earlier in the sentence.
 - ▶ Do the different cues play a role in other question types/ sentence types

Outline of the talk

- ▶ Experimental studies:
 - ▶ data and method
 - ▶ Tonal patterns observed at the end of non-final conjuncts
- ▶ How to explain and model the differences
 - ▶ In terms of prosodic phrasing / prosodic structure
 - ▶ Tonal form inventory / approach to phonological units
- ▶ Conclusion and perspectives

Production studies: Method (1)

Participants

- ▶ 2 males
- ▶ 2 females

Stimuli

Experiment 1

10 experimental pairs (a question and a statement) produced once by all 4 speakers: $2 * 10 * 4 = 80$ sentences

Stat. Dans l'école de commerce de mon fils, la seconde année se fait à l'étranger. Il a posé ses choix. **Il veut aller à Madrid, à Amsterdam ou à Berlin.**

Quest. Pendant leur formation, les enfants doivent passer leur seconde année à l'étranger. Je sais où ma fille ira. Est-ce que ton fils a fait son choix ? **Il veut aller à Madrid, à Amsterdam ou à Berlin ?**

Production studies: Method (2)

Participants

- ▶ 2 males
- ▶ 2 females

Stimuli

Experiment 2

20 experimental pairs (a question and a statement) produced once by all 4 speakers: $2 * 10 * 4 = 80$ sentences

Stat. Nous nous rencontrons pour déjeuner ensemble une fois par mois durant le week-end. **Ca a lieu le samedi ou le dimanche.** Le calendrier est donné en début d'année.

Quest. C'est le week-end que Pierre a son cours de tennis. Tu en sais plus ? **Ca a lieu le samedi ou le dimanche ?**

Pilot Study: Method (3)

▶ Procedure

- ▶ Participants read out aloud each sentence once.
- ▶ Experimental items were interspersed with filler items.

▶ Data analysis procedure

- ▶ Using the recording script, the recordings were first orthographically transcribed within Praat;
- ▶ Each utterance were aligned in phones, syllables and words with EasyAlign (see Goldman, 2011), and all alignments were manually verified and corrected.
- ▶ The sentence were also segmented in prosodic phrases, but the phrases were derived from the syntax in order to allow cross-comparison and avoid circularity

Pilot Study: Method (4)

Experiment 1:

- ▶ For the analysis of the sentence, several phonetic cues were calculated with the help of praat scripts. The results obtained were compared depending on the sentence modality (Question vs. Statement)
 - ▶ Contour form/ pitch accent type
 - ▶ Pitch Range and scaling
 - ▶ Slope of the tonal movement
 - ▶ Syllable duration and pause
 - ▶ Pitch alignment

Experiment 2

- ▶ Pitch height of the nucleus in the last two syllables of the two conjuncts
- ▶ Importance of the rise / fall in semi-tone

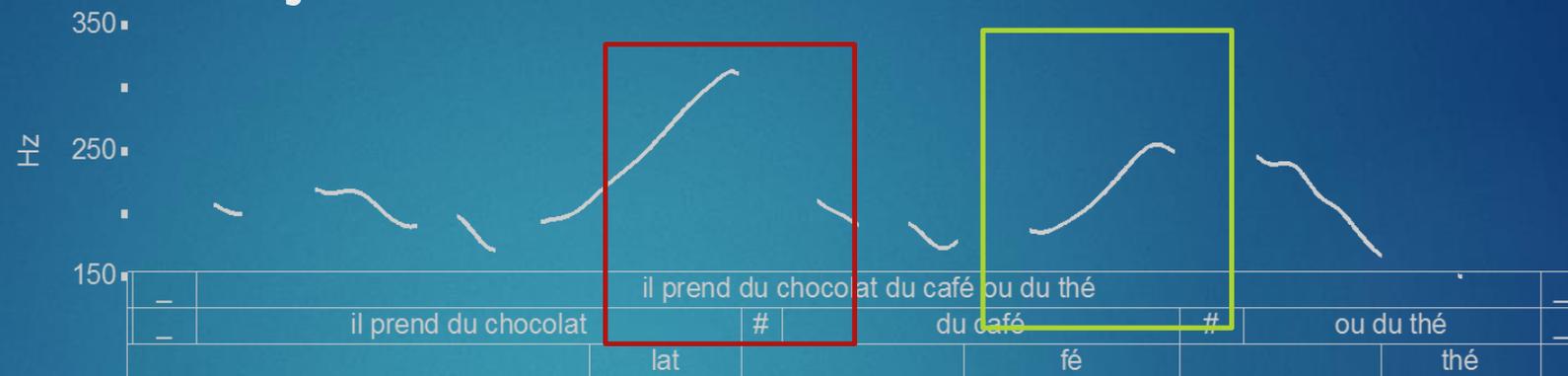
Result (1) : tonal pattern observed at the end of the sentence (on the last conjunct)

- ▶ There is a difference in the realization of the tonal contour at the end of the sentence
 - ▶ It is always a fall in statements, whereas it may be a plateau at the end of questions.
 - ▶ In addition, falls are realized differently at the end of questions and statements
 - ▶ Fall to low in statements
 - ▶ Fall to mid in questions

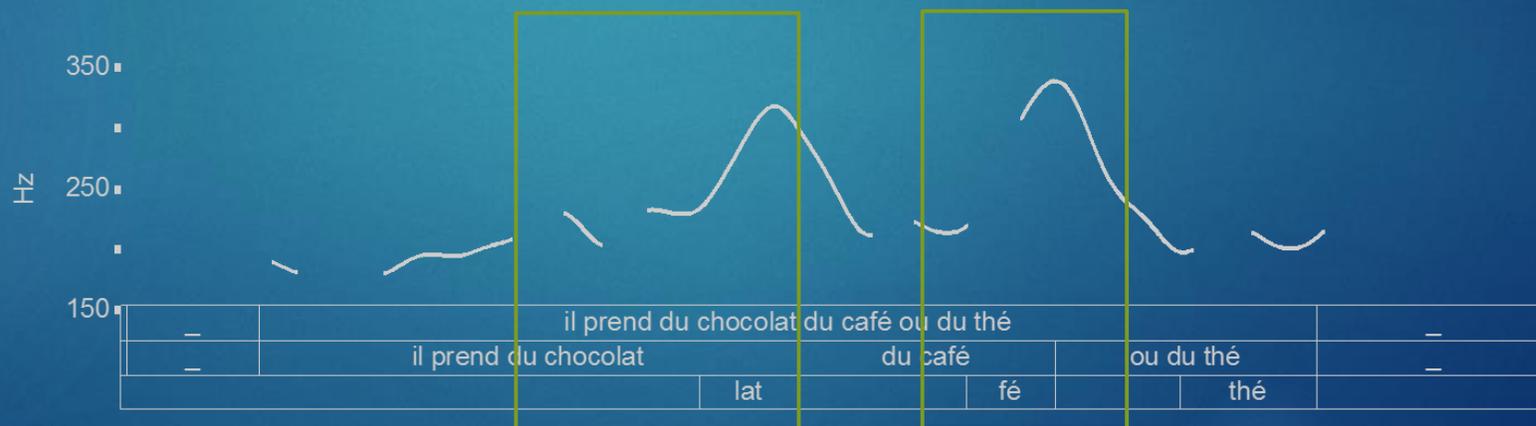
⇒ The results confirmed what was said by Di Cristo.

Results (2) : Prosodic event at the end of non-final conjuncts

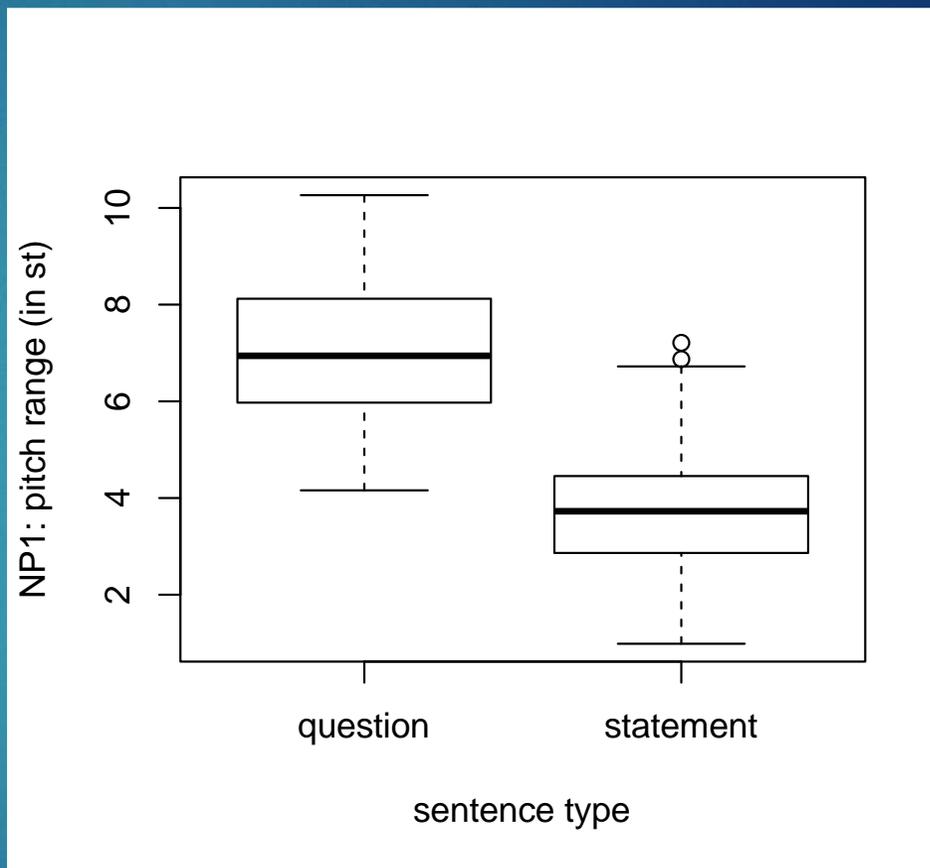
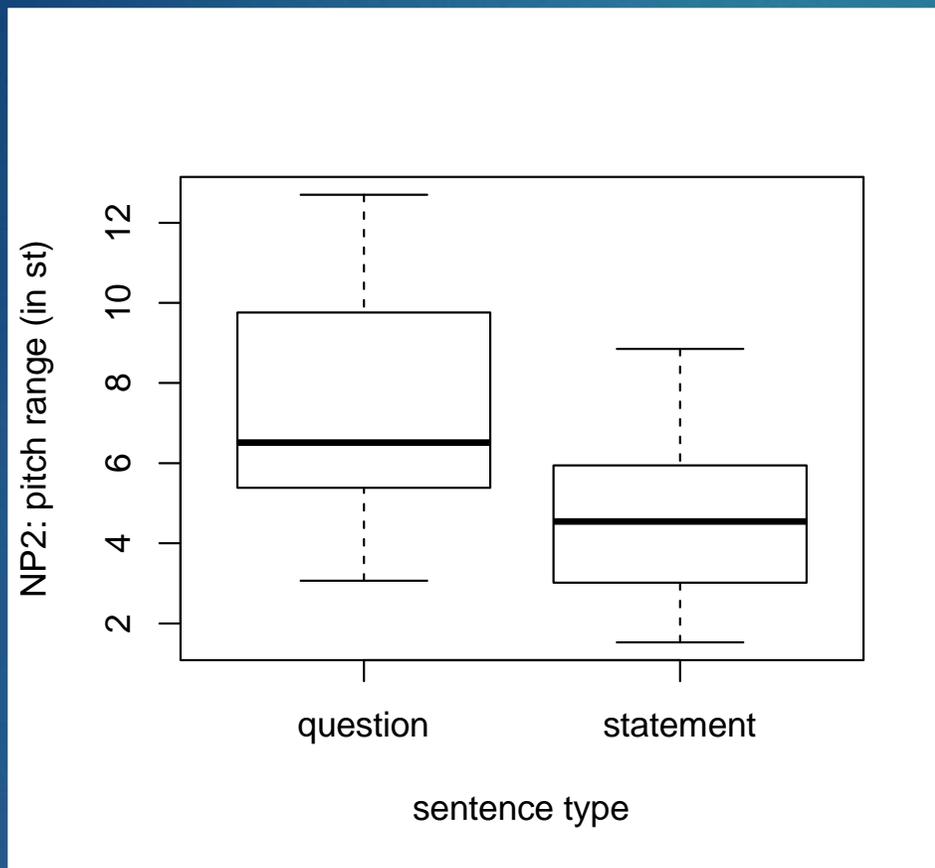
Statement



Question



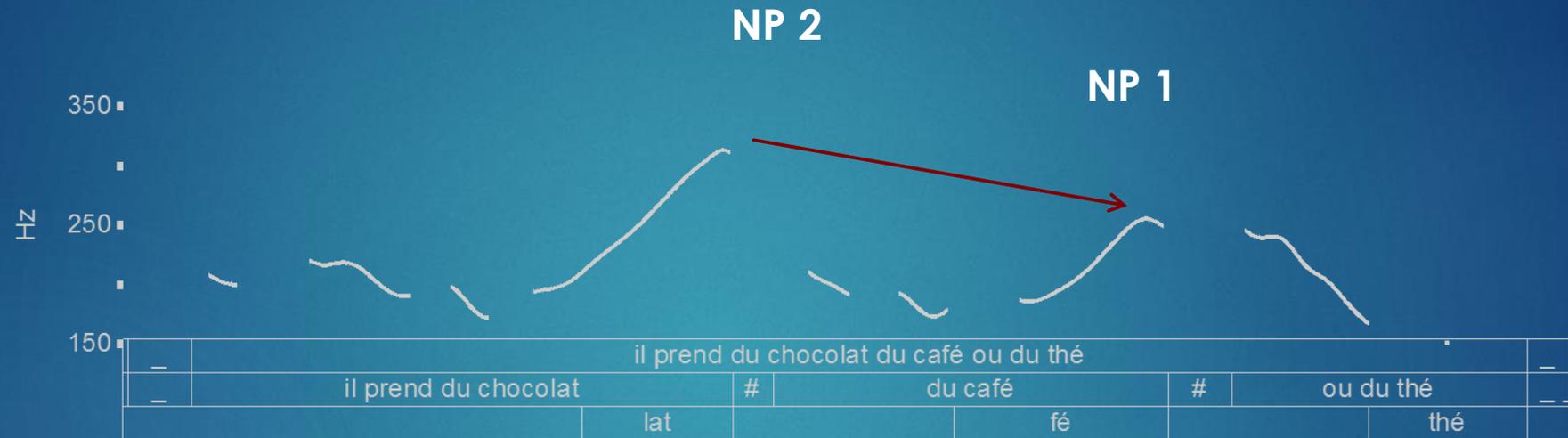
Pitch Range



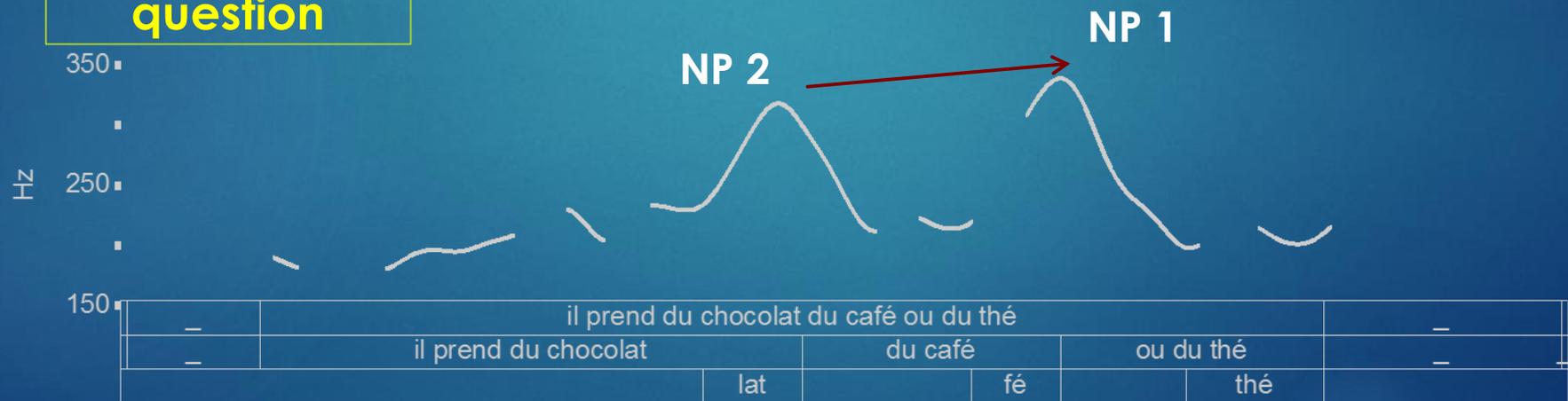
Rises are more important in questions than in statements, as a consequence pitch range is more compressed in the latter.

Scaling - NP1 & NP2

statement



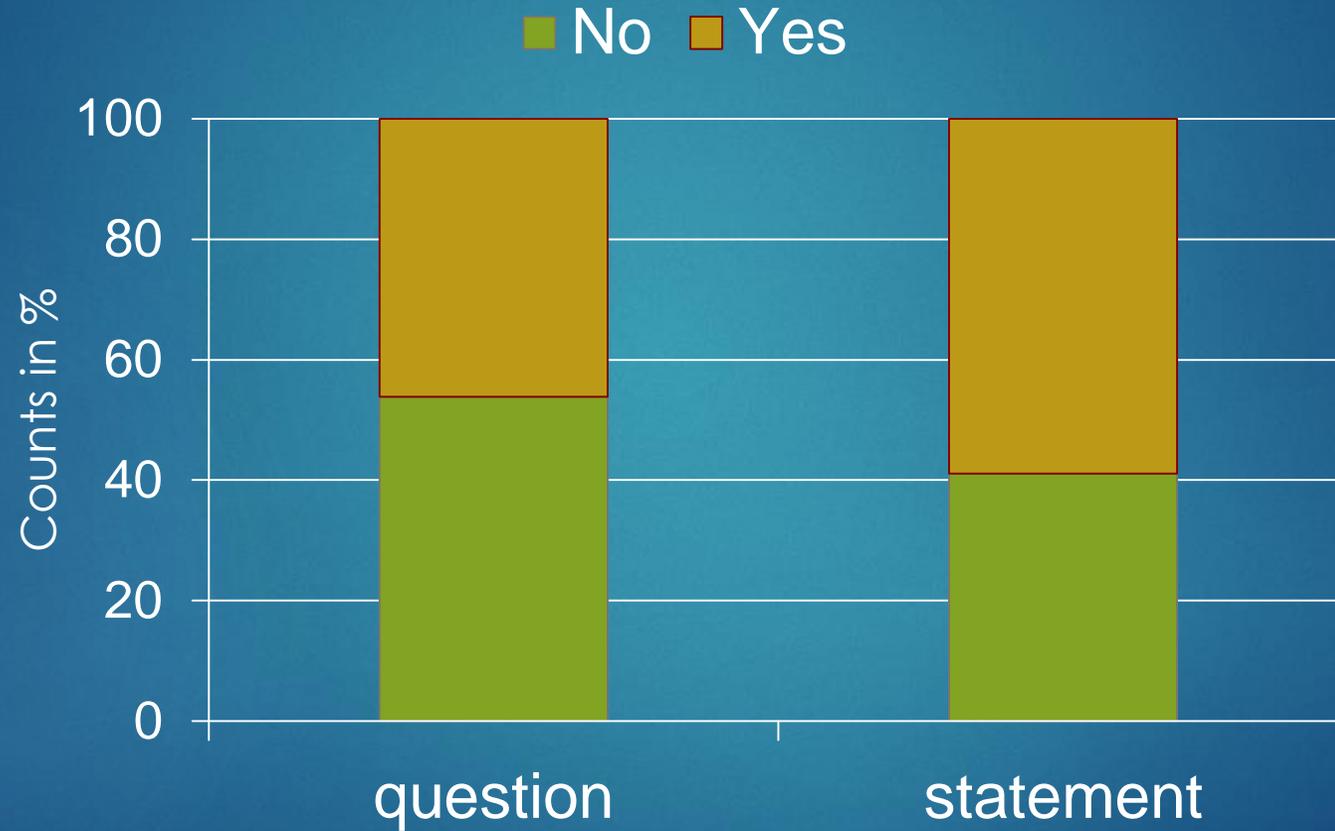
question



Phrasing : Final lengthening and pausing



Phrasing & pauses : First non-final conjunct



Phrasing & pauses : Second/last non-final conjunct



Results (3) : Prosodic events in non-final position

- ▶ In our data, there is a clear difference between questions and statements in the way rises are implemented :
 - ▶ They are more important in questions than in statements;
 - ▶ There is no downstep in questions, when several non-final conjuncts are present, but the rise is almost always downstepped in statements;
 - ▶ There is a frequent upstep in the realization of the last rise in questions;
 - ▶ The segmentation in phrase may be clearer in statements than in questions with the use of pauses.
- ▶ These findings disconfirm what is claimed by Di Cristo (2016)

How to explain and model the differences (1)

To account for the difference, two distinct approaches/hypotheses were considered:

- ▶ In terms of phrasing
- ▶ In terms of intonational analysis, and more specifically by arguing for an illocutionary tone associated with F-marked constituents.

How to explain the differences (2) : in terms of Phrasing

First hypothesis : Differences may result from a different syntax/phonology mapping. This difference is reflected:

- ▶ By a larger register and higher rises in questions in comparison to statements;
- ▶ By no downstep in questions in contradistinction to what happens in statements
- ▶ Difference in boundary strength: IP vs. *ip*
QUEST. [Il prend du chocolat,] [du café] [ou du thé]
STAT. [{il prend du chocolat} {du café} {ou du thé}]

How to explain the differences (3) : in terms of Phrasing

This would mean that we have a sequence of questions in the case of an alternative question, the first one being a declarative question, the other elliptical questions. By contrast, the conjunction is at the level of the NP in statements. (see Cornulier 1982, and also, but less clearly stated, Di Cristo 2016).

QUESTION: Il prend du chocolat] [il prend du café] [ou il prend du thé]

STATEMENT [il prend { du chocolat, du café ou du thé}]

How to explain the differences (4) : in terms of Phrasing

An analysis in terms of syntax-phonology mapping makes predictions that weren't observed in our data.

- ▶ In statements with disjunction, when conjuncts are clauses, we should have the same phrasing as in questions, as a IP boundary should be realized at the end of each conjunct.

J'ai eu Pierre au téléphone hier soir. **Il va accueillir Nicolas || ou il va aller en vacances chez Julien.**

vs.

Tu as des nouvelles de Pierre ? Tu sais ce qu'il a décidé pour les vacances ? **Il va accueillir Nicolas || ou il va aller chez Julien ? ||**

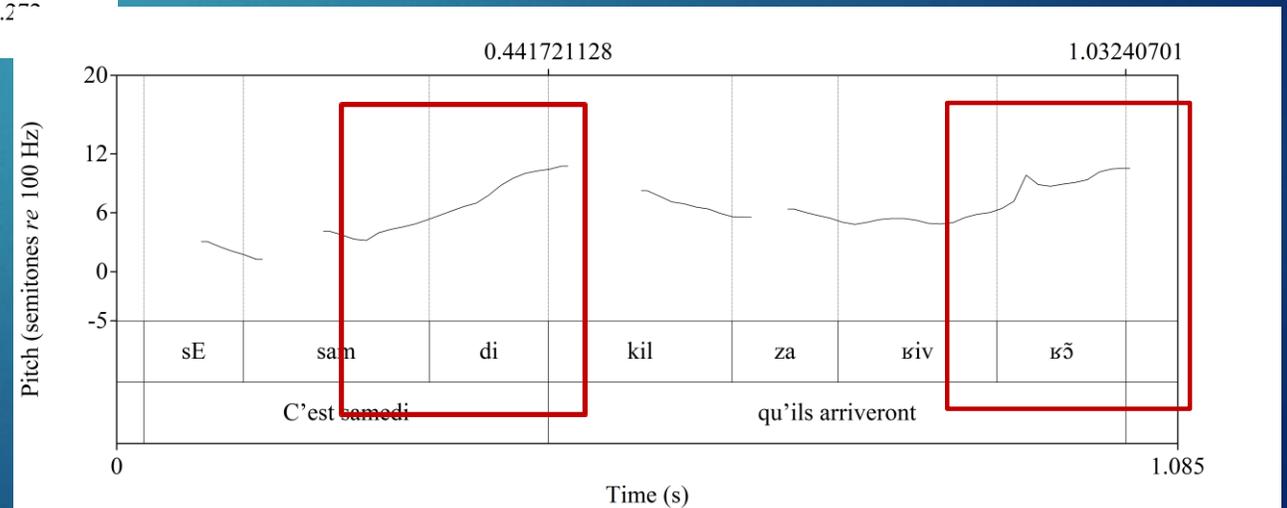
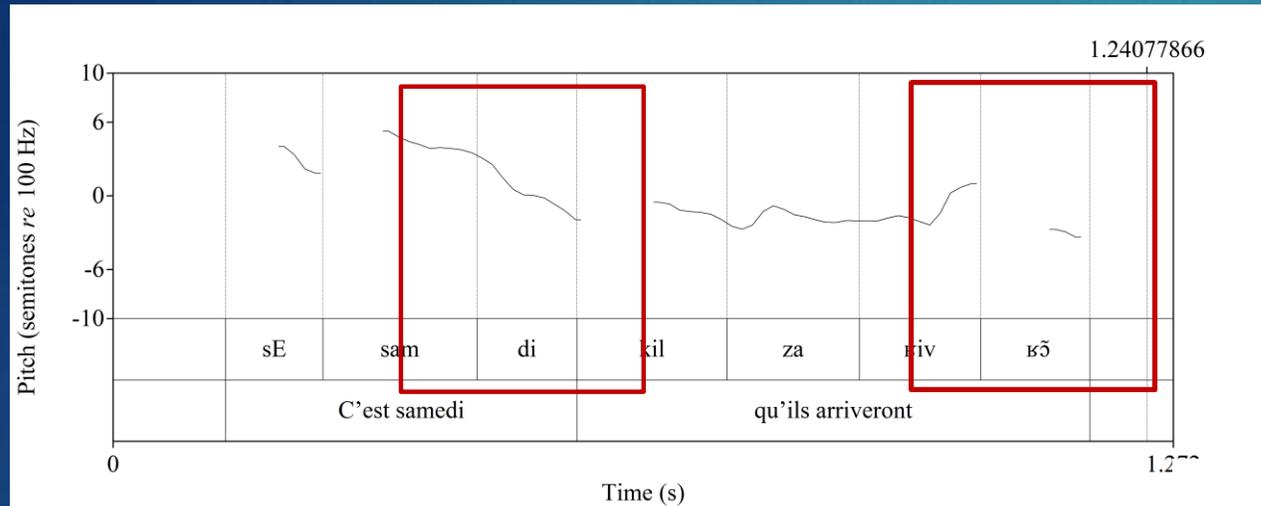
- ▶ Pausing is more frequent in statements than in questions

How to explain the differences (5) : illocutionary tone and F-marking

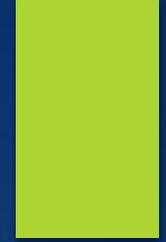
- ▶ We could also assume that the tone occurring at the end of the first conjunct is of a different type: it includes an illocutionary « operator », whereas it is a mere continuation rise in the case of statements.
- ▶ Such analysis echoes what was argued for in the case of narrow focus in questions and statements (cf. Beyssade et al. 2004)

How to explain the differences (6) : illocutionary tone and F-marking

C'est samedi qu'ils arriveront



How to explain the differences (7) : F-marking and illocutionary tone



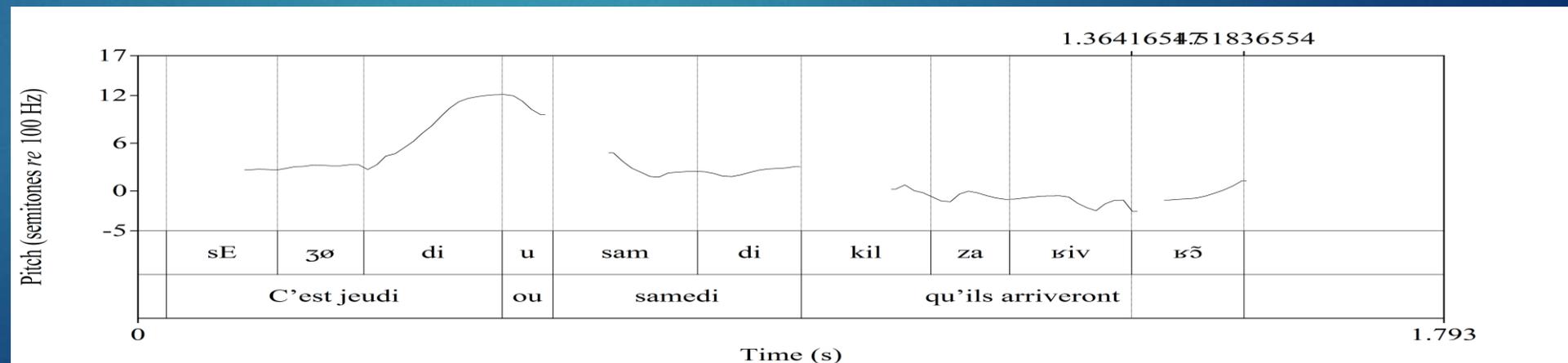
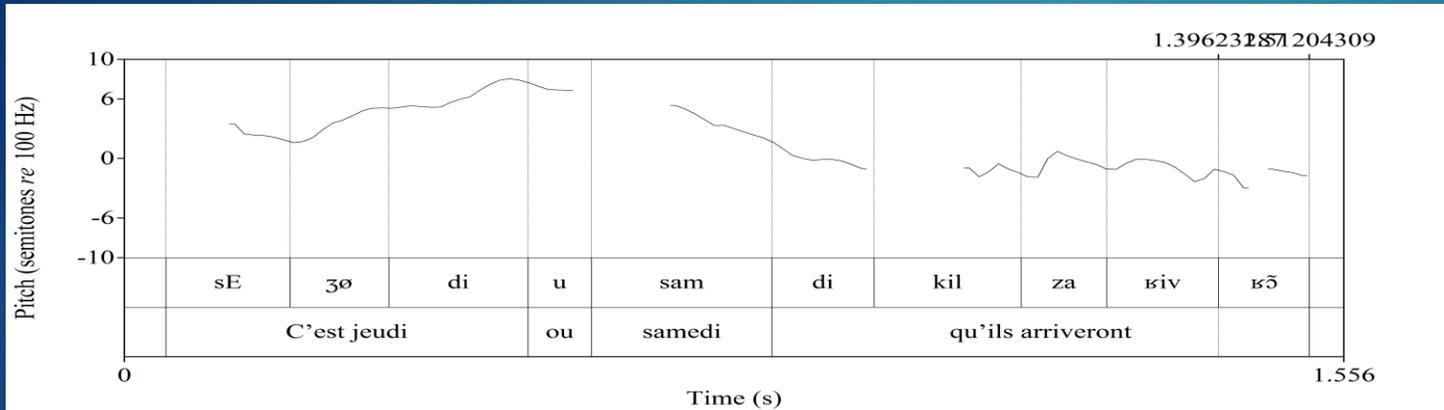
- ▶ The illocutionary tone is realized at the right edge of the F-marked phrase, at least once in any sentence (see Martin 1977).
- ▶ Its form is related to sentence modality : statements/ questions
- ▶ Its occurrence leads to specific prosodic realizations on its right :
 - ▶ postfocus effect such as dephrasing,
 - ▶ Register compression,
 - ▶ copy, etc.

How to explain the differences (8) : the illocutionary tone and F-marking

- ▶ Some of these features can also be observed in alternative questions:
- ▶ The absence of downstep could result from the realization of an illocutionary tone after each conjunct since they are all F-marked.
- ▶ Such an analysis could also partly explain why less pause appear after each conjunct in questions, in contradistinction to what happens in statements with disjunction.
 - dephrasing

How to explain the differences (9) : the illocutionary tone and F-marking

What could explain the realization observed on the last conjunct ?



How to explain the differences (10) : the illocutionary tone and F-marking

- ▶ The pitch compression that occurs through the last conjunct reflects the closure of the alternative set.
- ▶ It results from the occurrence of a L- phrase accent, with the phonological attribute from a phrase accent : it spreads over the entire phrase
- ▶ An illocutionary tone is associated with the last syllable of each F-marked constituent, independently of boundary strength (*ip* or IP)
- ▶ The observed realization could be seen as resulting from a sort of compositionality of the various tonal elements.

Conclusion & perspectives (1)



- ▶ The analysis of the data shows prosodic differences between alternative questions & statements with a disjunction
 - ▶ Fall to low vs. Fall to mid at the end of the sentence;
 - ▶ Realization of the non-final conjuncts with a steeper and larger rise in questions than in statements;
 - ▶ Different scaling in questions than in statements, with more upstepped rises in questions, and downstepped one in statements.
- ▶ To capture the differences an analysis in terms of phrasing isn't satisfactory;
- ▶ It is necessary to argue for specific tonal elements that are meaningful (interrogativity, closure);
- ▶ These elements are associated with F-marked constituents

Conclusion & perspectives (2)



- ▶ These results need to be confirmed more systematically on larger data set
- ▶ In terms of processing, we are planning to set up experiments in order to evaluate the exact weight of the different tonal elements in the interpretation of the different sentence types
 - ▶ The rising form at the end of non-final conjunct : statement/question
 - ▶ The L- phrase accent and the register compression : open List question vs. Alt question



Thanks for your attention

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