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# The role of prosody in information source marking

# Introduction

- All languages have some way of referring to **source of information**, but not all languages do it the same way.
- **Lexical means** for specifying source of information is probably universal.
  - (1) *Y eso, **dizque** es peligroso, ¿no?*  
'And that's dangerous (reported), no? '  
(Colombian Spanish)
  - (2) *S'han quedat sense llum, a Girona. **Es veu** que hi ha nevat molt.*  
'The power is out in Girona. There must have been a lot of snow'.  
(Speaker does not have firsthand knowledge)

Aikhenvald, 2004; González, 2012

# Introduction

- Some languages have **true evidential systems** (inflectional systems with morphemes that have source-marking at the core of their semantics, e.g. Tariana, Quechua, Korean).
- In other languages evidentiality specifications are **'scattered'** throughout the grammar – evidential meanings are there but do not form a single category.

Aikhenvald, 2004

# Introduction

- Fairly rare that prosody is discussed as one of the parts of the grammar that is recruited for **information source marking**.
- Hara & Kawahara (2012) showed that Japanese marks **public evidence** (i.e. a type of information source marking) through deaccentuation.
- To our knowledge no previous reports of intonation contributing to evidential meaning.

# Introduction

- Majorcan Catalan displays **several strategies** for forming polar questions.
- Speakers may choose from **different pitch accents** as in (3) or may head questions with **particles** such as *que* (complementizer 'that') or *o* (conjunction 'or'), see (4).

(3) *Teniu mandarines?*<sub>iH+L\* L%</sub> 'Do you have tangerines' vs. *Que hi ha gana?*<sub>L+H\* L%</sub> 'Are you hungry?'

(4) *Que encara no ha vengut, s'electricista?* 'The electrician hasn't arrived yet?' vs. *O no estàs bo?* 'Aren't you well?'

## Research questions

- What role might intonation play in encoding **information source** in QP *que* + LH\* L% questions?
- If information source is indeed being encoded through the use of QP *que* + LH\* L%, what **type of information** is the speaker conveying?

# Experiment 1

Production test

# Experiment 1: methodology

- **Goals:**
  - To determine the role of intonation in encoding information source in QP *que* + LH\* L% questions.
- **Participants:** 15 speakers of Majorcan Catalan (8 female, 7 male).
- **Task:** Discourse Completion Test (Byllmer & Varghese 2000).
  - Creation of a set of situations which contained two evidential conditions (visual and non-visual) plus a non-evidential/non-epistemic situation which triggered a neutral (info-seeking) question.
- 15 speakers x 26 situations = 390 utterances (160 utterances analyzed in this study).

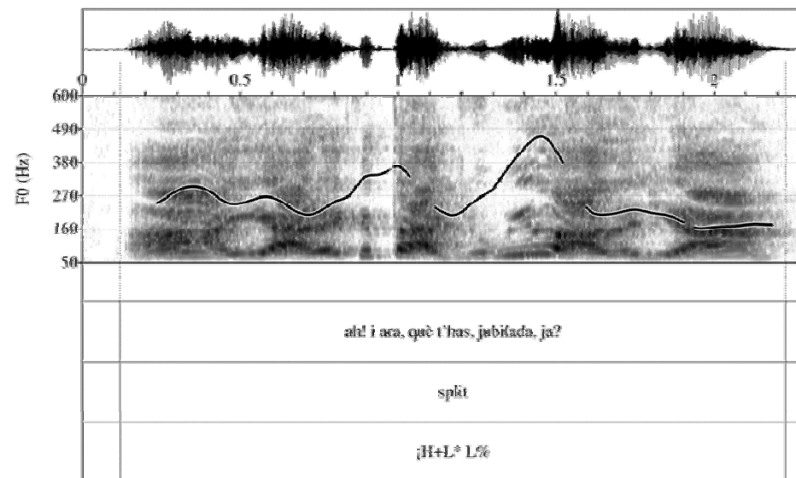


# Experiment 1: methodology, examples situations

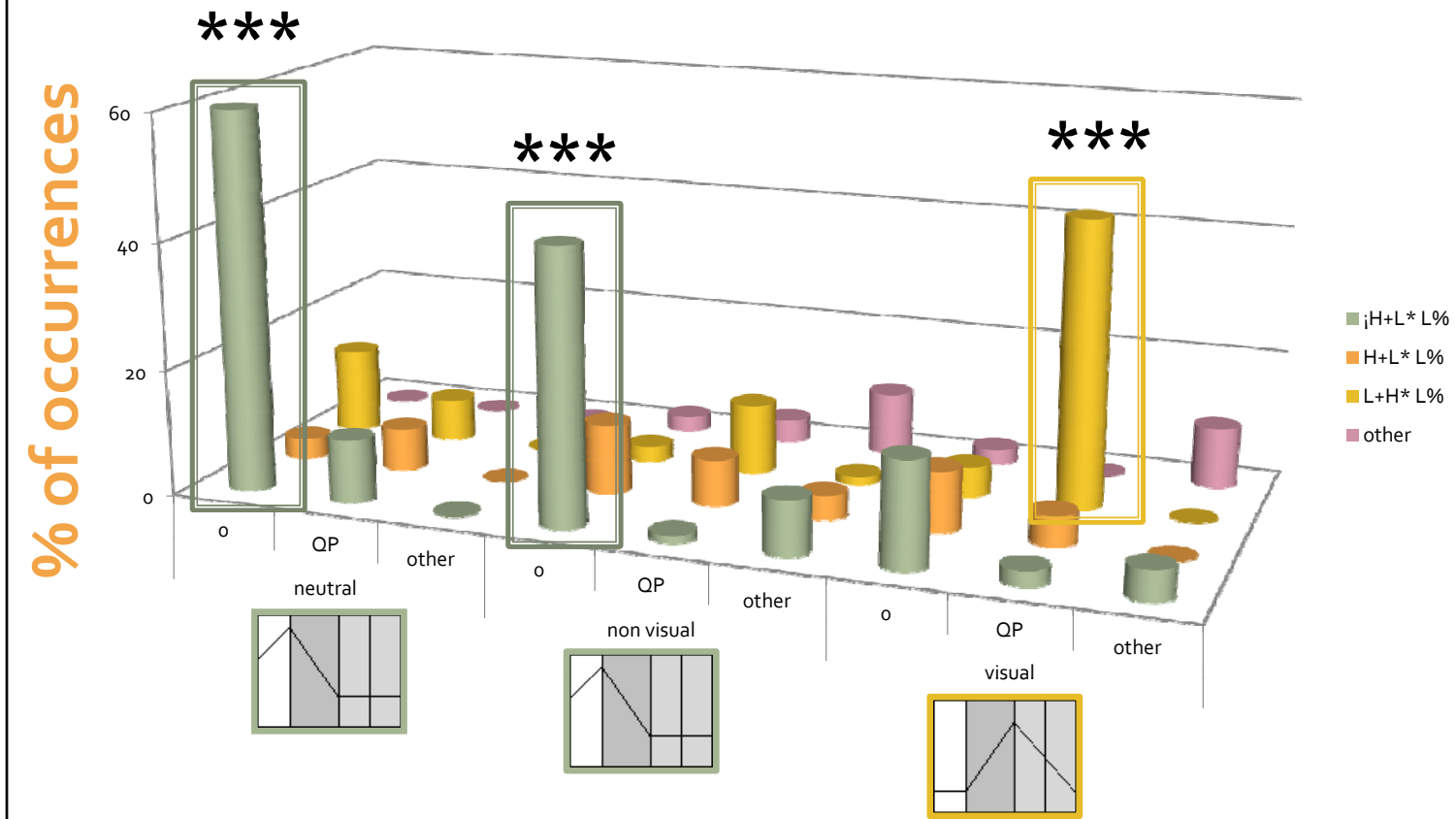
Conditions	Situations
Non-evidential/non-epistemic situation	Tens un poc de mal de coll i, de sobte, parlant amb la teva veïna, comences a sentir una picor molt forta a la gargamella. Demana a la teva veïna si té un caramel. 'You have a bit of a cough and suddenly while you `re talking to a neighbor, you feel a sore throat coming on. Ask her if she has a cough drop`.
Non-visual (auditory) situation	La teva cosina, que feia temps que no veies, et visita a casa teva. Parlant parlant, et diu que ara que no treballa té més temps per fer coses. Tu interpretes que això vol dir que ja s`ha jubilàda, però li ho demanes. 'Your cousin visits you. While you are talking, she says that since she isn't working, she has plenty of time to do different things. You take this to mean that she retired, so you confirm with her`.
Visual situation	És el dia del teu aniversari i un amic teu et dona un regal. Demana-li a aquest amic teu si és un llibre pensant que pot ser que sigui així perquè el paquet té la forma de llibre. 'It's your birthday and your friend gives you a present. You ask him if it's a book, since the package has a book-like shape`.

# Experiment 1: methodology

- Analysis:
  - The data were coded for use of lexical markers, syntactic markers, and prosodic markers (Cat\_ToBI system: Prieto et al. in press).



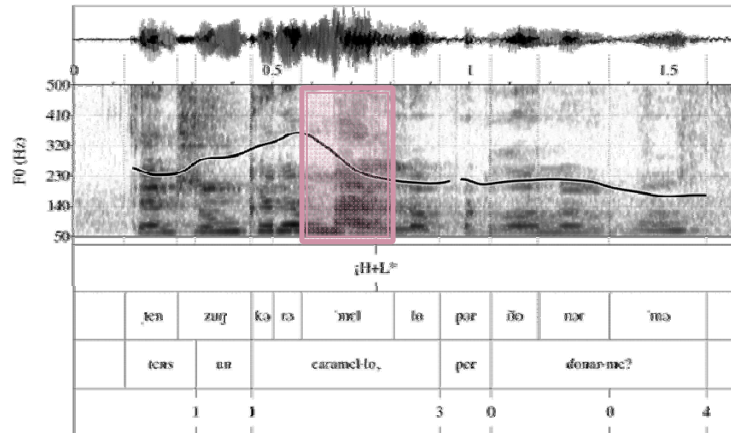
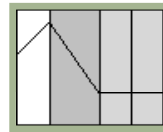
# Experiment 1: results



# Experiment 1: results, examples

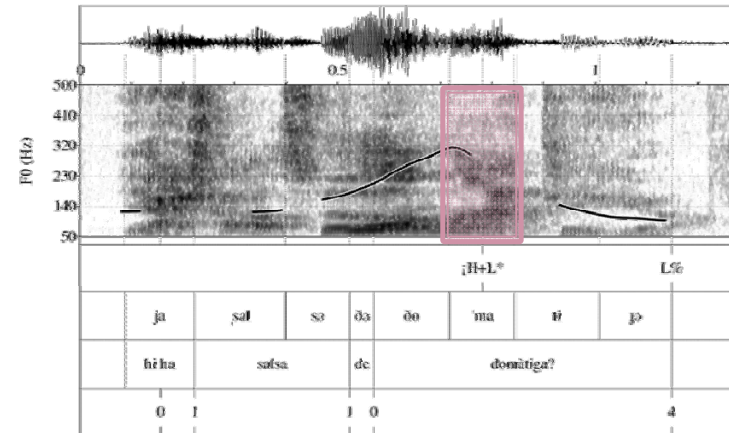
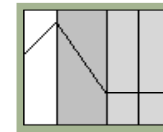
## NEUTRAL CONDITION

■  $iHL^* L\%$



## NON-VISUAL (AUDITORY) CONDITION

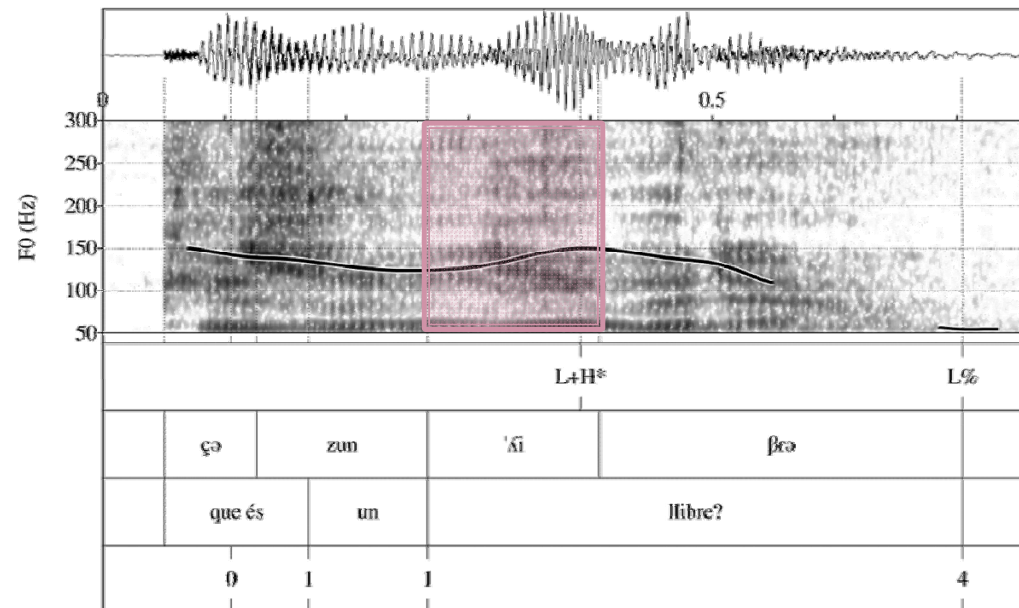
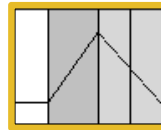
■  $iHL^* L\%$



# Experiment 1: results, examples

VISUAL CONDITION

■ QP *que* + LH\* L%



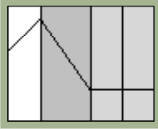


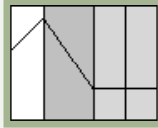


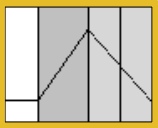


# Experiment 2

Perception test

# Experiment 2: methodology

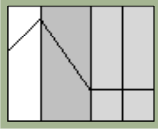


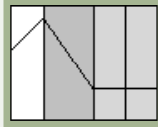


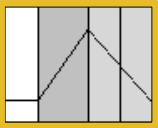


- **Goals:**
  - To investigate what type of information (information source) the speaker is conveying through the use of QP *que* + LH\* L%
- **Participants:** 43 Majorcan Catalan listeners (20 female, 23 male).
- **Task:** Contextualized acceptability task.
  - Subjects were asked to rate the acceptability of the question produced in a specific context using a 7-point Likert scale.
- 2 contexts (auditory evidence, visual evidence) x 3 QP + intonational conditions (QP  $\emptyset$ +jHL\* L%, QP *que* + jHL\* L%, QP *que* + LH\* L%) x 3 targets + 18 fillers = 36 tokens.
- **Software:** Survey Gizmo (Online Survey Software - [surveygizmo.com](http://surveygizmo.com) ).

# Experiment 2: methodology, examples

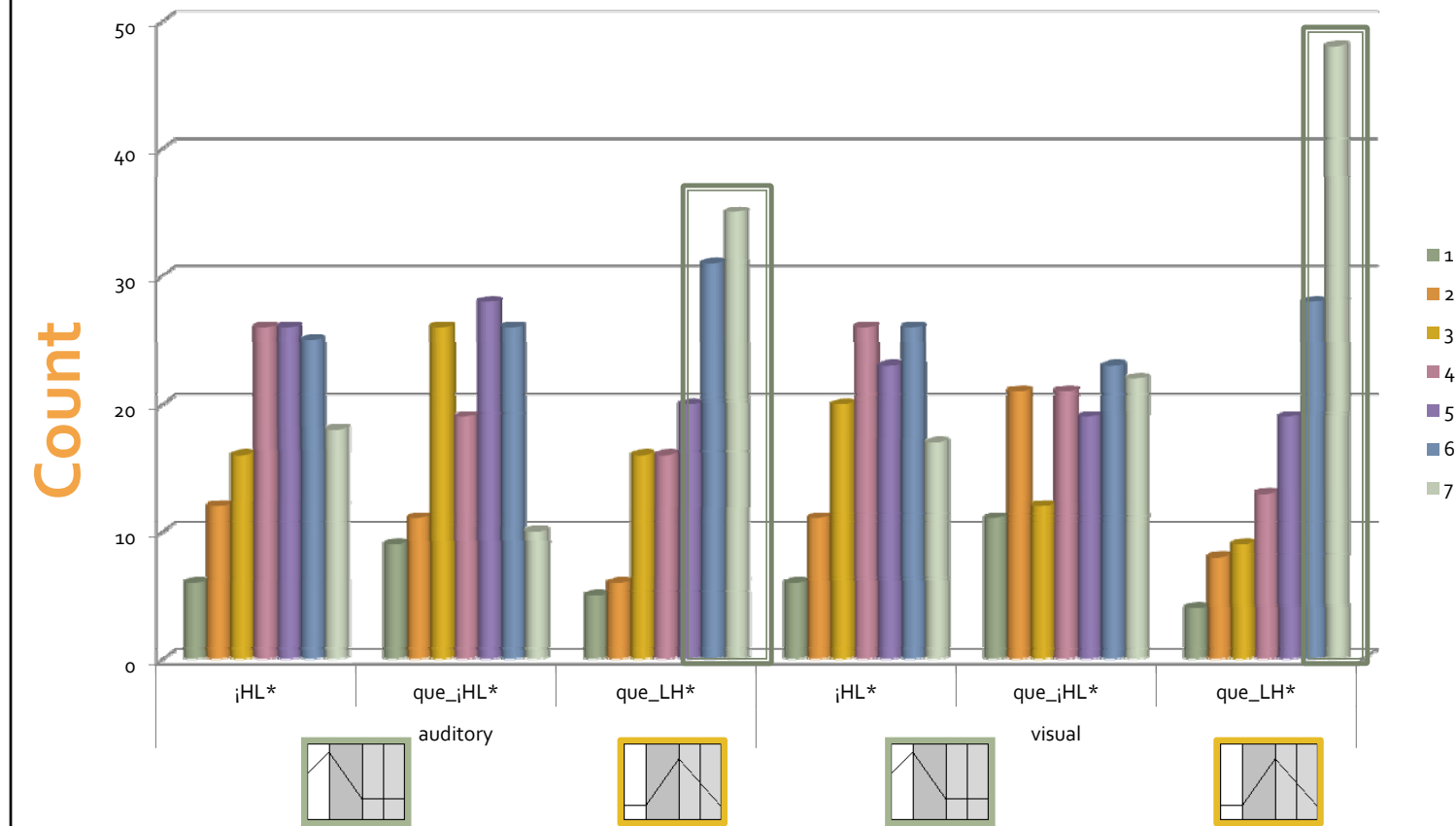
Target 3	Visual evidence	Auditory evidence
QP $\emptyset$ + ¡HL* L% 	Na Maria arriba a la botiga de fruita i <b>veu</b> que estan col·locant una sèrie de parells de sabates als prestatges de l'entrada. <i>Vendreu sabates?</i> 	Na Maria arriba a la botiga de fruita i sent que els amos parlen que han agafat les sabates de la sabateria de veïnat perquè tanquen per jubilació. <i>Vendreu sabates?</i> 
QP <i>que</i> + ¡HL* L% 	Na Maria arriba a la botiga de fruita i <b>veu</b> que estan col·locant una sèrie de parells de sabates als prestatges de l'entrada. <i>Que vendreu sabates?</i> 	Na Maria arriba a la botiga de fruita i sent que els amos parlen que han agafat les sabates de veïnat perquè tanquen per jubilació. <i>Que vendreu sabates?</i> 
QP <i>que</i> + LH* L% 	Na Maria arriba a la botiga de fruita i <b>veu</b> que estan col·locant una sèrie de parells de sabates als prestatges de l'entrada. <i>Que vendreu sabates?</i> 	Na Maria arriba a la botiga de fruita i sent que els amos parlen que han agafat les sabates de veïnat perquè tanquen per jubilació. <i>Que vendreu sabates?</i> 



# Experiment 2: methodology, examples

Target 3	Visual evidence	Auditory evidence
QP $\emptyset$ + ;HL* L% 	Maria arrives at the fruit store and <b>sees</b> that the owners are putting pairs of shoes on the shelves in the entrance. <i>Are you going to sell shoes?</i> 	Maria arrives at the fruit store and <b>hears</b> the owners talking about how they have the shoes from the shopowner next door, who has recently retired and closed the shop. <i>Are you going to sell shoes?</i> 
QP <i>que</i> + ;HL* L% 	Maria arrives at the fruit store and <b>sees</b> that the owners are putting pairs of shoes on the shelves in the entrance. <i>Are you going to sell shoes?</i> 	Maria arrives at the fruit store and <b>hears</b> the owners talking about how they have the shoes from the shopowner next door, who has recently retired and closed the shop. <i>Are you going to sell shoes?</i> 
QP <i>que</i> + LH* L% 	Maria arrives at the fruit store and <b>sees</b> that the owners are putting pairs of shoes on the shelves in the entrance. <i>Are you going to sell shoes?</i> 	Maria arrives at the fruit store and <b>hears</b> the owners talking about how they have the shoes from the shopowner next door, who has recently retired and closed the shop. <i>Are you going to sell shoes?</i> 

# Experiment 2: results



## Experiment 2 - Summary

- Listeners rate the QP *que* + LH\* L% questions produced in a visual context as the most natural (score = 48).
- However, QP *que* + LH\* L% questions are accepted with a high rate of acceptability in the auditory context (score for 6 = 31, score for 7 = 35).
- We interpret that QP *que* + LH\* L% questions are related to **sensory information source**.







# Experiment 3

Perception test







# Experiment 3: methodology

- **Goals:**
  - To investigate what type of information (information source and temporal information) the speaker is conveying through the use of QP *que* + LH\* L%
- **Participants:** 40 Majorcan Catalan listeners (25 female, 15 male).
- **Task:** Multiple choice task.
  - Subjects were asked to answer 2 multiple choice questions (information source and temporal information).
- Neutral context x 3 QP+intonational conditions (QP  $\emptyset$  +  $\uparrow$ HL\* L%, QP *que* +  $\uparrow$ HL\* L%, QP *que* + LH\* L%) x 3 targets + 5 fillers = 14 tokens.
- **Software:** Gizmo (Online Survey Software).

# Experiment 3: methodology, examples

Target 2	Visual evidence
QP $\emptyset$ + ¡HL* L% 	Si na Maria diu <i>T'has comprat un cotxe nou?</i> a en Miquel... 
QP <i>que</i> + ¡HL* L% 	Si na Maria diu <i>Que t'has comprat un cotxe nou?</i> a en Miquel... 
QP <i>que</i> + LH* L% 	Si na Maria diu <i>Que t'has comprat un cotxe nou?</i> a en Miquel... 
<p><b>...és que na Maria:</b></p> <ul style="list-style-type: none"> <li>a) Ha sentit que per ventura s'ha comprat un cotxe nou.</li> <li>b) Ha vist que per ventura s'ha comprat un cotxe nou.</li> <li>c) Ha sentit o ha vist que per ventura s'ha comprat un cotxe nou (però no n'estic segur/a).</li> <li>d) No en tenc ni idea.</li> </ul> <p><b>Quan ho ha sentit o vist, na Maria?</b></p> <ul style="list-style-type: none"> <li>a) Ara mateix</li> <li>b) Fa unes hores</li> <li>c) Ahir</li> <li>d) No ho puc saber</li> </ul>	

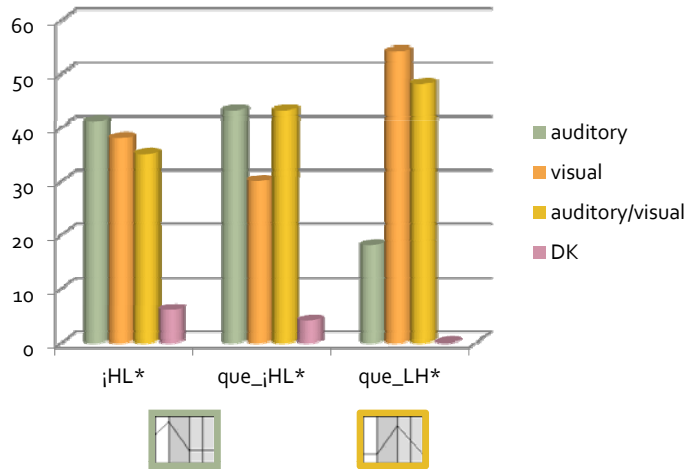
# Experiment 3: methodology, examples

Target 2	Visual evidence
QP $\emptyset$ + ;HL* L% 	If Maria says <i>Did you get a new car?</i> to Miquel... 
QP <i>que</i> + ;HL* L% 	If Maria says <i>Did you get a new car?</i> to Miquel... 
QP <i>que</i> + LH* L% 	If Maria says <i>Did you get a new car?</i> to Miquel... 
<p><b>...it is because Maria:</b></p> <ul style="list-style-type: none"> <li>a) has heard that he might have gotten a new car.</li> <li>b) has seen that he might have gotten a new car.</li> <li>c) she has heard or seen that he might have gotten a new car (but I'm not sure)</li> <li>d) I don't know.</li> </ul> <p><b>When did Maria hear or see it?</b></p> <ul style="list-style-type: none"> <li>a) Just now</li> <li>b) A few hours ago</li> <li>c) Yesterday</li> <li>d) I don't know</li> </ul>	

# Experiment 3: results

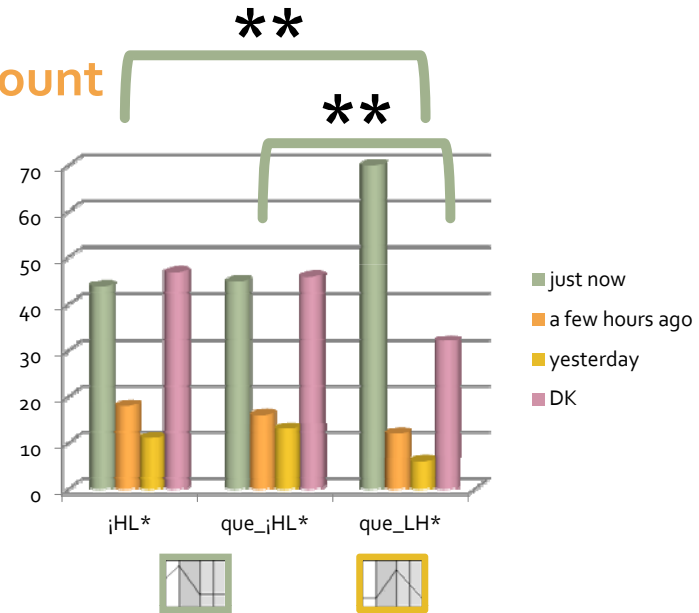
## Source

Count



## Temporal information

Count





## Experiment 3: Summary

- Listeners related QP *que* + LH\* L% questions with **sensory** (hearing, seeing) sources of information more than they did other question types.
- Not only do listeners infer that the speaker has sensory source information, but they also infer information about **when that information became available to the speaker** - just prior to the time of utterance ( $t_u$ ).

## Discussion

- Three types of information encoded in Q\_LH\* questions.
- **Sentence modality**: polar question.
- **Information source**: sensory - evidence is seen or heard.
- **Temporal information**: propositional content became available to speaker just prior to  $t_U$ .

# Discussion

- Close relationship between temporal information and evidential strategies – many languages use perfects (i.e. tense marking) as an evidential strategy (Hewitt 1995; Friedman 2003).

# Conclusions

- QP *que* + LH\* questions function as a construction (learned pairing of form + meaning – Goldberg 1996, 2006) that conveys **sentence modality, source-marking** and **temporal information**.
- Results show without recruiting a specific part of the grammar (**intonation**), **source-marking** and **temporal information** are **no longer available** to the listener.
- We confirm that the **intonation** is indeed a part of the grammar **available for conveying evidential meaning**, in this case working in tandem with the particle *que*.

## References

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