INTONATION AND THE PRAGMATICS OF YES-NO QUESTIONS IN CENTRAL CATALAN

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ABSTRACT

The main aim of this paper is to test the claim that intonation plays an important role in the specification of dynamic epistemic commitments, i.e., speaker commitments to the speaker's own proposition and to the addressee's propositions. In an acceptability judgment task, 119 Central Catalan listeners were asked to rate the perceived degree of acceptability between a set of interrogative utterances (variously produced with one of four intonational contours) and their immediate discourse context (which was controlled for epistemic bias). We found that participants preferred some question intonation contours over others in specific epistemic contexts. That is, results show that question intonation encodes fine-grained information about the epistemic stance of the speaker, not only in relation to the speaker's own propositions but also in relation to the addressee's propositions.

Keywords: intonation, yes-no questions, speaker knowledge, epistemicity.

1. INTRODUCTION

Human languages can use a variety of linguistic strategies, including prosody, for the expression of the speakers' epistemic disposition (or speaker knowledge) towards a proposition (e.g., [11]). One of the common expressions of epistemic disposition is **speaker certainty**, or the expression of the **degree of commitment** of the speaker towards the proposition expressed (e.g., [8] for English, [15] for Catalan). Previous literature on the pragmatics of yes-no questions has shown that intonation can encode a distinction between pure information-seeking questions (i.e., when the speaker has no particular bias with respect to the answer he/she expects) and confirmation-seeking questions (i.e., when the speaker expresses some degree of commitment to the content of his/her proposition [5, 9, 7, 17]). Recently, Vanrell et al. [18] have shown that a specific type of yes-no question intonation in Majorcan Catalan signals the speaker's sensory access to evidential information, which in turn has implications for speaker certainty.

In the last few decades, researchers have emphasized the **dialogical status of intonation** and the need to take into account interactive dimensions of meaning. Theories of **speech act dynamics** have analyzed biased questions in detail by assessing the conditions that restrict their appearance in discourse ([2, 3, 10]). **Declarative questions** (e.g., *France is a monarchy?*) are probably the most well-researched type of biased questions. Gunlogson [9] was one of the first to analyze the semantics of **declarative questions** within a dynamic model of discourse and dialogue. The examples in (1) show that a rising declarative question in (1a) is *only* adequate when the addressee has shown some type of previous commitment. Declarative questions fail to commit the speaker to the content of his/her proposition.

(1) A: The king of France is bald.
B's response:
a. France is a monarchy?
b. #France is a monarchy.

Declarative questions are thus used to express the difference (or **disagreement**) between speaker and addressee in terms of commitment to a given proposition (or belief/disbelief on contextual evidence that has just become available to them). Recent studies have shown that intonation contours across languages not only encode information about the commitment of the speaker to the truth of the proposition but can also constitute a linguistic signal anticipating **agreement** or **disagreement** between speaker and addressee (e.g., [12, 13, 6, 16]).

Recently, Enfield et al. [4: 219] have shown that question-final particles in many languages "are more than just question markers, in the sense that they make subtle distinctions in relative strengths of knowledge or commitment to a proposition, of both speaker and addressee, manipulating the local **epistemic gradient**". The term "epistemic gradient" refers to the difference between interlocutors in terms of epistemic commitment to the truth of a proposition. We would like to test the claim that intonation, like question-final particles, can be used by languages to make fine distinctions in the specification of epistemic asymmetries in speech

events by performing a tilting function in the epistemic gradient between speaker and addressee.

Central Catalan is a language that uses four distinct types of intonation contour for the expression of yes-no questions, traditionally described as follows: L* H% is used for pure information and incredulity questions, ¡H+L* L% for confirmation-seeking questions, and L+¡H* L% and L+H* LH% for echo and surprise questions (see the Cat_ToBI proposal in [14]). We would like to test the hypothesis that question pitch contours in this language encode fine-grained semantic distinctions in the epistemic gradient, specifically: (a) different levels of **speaker commitment**, or the degree of epistemic disposition about the propositional content of the proposition in the question (3 levels: low, mid and high); and (b) different levels of **speaker agreement**, or degree of speaker acceptance of the addressee's proposition or contextual evidence that has just become available (3 levels: low, mid and high). We hypothesize that these two epistemic factors (speaker commitment and speaker agreement) will significantly affect the speaker's selection of question intonation contours in Catalan.

2. METHODOLOGY

We designed an acceptability judgment task to assess whether different question intonation contours in Catalan encode fine-grained distinctions in degree of speaker commitment and agreement. Participants were asked to rate the degree of acceptability between a sentence produced in a given pitch contour and its preceding discourse context.

2.1. Participants

A total of 119 native Central Catalan speakers completed the task (32 males and 87 females; mean age 38.18, SD 11.19). Participants reported a mean daily usage of Catalan of 85.07% (SD 25.89%).

2.2. Materials

2.2.1. Target sentences

A total of 12 target sentences were used in the experiment. They contained only predicates in focus position (e.g., *Tens gana?* 'Are you hungry?'), with no post-focal material or explicit subjects. These 12 sentences were each recorded four times as spoken by the second author of this study, an expert in the intonation of Central Catalan and native speaker of this variety, under the guidance of the first author. Each of the four instances exemplified one of the four most common types of nuclear configuration found for Central Catalan yes-no questions (a *final rise* L* H%, a *final fall* H+L* L%, a *rise-fall* L+¡H* L%, and a *rise-fall-rise* L+H* LH%). This yielded a total of 48 (12 × 4) tokens.

2.2.2. Pragmatic contexts

The 12 target sentences were placed after a total of 12 discourse contexts conveying clear epistemic biases. Six of these contexts encoded different levels of strength of **speaker commitment**, or degree of epistemic disposition about the propositional content of the proposition in the question, namely low commitment ('I have no information'), mid commitment ('I think that X'), and high commitment ('I see/hear that X').

The other six discourse contexts encoded different levels of strength of **speaker agreement**, or questions evaluating the speakers' acceptance of the proposition given by the addressee, namely low agreement ('I think that X; my interlocutor says Y; I don't believe him'), mid agreement ('I think that X; my interlocutor says Y; I trust him') and high agreement ('I have no information; my interlocutor says Y').

In essence, the three commitment levels correspond to so-called information questions, confirmatory questions and evidential questions, and the three agreement levels correspond to so-called disbelief/incredulity questions (low agreement), surprise questions (mid agreement), and understanding echo questions (high agreement). The examples in (2) and (3) show discourse contexts encoding high speaker commitment and low speaker agreement, respectively (target utterances are shown in italics).

(2) It's almost two in the afternoon and you and Sonia are together working at the office, as always. You're concentrating on your work when all of a sudden you hear her stomach growl.
—*Are you hungry?*

(3) Your roommate is a photographer. It's a sunny, gorgeous day out today, and she went to Salou to cover a wedding. When she gets back she tells you it starting raining. You can't believe it because it was such a gorgeous day.
—So we got caught in the rain.
—*You got caught in the rain?*

2.3. Experimental procedure

The experiment was set up through the online survey platform SurveyGizmo. The 12 pragmatic contexts were randomly presented to the subjects in 12 separate slides. In all slides, the discourse context was presented both textually and in audio form. By clicking on buttons at the bottom of the discourse text, subjects could play the audio file corresponding

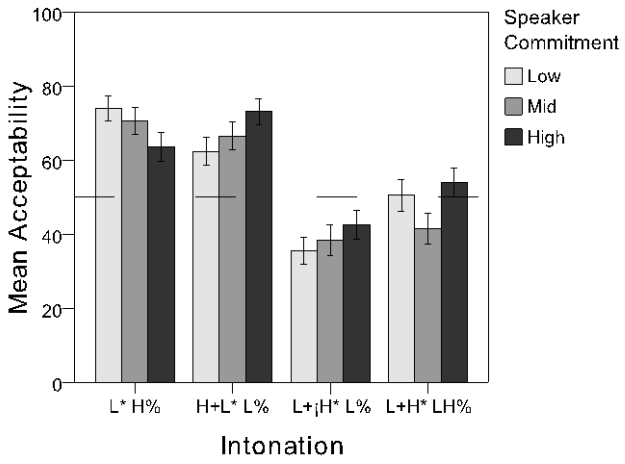
to the target utterance spoken with one of the four intonation patterns (see 2.1.1). After listening to each prompt, participants were asked to rate its contextual appropriateness by clicking at some point on a horizontal bar representing a 0-100 scale (0 = totally inappropriate; 100 = totally appropriate). A total of 5,712 responses were obtained (119 participants × 12 contexts × 4 intonational contours).

3. RESULTS

3.1. Speaker commitment

Figure 2 summarizes the results of the acceptability judgment task with regard to Speaker Commitment. While the rising contour (L* H%) shows a preference for the expression of low speaker commitment (low > mid > high), the falling contour (H+L* L%) shows a preference for high speaker commitment (high > mid > low). The other contours (L+¡H* L%, L+H* LH%) receive low acceptability rates overall.

Figure 2: Mean acceptability rates (error bars: 95% CI) of the different intonation contours (*x*-axis) when judged in each of the three levels of speaker commitment (different color bars).



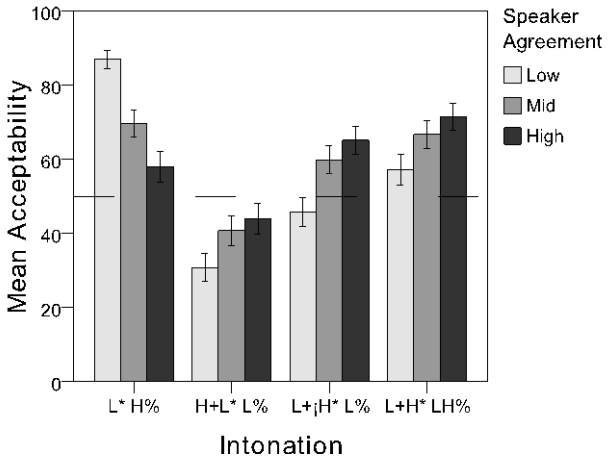
A Generalized Linear Mixed Model (GLMM) was performed in SPSS v22 with Acceptability (0–100) as the dependent variable. Speaker Commitment, Intonation and their interaction were set as fixed factors. Subject and Item were set as random factors. A main effect of Intonation was found to be significant ($F_{3, 2206} = 151.212$, $p < .001$), and so was the interaction Speaker Commitment × Intonation ($F_{6, 2206} = 10.807$, $p < .001$).

The main effect of Intonation can be interpreted as a general preference for using both L* H% and H+L* L% over L+H* LH% and L+¡H* L%. The interaction Speaker Commitment × Intonation can be read in the following way. Low commitment contexts showed a contour preference scale such that L* H% > H+L* L% > L+H* LH% > L+¡H* L%. In mid commitment contexts, both L* H% and H+L* L% were preferred over the other two contours. Finally, in high commitment contexts, H+L* L% was preferred over both L* H% and L+H* LH% ($p = .458$ between them), and all these three also over L+¡H* L%.

3.2. Speaker agreement

Figure 3 summarizes the results of the acceptability judgment task with regard to the independent variable Speaker Agreement. While the rising contour (L* H%) is preferred for the low speaker agreement (low > mid > high), the circumflex pitch contours (L+¡H* L%, L+H* LH%) are preferred for higher levels of speaker commitment (high > mid > low). The falling contour (H+L* L%) receives the lowest acceptance rates overall.

Figure 3: Mean acceptability rates (error bars: 95% CI) of the different intonation contours (*x*-axis) when judged in each of the three levels of speaker agreement (different color bars).



Another GLMM was performed with the same dependent variable and random factors. Speaker Agreement, Intonation and their interaction were now set as fixed factors. A main effect of Intonation was found to be significant ($F_{3, 2201} = 143.714$, $p < .001$) and so was the interaction Speaker Agreement × Intonation ($F_{6, 2201} = 41.941$, $p < .001$).

The main effect of Intonation can be interpreted as an overall scale of contour preference, as follows: L* H% > L+H* LH% > L+¡H* L% > H+L* L% ($p = .023$ between L* H% and L+H* LH%; $p < .001$ for all other comparisons). The interaction Speaker Agreement × Intonation can be read in the following way. Low agreement contexts showed a contour preference scale such that L* H% > L+H* LH% > L+¡H* L% > H+L* L%, indicating that rising

questions position the speaker as skeptical of or in disagreement with the addressee's proposition. In mid agreement contexts, both L+H* LH% and L* H% were preferred over L+¡H* L%, and all these three also over H+L* L%. Finally, high agreement contexts showed a contour preference scale such that L+H* LH% > L+¡H* L% > L* H% > H+L* L%, indicating that the two circumflex contours signal the speaker agreement with an addressee's proposition.

4. CONCLUSIONS

An acceptability judgment task in which participants were asked to rate the perceived degree of appropriateness between various intonational contours and their preceding discourse context has revealed that question intonation in Catalan is sensitive to fine-grained epistemic information that is related not only to the speaker's epistemic **commitment** to the proposition expressed but also to the speaker's **agreement** or acceptance of the addressee's propositions. The results showed that the rising intonation contour L* H% is preferred for both the conveyance of low epistemic commitment and low epistemic agreement. As for the falling pitch contour H+L* L%, it is preferred for the expression of high epistemic commitment. The circumflex contours L+H* LH% and L+¡H* L% were preferred for the expression of high speaker agreement. These results confirm recent descriptions of the epistemic characteristics of Catalan pitch contours ([14]).

In a nutshell, the results of this experiment have shown how question intonation contours in Catalan can be interpreted as epistemic operators which encode fine-grained distinctions in speaker commitment not only in relation to the speaker's own propositions but also in relation to the addressee's propositions. Thus intonation, like question-final particles in other languages, can have the function of tilting the epistemic gradient between speaker and addressee and strongly interacting with the epistemic asymmetries that are found in normal conversation (see [1, 4, 15]).

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