Prosodic cues of confidence and uncertainty in Catalan
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Previous work on Catalan intonation suggests that differences in the scaling of the final boundary tone (low vs. mid) can signal degrees of certainty, that is, whether speakers are confident about what they are saying (Prieto, 2002; Prieto & Cabrè, 2007-2010). Fig. 1 shows the intonational schema for the statement De Mòdena ‘From Modena’ produced respectively with certain and uncertain intonation. The crucial difference between the two lies in the height of the utterance-final boundary tone. In addition, uncertainty statements tend to be accompanied by a decrease in the speech rate and a noticeable lengthening of the final syllable (Prieto, 2002; Prieto & Cabrè, 2007-2010). Other research on prosodic manifestations of (un)certainty in American English (Smith & Clark, 1993; Liscombe et al., 2005; Pon-Barry, 2008) conclude that the perceived level of certainty can be associated with a combination of temporal features (total silence, percent silence, total duration, speaking duration), together with other prosodic features such as slope f0, range f0, and speaking rate, as well as the presence of sentential adverbs, added “uh” or “um” or the use of hedges such as “I guess”. With the aim of investigating the relative weight of a set of prosodic cues to the perception of uncertainty, a pilot production experiment was carried out. The data consisted of 5 confident statements and 5 uncertainty statements, which were elicited by means of a series of question-answer pairs. Participants were asked to avoid the use of questions or interjections such as “uh”, “hm” or “mm” so that the main difference between confident and uncertainty statements was conveyed by prosodic mechanisms. A total of 90 utterances (5 sentences × 2 types × 3 repetitions × 3 speakers) were obtained. The results show that uncertainty statements tend to present mid-level boundary tones, slower speech rate and optional longer final syllables compared to the confident ones.

In order to find out the specific contribution in perception of the cues used in production, we run two perception tasks in which listeners were asked to rate the perceived level of confidence/uncertainty on a seven-point scale. The materials for Experiment 1 consisted of two tokens produced by two different speakers in which the pitch height of the final boundary tone was manipulated in 5 steps of 10 Hz and 7.5 Hz each (depending on the speaker) from an uncertain to a confident meaning. Experiment 1 was made of 20 tokens (2 items × 2 speakers × 5 steps). For Experiment 2, prosodic parameters such as scaling of the final boundary tone (5 steps), duration of the final syllable (3 steps) and speech rate (slow and fast) were manipulated and then combined in an orthogonal way. Experiment 2 consisted of 120 tokens (2 items × 2 speakers × 5 scaling steps × 3 final duration steps × 2 speech rate levels). Preliminary results with 5 listeners suggest that although the scaling of the final boundary tone exerts an effect on the perceived level of uncertainty (Fig. 2), the most important role in the identification of uncertainty is played by the combination of scaling with speech rate (not so much with duration of the final syllable) (Fig. 3). These results demonstrate the importance of the analysis of temporal patterns in conjunction with pitch patterns in the conveyance of pragmatic meaning (see Congosto et al., 2010; Escandell, 2011). As a methodological issue, in the paper we will compare the effect of the response type, that is, dual response versus gradual response on the obtained results. Based on previous work (Crespo-Sendra et al., 2010), our hypothesis is that gradual response will trigger shallower curves.
Figure 1. Intonational schema for the statement *De Mòdena* ‘From Modena’ produced with certain (1a) and uncertain (1b) intonation

(1a) Confident statement

\[\text{De Mò de na}\]

(1b) Uncertainty statement

\[\text{De Mò de na}\]

Figures 2 and 3. Results of Experiment 1 (left) and Experiment 2 (right). Y-axis represents the perceived level of certainty. X-axis represents the 5 different steps of scaling. In the right graph, the two panels show the different levels of speech rate (slow and fast) whereas the 3 types of line represent the levels of duration of the last syllable (black = short, grey = medium, dashed = long).

References


