

# Using intonation to disambiguate meaning:

## The role of empathy and proficiency in L2 perceptual development

The present study investigates the interplay between proficiency and individual pragmatic skills in the process of learning a new language. Notably, we focus on the role of empathy in the development of second language (L2) prosody by analyzing the perception and processing of intonation in questions and statements in L2 Spanish. It is common for L2 learners to struggle with L2 intonation, often resulting in comprehension and communication difficulties (Trofimovich & Baker, 2006). Previous research attests that learners gradually acquire target-language prosody as they gain proficiency in the language. Concretely, the perception and processing of L2 intonation has been shown to improve in conjunction with proficiency conditional on intonation type (Brandl et al., 2020), with polar ('yes/no') interrogatives being more difficult to process and acquire when compared with simple statements. The construct empathy has been shown to influence native language processing in how listeners interpret intonation and meaning when words are ambiguous (Esteve-Gibert et al., 2020). Importantly, higher empathy individuals, in comparison with lower empathy individuals, appear to be more sensitive to intonation cues in the process of forming sound-meaning associations. We extend this research to L2 acquisition in order to determine if individual differences in pragmatic skills affect the development of intonation in L2 processing and sentence comprehension.

A total of 223 participants completed a two-alternative forced choice (2AFC) task in which four utterance types were categorized as questions or statements. The stimuli were randomly drawn tokens of declarative (broad, narrow focus) and interrogative (polar, wh-) utterances, spoken by native speakers of eight distinct varieties of Spanish (Andalusian, Argentine, Castilian, Chilean, Cuban, Mexican, Peruvian, Puerto Rican). Additionally, participants completed the LexTALE vocabulary task in Spanish (Izura et al., 2014), which served as a proxy for L2 proficiency, as well as the Empathy Quotient questionnaire in English (Baron-Cohen & Wheelwright, 2004), which provided an individual assessment of the construct empathy.

The data were analyzed using Bayesian multilevel regression and Drift Diffusion models. The results replicated findings from Brandl et al. (2020) showing that learner response accuracy improved as a function of proficiency for all utterance types. Importantly, empathy scores were positively correlated with higher accuracy in polar interrogatives (see Figure 1). As is the case with L1 research, the present project underscores the importance of considering individual pragmatic differences when examining intonational meaning processing and sentence comprehension in an L2. More notably, the results also motivate the inclusion of measures of pragmatic skill, such as empathy, as predictors for L2 acquisition outcomes. Furthermore, these findings highlight an area in which models of L2 development can improve in order to better account for individual differences in L2 learning.

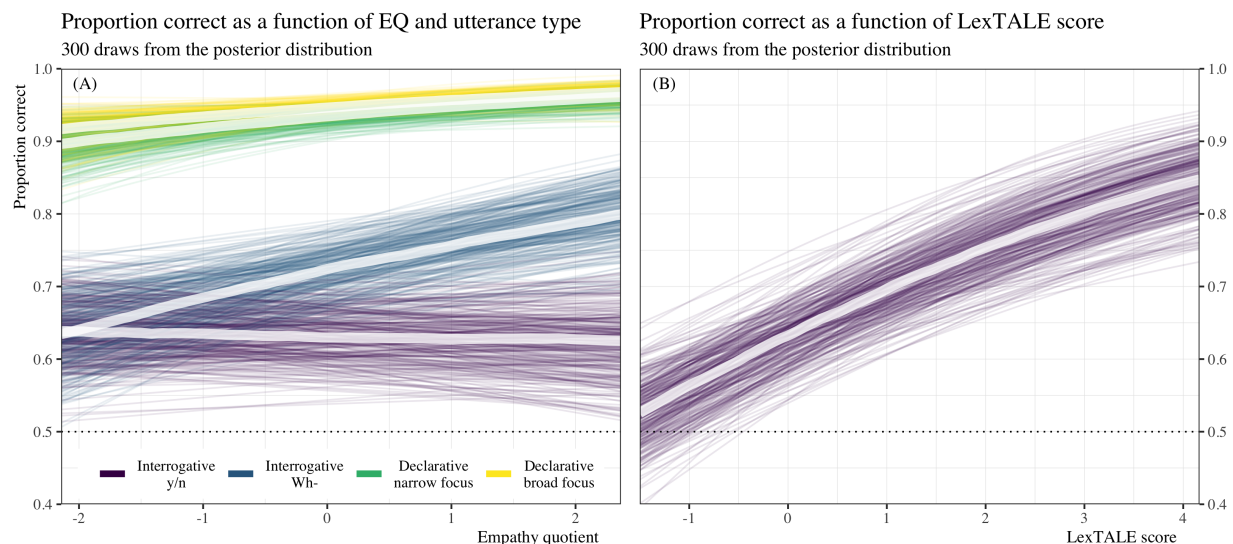


Figure 1: Conditional effects of response accuracy as a function of Empathy quotient and utterance type (panel A) and standardized LexTALE score (panel B). Individual colored lines represent 300 draws from the posterior distribution. White lines indicate the median lines of best fit from the posterior.

## References

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