Variable talkers, adaptive listeners: Where to find prosodic categories (if ever!) and how listeners can navigate prosodic variability

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Prosodic production varies within and across talkers (Arvaniti et al., 2024; Cangemi, Krüger, & Grice, 2015; Chodroff & Cole, 2019; Grice et al., 2017). This makes the relationship between the speech signal and meaning-bearing prosodic categories—e.g., pitch accents, boundary tones, or tune types—probabilistic. No two instances of a given category are ever exactly alike, especially across talkers. And very similar F0 contours could signal different categories when heard in different contexts. This probabilistic relationship, in turn, raises a critical theoretical question in comprehension: How do listeners arrive at a meaning intended by the talker despite the variability? A hegemonic view advocates a reductionist approach. That is, although prosodic production is messy, a listener can find a categorical distinction in the signal itself by removing or partialling out the variability. My lab's work tests an alternative hypothesis: a categorical distinction is not found in the signal itself, but results from an inference that listeners make based on the variable input (Kurumada & Roettger, 2021). In this talk, I will first discuss the idea of prosodic adaptation, in which listeners fine-tune their signal-meaning mapping according to the statistics unique to a current talker (Xie, Buxó-Lugo, & Kurumada, 2021). I will then discuss what would happen if there were no adaptation. Through a computational simulation of categorization of a question ("It's raining?") vs. a statement ("It's raining") in American English, as well as a perceptual experiment with autistic adolescents (Kurumada, Rivera, Allen, & Bennetto, 2024), I argue that adaptation is demonstrably critical for accurate and robust categorization of variable prosodic input.