

Continuity and the emergence of the discrete: Intonation and its meaning

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Phonological categories enable fast mapping from highly variable speech input to units that carry meaning, such as morphemes and words. While early theories modeled phone-level categories as discrete entities that are perceived categorically, current theories recognize categories as *gradient*, based on findings that listeners are sensitive to within-category variation. This talk addresses the discrete and/or gradient status of phonological categories in intonation, and the nature of the mapping between intonation and pragmatic meaning at the discourse level. I review two streams of work on American English intonation from my lab. First, my work with Jeremy Steffman shows intonational categories (pitch accents and edge tones) to be both discrete and gradient in the production of phrasal “tunes” and in their perceptual discrimination. It is possible to accommodate gradience within a traditional theory of phonological categories, but I argue for an alternative approach based on dynamical systems analysis, developed with Khalil Iskarous, where phonological categories and gradient phonetic variation are integrated in a computationally explicit and physiologically grounded model of pitch/F0. The second stream of research in my lab shows that gradience isn’t limited to phonological categories. Evidence from comprehension experiments shows discreteness and gradience in the pragmatic meaning distinctions associated with phrasal tunes, related to the interpretation of speech acts, scalar inference, mirativity, and information structure. I discuss how these findings may be treated in a dynamical systems analysis that links sound and meaning. Finally, and if time allows, I will discuss my recent work with Juan Pablo Vigneaux that examines the audio encoding of intonation in transformer-based conversational AI agents, to ask if AI agents, like humans, distinguish discrete and gradient intonational categories that are independent of lexical context and speaker voice.