Prosody in a musical context: Comparisons of emotional prosody in song and speech

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When people display musical behaviors, from tapping to a beat to formal concert performance, they add variation to the pitch and rhythmic categories that are the building blocks of music. We consider whether these variations constitute a "musical prosody": an abstract, rule-governed level of representation that is distinct from individualistic forms of musical expression and is shared by listeners. Palmer and Hutchins (2006) proposed functions of musical prosody that bear similarities to those proposed for language, including the segmentation of a continuous acoustic stream into its component units, conveying focus by highlighting items of relative importance (musical interpretation), and attributing emotional states to producers. Although the first two functions have been the topic of much research, less research has focused until recently on the role of emotional functions in music. The focus of this talk is on the role of musical prosody in marking emotional states, and whether those markers bear resemblance to markers of emotional prosody in speech. Similar to experimental studies of emotional prosody in speech, emotional prosody in music performance is typically measured in comparisons of performances by musicians who attempt to convey different emotional states for the same piece of (emotionally neutral) music.

We compared acoustic markers of emotional prosody in speech and in song produced by the same participants. Experienced singers produced emotionally neutral phrases in natural speech and in song conditions. Participants uttered each phrase with one of three emotions (neutral, happy, and sad). The speech rate was determined by the participants; the song conditions were preceded by a metronome that indicated an initial tempo. Participants' mean vocal intensity was higher in happy than in sad emotional intentions, both in the context of speech and song. Despite the controlled tempo of song and uncontrolled speech rate, mean duration of the utterances showed the same pattern across speech and song contexts: mean utterance duration was shorter (increased speech rate) for happy than for sad emotional intentions. The documented increases in intensity and rate for happy relative to sad emotions are consistent with theories of increased physiological arousal for positive-valence emotions. In contrast, acoustic frequency markers differed substantially with change in emotional states across speech and song contexts; both mean F0 and jitter (rapid fluctuations in F0) changed across emotional states in speech but not in song contexts, in which the singers' task requires the production of specific, sustained frequencies on each syllable. These findings suggest some commonalities in emotional prosody across speech and song contexts in acoustic markers that are less controlled by the segmental content.

References:

Palmer, C., & Hutchins, S. (2006). What is musical prosody? In *The psychology of learning and motivation,* vol 46 (Ed. B.H. Ross), pp.245-278. New York: Elsevier.