

## Review of “The Psychology of Learning and Motivation”

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IN THIS PAPER, Palmer and Hutchins ask the question, “What is Musical Prosody?” *Prosody* is originally defined as “the science or study of poetic meters and versification.” Does it make sense to talk about a feature such as prosody, well-known in linguistics for its relevance to speech perception but barely examined in relation to music cognition?

Yes, as it turns out.

Whenever we listen to a musical performance, we receive a wealth of information through our ears that goes beyond the notes and rhythms written in the pages. Each rendition of a musical piece is different because the musician may choose to vary the tempo, rhythm, frequency, or timbre while playing a passage. These variations are typically small alterations that still retain the overall categorical distinctions of the piece. This constitutes *musical expression*, which is also the phenomenon that the authors describe as “musical prosody,” to use a term amenable to speech recognition researchers.

Prosody is obligatory in most forms of music, argue Palmer and Hutchins. This is because, as in speech, prosody serves to convey meaningful information about the content, such as structure and emotion. Also, as in speech, a musical performance is tinged with the expressive intent of its performer, which is why understanding prosody is critical to the study of music cognition.

What, exactly, can prosody in music better help us comprehend? For one, prosodic cues serve to separate significant musical events from one another. This is best embodied as the *musical phrase*, a collected, meaningful set of events usually distinguished by salient elements at each boundary. Another feature in auditory communication is *prominence*, which is captured in musical prosody as acoustical stress, accents, and intonation. Prosodic cues also help musicians to coordinate instrumental signals with each other and play together. And finally, prosody also communicates a wide spectrum of emotion, from both the composers and the performers of a piece of music.

Because musical prosody imparts such a wealth of information to a listener, Palmer and Hutchins suggest that there are certain rules that govern the relationship between musical structure and musical prosody. These rules manifest as special notations in the music that provoke a certain type of expressive response in the performer, such as staccato markings for shorter notes or *ritard.* titles for decelerated passages. Such rules are significant because too much interpretation would hamper a listener's cognition of the intended piece.

One area that could have been better addressed by the authors is the effect of non-acoustical transformations on musical prosody. Today, live music is a less common form of musical perception. Almost all the music a person hears is time-shifted, recorded and reproduced for the listener. In all professionally-produced music, engineers and producers artistically make digital changes to the signal to convey different types of information. This is most apparent in genres such as electronica and other synthesizer-heavy categories. Effects such as digital delays, pitch shifts, and frequency warping all serve an artistic and communicative purpose, which I believe also warrant a few chapters in a serious study of musical prosody.