

Perceptual Constancy of Musical Instrument Timbres; Generalizing Timbre Knowledge Across Registers

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The word "timbre" is often used to refer to not a single event but the multitude of possible sounds associated with a source (for example, "the timbre of the violin"). The psychological attribute of sounds that makes this possible is sometimes termed *perceptual constancy*: that is, in learning the sound of an instrument, listeners appear to apprehend and learn characteristics that remain invariant over many transformations (different pitches, loudness, expressive inflections, etc.). This study focuses on how timbre learning occurs with exposure to different pitches and the importance of hearing relationships among the timbres of different pitches. Naive listeners learned to distinguish oboe and English horn on the basis of a set of five common notes. Some were trained with the five sample notes in isolation (S-listeners), others with all five notes always sounding in succession (M-listeners) in order to assess the importance of hearing timbres relationally. Successful learning of an instrument was measured by how accurately listeners identified novel notes (pitches not presented in a prior training period). S-listeners showed good performance at identifying the sample notes in later testing but were worse (by 15%) on novel notes from a remote register. In contrast, M-listeners were equally proficient at their sample notes and the remote novel notes. This suggests that making comparisons during learning allows listeners to abstract information from one register to another. The two listeners showed the same amount of superiority for identification of sample notes over novel notes from the same register as the sample notes. Thus in a local register, identification may have more to do with judgments of similarity to memorized sample notes than making abstractions.



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