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# Quantifying the Influence of Musical Features on Perceptual Similarity of Popular Songs

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## Abstract

Which auditory features drive listeners' everyday perception of their favorite music? To test this, we created a novel corpus of covers of 50 popular songs from 2008 to 2019, capturing a wide variety of genres and styles. Cover versions of popular songs offer a rich space of natural musical stimuli that match original songs on some dimensions (e.g., lyrics) but not others (e.g., genre). We pseudo-randomly selected one cover per song and asked subjects to rate similarity between clips of original and cover versions. We measured differences between originals and covers in terms of tempo, key, gender, timbre (MFCCs), and genre. While all of the features had significant relationships with similarity ratings, similarity ratings were driven most strongly by tempo, timbre, and genre ( $R^2 = 0.5076$ ). Our uniquely naturalistic and holistic approach links listeners' everyday, subjective impressions of popular music with fine-grained acoustic features.