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Sorting Carnātic melodies based on rāgams, melody type, and expertise using DiSTATIS.

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In Raman et al.'s (2020) study, sorting tasks were used successfully to nonverbally compare experts' and non-experts' perception of similarity of piano melodies by Bach, Mozart, and Beethoven, which were either MIDI-generated or recorded performances played by 4 pianists. Here, we applied the sorting technique to South Indian classical (Carnātic) music to investigate the effects of melody type and music training on perception of rāgam (modal scale) similarities. We chose 4 popular rāgams, wherein each rāgam of a pair of rāgams (Māyāmāḷavagowḷai-Pantuvarāḷi, Kīravāṇi-Simhēndramadyamam) differed from the other by only 1 note (F or F$^{\#}$). We then varied melody type by choosing excerpts from 3 popular kritis (songs) plus 3 improvised kalpana-swaram segments (solfèges) in each rāgam played in tempo, to generate 24 total excerpts. All excerpts were played on the saxophone. Participants sorted excerpts freely into any number of clusters. We divided participants into three groups based on music training. To analyze the data, we applied DiSTATIS (Abdi et al., 2012), an adaptation of multi-dimensional scaling specifically adapted to reveal the perceived dissimilarity among items, as well as to investigate group differences. The results showed an effect of rāgam; participants were able to strongly differentiate among the 4 rāgams. Participants' sorting decisions were also strongly influenced by melody type: Excerpts of kritis were clustered closely whereas excerpts of kalpana swarams were grouped together. Finally, experience effects were strong with teachers performing differently from the students and aficionados.