

# From hearing to feeling: Quantifying music-emotion and examining the different processing patterns in children with special educational needs (SEN)

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## Abstract

Music-emotion recognition, the ability to perceive emotions in music, has emerged as a means of understanding emotion beyond verbal language, specifically for individuals with special educational needs (SEN). However, there has been little focus on delineating emotion through quantified music features for a systematic comparison between different SEN groups. This study identified specific musical features and examined the different music-emotion processing patterns in 3-to 10-year-old Chinese children with and without SEN. Participants completed a forced-choice task by identifying four emotions involving happiness, sadness, anger, and fear from Western classical music. Through integrating a biologically-inspired filterbank into music information retrieval analysis, the result revealed that musical features, such as spectral density, contributed to human emotional recognition. In addition, children with SEN exhibited distinct confusion patterns in some emotion pairs compared to their typically developing counterparts. These findings demonstrated a novel approach to investigating musical-emotional recognition across the developmental span.