RECOGNISING THE COMPOSITION STYLE BY THEMES SELECTED FROM THE "SONATA" REPERTOIRE: A COMPARISON BETWEEN THE MATHEMATICAL MODELING AND THE EXPERIMENTAL PSYCHOLOGICAL RESULTS

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A great number of studies have suggested the possibility of building up a mathematical model, which represents the distance between musical fragments. The most significant works have been focused on melodic similarity, using mathematical functions. Another great number of psychological studies have suggested the existence of an identification process of salient cues like distinctive musical features picked up during the listening. The aim of this work is to compare the results of a mathematical model of musical similarity with the psychological experimental findings. Sixty musical themes (10 and 12 seconds long) were selected from the Sonatas for piano solo, composed by Mozart, Beethoven and Clementi. The musical excerpts were codified into five multivariate numerical arrays, paying attention to encode all significant parameters of each sequence. The distance between musical sequences was calculated using the cross-correlation function. Regarding the psychological experiment, three tasks were planned: 1) familiarization with the sequences; 2) classification of the same musical excerpts in two appropriate categories (X or Y) and 3) evaluation of their "quality of representation" on a scale from 1 to 10. The subjects were invited to classify the sequences as belonging to different categories without any information about the author's name or the pieces' composition style. Three series of forty sequences (i.e. twenty from one composer and twenty from another one) were presented to sixty naïve listeners in a random order. The cluster analysis theory allows us to classify both the mathematical and psychological findings. The results show that: (i) the naïve listeners classify the musical sequences abstracting salient features in relation to musical style differentiations and then (ii) they assess the representativeness' degree to each sequence, confirming the results of the mathematical model.

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