

THE EMPIRICAL EVALUATION OF A MATHEMATICAL MODEL FOR INNER METRIC ANALYSIS

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Background

This paper introduces an experimental research approach on the relationship between a musical composition and its performance exemplified on *metric structures*.

Aims

A theoretic notion of *metric coherence* is to be tested empirically by applying it to analyses as well as within listening experiments. The latter use performances shaped on the basis of metric analyses in order to investigate the influence of different degrees of metric coherence on the perception of these metric structures within musical performances.

Method

The RUBATO-Workstation models the *transformative process* from the score into the physical reality of sounds on the basis of analytical data and the method of applying analytical weights in order to shape the performance. The notion of metric coherence is based upon the model of *inner* metric analysis implemented in RUBATO, which studies the metric structure of the notes without considering the time signature and bar lines. In order to gain a description in how far metric weights might help to shape a performance that elucidates the metric structure listening experiments have been conducted. Drum rhythms were played with various structures of *accentuation*, arising from metric weights of different degrees of coherence.

Results

The notion of metric coherence gives surprising insights into the understanding of metric architectures of compositions. A higher degree of coherence is detected within those works, which are typical representations of the accent scheme given by the time signature. Furthermore, metric weights of a higher degree of coherence led to a more convincing interpretation regarding the question in how far the metric structure was expressed properly.

Conclusions

The suggested music-theoretic notion of metric coherence is suitable for the description of the metricity of compositions and for transferring structural aspects to listeners.