PERFORMED PERCEPTION: WALKING THE METER OF COMPUTER-CONTROLLED PIANO MUSIC

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Abstract

A new method for empirical research on rhythmical timing synchronisation through human walking is developed and tested.

Background

Empirical rhythm research usually works with highly discriminated perceptive and motoric preferences, like tapping a finger or a foot to a metronome click while sitting in a chair, e.g. in investigations on a „biological clock". This leads to certain results, but cannot explain how and why our movements are connected to the context of sounding music.

On the other hand, music-educational methods like „eurythmics", dealing with large space body movement like walking the meter on complex sounding structures have led pupils to better knowledge on musical rhythm and timing for over 100 years (Methode Jaques-Dalcroze) with great sucess – even if the pupils do not play a musical instrument! How can this work?

Aims

This methodological exploration included the development of a wireless technological set and a setting for „holistic" rhythm investigations, focussing the senso-motoric processes of human locomotion as an „interface" for research in musical timing perception. We have tested this method and the set empirically in a laboratorial situation by walking the meter on computer-controlled sounding piano-music. The influence of „original-" (strings) and electro- (replicat) acoustical sounding stimulation on the temporal synchrony of the walking has been compared exemplarily.

Method

Subjects of different ages and musical skills were asked in single sessions to walk the meter around a computer-controlled Yamaha grand-piano. Several stimuli were given by automatic performance of the „real" instrument and of its electroacoustical replication (speakers hidden in the piano).

The temporal structure of the gait is indicated through piezomechanical shoes and documentated on hard-disc recording (Ch1), simultanous to the re-recording of the acoustical stimulation at the subject's ears (Ch2). This documentation level is reduced by „beat-tracking" on HLSD-Scores and both timing structure channels are compared by IOI-analysis.

Results

Significant intra-individual constancies in the syncronization-strategy and high-significant inter-individual negative asynchronies (50 to 200msec) were observed.

Subjects reproduced their individual synchronisation „signatures".

Breaks never induced directly nor delayed tempo changes. Trying to keep the tempo after the stimulus-stops, in general a slight accelerando appears.

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Actively trained musicians performed more equal synchronisations than musical laymen.

Different kind of sound-reproducing systems did not lead to significant differences in the synchronisation through the walking.

Conclusions

The recording technology used works precisely (±2 msec) and is now ready for further use in the „field“, e.g. of dance education, music therapy or ethnomusical research, etc.

Observed asynchronies coincide very well with the known results in biopsychological rhythm research, which implicates that this investigation can also fit into the current discourses on musical cognition.

Human individuality seems to appear in this study even through a „simple“ everyday movement like walking the meter!

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