Perception and production of short western musical rhythms

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Background
Recently, an index that measures the variability of successive durations (nPVI) has been applied for the analysis of music scores. It has revealed that such serial characteristic of temporal information in music differs cross-culturally (Patel & Daniele, 2003, etc.). More interestingly, this difference was in line with the difference found in the speech rhythm of the mother tongue.

Aims
The nPVI measures a serial surface level of durational contrast. However, most rhythms in western tonal music are structured in a hierarchical manner. Therefore, it is interesting to see if a hierarchical measure accounts even more for cross-cultural differences in the perception and production of musical rhythms.

Method
We used short rhythms consisting of three intervals. Eighteen Dutch and 18 Japanese pianists participated in experiments, which consisted of a rhythm perception task (identification), a rhythm production task (performance from scores) and a familiarity judgement task. We applied the serial index (nPVI) as well as the hierarchical index (syncopation measure by Longuet-Higgins & LEE, 1982) of the rhythmic structure for analysing data.

Results
Results confirmed the systematic cultural difference only in the rhythm production of syncopated rhythms. Dutch pianists tended to perform the second duration longer, while Japanese pianists tended to produce the last duration longer. Interestingly, a related tendency has reported in the perception of speech rhythms. A positive correlation has found between the syncopation index of the rhythm and the amount of diversity in processing musical rhythm. The variability in performing tasks within and between individuals became significant when the task involved more complex syncopations.

Conclusions
Within the rhythms we used, the cultural differences emerge only for patterns that are more complex in terms of their hierarchical structure. This cultural tendency corresponds with its counterpart in speech rhythm.

References

Key words: Cross-cultural study, Rhythm production, Rhythm perception

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