Investigating the Effect of Tempo on Non-Isochronous Subdivisions in Brazilian Samba

Mari Romarheim Haugen

RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, Department of Musicology, University of Oslo, Norway

INTRODUCTION

Previous rhythm studies have revealed that a non-isochronous (uneven) duration pattern at the level of sixteenth notes is a prominent feature of samba.¹

The present study investigates the influence of tempo on this non-isochronous duration pattern in a performed samba groove.

METHOD

A professional percussionist played a samba groove on a hand drum (pandeiro) at three different tempi: fast (133 bpm), preferred (100 bpm), and slow (69 bpm).

The temporal positions of the played sixteenth notes were determined using an onset detection function in the MIRToolbox.² The inter-onset-intervals between all the detected sixteenth notes (durations), measured in milliseconds and percent, were calculated. Mean first, second, third, and fourth sixteenth note durations for each tempo were calculated.

Differences between mean durations were tested using repeated measures ANOVAs.

### RESULTS

- **Duration patterns:** The analysis showed that all the sixteenth notes were significantly different in all tempi, suggesting a medium/long–short–medium/short–long duration pattern in all tempi.

- **Influence of tempo:** The short second sixteenth note becomes relatively shorter and the long fourth sixteenth note becomes relatively longer as the tempo increases.

### CONCLUSIONS

- The non-isochronous duration pattern must become more pronounced when tempo increases in order to maintain the specific samba ‘feel.’

- The subdivision is a pattern of duration categories rather than fixed percentages.

- Fine-meshed rhythmical patterns can be perceived and reproduced with high accuracy, depending on musical context.

### FUTURE WORK

Future work will include more recordings in order to be able to draw more general conclusions.

---