Lígia Silva, Michelle Phillips and José Oliveira Martins
Faculty of Arts and Humanities; Centre for Interdisciplinary Studies (CEIS20), University of Coimbra

The Influence of Tonality, Musical Tempo and Individual Level of Musical Sophistication on Listeners' Estimates of Musical Duration

KEYWORDS musical tempo; duration estimation; time perception; tonality; musical sophistication

Music listening affects time perception. A number of studies suggest that musical, individual, conventional, and environmental factors may cause this influence. In the present study, two experiments investigated the effect of musical factors (tonality and tempo) and individual factors (listener's level of musical sophistication) on subjective estimates of duration. Participants estimated the duration of different versions of musical stimuli under retrospective and prospective conditions. Stimuli varied in tonality and tempo, while other musical parameters remained constant. Estimates were made using written estimates of minutes and seconds (Experiment 1) and reproducing the perceived duration (Experiment 2). Results showed no effect of tonality or musical sophistication on duration estimates. A faster tempo led to longer estimates, in the prospective condition, in Experiment 2. In conclusion, findings suggest that isolated changes in tonality and differences in musical sophistication do not affect estimates, and musical tempo changes may influence estimates under specific conditions.

LÍGIA SILVA
Ligia is currently a Ph.D. student in Art Studies at the University of Coimbra, studying the effects of music listening on time perception. Flutist and saxophonist, with extensive work as a music performer. Holds bachelor degrees in both classical and jazz music, and a master degree in music education. Received a merit grant from the University of Coimbra and a 3rd prize in the 3-min thesis competition. After over a decade of experience as a music teacher is now a full-time researcher at the Centre for Interdisciplinary Studies (CEIS20) under a grant from the Foundation for Science and Technology (FCT).

MICHELLE PHILLIPS
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JOSÉ OLIVEIRA MARTINS
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Marc Vidal and Nádia Moura
IPEM, Ghent University; Dept. of Statistics and Institute of Mathematics, Universidad de Granada; Dept. of Neurology, Max Planck Institute for Human Cognitive and Brain Sciences

Relationships of prediction and alignment between musicians' movement and rhythmical and tonal contexts of music

KEYWORDS Sensorimotor prediction; Music-related motion; Auditory modeling; Involuntary micromotion; Granger causality

Music performance requires high levels of motor control to express musical intentions. In this study, we analysed motion and audio data of 20 expert saxophone players performing four musical fragments varying in the degree of technical difficulty. Using a computational model of the auditory periphery, we extracted emergent acoustical properties of sound to inference critical cognitive patterns of music processing and relate them to motion data. Results showed that knee flexion is causally linked to real-time tone expectations as measured by our auditory model and correlated to rhythmical density, a likelihood measure on rhythmic events that relies on the roughness properties of the sound. These findings underline the robustness of body movement in musical performance, providing valuable insights for the understanding of musical expression and development of motor learning cues.

MARC VIDAL
Marc Vidal holds a bachelor's degree in music and communications. He received his master's degree in mathematical statistics from the University of Granada. His research revolves around mathematical and applied statistics and music neuroscience. In particular, he is interested in modelling biosignals (EEG, fMRI, pupillometry) to uncover the neuromodulatory effects of motor intention during music performance tasks.

NÁDIA MOURA
Nádia Moura is a doctoral student at Universidade Católica Portuguesa and Research Centre in Science and Technology of the Arts (FCT fellowship). She holds a Master's in Music Teaching (2019) from the same institution and a Bachelor's in Music: Saxophone Performance (2017) from University of Aveiro. Her ongoing research focuses on the analysis of expressiveness and body language in saxophone performance using multimodal datasets and 3D motion capture. She has conducted research as a visiting student at RITMO (Oslo) and IPEM (Ghent). She has participated in several conferences and published in PLOS ONE and npj Science of Learning, among others.