

INTRODUCTION

Background

- People's strongest musical experiences are most often at live concerts (Lamont, 2011).
- Audience members physiology can synchronise during a concert (Czepiel et al., 2021), and greater brainwave synchrony appears to be related to moments of pleasure (Chabin et al., 2022).
- How does neurophysiological activity during a concert relate to the structural, dynamic, and emotional changes in the music?

Current study

- A live performance was held at the McMaster University LIVELab featuring a high-level, professional pianist from the Canadian Chopin Society.
- A 40-minute set was performed to a sold-out audience, including pieces from Scarlatti, Schuman, Prokofiev, and Chopin.
- The performers played on a Yamaha Disklavier piano.

AIMS

- To explore how audience members neurophysiological activity changes during highly musically dynamic and expressive concerts.



Figure 1: Eric Guo performing at the McMaster LIVELab on October 21, 2022

METHODS

Participants

- N=20 (13F), recruited from ticket holders.

Stimuli

- Scarlatti – Sonata in D Major, K. 45, Sonata in D minor, K. 213
- Schumann – Novelette No. 8 in F Sharp Minor, Op.21
- Prokofiev – Sonata No.3 in A minor, Op. 28
- Chopin – Etude Op.25, No.1 “Aeolian Harp” in A Flat Major, Scherzo No. 2 in B flat Minor, Op. 31

Measures

Background questionnaires

Electrophysiology

Ratings after each piece

Online follow up

Musicality (Gold-MSI), musical reward sensitivity (BMRQ) personality (TIPI), music preferences (STOMP).

EEG, GSR, and HR.

Enjoyment, emotional intensity, familiarity, and connectedness with the audience and with the performer on 7-point Likert scales.

Continuous ratings of valence and arousal.



Figure 2: pre-concert setting up and demonstration of ratings task.

PLANNED ANALYSIS

- Correlations between rated emotions and EEG alpha power, HR and GSR.
- Compare EEG alpha power during highly expressive moments and less expressive moments in the performances.
- Compare auditory features and subjective ratings in predicting neurophysiological synchronisation between audience members, considering distinctions between auditory and emotional processing (Wollman et al., 2020), and engagement and enjoyment of musical experiences (Kaneshiro et al., 2020).
 - Music features:
 - Spectral flux, brightness, loudness/intensity, pitch height, tempo (flux)
- Individual variability.

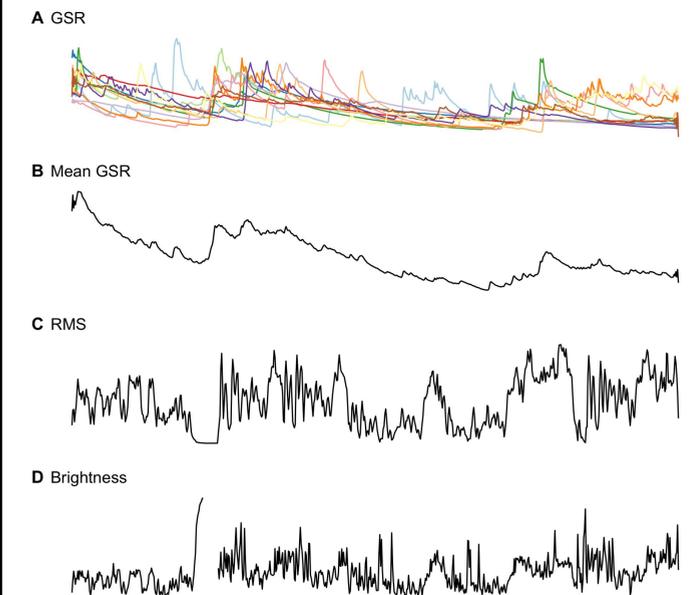


Figure 3: GSR responses and audio features from the performance of Chopin's Etude and Scherzo. A. Standardised (non de-trended) GSR responses from participants, B. mean GSR signal, C. RMS and D. Brightness time series. Features extracted using the MIR Toolbox for MATLAB.

REFERENCES

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