INTRODUCTION

Artistic deviation in a musical performance
- Musical performers manipulate acoustical features (e.g., timing, dynamics) to make their performances expressive.
  (Seashore, 1938/1967; Rapp, 1990, 1996)
- Performers also manipulate their body movement.
  (Davidson, 2002)

The relationship between two expressive parameters:
Acoustical and movement manipulations
- Clarinetists raised fingers higher in playing the melodies at fast rates.
  (Palmer, Carter, Koopmans, & Loehr, 2007)
- Time lags exist between the pianist’s postural change and the dynamic expression in playing a Romantic piece.
  - In playing a slower piece, pianists moved ‘before’ a long tone in slower sections and ‘after’ a long tone in faster sections.
  - In playing a faster piece, the pianists moved in synchronization with the temporal manipulation.
  (Shoda & Adachi, 2009)

The relationship between the postural change and the dynamic expression was not fully studied.

Purpose
- To clarify the time-series relationship between a pianist’s postural change and the dynamic expression when playing a Romantic piece.

Hypotheses
- Time lags would exist between these parameters.

METHOD

Participants
Six female undergraduates (majored in piano performance) -19-24 (M = 21.5, SD = 1.64) years old

Musical pieces (Romantic pieces)
Either a favorite piece or one of the suggested pieces of the following Romantic composers:
Schubert, Burgmüller, Schumann, Brahms, Chopin

The pianists have practiced the piece for more than one year.

Procedure
1. Prior to the experiment, the pianists were familiarized with a YAMAHA Clavinova (CLP-170).
2. The four pieces were recorded in a random order (one of which was the target piece). They were instructed to perform them expressively.
3. After the performances, an interview was conducted with each pianist to obtain her interpretation of the piece.

Temporal unit
- For each piece, the duration was measured per temporal unit (appropriate grouping of notes).

Body movement (Postural change, rad/s)
1. Measuring the 3-dimensional coordinates (xyz-coordinates) at the rate of 30.00 frames/sec for the head and the hip.
2. Calculating the posture angle \( \theta \) (rad) for each frame.
3. Dividing the value by the duration per temporal unit - postural change (rad/s)

Dynamics (Maximal intensity, dBA)
- A-weighted sound pressure level (SPL(A)) was measured per 3.00 ms by using 1/3 octave band real time analyzer (RION, SA-29).
- As a parameter of dynamics, the SPL(A) within each temporal unit was specified in hitting the loudest keystroke. - maximal intensity (dBA)

Outcome example

Results
- +2 time lag

Discussion
The results indicated that the pianists manipulate their body movement according to the dynamic expression (i.e., crescendo/decrescendo). In playing in the crescendo sections, the reason why pianists move either before or in phase with the intensified tone still remains unexplained. However, one possible reason is that the performers may manipulate their body movement in making the first tone softer to achieve crescendo effectively.

Further Questions
- Is the outcome of this study replicable, or specific to the Romantic pieces?
- Does a specialist training (e.g., college degree program) influence how the expert pianist moves his or her body?

References

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