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Piano performance assessment: Video feedback and the Quality Assessment in Music Performance Inventory (QAMPI)

Megumi Masaki[1], Peter Hechler[2], Shannon Gadbois[3], and George Waddell[1]

[1] School of Music, Brandon University, Canada
[2] Faculty of Science, Brandon University, Canada
[3] Department of Psychology, Brandon University, Canada

This study assesses the validity of a new self-report measure of piano performance quality, the *Quality Assessment in Music Performance Inventory* (QAMPI), and the adaptability of sport video analysis methods to piano performance evaluation. Piano students from Brandon University's School of Music (n=21) volunteered to have real rehearsal and concert performances video recorded. Students employed QAMPI before and while watching the video recording to assess the perceived quality of their concert performance compared with their individual performance potential established in the rehearsal. An expert also employed QAMPI to evaluate each student's concert piano performance quality after reviewing the rehearsal and concert video recordings. Initial results indicate that piano students' assessment of their performance quality measured by QAMPI before and while watching the video recording differ substantially and that the students' self-evaluation while watching the performance video recording is closer to that of expert assessment. Cronbach's alpha demonstrated good internal consistency. These initial results indicate that QAMPI provides a consistent measure of music performance elements using video feedback and insight into pianists' self-perception of performance quality.

Keywords: music performance assessment; QAMPI; video feedback; performance perception; music performance anxiety

Sport studies have established the efficacy of video feedback for training, performance analysis, and understanding (Wang and Parameswaran 2004, Cassidy *et. al.* 2006, O'Donoghue 2006) and practical aspects for systematic

video recording for seated athletes (Frossard *et. al.* 2006). Video recordings of music performances are also increasingly common means of assessment for acceptance to training institutions, competitions, and music performance research. However, research has shown that music performance quality assessment methods are problematic, often with unreliable measuring schemes (Thompson and Williamon 2003). Researchers of music performance evaluation regard rating scales to improve the reliability of judgment (Okay 2010). Little information is available in the literature about the practical aspects of systematic video recording of pianists' performance. Considering the significant similarities that exist between sports and music performance, this initial study has two aims: (1) to determine the adaptability of sports performance video recording setup and assessment methods to pianist performance in real practice and concert settings and (2) to assess the feasibility of a new self-report *Quality Assessment in Music Performance Inventory* (QAMPI) to measure elements of piano performance quality and to identify possible differences in pianists' self-perception of performance quality without and with video feedback.

METHOD

Participants

Twenty one Brandon University undergraduate and graduate piano students (11 female, 10 male; mean age=21.0 years, SD=2.32) volunteered to participated in the study. A professional pianist with extensive experience evaluating at the university level was the expert assessor and a research assistant with professional recording experience positioned and operated the audio and video recording equipment.

Materials

Rehearsal and concert performances were video recorded with two compact Sony DCR-SR82 video camcorders on tripods and audio recorded using two B&K cardioid condenser microphones in an X-Y stereo arrangement suspended above the stage, recording to a Roland CD-2 CF/CD. A new self-report measure survey *Quality Assessment in Music Performance Inventory* (QAMPI) was developed so that eight different items of performance quality in concert could be compared with rehearsal performance quality. Each of the eight performance categories was scored using a 7-point Likert-type scale ranging from -3 (much worse) to 3 (much better) (see Table 1).

Table 1. QAMPI form. Directions: Compare your concert performance with your rehearsal performance by completing two QAMPI forms. One after your concert performance *before* watching your video and the second *while* watching your concert performance video. Circle the appropriate number to the right of each category.

	Much worse	*Worse*	*A bit worse*	*Same as in practice*	*A bit better*	*Better*	*Much better*
Memory control	-3	-2	-1	0	1	2	3
Note accuracy	-3	-2	-1	0	1	2	3
Control of tempo	-3	-2	-1	0	1	2	3
Rhythmic accuracy	-3	-2	-1	0	1	2	3
Articulation accuracy	-3	-2	-1	0	1	2	3
Dynamic accuracy	-3	-2	-1	0	1	2	3
Tone quality	-3	-2	-1	0	1	2	3
Expressiveness	-3	-2	-1	0	1	2	3

Procedure

Based on models of procedure and bi-planar video-camera setup adapted from sports research on seated athletes (Frossard *et al.* 2006), various camera positions were tested for optimal capture without intrusion on the pianist. The two cameras were set at the back of the hall approximately 2 m left and right of the meridian, 12 m from and 3 m higher than the keyboard to capture full-body lateral and frontal views of the students, piano keyboard, and pedals. These positions also allowed camera placement where jurors would normally be seated in recital and competition settings. One rehearsal session and one concert performance for each student was video and audio recorded for sound quality control. As these were real concert performances of university piano students in different years, the duration of the recordings between participants varied from 10 minutes to 50 minutes. Each participant completed the QAMPI form immediately after their concert performances before watching and then again while reviewing the video recordings. The expert completed the QAMPI after watching the practice and while reviewing the performance video of each participant.

RESULTS

As the eight items included in QAMPI measure separate aspects of the same underlying construct of performance quality, Cronbach's alpha was calculated

Table 1. Correlation coefficients (Spearman's rho).

	QAMPI self without video	*QAMPI self with video*	*QAMPI expert with video*
QAMPI self without video	1.00	0.87*	0.79*
QAMPI self with video	-	1.00	0.94*
QAMPI expert with video	-	-	1.00

Note. * p<0.01.

as an estimate of QAMPI's internal consistency. The computation was completed for the eight items once without use of video analysis and once while using video analysis. Cronbach's alpha for performers' self assessment without video (n=21) was α=0.96, while α=0.95 for the self assessment with video (n=21).

For each of the 21 concert performances, QAMPI was applied three times: self assessment without video, self assessment with video, and expert assessment with video. For each of these applications the respective sum score was calculated by adding up the eight item scores ranging from -3 to +3. Table 2 shows the correlation coefficients for these QAMPI sum scores.

This demonstrates a particularly high correlation (0.94) between the performer's self assessment with video and the expert's assessment with video. The graphical representation of this is shown in Figure 1 (left panel).

The lowest correlation (0.79) was found between the performer's self assessment without video and the expert's assessment with video, which is shown in Figure 1 (right panel). The correlation between the performer's self assessment without and with video (0.87) is shown in Figure 2.

DISCUSSION

The preliminary data shows evidence of good internal consistency of the QAMPI scale. The high correlation between self assessment during video feedback and expert assessment are an indication of the validity of QAMPI. Further validation of these data should be explored with an expanded sample of students and experts and by a comparison of QAMPI results with an external measure of performance quality such as their recital grade.

The positioning of cameras for the video recording of pianists adapted from studies of seated athletes in competition proved useful in capturing analyzable bi-planar visual and sound representations of their performances. Examining the interface between software, technology, and computational analysis of sport performance for adaptation to assess and understand piano

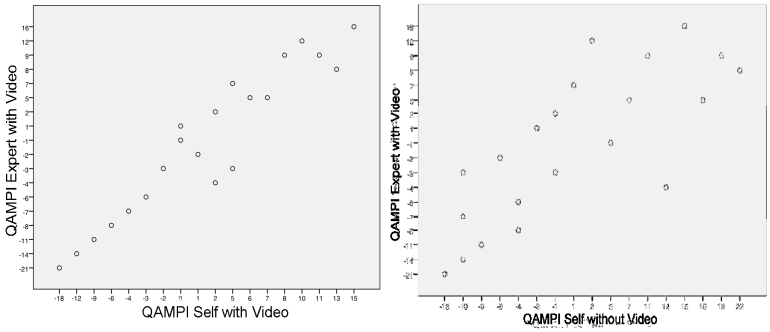

Figure 1. Scatter plots showing self assessment with and expert assessment with video analysis (left panel) and self assessment without and expert assessment with video analysis (right panel).

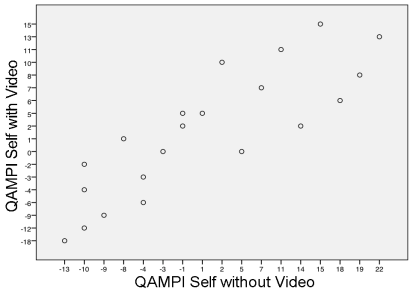

Figure 2. Scatter plot showing self assessment without and with video analysis.

performance quality could also be beneficial for training and performance enhancement.

QAMPI is a tool that allows pianists to rate their concert performance against their previous rehearsal performance. The main distinction between both concert and rehearsal conditions are different levels of performance anxiety. Further QAMPI studies with an increased sample of pianists might show how different aspects of performance are influenced by performance anxiety. As the use of video analysis together with QAMPI substantially increases the correlation with expert assessment, it enables the performer to judge the performance quality more objectively. Whether differences between pianists' self-perceived performance quality measured by QAMPI without and with video feedback can predict performance success, manage performance anxiety, or ultimately enhance effectiveness of training to achieve desired performance outcome warrants further exploration.

Address for correspondence

Megumi Masaki, School of Music, Brandon University, 270 18th Street, Brandon University, Brandon, Manitoba R7A 6A9, Canada; *Email:* masakim@brandonu.ca

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