

June 5, 2023
Keio University

Scientific experiments led by national champion Tsugaru shamisen performer reveal cross-cultural role of vision in music competition evaluation

A research team led by Gakuto Chiba and Yuto Ozaki, PhD students at the Graduate School of Media and Governance, Keio University, along with their advisor, Associate Professor Patrick Savage (Faculty of Environment and Information Studies), and co-researcher, Associate Professor Shinya Fujii (Faculty of Environment and Information Studies), conducted the 1st fully published Registered Report in the field of music studies and published their research paper in the journal *Collabra: Psychology* on May 22, 2023. The team conducted an online experiment in which 155 Japanese participants were asked to judge the winner of a classical piano and Tsugaru shamisen competition by designing an experiment that controlled for quality (1st-vs. 2nd-placed, 1st-vs. low-ranked) and video viewing conditions (visual vs. audio only) among the performers to study which information dominates in evaluating performance in music. The results showed an interaction between the relative quality of the performers and the relative influence of visual and audio information, and this interaction was found to be general across cultures. On the other hand, the results also showed that visual information dominated the judgment of piano performance among upper ranks, and audio dominated the judgment of Tsugaru shamisen performance between upper and lower ranks, suggesting that cultural factors affect the balance between visual and auditory judgments in musical performance.

1. Main Points of Research

- Cross-modal music studies beyond Western subjects
- Sight vs. sound effects in judgment of musical performance depend on the relative quality of the performers
- The interaction is general across cultures
- The precise balance between sight vs. sound judgments of musical performance also depends on cultural factors

2. Background of Research

Musical performance is supposed to be evaluated primarily by how it sounds, but at least some studies show that visual information can play a stronger role. However, whether this phenomenon applies generally to music competitions or is restricted to specific repertoires or contexts is disputed. This debate drew the attention of lead author Gakuto Chiba, who as a national Tsugaru shamisen champion had learned the importance of auditory information from Tsugaru shamisen's historical origins as an instrument played by the blind and the fact that its techniques are passed on through oral traditions by his sensei, Kozan Kanno. The team focuses on testing the generalizability of sight vs. sound effects by replicating previous studies of classical piano competitions with Japanese participants, while also expanding the same paradigm by using new examples from competitions of a traditional Japanese folk musical instrument: the Tsugaru shamisen. To avoid potential biases that may have influenced previous debate on this topic, the researchers chose for the first time in the field of music studies to use the “Registered Report” format where research hypotheses and analysis methods are peer-reviewed and accepted in principle *before* data are collected.



Photo 1: Lead author and national champion Gakuto Chiba plays the Tsugaru shamisen (津軽三味線), a Japanese instrument that traditionally accompanies folk songs. Photograph © Takada Photography; used with permission.

3. Content of Research and Results

For both classical piano and Tsugaru shamisen, the team asked participants via online experiments to choose the winner between the 1st- and 2nd-place performers in 5 competitions and the 1st-place and low-ranking performers in 5 competitions (i.e., 40 performers total from 10 piano and 10 shamisen competitions) based on 6-second excerpts containing only video or only audio. Chiba writes, "I was able to take advantage of my programming studies at Shonan Fujisawa Campus (SFC) to collect data from 155 online experiment participants despite the challenges of the coronavirus pandemic."

From this data, the co-first author Ozaki analyzed the ranking gap of two performers as a proxy of the variance in their performance quality (High-variance and Low-variance) and stimulus domain (Audio-only vs. Visual-only) as the independent variables, and the percentage of participants correctly choosing the 1st-placed performer as the dependent variable (Fig. 1). The analyses confirmed interaction effects between audio/visual modality and variance in performer quality in both piano and Tsugaru shamisen. Also, they confirmed that visuals dominate in the evaluation of low variance in performer quality (1st vs. 2nd place) for the piano condition and that audio dominates in the evaluation of high variance in performance quality (1st vs. low rank) for the Tsugaru shamisen condition.

On the other hand, the analyses did not confirm sight vs. sound effects for the high-variance condition with piano or the low-variance condition with Tsugaru shamisen. Ozaki, who led the statistical analysis, said, "By revamping the past paradigm with a cross-cultural perspective, our study could quantitatively show that the role played by audio and visual in performance evaluation is not necessarily the same uniformly across cultures."

4. Future Developments

These results suggest that, while the general phenomenon of cross-modal interactions is cross-culturally general, the specific ways in which they manifest vary depending on the cultural and performance context. Future works should explore qualitative studies of the effects of different musical traditions and histories and micro-level interactions in musical performance. Chiba and Savage (also an award-winning performer of Japanese folk music) say "We are excited to apply these research findings to our own performances and to hone our own performance skills, but we also want to study the generality and diversity of all music to support and promote musical diversity throughout the world." The study adds an important new cross-modal (audio/visual) dimension to an emerging body of cross-cultural music cognition, providing further evidence for the complex interplay between cross-culturally universal and culturally-dependent aspects of music cognition in the important applied domain of evaluating musical performance.

5. Special notes

- Dr. Savage and Fujii: Grant-in-Aid no. 19KK0064 and 20H04092 from the Japan Society for the Promotion of Science
- Dr. Savage: Startup grants from Keio University (Keio Global Research Institute, Keio Research Institute at SFC, and Keio Gijuku Academic Development Funds)

Details of Journal Article

Title: Sight vs. sound judgments of music performance depend on relative performer quality: Cross-cultural evidence from classical piano and Tsugaru shamisen competitions

Authors: Gakuto Chiba*, Yuto Ozaki*, Shinya Fujii, Patrick E. Savage

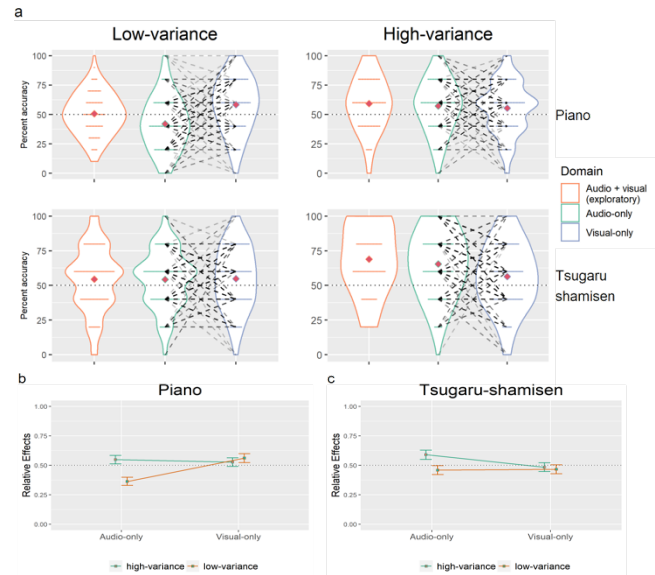


Figure 2: The top figure (a) shows violin plots of the full data ($n = 155$ participants for the audio-only and visual-only data) for the dependent variable of % correctly choosing the 1st-placed performer in a two-choice forced choice task. Red diamonds indicate mean values. Dashed lines indicate paired data from the same participant. The bottom two figures show the interaction effect of relative effects of piano (b) and Tsugaru-shamisen (c), and the bars are 95% confidence intervals based on the ANOVA-type statistics. Dashed lines ($q = 0.5$) indicate there is no effect.

* Equal contribution

Keio University, Fujisawa, Japan

Journal: *Collabra: Psychology*

<https://doi.org/10.1525/collabra.73641>

*Please direct any requests or inquiries to the contact information provided below.

• Inquiries about research

Keio University Faculty of Environment and Information Studies

Associate Professor Patrick Savage

Tel: +81-80-6551-4063 E-mail: <mailto:psavage@sfc.keio.ac.jp>

<http://compmusic.info>

• Inquiries about press release

Keio University Office of Communications and Public Relations (Ms. Tang)

Tel: +81-3-5427-1541 Fax: +81-3-5441-7640 Email: m-pr@adst.keio.ac.jp

<https://www.keio.ac.jp/en/>