

## <<Academic Exchange Grants>> FY2021 Final report

**Project name:** Music AP: Music and social bonding

**Principal Investigator:** Associate Professor Patrick E. SAVAGE

**Faculty:** Environment and Information Studies

Research Members		
Name	Affiliation / Job Title / Student Year etc.	Assigned Research Tasks
Shinya FUJII	環境情報学部・准教授	Experimental design/analysis/interpretation
Yoichi KITAYAMA	環境情報学部・特別招聘教授	Experimental design / recruitment / interpretation
Junichi USHIYAMA	環境情報学部・准教授	Experimental facility administration / recruitment
Bronwyn TARR	University of Oxford ・ Research Associate	Experimental design/analysis/interpretation
Masashi NAKATANI	環境情報学部・准教授	Experimental facility administration / recruitment
Atsushi AOYAMA	環境情報学部・准教授	Experimental facility administration / recruitment
Kazuto ATAKA	環境情報学部・教授	Experimental facility administration / recruitment
Total Number of Members: 7		

**Amount:** ¥1,000,000

Thanks to the support of the Academic Exchange Grant, we were able to successfully carry out our proposed research, publish 9 original research papers, and give 22 presentations at international conferences (all virtual due to COVID-19).

Specifically, the fund allowed us to pay for lab space and student part-time work to undertake research and to present and publish our research findings at international journals and conferences such as *Behavioral and Brain Sciences*, *Current Biology*, the *International Society for Music Information Retrieval*, the *International Conference on Music Perception and Cognition*, and the *Cultural Evolution Society World Conference*.

Our major findings were that there is both substantial cross-cultural variation and cross-cultural universals in music perception and production, and that social bonding is a unifying factor that shapes this cross-cultural diversity and universality. We obtained these findings using new methods from computer science and cognitive science to analyze and compare music from around the world. In the future we hope to build on these results to apply these techniques at larger scales to tackle challenges such as automatic music recommendation and understanding global variation in music perception and production. We are grateful for the financial support of the Keio Academic Exchange Grant.

### Research articles (9):

(**Bold** = PI/co-I, & = equal contribution, \* = corresponding author)

\***Savage, P. E.**, Passmore, S., Chiba, G., Currie, T. E., Suzuki, H., & Atkinson, Q. D. (2022). Sequence alignment of folk song melodies reveals cross-cultural regularities of musical evolution. *Current Biology*. <https://doi.org/10.1016/j.cub.2022.01.039>

Turchin, P., Whitehouse, H., \*Larson, J., Cioni, E., Reddish, J., Hoyer, D., **Savage, P. E.**, Covey, R. A., Baines, J., Altaweel, M., Anderson, E., Bol, P., Brandl, E., Carballo, D.,

Feinman, G., Korotayev, A., Kradin, N., Levine, J. D., Nugent, S. E., Squitieri, A., Wallace, V., & François, P. (In press). Explaining the rise of moralizing religions: A test of competing hypotheses using the Seshat Databank. *Religion, Brain & Behavior*. Preprint: <https://doi.org/10.31235/osf.io/2v59j>

&Chiba, G., &Ozaki, Y., Fujii, S., & \*Savage, P. E. (Accepted In Principle). Sight vs. sound in the judgment of music performance: Cross-cultural evidence from classical piano and Tsugaru shamisen competitions [Stage 1 Registered Report]. *Peer Community In Registered Reports*. Preprint: <https://doi.org/10.31234/osf.io/xky4j>

\*Savage, P. E., Loui, P., Tarr, B., Schachner, A., Glowacki, L., Mithen, S., & Fitch, W. T. (2021). Music as a coevolved system for social bonding [one of two target articles, accompanied by 60 commentaries]. *Behavioral and Brain Sciences*, 44(e59), 1-22. <https://doi.org/10.1017/S0140525X20000333>

&\*Matsumae, H., &\*Ranacher, P., \*Savage, P. E., Blasi, D., Currie, T. E., Sato, T., Koganebuchi, K., Nishida, N., Sato, T., Tanabe, H., Tajima, A., Brown, S., Stoneking, M., Shimizu, K. K., \*Oota, H., \*Bickel, B. (2021). Exploring correlations in genetic and cultural variation across language families in Northeast Asia. *Science Advances*, 7(34), eabd9223. <https://doi.org/10.1126/sciadv.abd9223>

\*Youngblood, M., Baraghith, K., & Savage, P. E. (2021). Phylogenetic reconstruction of the cultural evolution of electronic music via dynamic community detection (1975–1999). *Evolution and Human Behavior*, 42(6), 573–582. <https://doi.org/10.1016/j.evolhumbehav.2021.06.002>

\*&Savage, P. E., &Jacoby, N., &Margulis, E. H., Daikoku, H., Anglada-Tort, M., Castelo-Branco, S. E.-S., Nweke, F. E., Fujii, S., Hegde, S., Chuan-Peng, H., Jabbour, J., Lew-Williams, C., Mangalagiu, D., McNamara, R., Müllensiefen, D., Opondo, P., Patel, A., & Schippers, H. (In press). Building sustainable global collaborative networks: Recommendations from music studies and the social sciences. In E. H. Margulis, D. Loughridge, & P. Loui (Eds.), *The science-music borderlands: Reckoning with the past, imagining the future*. MIT Press. Preprint: <http://doi.org/10.31234/osf.io/cb4ys>

Ozaki, Y., McBride, J., Benetos, E., Pfordresher, P., Six, J., Tierney, A. T., Proutskova, P., Sakai, E., Kondo, H., Fukatsu, H., Fujii, S., & \*Savage, P. E. (2021). [Agreement among human and automated transcriptions of global songs](#). *Proceedings of the 22nd International Conference on Music Information Retrieval (ISMIR 2021)*, 500-508.

\*Youngblood, M., Ozaki, Y., & \*Savage, P. E. (In press). Cultural evolution and music. In J. J. Tehrani, J. R. Kendal, & R. L. Kendal (Eds.), *The Oxford Handbook of Cultural Evolution*. Oxford University Press. Preprint: <https://doi.org/10.31234/osf.io/xsb7v>

### Conference presentations (22):

Ozaki, Y., Kuroyanagi, J., McBride, J., Protskouva, P., Tierney, A., Pfordresher, P. Q., Benetos, E., Liu, F., & Savage, P. E. (2022). Cross-cultural similarities and differences in a global sample of song and speech recordings. Poster presented at the “Social

bridges: Do-re-mi DNA: The biological bases of music” conference, Universität der Bundeswehr München. [https://www.youtube.com/watch?v=-NE3\\_M\\_7XP0](https://www.youtube.com/watch?v=-NE3_M_7XP0)

Duan, Z., Nam, J., Rao, P., van Kranenburg, P., **Savage, P. E.**, et al. (2021). Promoting cultural diversity in MIR research. Special session presented at the 22nd International Conference on Music Information Retrieval (ISMIR 2021).

*Ozaki, Y.*, McBride, J., Benetos, E., Pfordresher, P., Six, J., Tierney, A. T., Proutskova, P., Sakai, E., Kondo, H., Fukatsu, H., Fujii, S., & **\*Savage, P. E.** (2021). Agreement among human and automated transcriptions of global songs. Talk presented at the 22nd International Conference on Music Information Retrieval (ISMIR 2021).

Matsumae, H., Ranacher, P., **Savage, P. E.**, Shimizu, K., Bickel, B. (2021). Exploring correlations in genetic and cultural variation across language families in northeast Asia. Talk presented at the symposium on “The Molecular Anthropology of Language: Results and Prospects”, University of Zurich.

McNally, J., Chocano, R., Wood, A. L., **Savage, P. E.**, Kirby, K., McGraw, A., Frishkopf, M. (2021). Broadening the ethnomusicological toolkit: Perspectives and approaches from the digital humanities. Roundtable panel to be presented at the Society for Ethnomusicology Annual Meeting, Atlanta, GA, USA.

McNally, J., Chocano, R., Mosely, I., Wood, A. L., **Savage, P. E.**, Kirby, K., McGraw, A., Frishkopf, M. (2021). Broadening the ethnomusicological toolkit: Perspectives and approaches from the digital humanities. Roundtable panel to be presented virtually at the American Musicological Society Annual Meeting.

**Savage, P. E.** (chair), Jacoby, N. Wood, A. L. C., Ozaki, Y., Margulis, E. (2021). Global diversity in music cognition. Symposium presented virtually at the International Conference on Music Perception and Cognition.

*Ozaki, Y.*, McBride, J., Benetos, E., Pfordresher, P., Six, J., Tierney, A., Fujii, S., **Savage, P. E.** (2021). Reliability of automated and human transcriptions of non-Western music. Talk presented virtually at the International Conference on Music Perception and Cognition.

Wood, A. L. C., Kirby, K., Ember, C., Silbert, S., *Daikoku, H.*, McBride, J., **Savage, P. E.** (2021). The Global Jukebox: An interactive database of the expressive arts and culture. Talk presented virtually at the International Conference on Music Perception and Cognition.

Daikoku, H., Ding, S., Benetos, E., Wood, A. L. C.; Fujii, S., **Savage, P. E.** (2021). Human and automated judgements of musical similarity in a global sample. Talk presented virtually at the International Conference on Music Perception and Cognition.

*Yuan, Y.*, Cronin, C., Müllensiefen, D., Fujii, S., **Savage, P. E.** (2021). Perceptual vs. automated judgements of music copyright infringement. Poster presented virtually at the International Conference on Music Perception and Cognition.

*Chiba, G., Fujii, S., Savage, P. E.* (2021). Sight vs. sound in the judgment of music performance: Evidence from Tsugaru shamisen competitions in Japan. Poster presented virtually at the International Conference on Music Perception and Cognition.

McBride, J. M., Tierney, A. T., Pfordresher, P., Six, J., Fuji, S., **Savage, P. E.** (2021). Are pitches discrete? An information-theoretic framework and a corpus study. Talk presented virtually at the International Conference on Music Perception and Cognition.

Fudolig, M. I., Hiraoka, T., Jo, H.-H., **Savage, P. E.** (2021). Bursty behavior in classical music. Talk presented virtually at the International Conference on Music Perception and Cognition.

*Ozaki, Y., McBride, J., Benetos, E., Pfordresher, P., Six, J., Tierney, A., Protskouva, P., Sakai, E., Kondo, H., Fukatsu, H., Fujii, S., Savage, P. E.* (2021). Reliability of automated and human transcriptions of global songs. Talk presented virtually at the Cultural Evolution Society world conference.

*Passmore, S., Shilton, D., Barbier, C., & Savage, P. E.* (2021). Testing hypotheses of music-culture coevolution with a global sample of 5,783 songs. Talk presented virtually at the Cultural Evolution Society world conference.

Shilton, D., *Passmore, S., & Savage, P. E.* (2021). Music and sociality: Global analyses of solo vs. group singing. Talk presented virtually at the Cultural Evolution Society world conference.

*Sato, S., Passmore, S., & Savage, P. E.* (2021). Does social complexity promote musical pitch complexity? Talk presented virtually at the Cultural Evolution Society world conference.

Wood, A. L. C., Kirby, K., Ember, C., Silbert, S., *Daikoku, H., McBride, J., Passmore, S., & Savage, P. E.* (2021). The Global Jukebox: A public database of the performing arts and culture. Talk presented virtually at the Cultural Evolution Society world conference.

Daikoku, H., Wood, A. L. C., & **Savage, P. E.** (2021). Musical diversity within and between societies in India. Talk presented virtually at the Cultural Evolution Society world conference.

*Chiba, G., Fujii, S., Savage, P. E.* (2021). Sight vs. sound in the judgment of music performance: Evidence from Tsugaru shamisen competitions in Japan. Talk presented virtually at the Cultural Evolution Society world conference.

Matsumae, H., Ranacher, P., **Savage, P. E.**, Blasi, D., Currie, T. E., Sato, T., Koganebuchi, K., Nishida, N., Sato, T., Tanabe, H., Tajima, A., Brown, S., Stoneking, M., Shimizu, K. K., Oota, H., Bickel, B. (2021). Exploring correlations in genetic and cultural variation across language families in Northeast Asia. Talk presented virtually at the Cultural Evolution Society world conference.