

Unknown link between co-occurring soothing behaviours

Coupling of soothing behaviours: temporal similarity between stroking & lullabies

Background

- **Lullabies** are some of first soothing cues
- **Slow tempo** ($\approx 60-80$ BPM) and gentle melodies **lower infant heart rate** and **stress** markers.
- Light stroking at **CT-optimal speed** ($3-10$ cm/s) **fosters bonding** and **reducing arousal**.
- Both soothing behaviours **co-occur** in everyday care
- Little known about **how they interact**
- Are lullabies performed within a **certain tempo range** and how well we can **align** our **singing tempo** with **visual touch cues**?

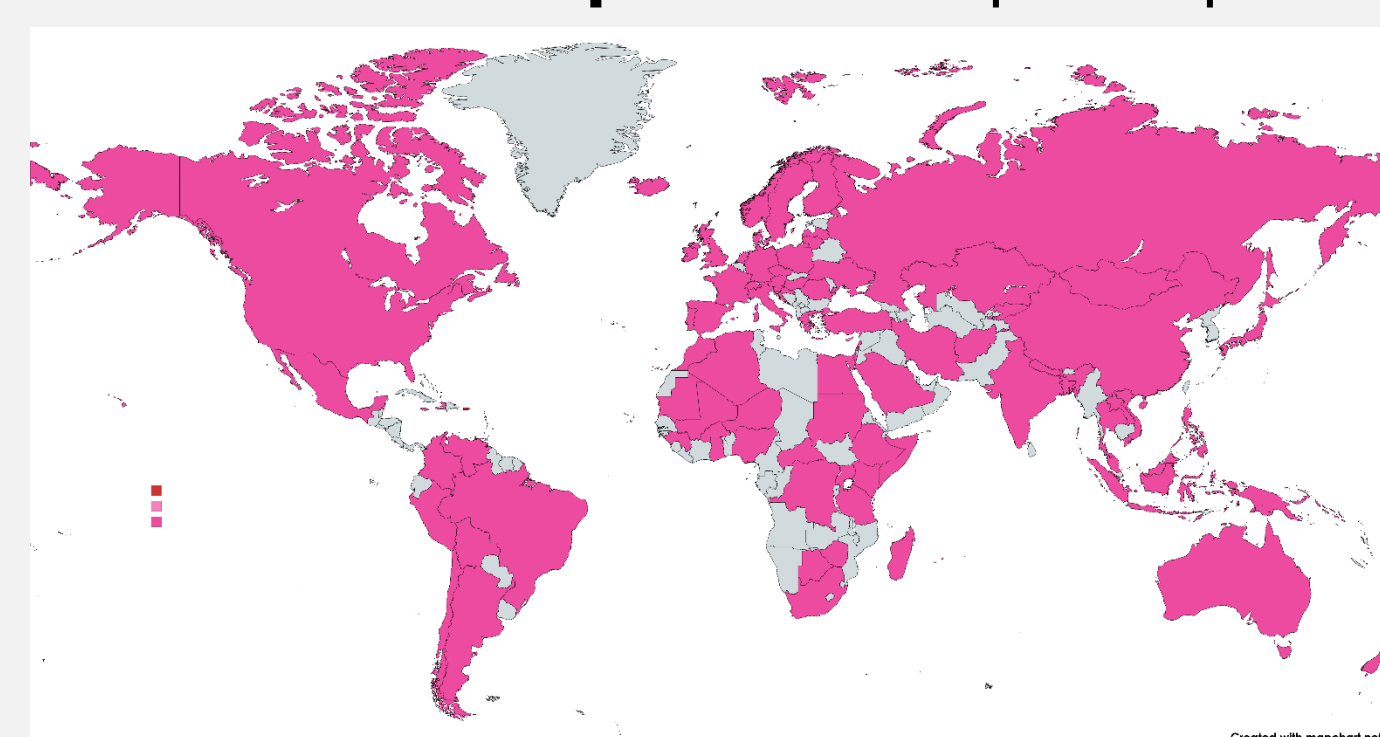
Design



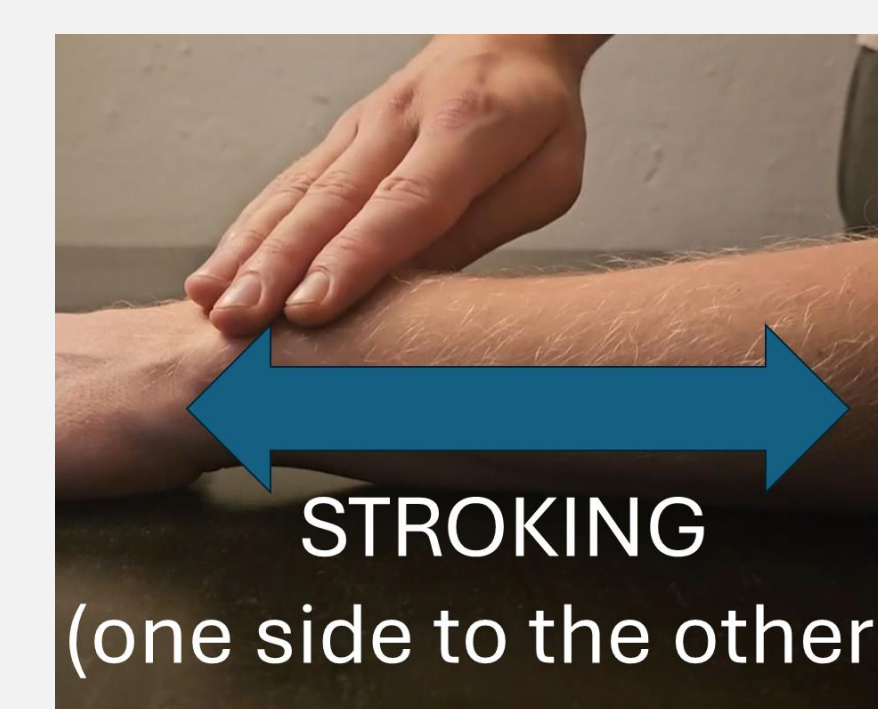
Study 1: Cross-cultural study
Sing lullaby, love song and sleep song

Study 2: Entrainment Study
Watch different touch types and tempi and match lullaby tempo with movement

Participants: 200 per experiment



Cross-cultural study: Performed different song types
Love song vs. lullabies



Entrainment Study

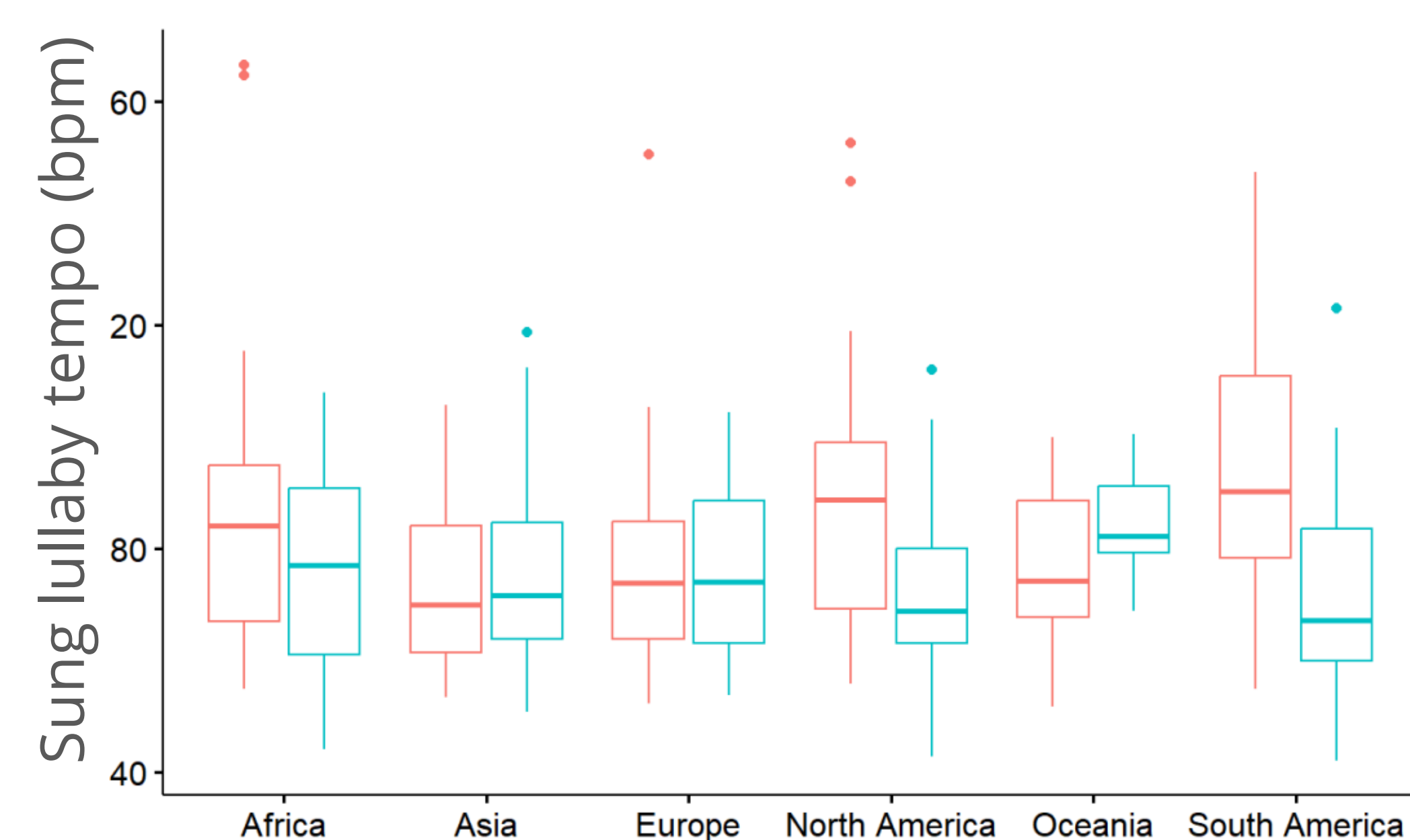
Touch: Stroking vs Tapping
Speed: CT optimal vs. fast

Research Questions and Results

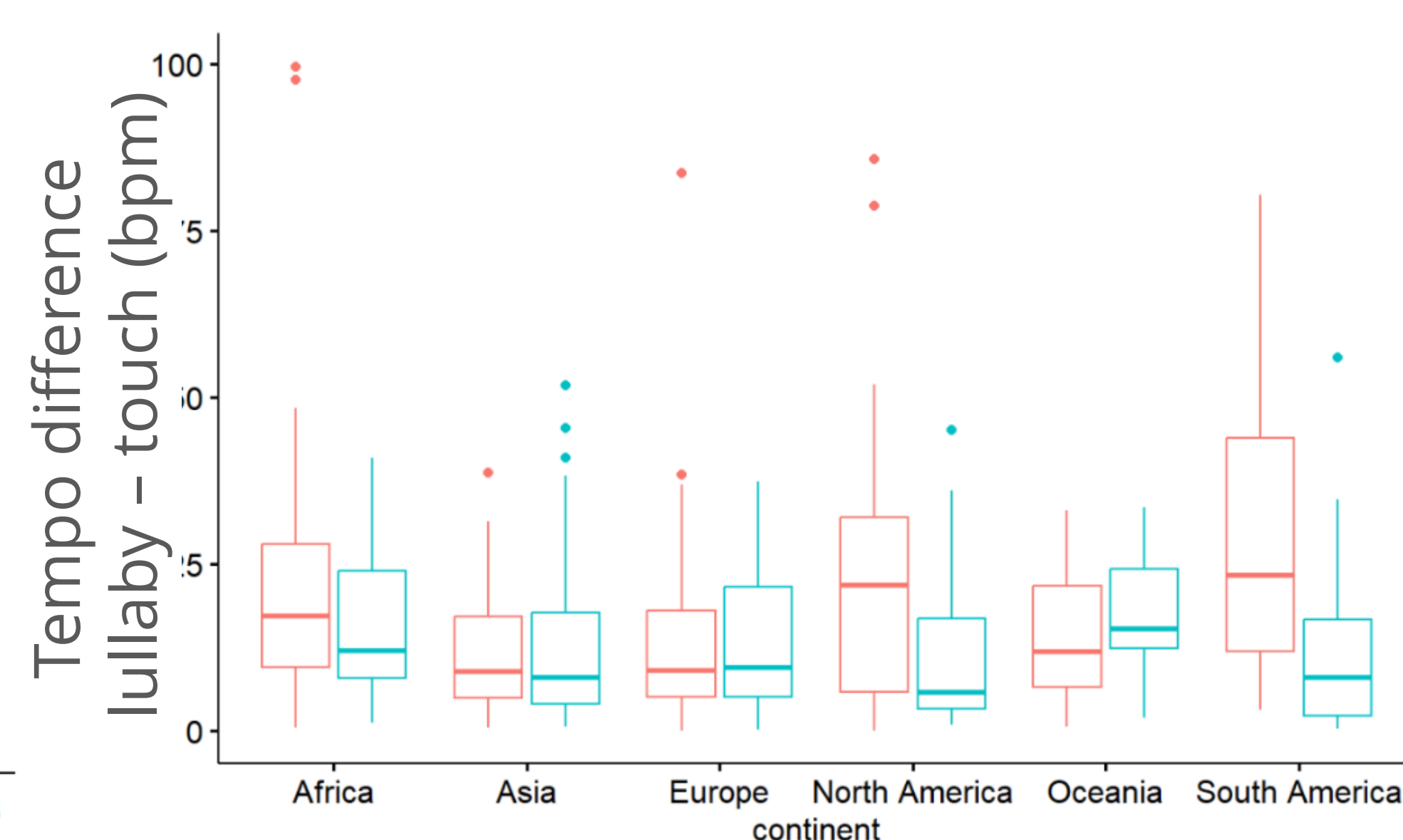
Do lullabies have a consistent tempo range across cultures?

Is the tempo range of lullabies similar to optimal stroking speed?

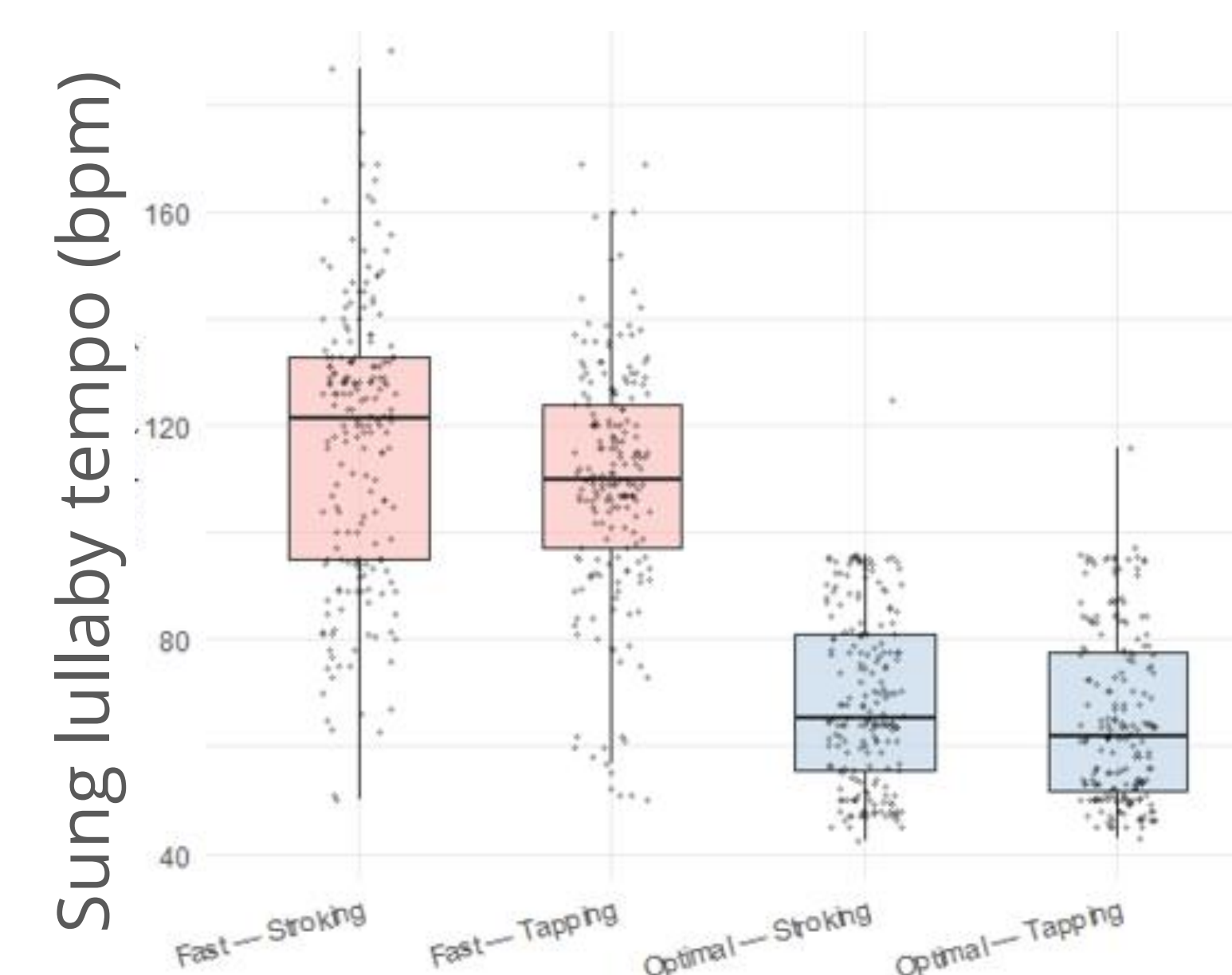
Is there a difference between touch types when matching singing tempo?



„universal“ lullaby tempo...



...which also overlaps with **resting heart rate** and **optimal stroking velocity** for affective touch



Entrainment of sung lullabies is more accurate with **optimal CT speed tapping**

Lullaby tempo vs. Love song tempo across continents (both are described as slow and affective in the literature)

Lullaby singing tempo when matching different tempo and touch types in the video

Download!



References

- 1) Cirelli, L. K., Trehub, S. E., & Trainor, L. J. (2018). Rhythm and melody as social signals for infants. *Annals of the New York Academy of Sciences*, 1423(1), 66–72. <https://doi.org/10.1111/nyas.13580>
- 2) Fairhurst, M. T., Löken, L., & Grossmann, T. (2014). Physiological and Behavioral Responses Reveal 9-Month-Old Infants' Sensitivity to Pleasant Touch. *Psychological Science*, 25(5), 1124–1131. <https://doi.org/10.1177/0956797614527114>
- 3) Mehr, S. A., Singh, M., Knox, D., Ketter, D. M., Pickens-Jones, D., Atwood, S., Lucas, C., Jacoby, N., Egner, A. A., Hopkins, E. J., Howard, R. M., Hartshorne, J. K., Jennings, M. V., Simson, J., Bainbridge, C. M., Pinker, S., O'Donnell, T. J., Krasnow, M. M., & Glowacki, L. (2019). Universality and diversity in human song. *Science*, 366(6468). <https://doi.org/10.1126/SCIENCE.AAX0868>

Conclusions and next steps

- Lullaby tempo aligns with optimal stroking CT velocity & resting HR
- Coupling of sung lullabies to observing touch videos at optimal CT velocity (but not specifically for stroking)

→ Lab based-study follow-up exploring coupling between co-occurring soothing behaviours and measuring neurophysiological synchrony