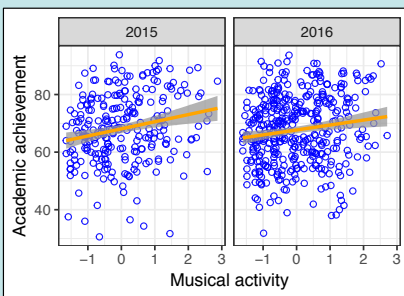


# Musical abilities and academic achievement – what makes the difference?

**Conclusion: Academic performance and musical activity grow together but changes in beat perception ability happen on longer time scale**

## Results

Level of academic achievement associated with level of musical activity (and IQ)

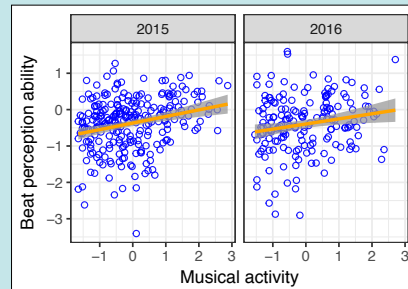


Mixed-effects regression coefficients:

Coefficient	Estimate ± SE
Musical activity**	0.12 ± 0.04
IQ***	0.19 ± 0.03

DV: Academic achievement

Level of beat perception ability is associated with level of musical activity



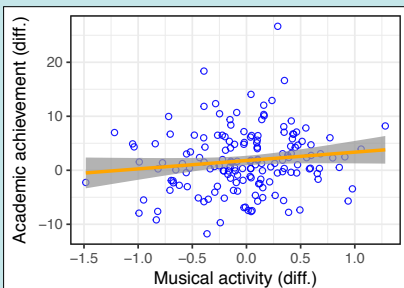
Mixed-effects regression coefficients:

Coefficient	Estimate ± SE
Age	0.02 ± 0.07
Musical activity**	0.17 ± 0.06
IQ	0.08 ± 0.06

DV: Beat perception ability

\*\*  $p < .05$     \*\*  $p < .01$     \*\*\*  $p < .001$

Increase in academic achievement is associated with increase in musical activity

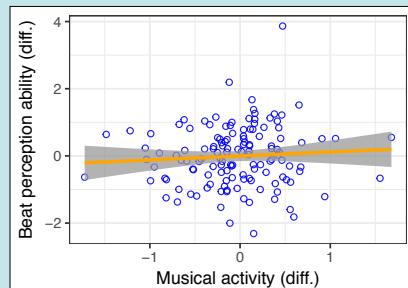


Standardized OLS regression coefficients:

Coefficient	Estimate ± SE
Musical activity (diff.)*	0.20 ± 0.09
Starting IQ	-0.12 ± 0.09

DV: Academic achievement

Change in beat perception ability is not associated with change in musical activity (and negatively related to age)



Standardized OLS regression coefficients:

Coefficient	Estimate ± SE
Age***	-0.36 ± 0.10
Musical activity	0.07 ± 0.08
Starting IQ	0.03 ± 0.08

DV: Beat perception ability

## Method

### Participants

- 540 students (ages 9-18) from two UK secondary schools
- 188 students tested on same tests 2015 and 2016

### Testing

- Individual computer interfaces in classroom setting

### Tests

- Adaptive Beat Alignment Test<sup>1</sup>
- Adaptive Matrix Reasoning IQ Test<sup>2</sup>
- Musical Activity = PCA(Gold-MSI Musical Training<sup>3</sup> + Concurrent Musical Activities<sup>4</sup>)
- 20 additional tests + questionnaires (not reported here)

## Background

### Questions

- Musical training, listening abilities, Intelligence and academic performance often reported to be highly correlated
- But what is their causal relationship?
- How does their temporal development align?

### The LongGold study

- Start: 2015<sup>4</sup>
- Duration: 7 years
- Participants: Secondary school children from UK and Germany
- Aim: Assess same children on same tests every year and observe developmental trajectories for music, cognition, self-concepts, personality, mental well-being, academic performance

<sup>1</sup>Iversen, J. & Patel, A. (2008). The Beat Alignment Test (BAT): Surveying beat processing abilities in the general population. In: *Proceedings of the 10th International Conference on Music Perception & Cognition (ICMPC10)*, August 2008, Sapporo, Japan. K. Miyazaki et al. (Eds.), Adelaide: Causal Productions.

<sup>2</sup>Chan, Y. W. F., and Kosinski, M. (2015). *ICAR Project Wiki. International Cognitive Ability Resource (ICAR)*. Available online at: <http://icar-project.com/projects/icar-project/wiki>

<sup>3</sup>Müllensiefen, D., Gingras, B., Musil, J. & Stewart, L. (2014). The Musicality of Non-Musicians: An Index for Assessing Musical Sophistication in the General Population. *PLoS ONE*, 9(2): e89642. doi:10.1371/journal.pone.0089642.

<sup>4</sup>Müllensiefen, D., Harrison, P., Caprini, F., & Fancourt, A. (2015). Investigating the importance of self-theories of intelligence and musicality for students' academic and musical achievement. *Frontiers in Psychology*, 6:1702. doi: 10.3389/fpsyg.2015.01702