

# Infants have a movement bias for rhythms with moderate syncopation



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## INTRODUCTION

- Rhythms with a moderate amount of syncopation (vs. low or high levels of syncopation) elicit the strongest urge to move in adults<sup>1</sup>
- A previous study found a Medium > Low syncopation movement bias is also present in children 3-6 years old<sup>2</sup>
- Syncopation's movement-motivating effects may depend on synchronization abilities that infants lack
- Here, we test whether infants (6-18 months) have a movement bias for moderate > low syncopation

## RESEARCH QUESTION

- Do infants move more when hearing rhythms with moderate syncopation > low syncopation?

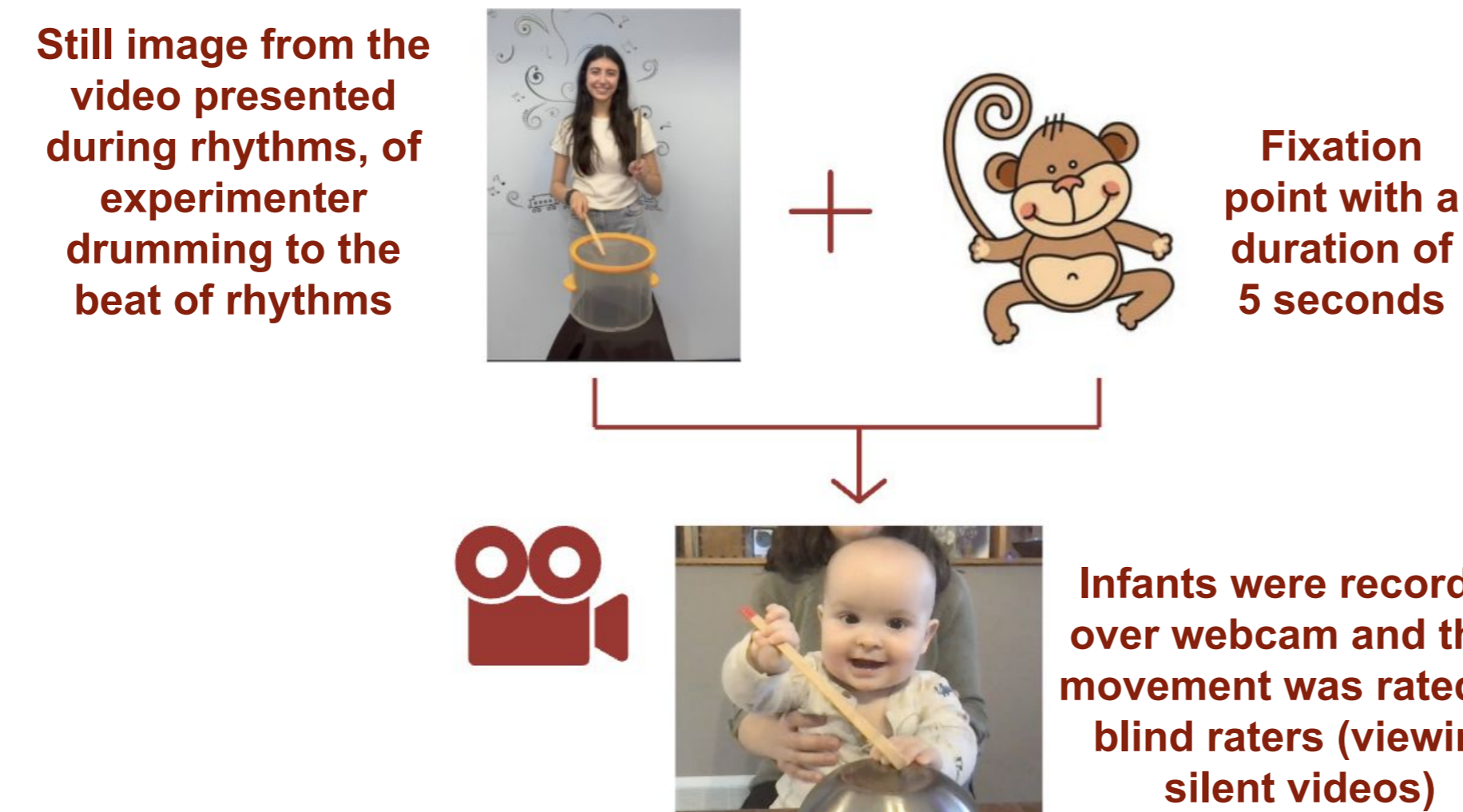
## METHODS

- Infants aged 6-18 months (n = 38 for Exp. 1; n= 40 for Exp. 2)
- Infants participated online, from home, over Lookit<sup>3</sup>
- Four low and four medium syncopation drum breaks, as used in previous research<sup>1,2</sup>
- Infants listened to rhythms while watching pre-recorded videos/images of experimenter drumming to the beat of the rhythms
- Parents were encouraged to give their child a drumstick and a surface to drum on
- Raters watched (silent) videos of infants to rate movement, focus, and smiling.
- We compared movement, focus, and smiling ratings between Medium and Low syncopation conditions and the two experiments.

## Experimental Design

### Experiment 1:

- Infants watched a video of the experimenter drumming to the beat of the rhythms. They were then presented with a blank screen with a fixation point of a cartoon monkey
- The videos were identical in all trials.



### Experiment 2:

- Infants watched a **video** of the experimenter drumming to the beat of the rhythms (demonstration phase), followed by a video of the experimenter saying, "Now it's your turn to drum!"
- Infants were then presented with a **still image** of the experimenter drumming (encouragement phase)



## DISCUSSION

- Infants show a similar syncopation-movement relationship to adults for Medium > Low syncopated rhythms
- Because infants do not systematically synchronize their movements to rhythms, these results indicate that the motivating effect of rhythm structure does not depend on experience with volitional sensorimotor synchronization

## RESULTS

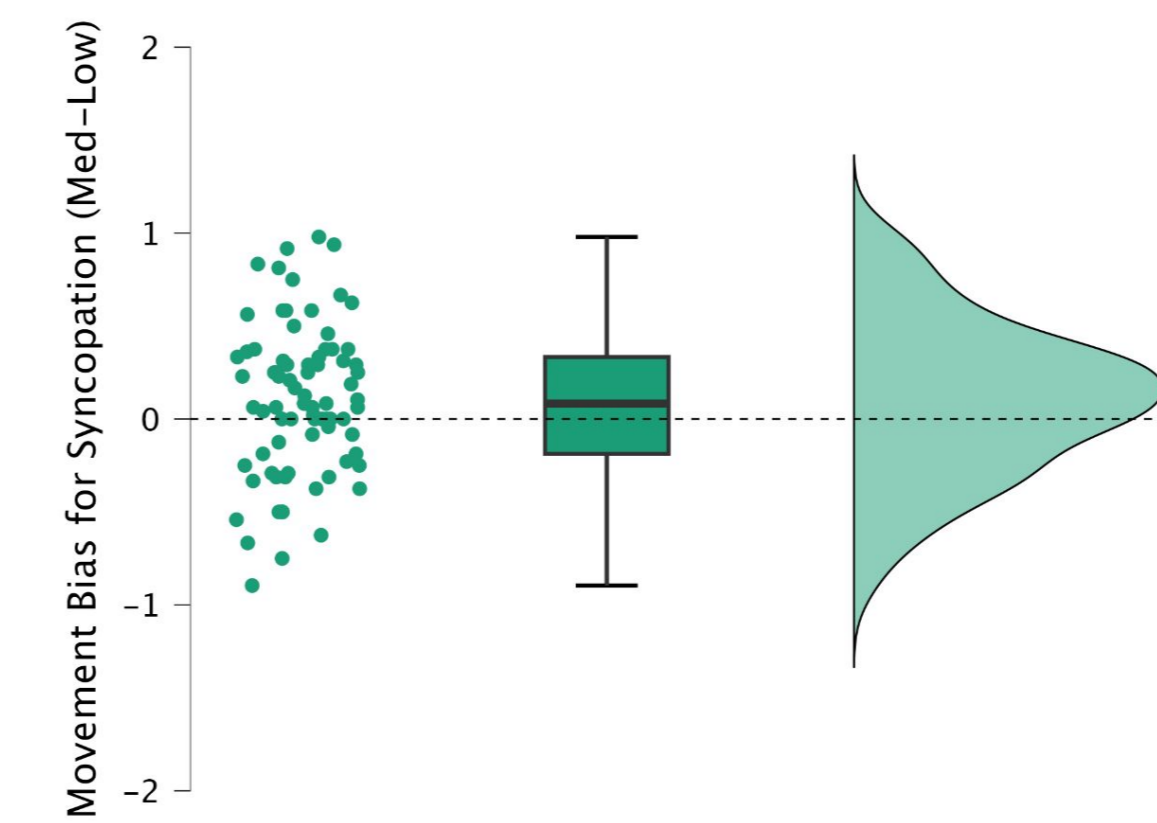


Fig. 1. Movement Difference scores (Medium - Low syncopation conditions). Infants moved more for Med than Low syncopation rhythms ( $p = .007$ )

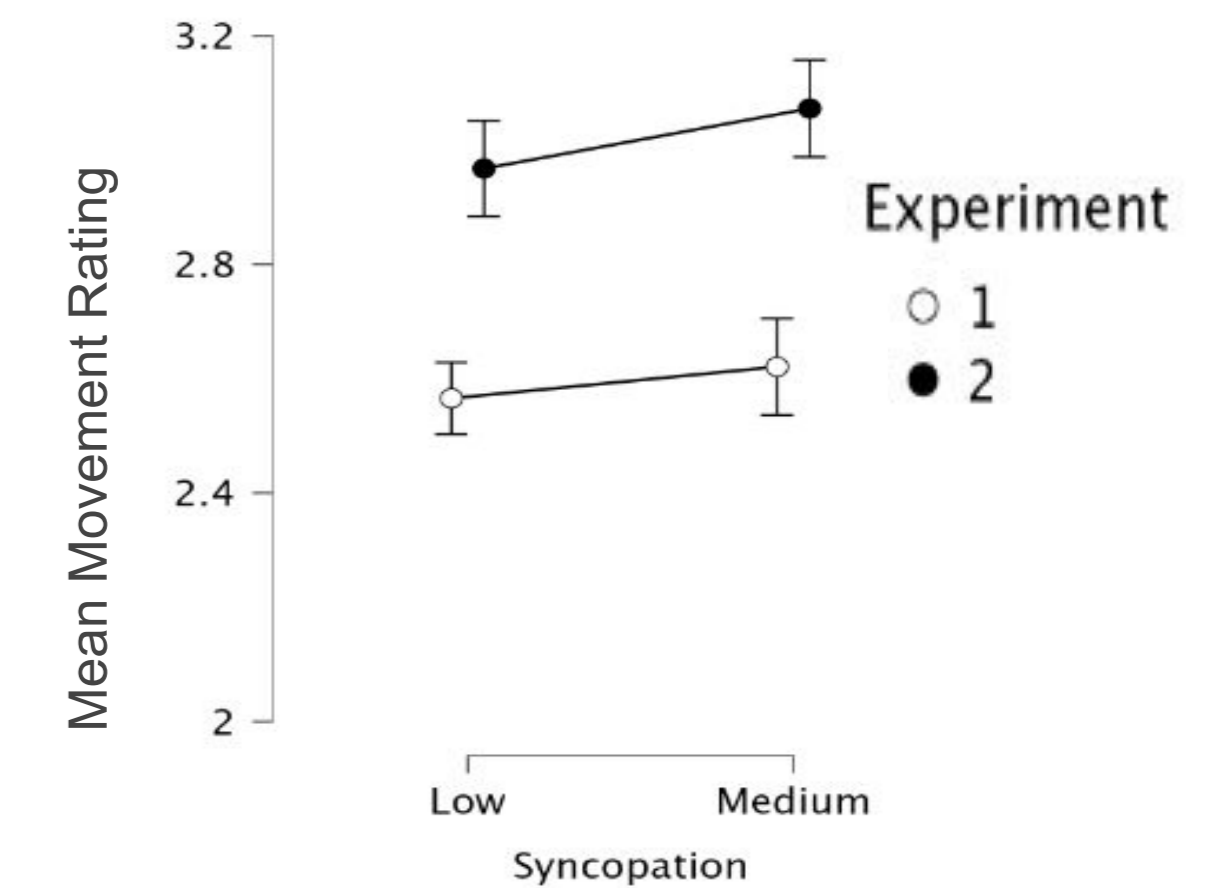


Fig. 2. Infants moved more when encouraged to (Exp 2 > Exp 1;  $p = .004$ ) and the bias toward Medium > Low syncopated did not differ between experiments.

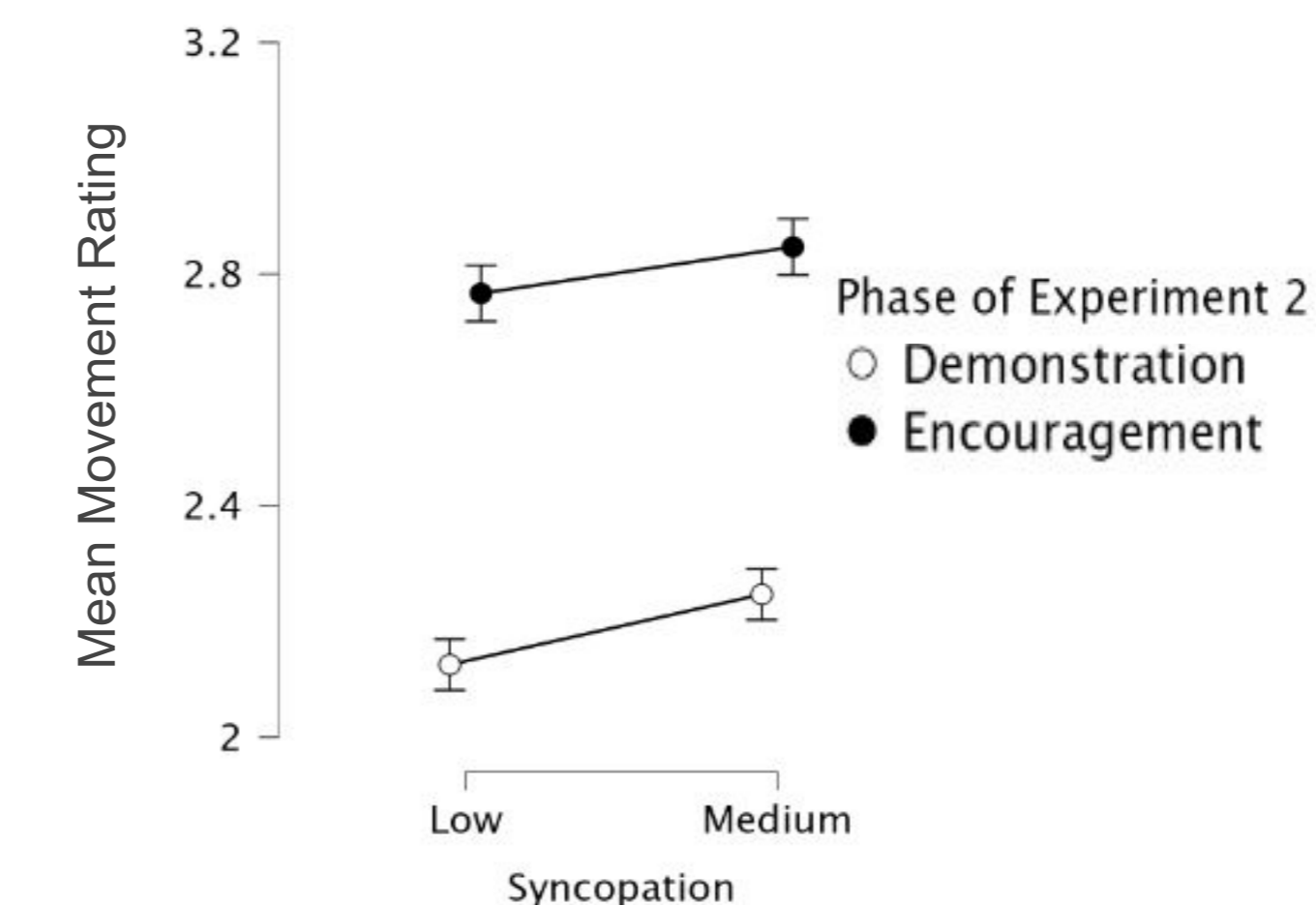


Fig. 3. In Experiment 2, infants moved more during the Encouragement phase than the Demonstration phase, and the effect of syncopation did not depend on phase.

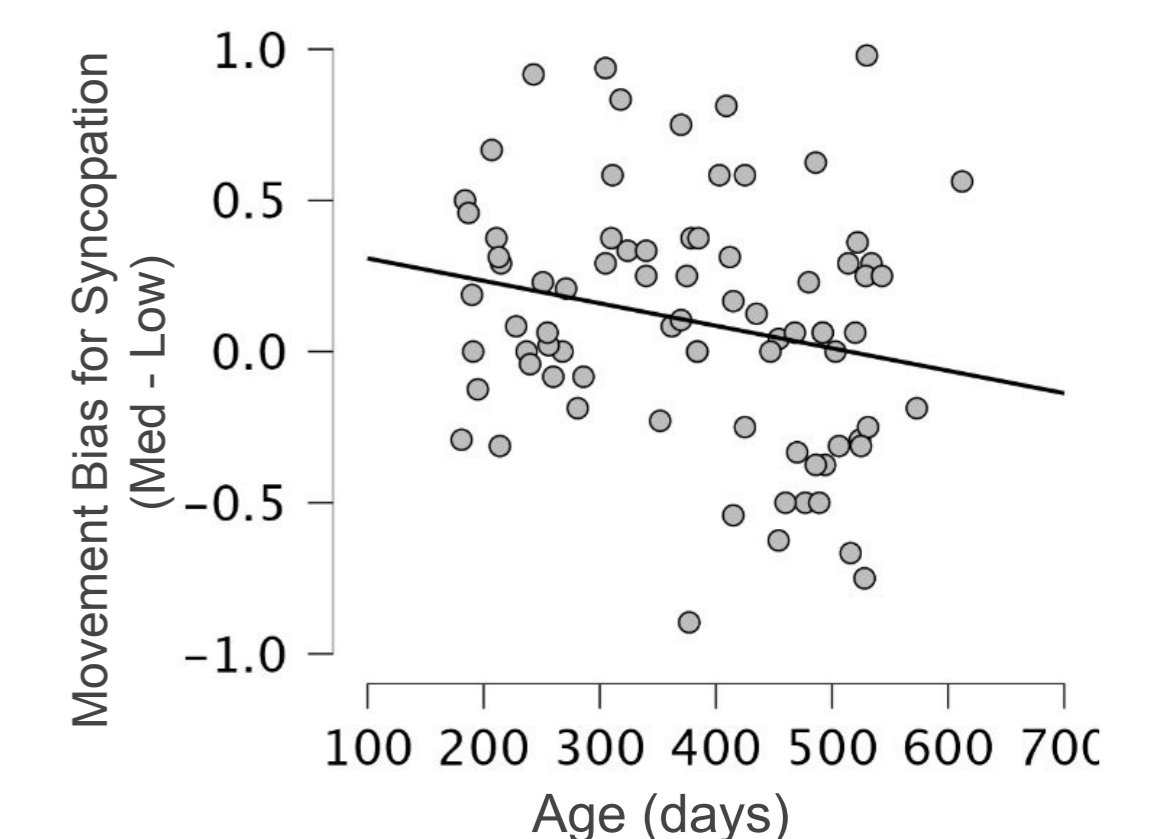


Fig. 4. Syncopation bias (Med - Low) across the 6-18 months age range of infants. A statistically marginal correlation ( $r = -.22$ ,  $p = .055$ ) suggests younger infants may have a stronger bias.

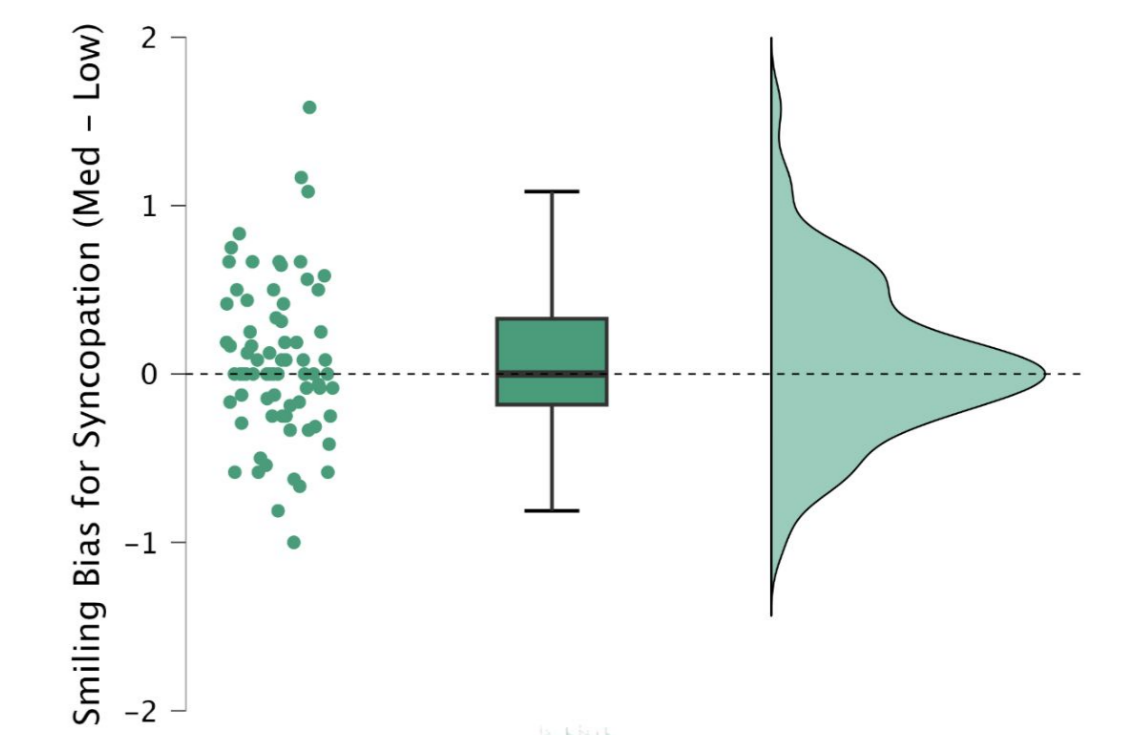
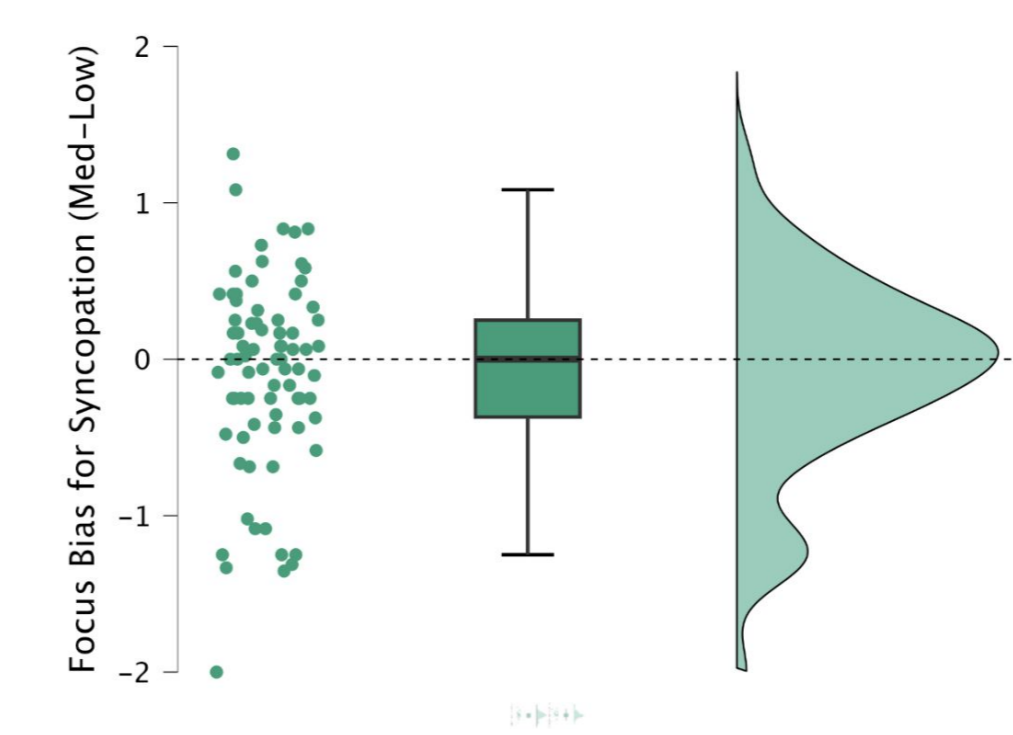


Fig. 5 & 6. Focus and Smiling Difference scores (Med - Low). There was no difference in infants' focus or smiling between Med and Low syncopation conditions ( $p > 0.05$ ).

## Acknowledgements

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## References

- 1 Witek, et al (2014) *PLoS one* 3 Scott & Schulz (2017) *Disc Cog Sci*  
 2 Cameron et. al (2023) *Dev Sci* 4 Zentner & Eerola (2010) *PNAS*