

# DURATION AND BEAT PERCEPTION ACROSS MODALITIES

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## Introduction

- Beat perception ability varies across individuals.
- One possibility for weak beat perception is poor single duration timing. Another is poor timing for sequences. A third is a selective deficit in perceiving the beat.

## Hypothesis

- Single duration timing is necessary for sequence timing, and single duration and sequence timing are necessary for beat perception.
- This hierarchy exist in both modalities of audition and vision.

## Methods and Materials

101 online participants

Three levels of timing:

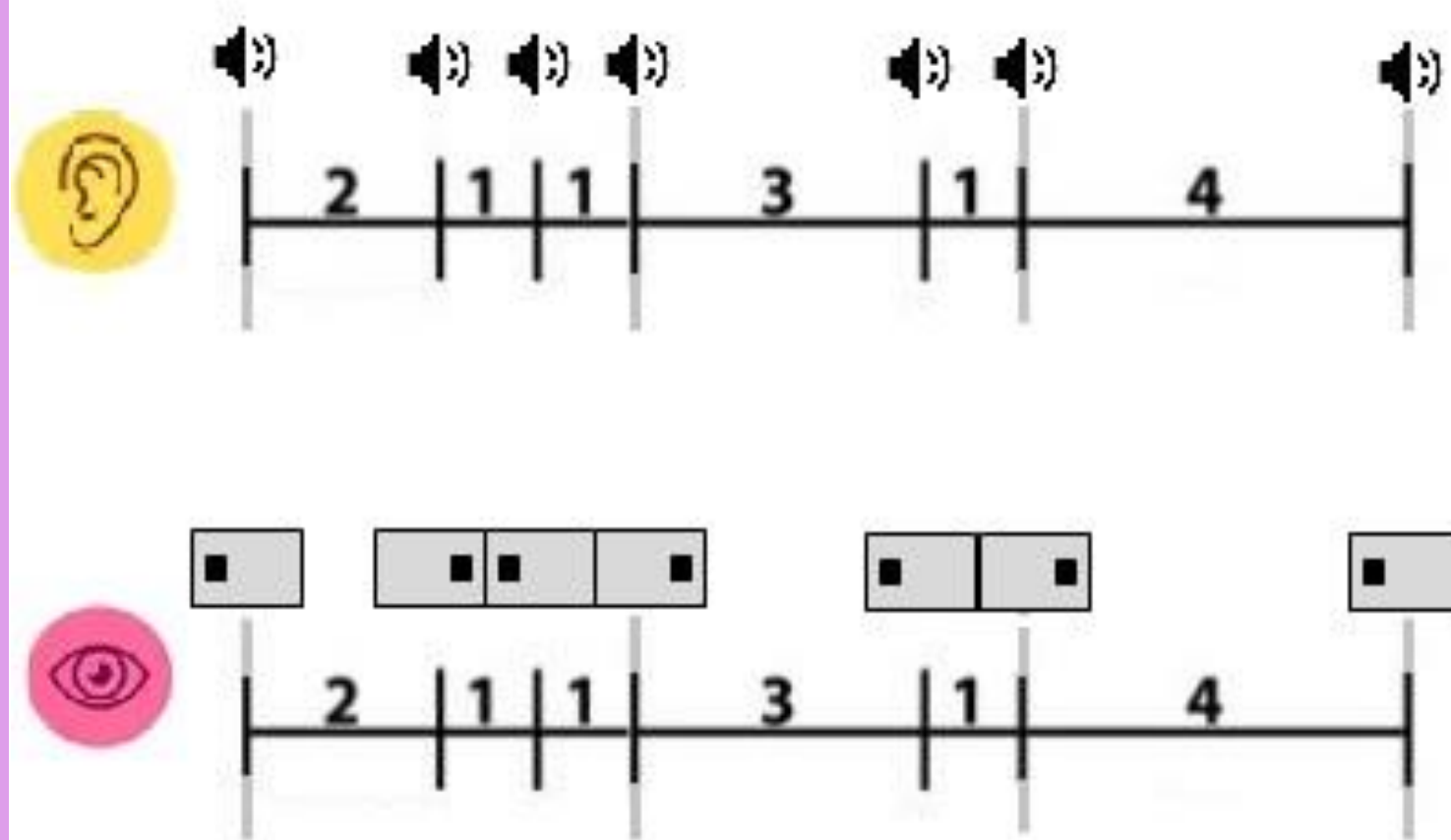
1- **Single duration timing** (intervals of 1:2:3:4:1.4:3.5:4.5)

2- **Sequence timing** (intervals of 1:1.4:3.5:4.5)

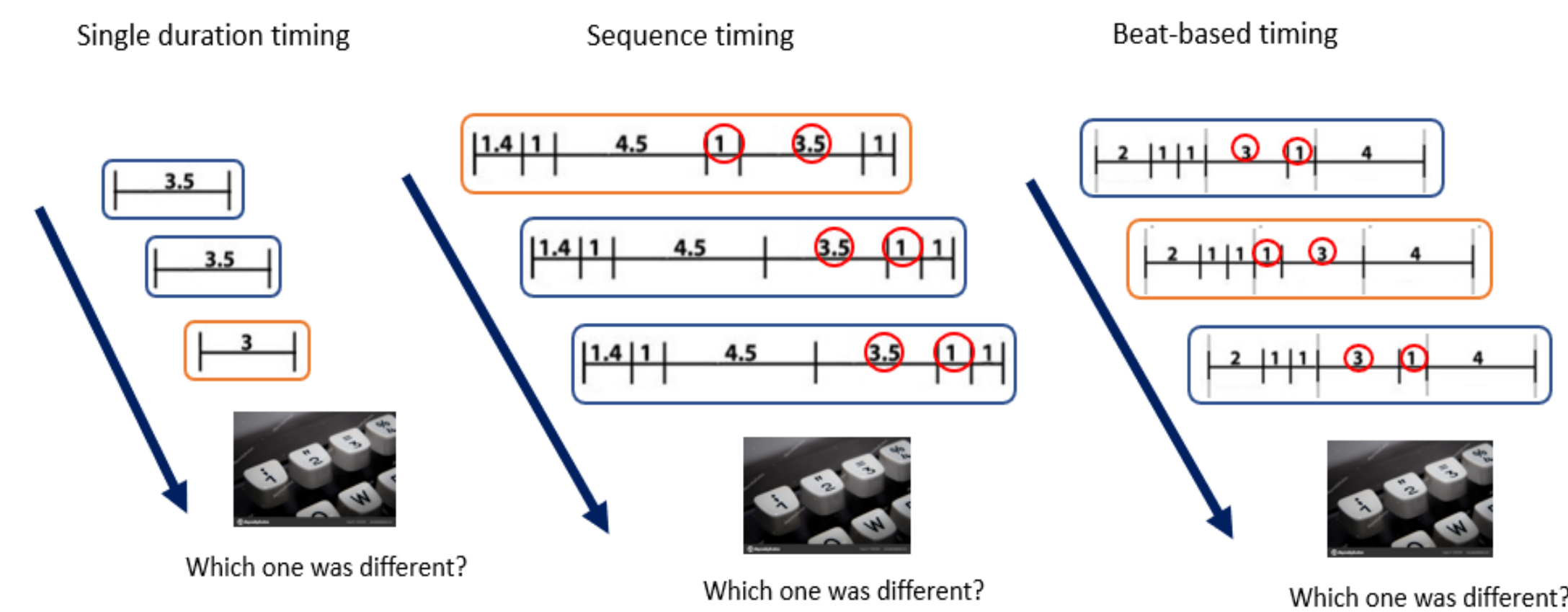
3- **Beat-based timing** (intervals of 1:2:3:4)

Auditory: 500 Hz pure tones

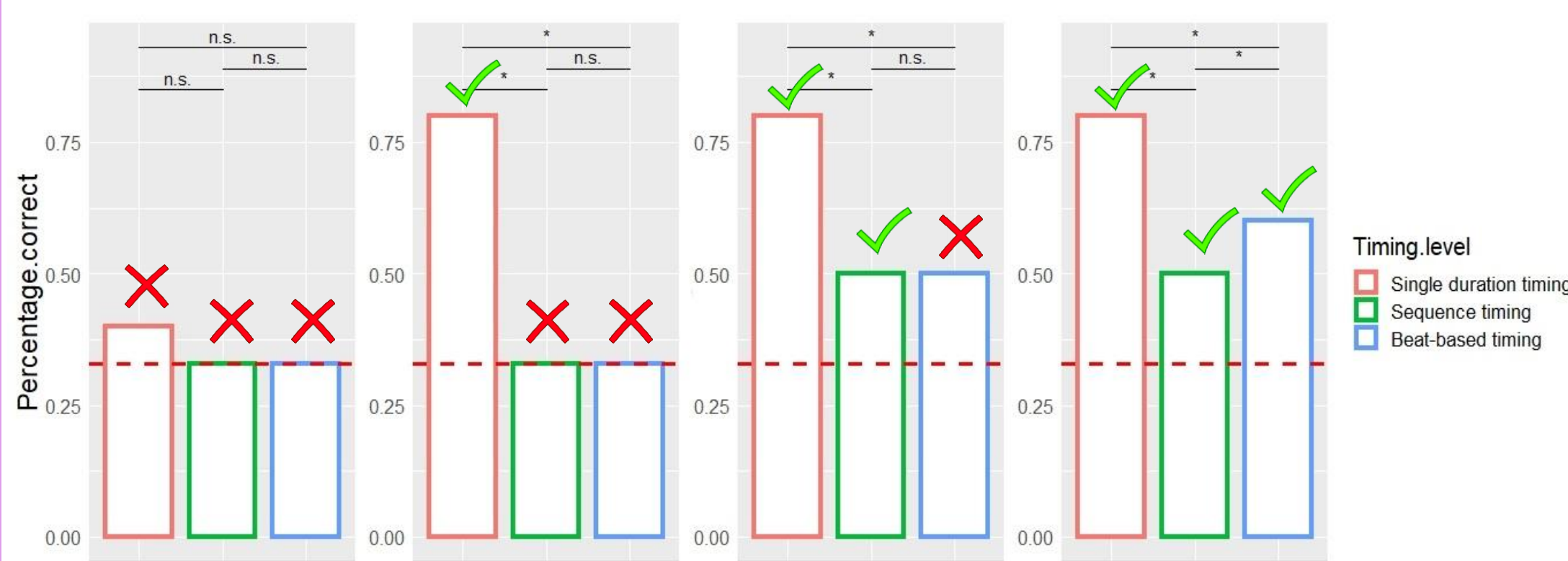
Visual: Black square on gray background



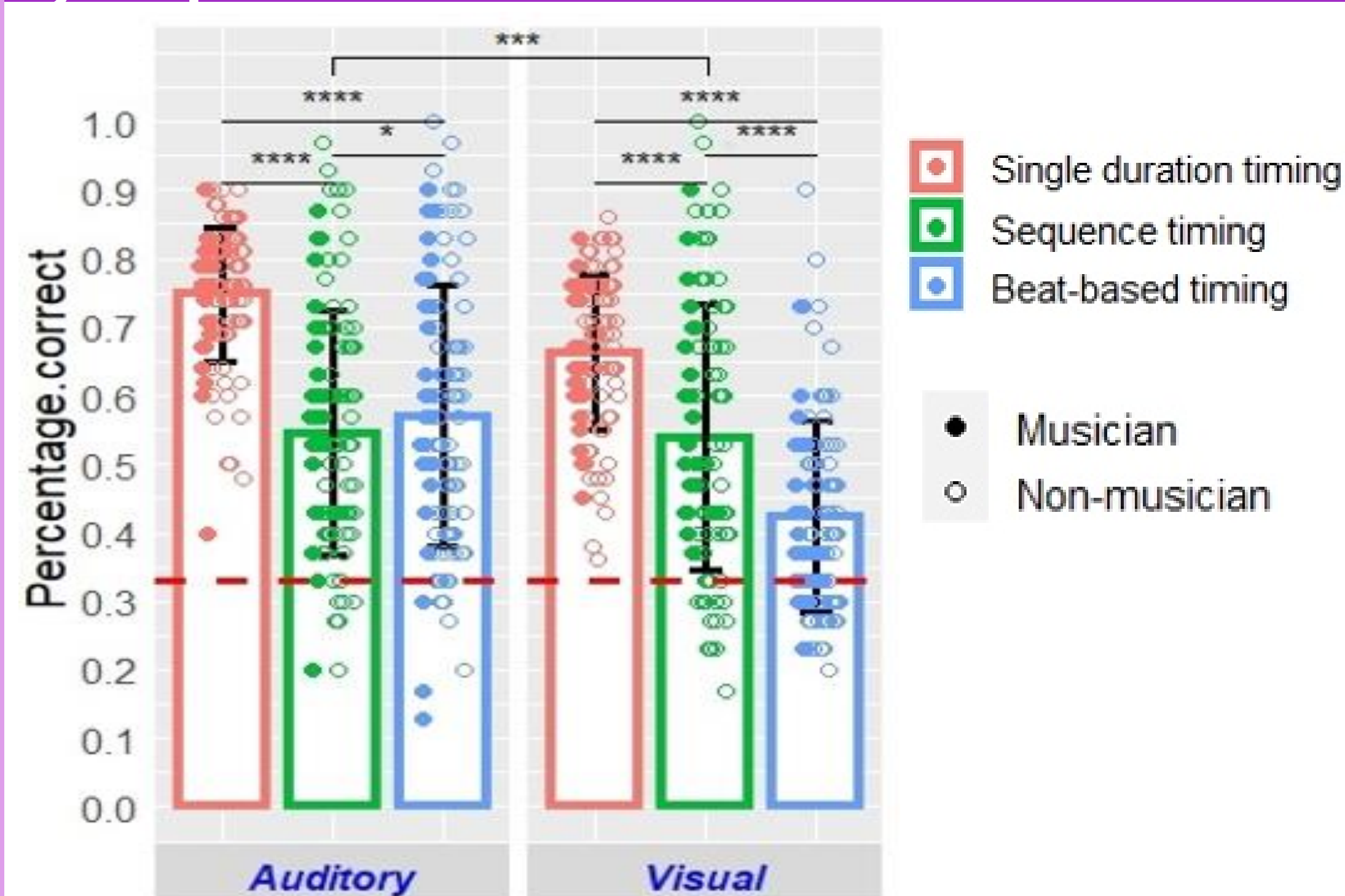
## Method (3-alternative forced choice)



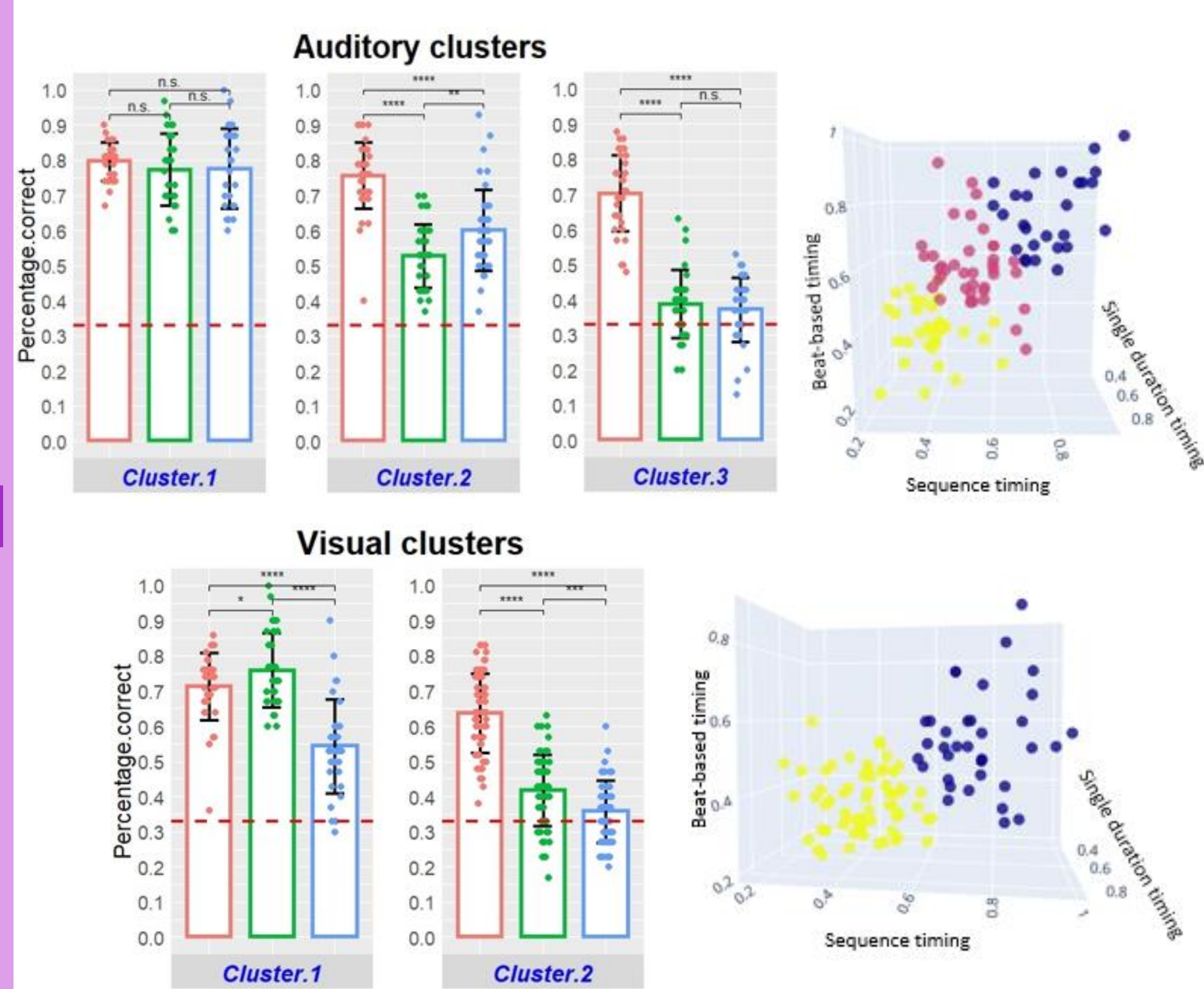
## Predicted clusters



## Group-level results



## Clustering Results (k-means)



## Conclusions

- Based on the pattern of performance in auditory clusters, there may be validity to the proposed hierarchy. However, the two clusters in the visual modality are not in line with hypothesis.
- This suggests that the hierarchy for beat perception may not operate in the same way across different modalities.

## References

- Brown, S., & Jordania, J. (2013).** Universals in the world's musics. *Psychology of Music*, 41(2), 229–248.
- Fujii, S., & Schlaug, G. (2013).** The Harvard Beat Assessment Test (H-BAT): A battery for assessing beat perception and production and their dissociation. *Frontiers in Human Neuroscience*, 0(NOV), 771.
- Grahn, J. A., & McAuley, J. D. (2009).** Neural bases of individual differences in beat perception. *NeuroImage*, 47(4), 1894–1903.