INVESTIGATING AUDITORY PREDICTION IN YOUNG INFANTS USING FNIRS

FELICIA ZHANG[1], RICHARD N. ASLIN[2], LAUREN L. EMBERSON[1]

1. DEPARTMENT OF PSYCHOLOGY, PRINCETON UNIVERSITY
2. BRAIN AND COGNITIVE SCIENCES DEPARTMENT, UNIVERSITY OF ROCHESTER

1. INTRODUCTION

Recently, neural evidence suggesting top-down sensory prediction in the occipital cortex (i.e. visual region) was found in 6-month-old infants (Emberson, Richards & Aslin, 2015).
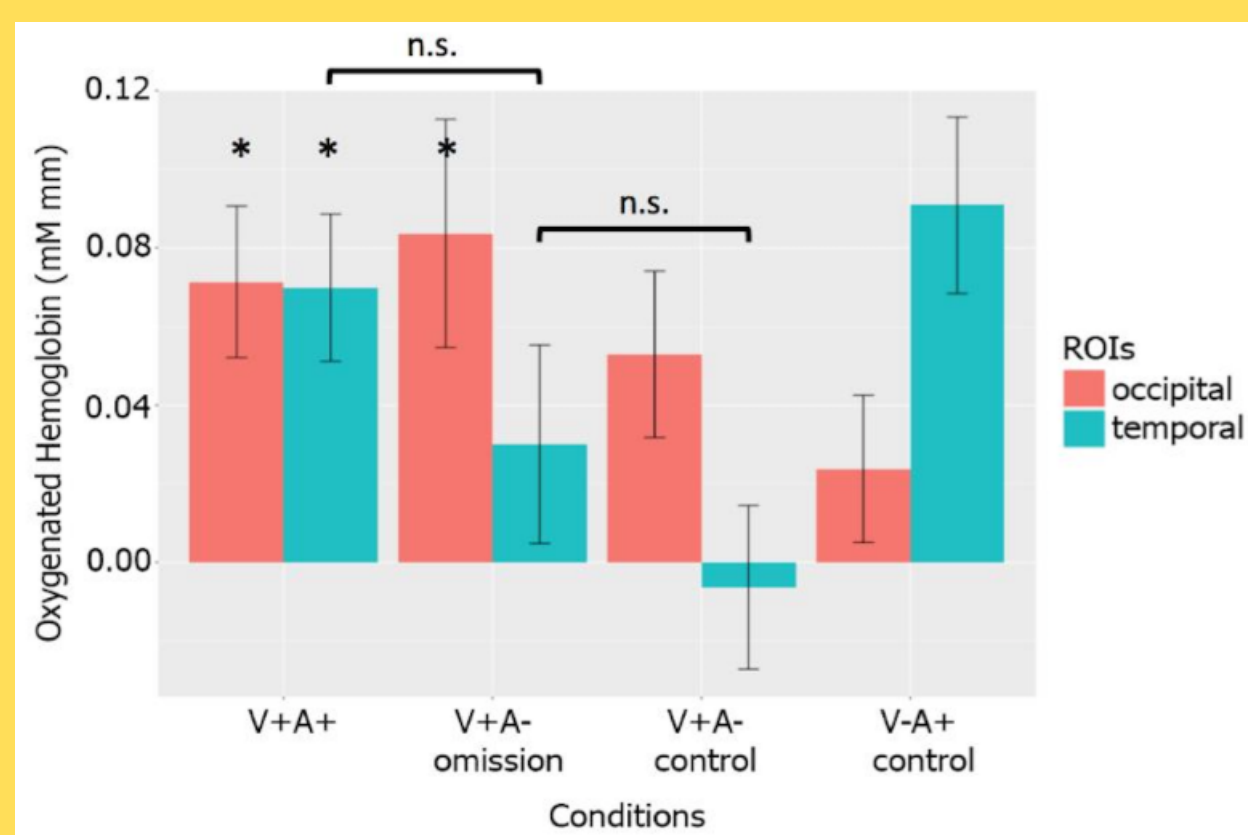
In this study, we investigate top-down sensory prediction in the temporal cortex (i.e. auditory region), which has yet to be determined.

2. METHODS

We recorded hemodynamic responses of 23 6-month-old infants' cortex, as they completed a study designed to promote the learning of associations between a picture (V+) and sound (A+)
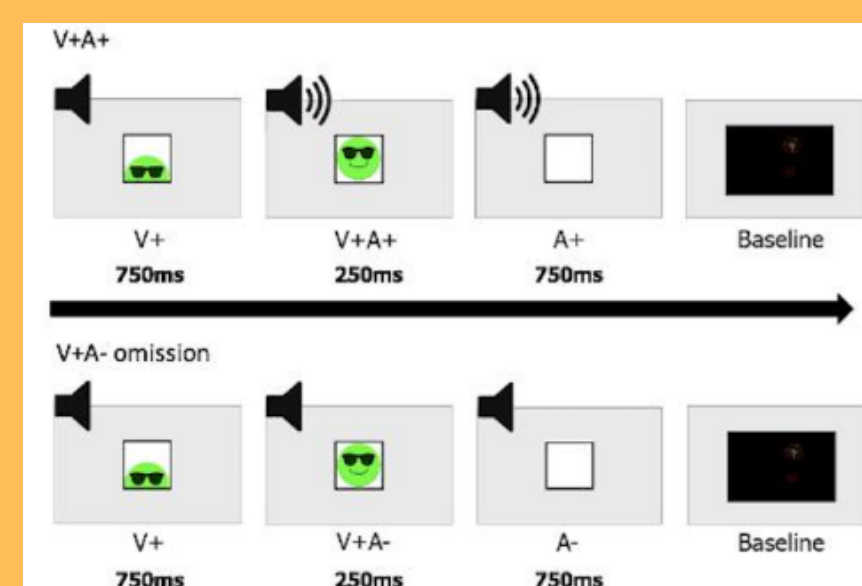
fNIRS

We completed fNIRS and MR co-registration to identify occipital and temporal channels
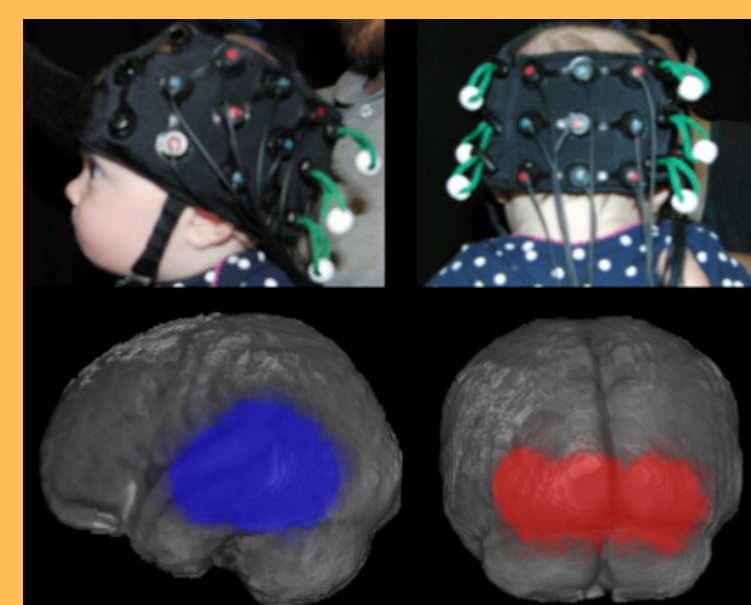
Preprocessing

After data collection, we coded looking behavior of each trial for each infant.
We removed trials where infants were looking less than 80% of the time and infants who had less than 2 trials for V+A+ and V+A- single trials

3. RESULTS

V+A+ : Infants showed occipital and temporal responses.
V+A- omission: Infants showed occipital response but no temporal response.

Comparing the temporal response for both conditions (V+A+ vs V+A- omission) revealed no difference. Comparing the temporal response for V+A- omission to V+A- control also revealed no difference.


4. CONCLUSION

Infants' temporal response to V+A-, although weak, suggests there could be top-down sensory prediction in the temporal cortex (i.e. auditory region). Next steps include changing study design, such as changing presentation time, or making the task interactive, to produce more definitive results.

Princeton Baby Lab