

Investigating prediction error in auditory and visual domain of infants using pupillometry

Felicia Zhang¹, Lauren L. Emberson¹

¹. Department of Psychology, Princeton University

1. INTRODUCTION

Infants have been shown to use prediction error to update their prediction of upcoming visual stimulus. In this study **we investigate if the prediction error response in infants is domain specific (i.e. only present in visual domain) or a domain general ability.**

2. METHOD

47 6-months-old infants completed an implicit learning, gaze-contingent task, designed to help them learn associations between sounds and pictures.

Pupil size was measured using an eyetracker (Eyelink 1000).

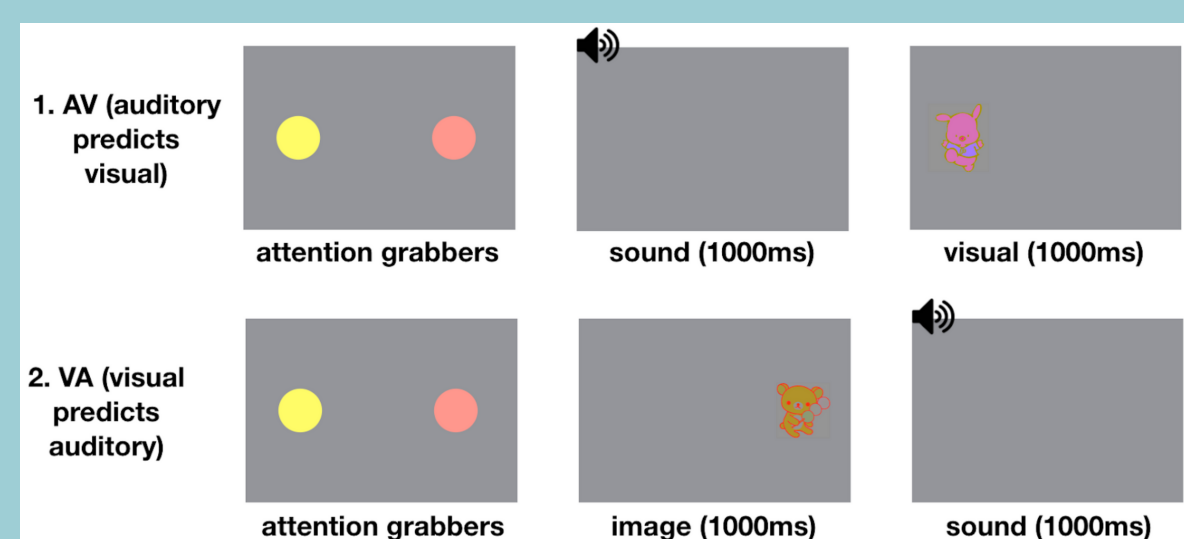


Figure 1. Infants completed 2 conditions: auditory predicts visual (AV) and visual predicts auditory (VA) in counterbalanced order.

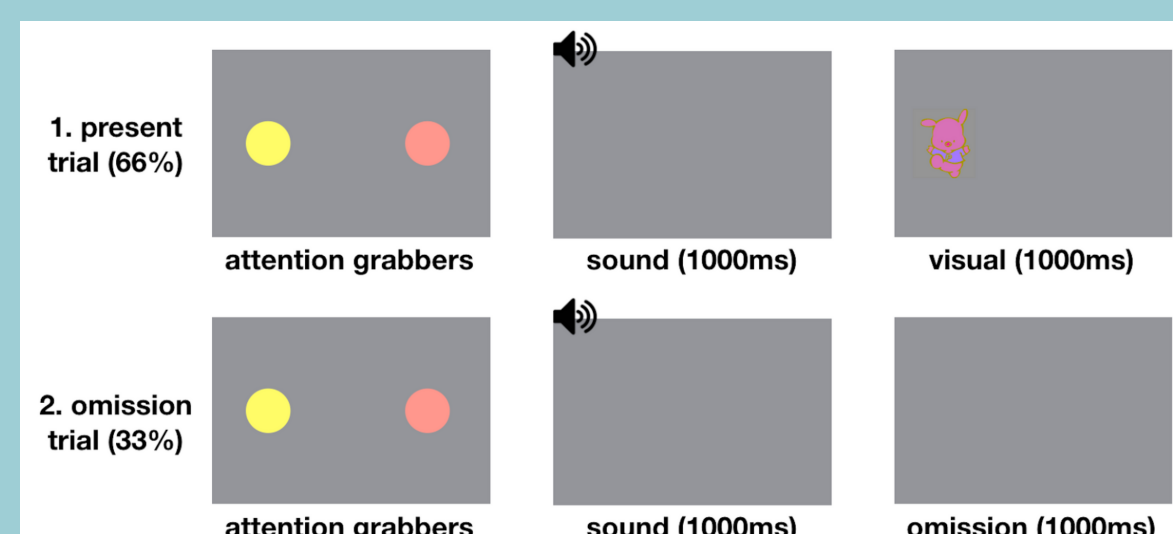


Figure 2. For each condition, infants viewed 2 trial types: present (A+V+ or V+A+) and omission (A+V- or V+A-). This figure is an example of present and omission trial in AV condition.

3. RESULTS

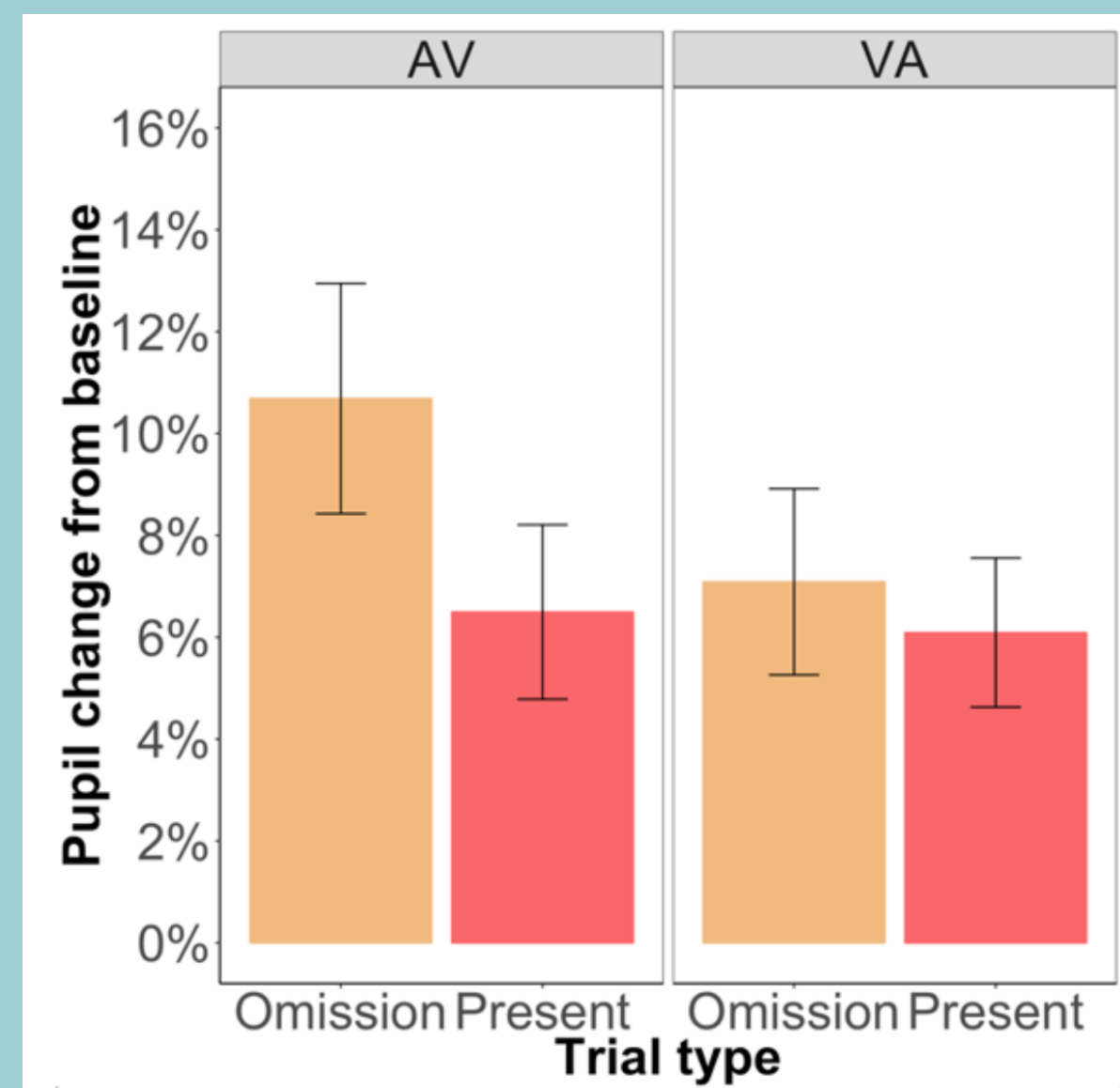


Figure 3. Plot of average pupil change from baseline.

A 2x2 repeated measures ANOVA was conducted. The main effect of condition was not significant $F(1,23) = 1.38$, $p = 0.25$. There was an almost significant main effect of trial type $F(1, 23) = 3.5$, $p=0.074$. There was no significant interaction $F(1,23) = 1.4$, $p = 0.25$.

T-tests were also conducted separately for each condition. There was an almost significant effect of trial type for AV condition $t(23) = -1.83$, $p = 0.08$. but not VA condition $t(23) = -0.33$, $p = 0.75$.

4. CONCLUSION

Results suggest possibility of prediction error response only in the AV condition (i.e. visual domain). We believe this lack of prediction error response in the VA condition (i.e. auditory domain) is task specific and not indicative of a true domain specific response.

5. FUTURE DIRECTION

Test infants on VV (visual predicts visual) condition to determine whether the lack of prediction error response in VA for A is caused by uninteresting predicting stimulus or truly a domain specific response.