

## INTRODUCTION

- Previous research has demonstrated that children from lower socioeconomic status (SES) households have poorer language outcomes than children from higher SES households (e.g., Hart & Risley, 1995).
- Recent findings from our lab have highlighted three multisensory attention skills (MASks; attention duration, speed of shifting, and intersensory processing accuracy), established in infancy, that are foundations for subsequent language development.
- Here we explore the extent to which each MASk differs as a function of SES, highlighting the potential role that each plays in the early prediction of language outcomes.

## METHODS

### The Multisensory Attention Assessment Protocol (MAAP)

- As part of an ongoing longitudinal study, a total of 104 infants (49 females), participated in the MAAP at 12 months of age ( $M = 11.61$ ,  $SD = 2.96$ ).
- The MAAP is designed to assess individual differences in MASks (Bahrick et al., 2018; Figure 1).
- The MAAP consists of 24 15-s trials, 12 social (women speaking with positive affect) and 12 nonsocial (objects dropping into a clear container).
- Gaze was live-coded by two trained observers.
- Each trial consists of a 3-s central visual stimulus and is followed by two 12-s lateral, dynamic video events—one in synchrony with an accompanying natural soundtrack and the other out of synchrony.
- On half of the trials, the central event remains on while the lateral events are presented (high-competition trials) and on the other half it is turned off during the lateral events (low-competition trials). MASks are quantified as follows:
  1. **Attention Duration:** proportion of available looking time to the lateral events.
  2. **Speed of Shifting:** reaction time to shift attention from the central event to fixate a lateral event.
  3. **Intersensory Accuracy:** proportion of total looking time to the sound-synchronous lateral event.

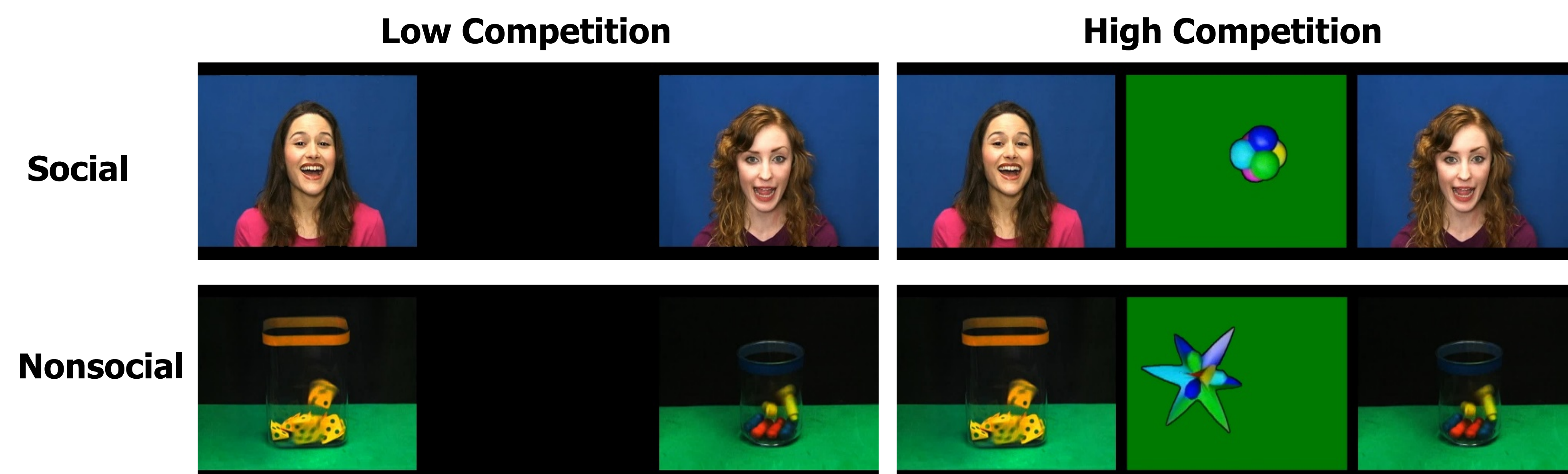


Figure 1: Static images of the dynamic audiovisual events from the MAAP.

### Language Outcome Measures

- Children also participated in two standardized language outcome measures at 36 months of age: the **Peabody Picture Vocabulary (PPVT)** and the **Expressive Vocabulary Test (EVT)**.

### Socioeconomic Status (SES)

- Maternal education was used as a proxy for SES.
- Children whose mothers reported having a bachelor's degree or higher ( $n = 51$ ) were classified as being from *higher SES households* and those from homes where mothers reported not having attained a bachelor's degree ( $n = 42$ ) were classified as being from *lower SES households*.

## RESULTS

- Replicating prior findings, children from lower SES households scored lower on both the PPVT and EVT compared to children from higher SES households (Figure 2;  $ps < .001$ ).
- MASks differed significantly as a function of SES (Figure 3A and 3B).

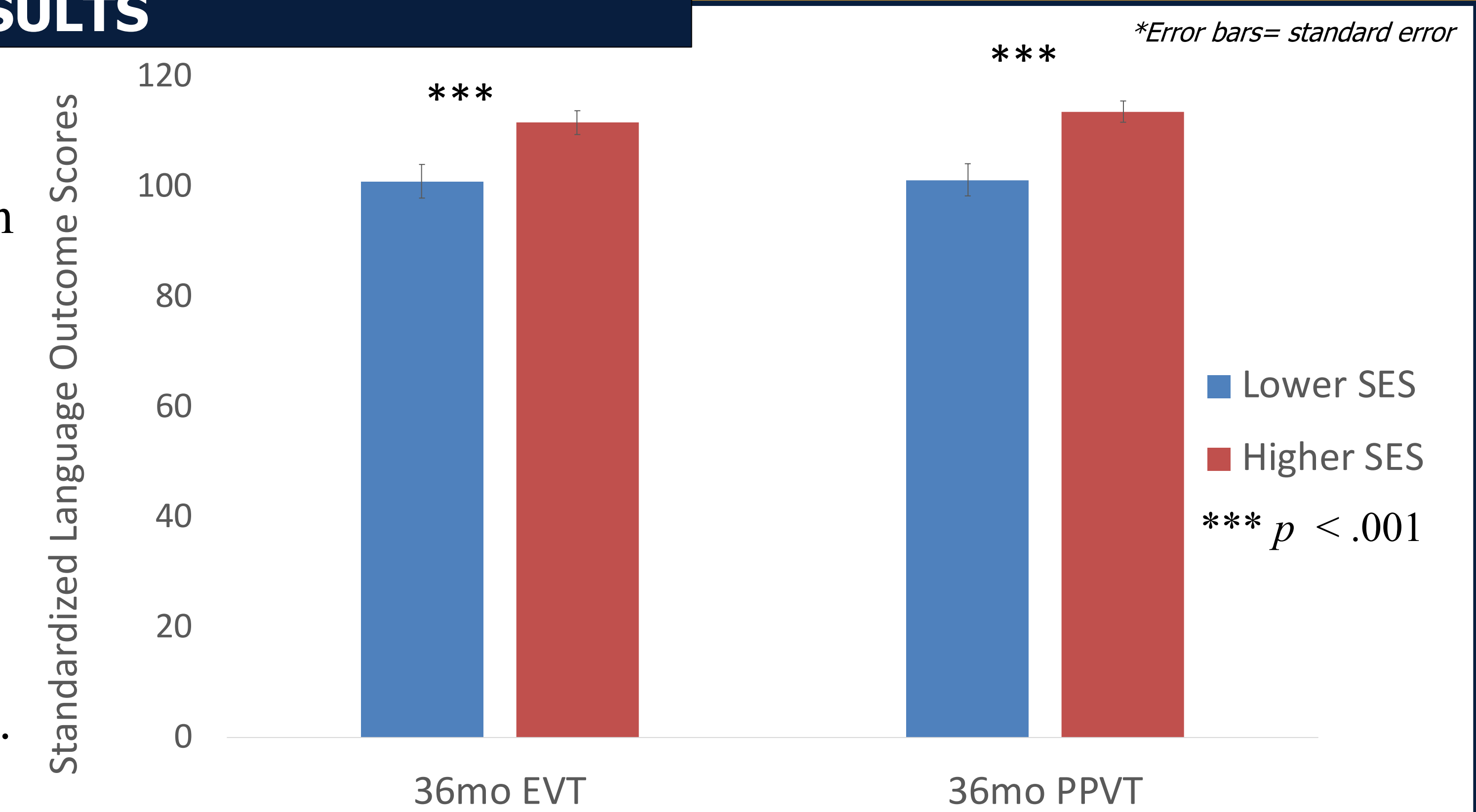


Figure 2: Language outcome measures (Standardized EVT and PPVT scores) at 36 months of age as a function of SES classification.

- Specifically, 12-month-old infants from higher SES households showed longer attention duration on all trial types ( $p = .037$ ).
- They also showed greater intersensory accuracy on the social high-competition trials ( $p = .032$ ).
- Further, intersensory accuracy of 12-month old infants from higher SES households (but not lower SES households) was significantly greater than chance (50%;  $p = .019$ ).

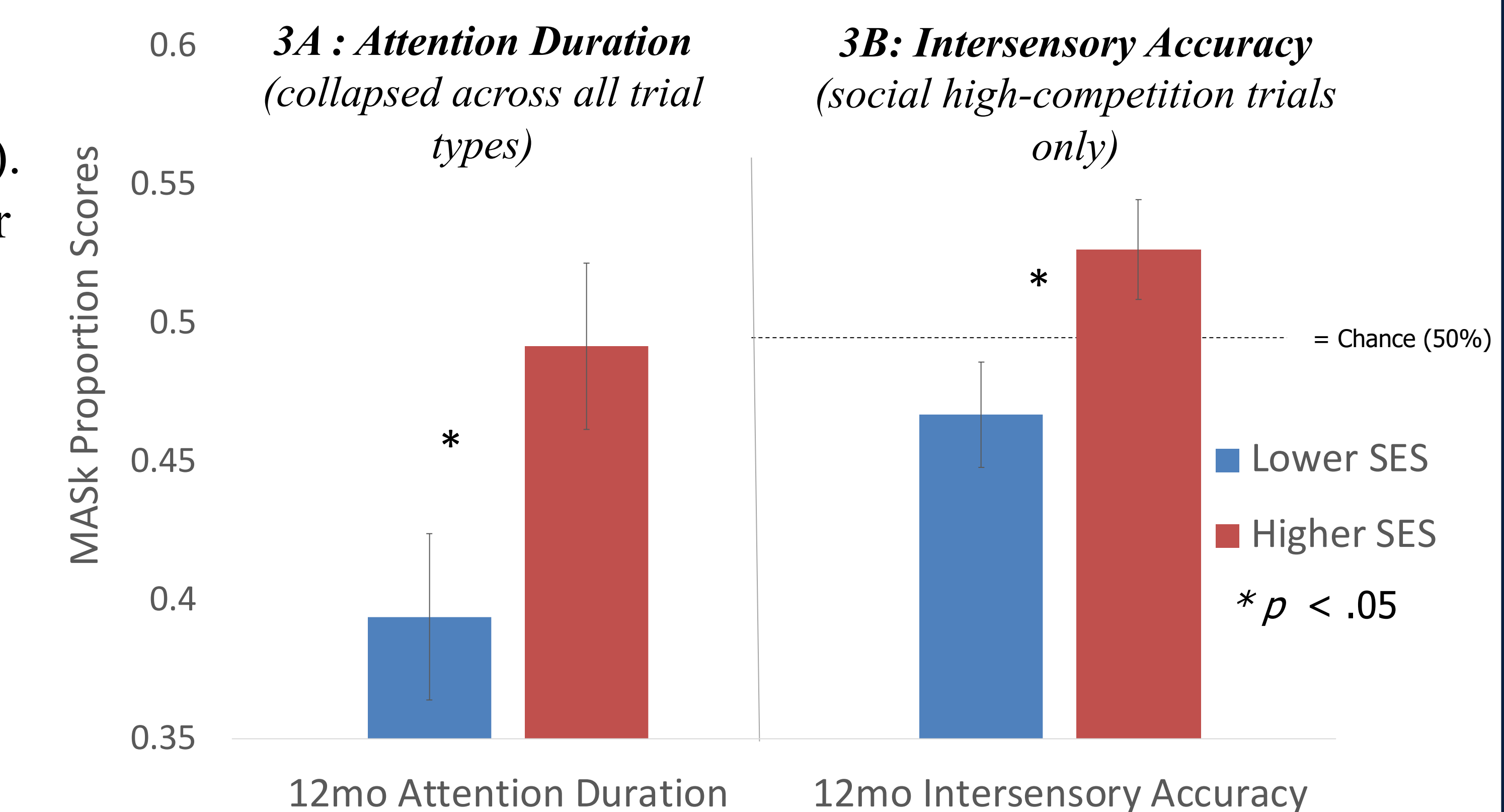


Figure 3: Multisensory attention skills (MASks) at 12 months of age as a function of SES classification. 3A: Attention duration (proportion of available looking time to the sound synchronous events). 3B: Accuracy of intersensory matching (proportion of total looking time to the sound synchronous social event).

## DISCUSSION

- The present study replicated the well-established finding of better language outcomes in children from higher SES households compared to children from lower SES households.
- We also found *new evidence* of better multisensory attention skills (duration, accuracy) in children from higher SES households than children from lower SES households.
  - Children from lower SES households have shorter attention duration (to both social and nonsocial events) and show poorer face-voice matching in the presence of competing stimulation than children from higher SES households
- These results suggest that children from lower SES households and those with poorer MASks may be more likely to have poorer language outcomes.
- Future work will explore how SES differences moderate the relationship between multisensory attention skills and language outcomes. This work is currently underway in our lab.