

Error Types in Synchrony Judgements of Audiovisual Stimuli in Children with Autism

Spectrum Disorder

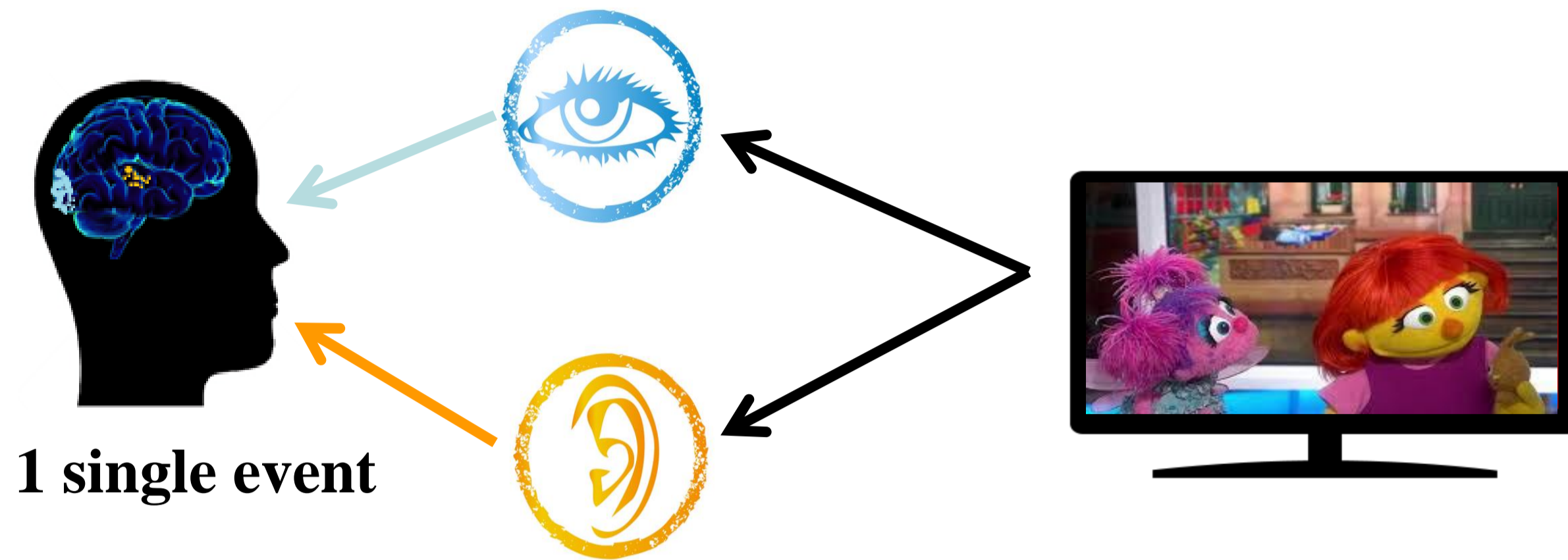
Melissa Ferland¹, Magali Segers¹, Busi Louise Ncube¹, Ryan A. Stevenson², & James M. Bebko¹

¹York University, Psychology Department ²Western University, Psychology Department



BACKGROUND

Intermodal Perception (IMP):



- Integrating multiple sensory information into a single, coherent perception (Dixon & Spitz, 1980)
- Most common: integration of audio-visual info (e.g., van Eijk et al., 2008)
- Crucial to different aspects of development (Bahrick, 2010)

Synchrony Judgement (SJ) Task:

- “Is what you see and hear synchronous or not?”
- Often used to measure IMP

Autism Spectrum Disorder (ASD):

- have atypical sensory experiences (APA, 2013)
- have atypical IMP (e.g., Bebko et al., 2006; Stevenson et al., 2014)
- atypical IMP linked to social-communicative deficits (e.g., Bebko et al., 2006)

PURPOSE

To examine how children with and without ASD perform on a SJ task for different audiovisual stimuli. Specifically, to observe differences in error types within and across groups.

DESIGN

Synchrony Judgement Task:

- Used a keyboard to respond (Y or N)
- Per video, 5 seconds to respond

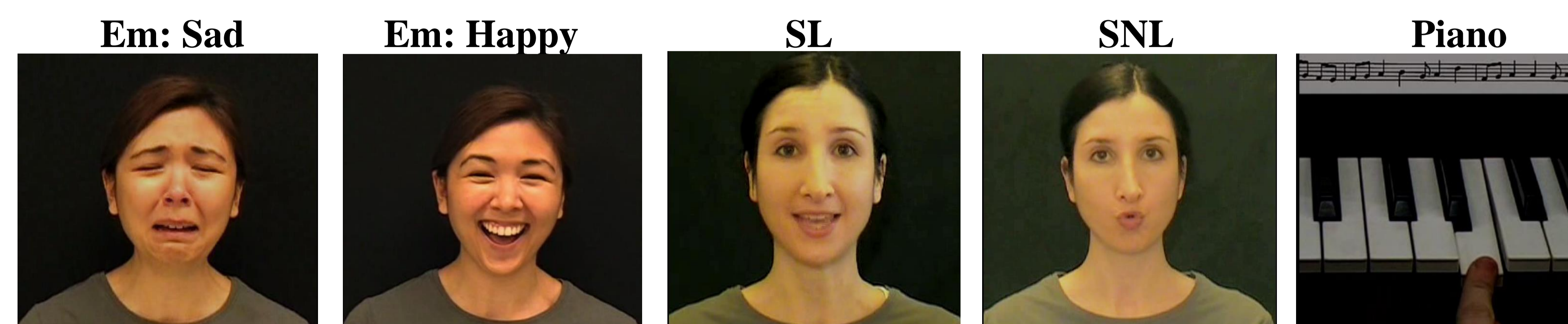
PARTICIPANTS

- 20 children with ASD (M = 12.6 years, SD = 3.0)
- 30 typically developing (TD) children (M = 11.9 years, SD = 2.7)
- Matched on age and FSIQ (WASI-II)

METHODS

Stimulus Type:

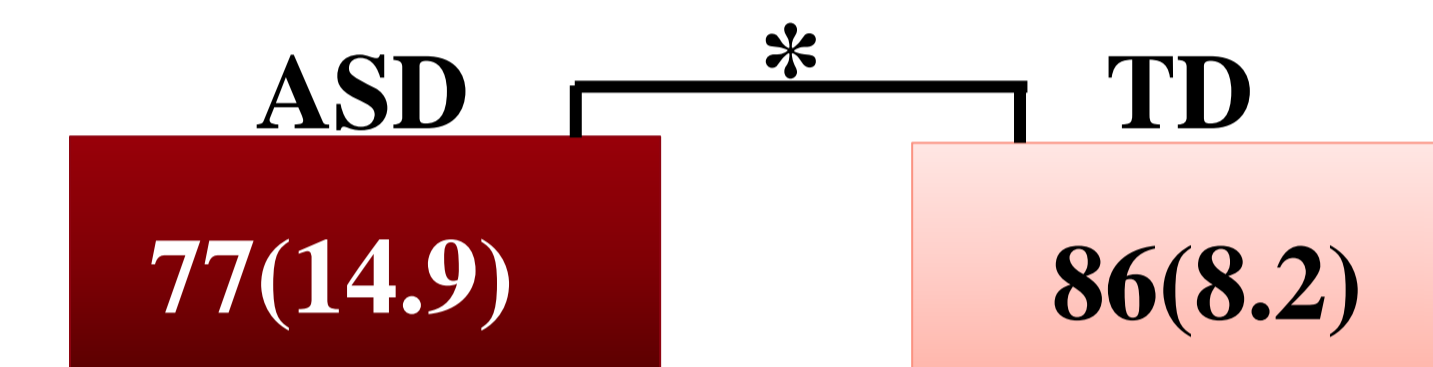
- 5 types: Emotion (Happy or Sad), social-linguistic (SL), social-non-linguistic (SNL), and non-social-non-linguistic (Piano).
- Audio Leading (1sec), Visual Leading (1 sec) or Synchronous



RESULTS

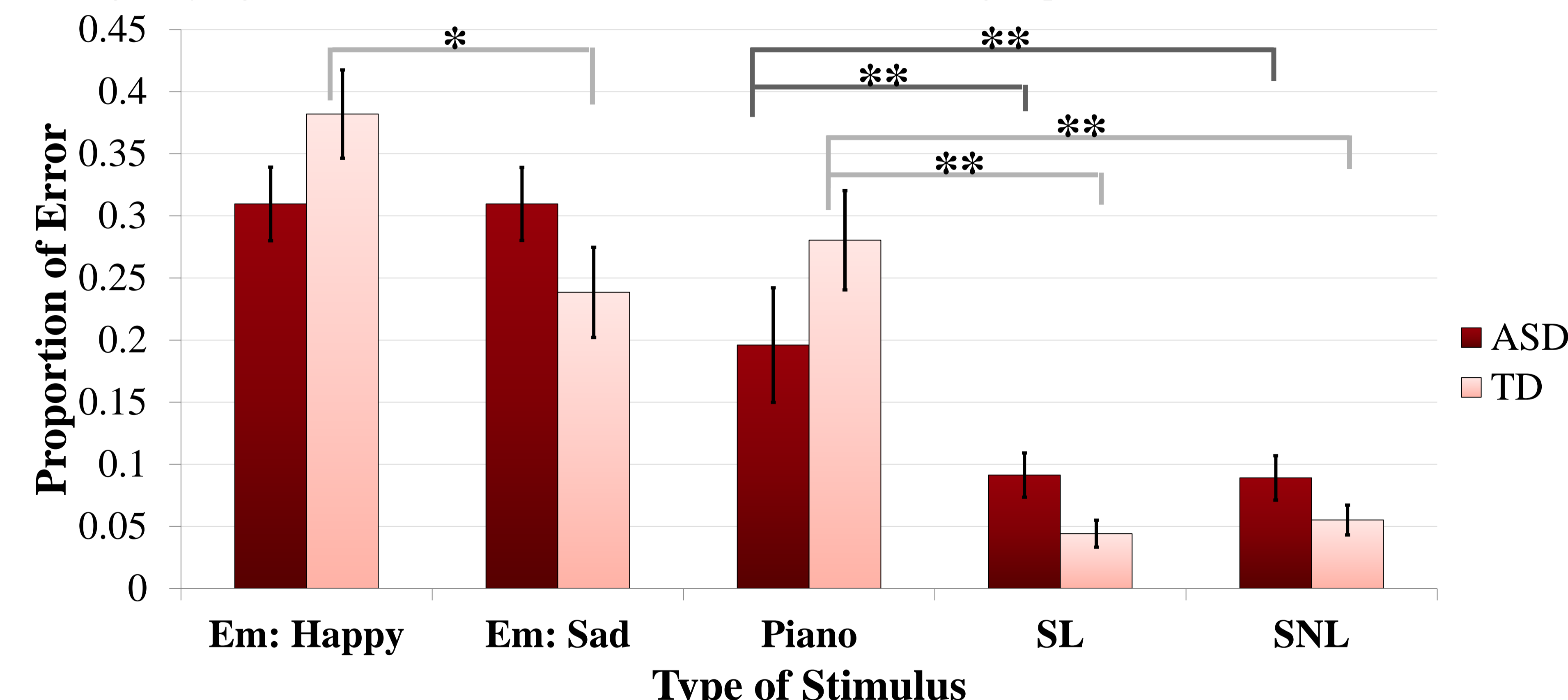
General Performance:

Mean % of correct response (SD):



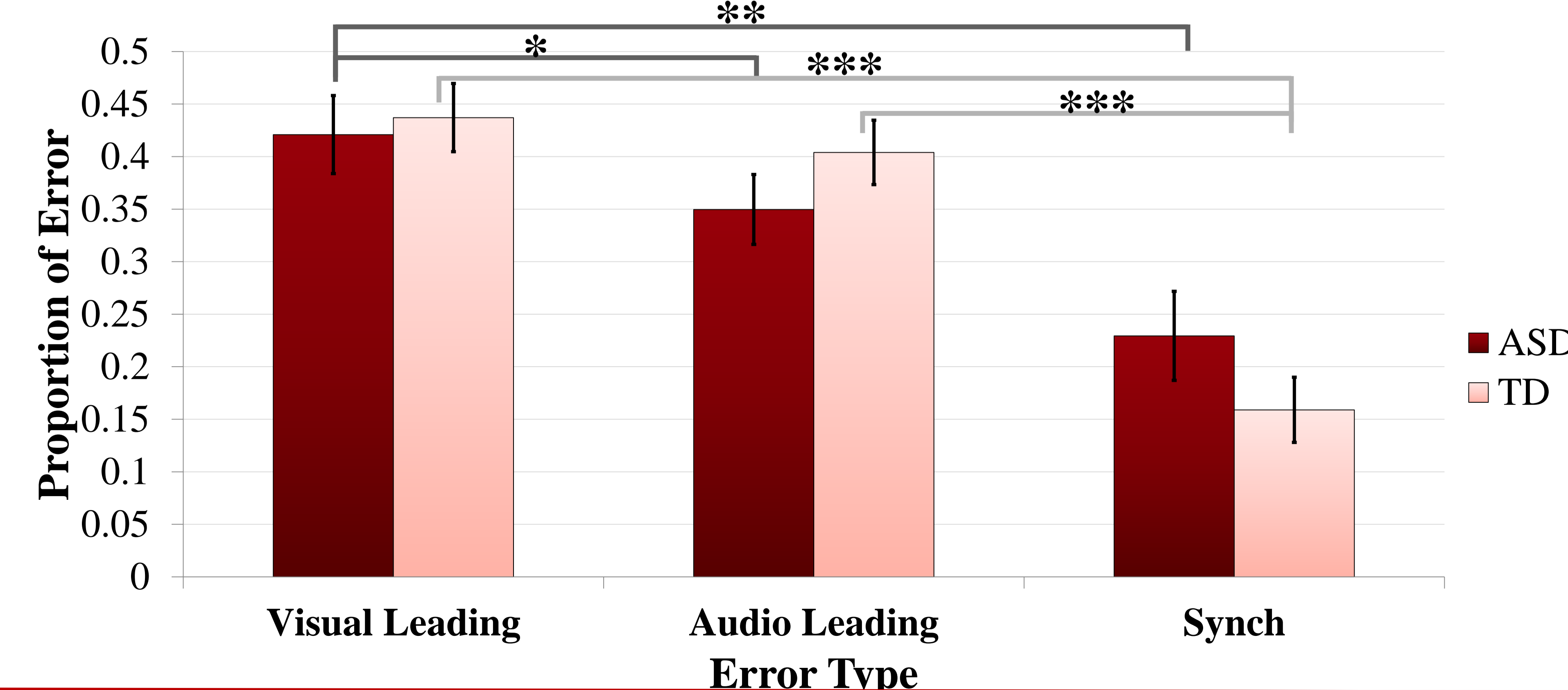
Errors Based on Stimulus Type:

- 2-way ANOVA: Stimuli X Group: Main effect of stimulus ($F(1, 4) = 40.71, p < 0.001, R^2 = .43$)
Marginally significant interaction ($p = 0.079$) but no main effect of groups ($p = 0.894$).



Error Types Across and Within Groups:

- 2-way ANOVA: Error X Group: Main effect of error type ($F(1,2) = 33.66, p < 0.001, R^2 = .36$)
No significant interaction ($p = 0.100$) or main effect of groups ($p = 0.912$).



SUMMARY

ASD group made more errors than TD:

- ($F(1, 49) = 5.47, p = .03$)* Brown-Forsythe correction

ASD group only findings:

- More errors on the Piano stimuli compare to both SL and SNL
- No difference between sad and happy stimuli
- More likely to say the stimuli is synchronous when it is visual-leading than when audio-leading

Significant main effect of stimuli & error type:

- More errors made on the emotion stimuli
- Less errors made on social stimuli, regardless of whether linguistic or not
- Less likely to make an error on synchronous stimuli

DISCUSSION

The ASD group made more errors in a SJ task, even though the asynchronous stimuli had a large offset. However, the type of errors made were similar to those of the TD group (no interaction or main effects of group). Further research is needed to better understand the underlying audiovisual IMP issues in ASD.

FUTURE DIRECTIONS

Future analyses will examine the relationship between perceptual errors in the synchrony judgement task and concurrent physiological responses (i.e., pupil dilation, Galvanic Skin Response (GSR)).

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