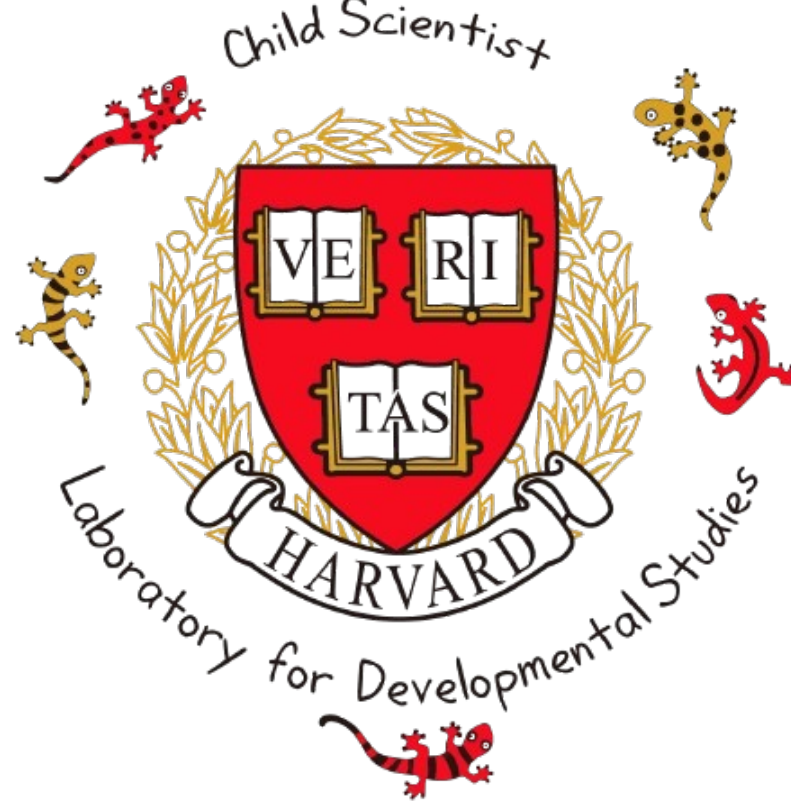




Examining Neural Adaptation in Typically Developing Children and Children with Autism

Isabel Sichlau, Hanna Shine, Jesse Snedeker



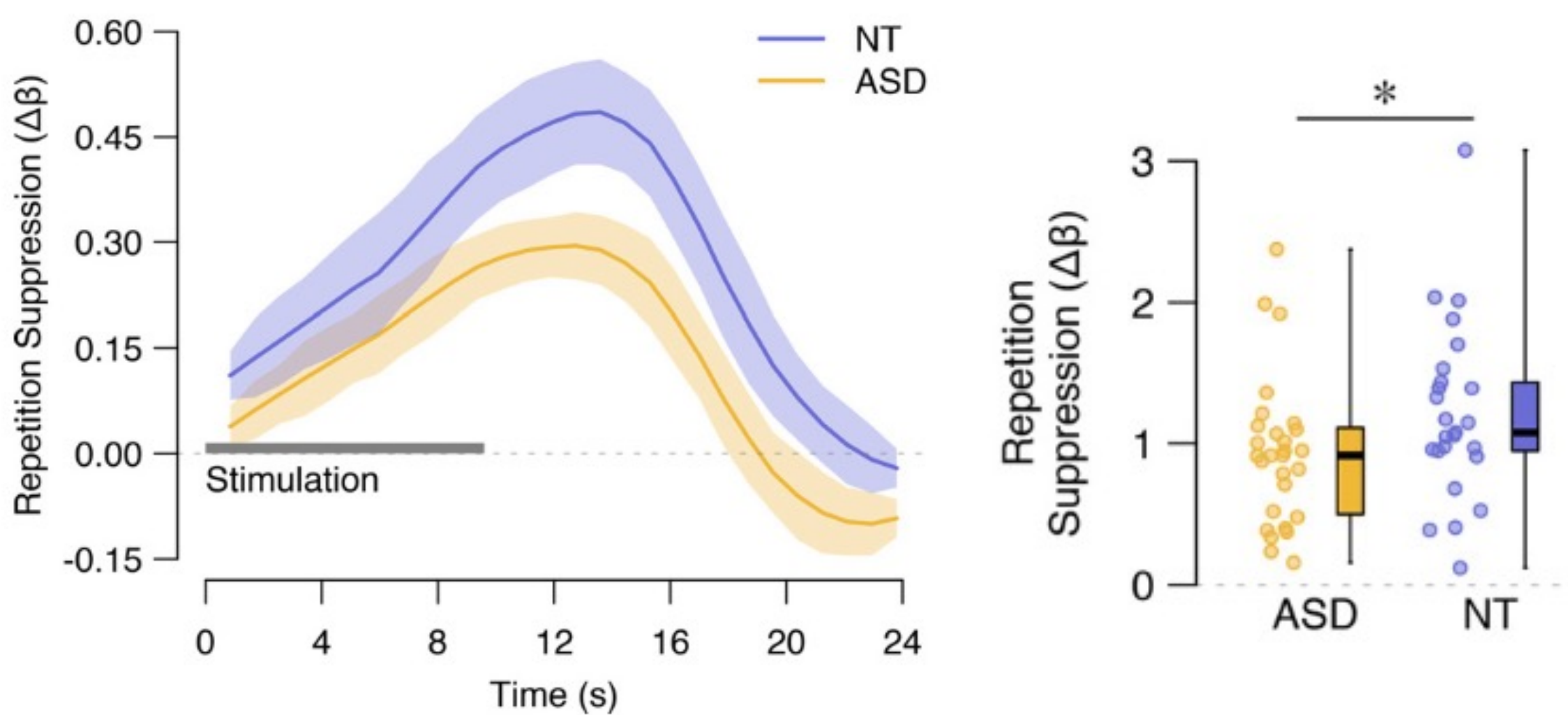
BACKGROUND

- Neural Adaptation: reduction in neural activity in response to repeated stimuli ²
- Diagnostic criteria for autism spectrum disorder (ASD) includes deficits in social-emotional reciprocity ¹
- Higher symptom severity in ASD is correlated with lower rates of adaptation^{4,5}
- Children with ASD took longer to habituate to visual stimuli in looking-time experiments compared to typically developing (TD) children ^{8,9}
- ASD adaptation to faces took longer overall ⁹

Is there a neurological difference?

PRIOR fMRI RESULTS

- Differences in neural adaptation to faces comparing adults with ASD to TD adults ³
- Differences only with social-visual stimuli ³
- Lower social communication score correlated with slower neural adaptation ³



RESEARCH QUESTIONS

Are there any differences in neural adaptation to social and non-social visual stimuli in TD children and children with ASD?

- 1) How does neural adaptation to repeated faces differ between TD children and children with ASD?
- 2) How does neural adaptation to repeated objects differ between TD children and children with ASD?

ERP COMPONENTS

ERP	Cognitive Process	Rationale
N250	Facial processing regarding <u>identification</u> ^{1,7,8}	Reflects neural adaptation to repeated <i>social</i> stimuli
N400	Facial/object processing regarding <u>recognition</u> ^{2,6}	Reflects neural adaptation to repeated <i>social</i> and <i>non-social</i> stimuli

METHODS

Testing goals:

- 40 6-12-year-old children with ASD (5 ASD participants tested this summer)
- 40 age and 40 language matched TD participants (3 TD participants tested this summer)

Testing Sessions:

- In-person, 2.5 hrs; EEG and behavioral tasks
- Zoom, 1.5 hrs; behavioral and lexical prediction tasks and standardized tests

EEG Visual Neural Adaptation Task:

- Participants viewed high-repetition and low-repetition blocks of faces and objects
- Block of stimuli were followed by a smiley face for attention

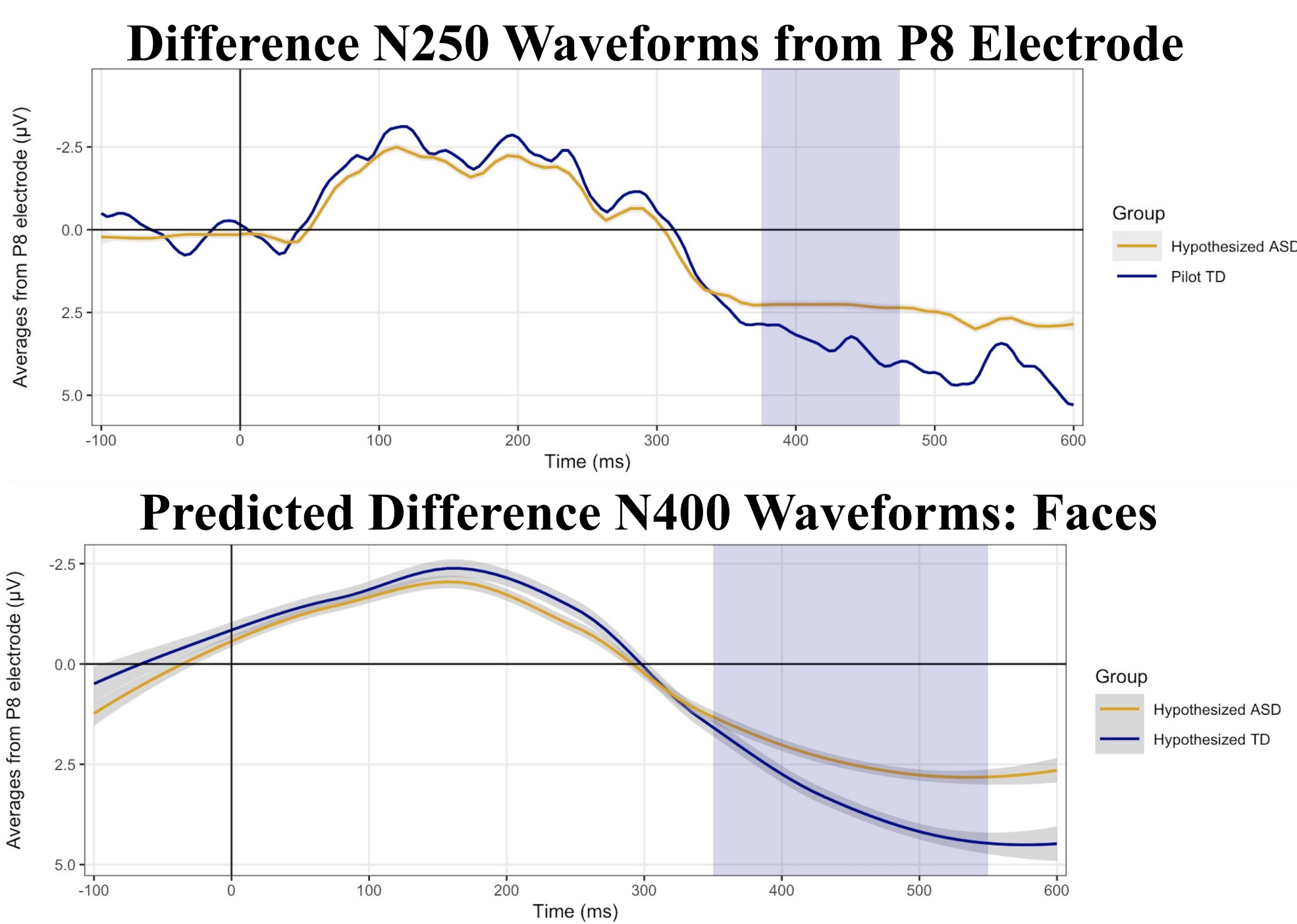
STIMULI

	High-Repetition	Low-Repetition
Faces		
Objects		

HYPOTHESES

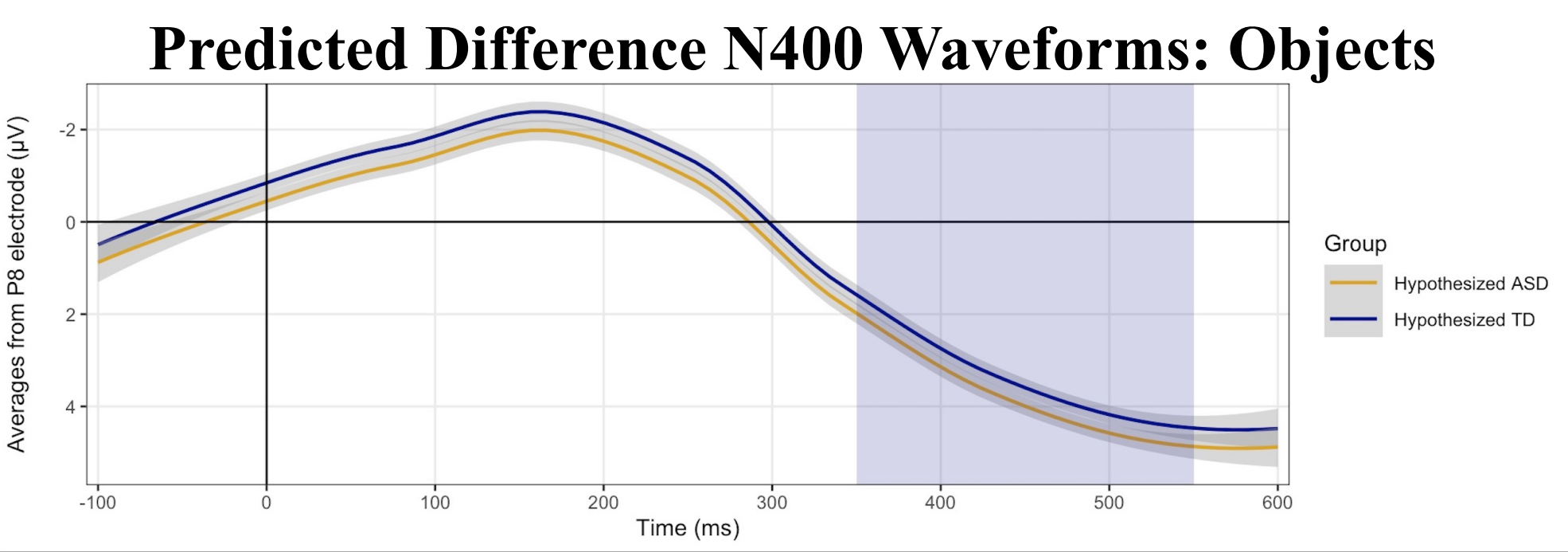
1) Adaptation to faces

- We expect children with ASD to exhibit diminished neural adaptation to social stimuli compared to TD children



2) Adaptation to objects

- We expect ASD children to exhibit typical neural adaptation to non-social stimuli compared to TD children



FUTURE DIRECTIONS: EXPLORING ANIMACY

How does adaptation to repeated *animate* and *inanimate* objects differ between TD children and children with ASD?

- fMRI research has found different patterns of brain activation for animate and inanimate visual stimuli ¹⁰
- Does neural adaptation vary as well?
- If no difference, could indicate domain-specific deficit in social-visual stimuli
- If difference, could indicate domain general deficit in animate stimuli

REFERENCES

¹American Psychiatric Association (2013); ²Andrews et al. (2017); ³Benda (2021); ⁴D'Mello et al. (2023); ⁵Olivares et al. (2015); ⁶Perry et al. (2007); ⁷Schendan et al. (2003); ⁸Schweinberger et al. (2002); ⁹Tanaka et al. (2006); ¹⁰Webb et al. (2010); ¹¹Wiggett, et al., (2009)