



Background

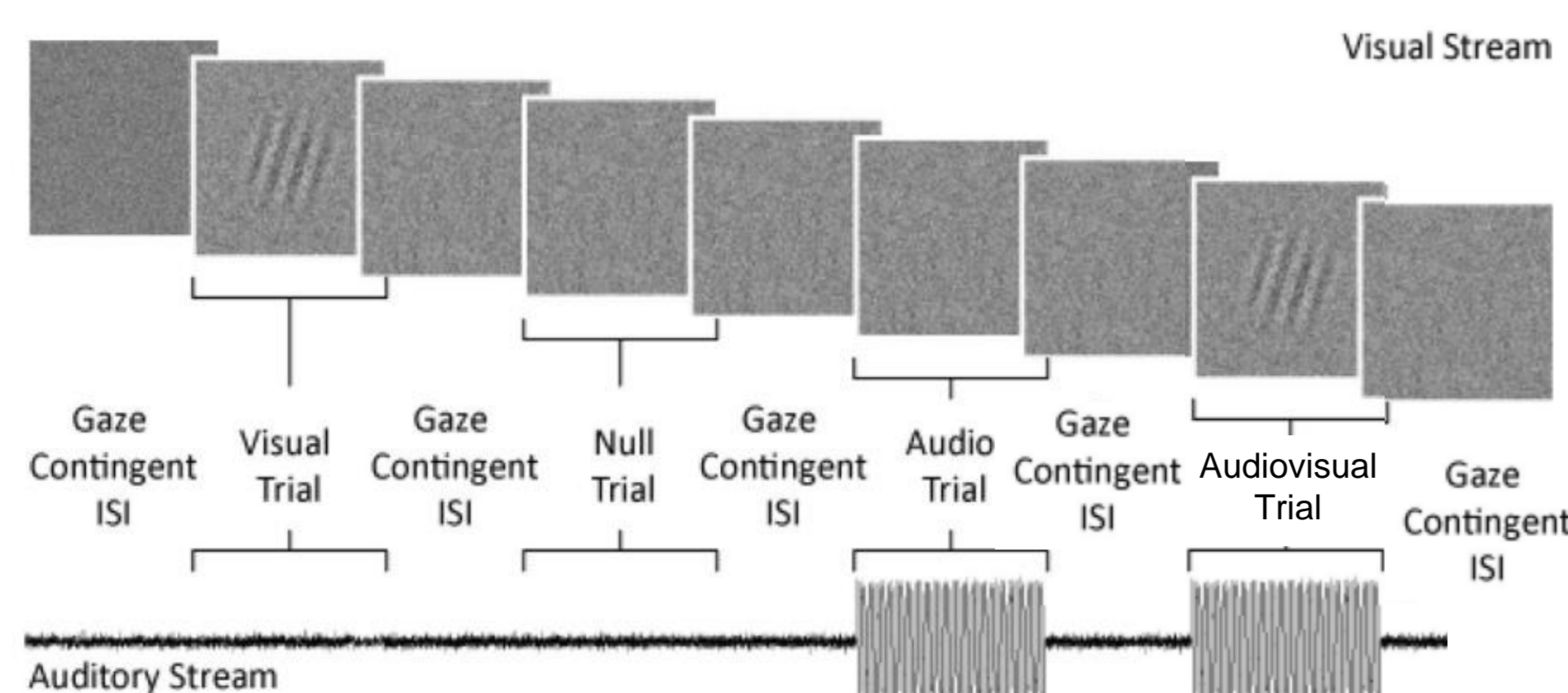
- Atypical sensory processing is a common symptom of autism spectrum disorder (ASD)
- Autistic individuals may experience differences in integrating information across different sensory modalities, known as multisensory integration (MSI)
- Autistic individuals may also detect sensory outputs (sensory sensitivity) differently than neurotypical individuals
- Findings from previous research are mixed regarding the relationship between the severity of autistic traits and sensory sensitivity¹, and MSI²
- Research objective:

To investigate the relationship between the severity of autistic traits and: 1) sensory sensitivity 2) multisensory integration.

Proposed Methods

- Participants:
 - Children and adolescents age 8-17
- Measures:
 - Autism and sensory questionnaires to measure the severity of autistic traits
 - Adaptive staircase detection task to measure sensory sensitivity and multisensory integration
 - Electroencephalogram (EEG) to measure electrophysiological responses to sensory stimuli

Fig 1. Adaptive Staircase Detection Task (adapted from Schulz and Stevenson, 2022).



Planned Analyses

- We plan to conduct a bivariate correlation between the severity of various autistic traits and the mean amplitude of visual and auditory ERP responses, as well as the ERP responses related to MSI
- Additionally, we plan to conduct a correlation between the severity of various autistic traits and the responses to auditory, visual, and audiovisual trials

Completed Tasks

- The following tasks were completed as part of the Undergraduate Student Research Internship:

Conducted Literature Review

- Conducted a literature review regarding sensory sensitivity and multisensory integration in individuals with ASD

Learned Applicable Skills

- Learned how to use EEG equipment and analyze EEG results through online workshops
- Learned applicable coding skills
- Participated in personal development workshops

Organized and Ran Research Days

- Helped organize and run lab Research Days during which children participated in research activities

Open Science Framework

- Began writing up the Open Science Framework for this study

Hypotheses

- We predict that there will be a positive relationship between the severity of autistic traits and sensory sensitivity
- Thus, we predict that individuals with a higher severity of autistic traits will display greater amplitudes of the auditory and visual ERP, as well as the ERP related to MSI, compared to individuals with a lower severity of autistic traits
- We also predict that individuals with a higher severity of autistic traits will display greater sensory sensitivity to the audiovisual trials compared to the auditory and visual only trials

Next Steps

- The following tasks will be completed as part of my Master's Thesis Project for the next two school years:

Submit ethics application.

Pilot study with community partners and lab members.

Incorporate edits and revisions.

Recruit participants.

Run the study with participants.

Run quantitative analysis.

Citations:

- Schulz, S. E., & Stevenson, R. A. (2022). Convergent validity of behavioural and subjective sensitivity in relation to autistic traits. *Journal of Autism and Developmental Disorders*, 52(2), 758-770
- Brandwein, A. B., Foxe, J. J., Butler, J. S., Frey, H. P., Bates, J. C., Shulman, L. H., & Molholm, S. (2015). Neurophysiological indices of atypical auditory processing and multisensory integration are associated with symptom severity in autism. *Journal of autism and developmental disorders*, 45(1), 230-244.