**BACKGROUND**

- Autism spectrum disorder (ASD) is a neurodevelopmental disorder, characterized by social interaction and communication impairment and restricted interests and repetitive behaviors (DSM-5, 2013).

- Another key characteristic of ASD is sensory sensitivities, which are associated with experiencing heightened or flattened amounts of sensory information such as with vision, touch, and sound; studies have found more sensory sensitivity behaviors in children with ASD as compared to children with other developmental disorders and typically developing children (e.g., Leekam et al., 2006; Ben-Sasson et al., 2007).

- The autonomic nervous system (ANS), a branch of the nervous system responsible for many involuntary processes, is one system controlling sensory processing and is thought to have atypical functions in individuals with sensory sensitivities (Lane, 2002).

  - Individuals with ASD have shown atypical ANS functions, including heightened skin conductance response (e.g., Kylliläinen & Hietanen, 2006) and reduced respiratory sinus arrhythmia (e.g., Vaughan Van Hecke et al., 2015).

  - The pupil light reflex (PLR) is an ANS marker defined as the change in pupil size in response to flashes of light, and this has been studied in the context of ASD and ASD traits.

  - Studies showed that individuals with ASD had PLR hypersensitivity, showing lower constriction velocity and smaller relative constriction than typically developing individuals (e.g., Fan et al., 2009).

  - Correlations between PLR and ASD traits were also found in a broad sample that included both ASD and non-ASD children (DiCriscio & Troiani, 2017).

- In a study looking at PLR and sensory difficulties in individuals with ASD, higher sensory sensitivities behaviors correlated with lower pupil constriction, and this correlation was not found in the typically developing group (Daluwatte et al., 2014).

**Study goal:** The current study aims to extend past work to examine correlations between PLR, sensory sensitivities and ASD traits in typically-developing children.

**Correlations Between Autistic Traits, Pupil Light Reflex, and Sensory Sensitivities in School-Aged Children**

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**METHOD**

**Participants**

- School-aged children between 4 and 11 years old
- Experiment took place at the Cognitive Development Lab at CSI, CUNY.

**Procedure**

- Participants were seated 65-70 cm away from an eye-tracking monitor.
- For a total of 9 trials, a PLR task (based on Nystrom et al., 2015) was presented and data was collected using an SMI RED eye-tracker.
  - PLR paradigm starts with a blank background with a fixation point (to bring individual’s attention to the screen), followed by a brief white flash screen (see Figure 1). Between each trial a baseline phase was presented that includes floating geometric shapes.
  - Later in the session, parents completed a set of questionnaires regarding their child, including the Social Responsiveness Scale, 2nd Edition (SRS-2; Constantino & Gruber, 2012) to assess autistic traits and the Short Sensory Profile-2 (SSP-2; Dunn, 2014) to assess sensory behaviors.

**Data Processing**

- PLR: Based on Nystrom et al. (2015), relative pupil constriction will be calculated and averaged across trials for each participant.
- SRS-2: Based on the set of 65 scaled questions, total scores will be calculated, with higher scores reflecting more autistic traits.
- SSP-2: Based on the 34-item measure, total scores will be calculated, with higher scores reflecting more atypical sensory sensitivities.

**PLANNED ANALYSES AND EXPECTED RESULTS**

**Sensory Sensitivities and ASD Traits**

- **Statistical analysis:** A correlational analysis will be done between SRS-2 and SSP-2 total scores.
- **Hypothesized results:** We predict that higher ASD traits will correlate with more sensory sensitivity behaviors (see Ben-Sasson et al., 2007).

**ASD Traits and PLR Constriction**

- **Statistical analysis:** A correlational analysis will be done between SRS-2 total score and PLR constriction percentage.
- **Hypothesized results:** We predict higher ASD traits will correlate with weaker PLR (see DiCriscio & Troiani, 2017).

**Sensory Sensitivities and PLR Constriction**

- **Statistical analysis:** A correlational analysis will be done between SSP-2 total score and PLR constriction percentage.
- **Hypothesized results:** We predict that our typically developing sample will show no correlation between sensory sensitivity behaviors and PLR, unlike in ASD (see Daluwatte et al., 2014).

**REFERENCES**


**Acknowledgments**

A huge thank you to my mentor Dr. Jennifer Wagner for her guidance and support and to all members of the Cognitive Development lab for their efforts.