Auditory Sensory Filtering and Development in Children with Autism Spectrum Disorder

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Introduction

- Atypical sensory filtering has been observed in Autistic children (ASD)
  - *IE.* increased startle response to auditory stimuli (**Acoustic Startle Response/ASR**)
- ASR can be modulated by sensory filtering in many different ways

- **PROBLEM —** previous studies have showed mixed results for changes in ASR, both when looking at different characteristics and ASD vs Neurotypical (NT) children

Objective/Hypothesis

Objective — to investigate whether altering characteristics of auditory stimuli affects the acoustic startle response
- Compare potential changes in ASR between ASD and NT children

Variables of Interest for ASR
(1) Pulse Intensity (65-105dB in 10dB increments)
(2) Prepulse Inhibition (75dB pulse then 105dB pulse after 60ms or 120ms)
(3) Habituation (at 105dB)

Hypothesis — altering characteristics of auditory stimuli will alter the ASR *to varying degrees in Autistic versus Neurotypical children*

Methods

Participants — ASD (n = 14) and NT children (n = 13)

Questionnaires/Assessments — completed to obtain sensory and trait profiles of participants

Hearing Assessments — otoscope, tympanometer, audiometer (passing all 3 were required to complete startle task)

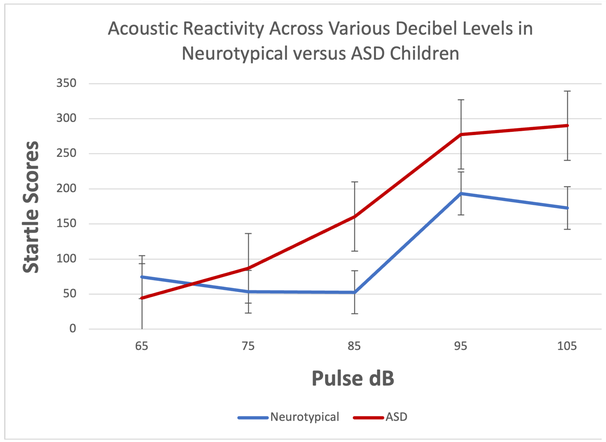
Startle Response — measured using EMG (under left eye) across 3 blocks while watching a silent children's movie

Analysis — looked at mean differences in scores between groups across each variable using independent sample t-tests

Discussion

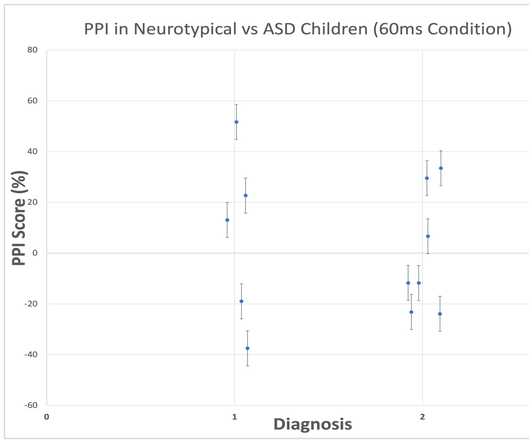
- Autistic children show increased startle at lower decibel stimuli and to greater degrees (still, results were mixed)
  - Comparing these with individual sensory profiles may provide more clear patterns
- **Some findings provide further evidence of sensory filtering differences**
  - Alongside neural underpinnings of ASD symptomology
  - PPI results may indicate startle pathway delays in ASD
  - Intensity results may suggest focusing on higher decibel pulses

Startle Findings



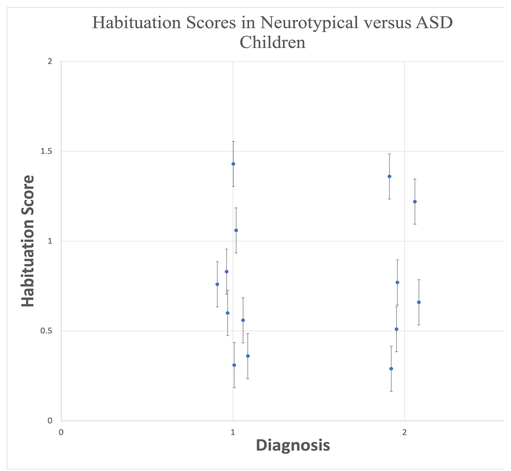
Block 1 (Acoustic Reactivity)

ASD group showed greater startle amplitudes at all intensities except 65dB, showed sig. greater startle at 105dB (p = 0.011)



Block 2 (PPI)

ASD group showed lower mean PPI in the 60ms condition (NTμ (1) = 6.1820, ASDμ (2) = -.1400) but not to a sig. degree (p = 0.970)



Block 3 (Habituation)

ASD group showed higher habituation (NTμ (1) = .7338, ASDμ (2) = .8017), but not to a sig. degree (p = 0.770)
ASD group also showed a greater score distribution