

0607

## **Sensory Processing, Temperament and the Brain: Comparing MEG brain data, sensory processing patterns and temperament in adolescents with Asperger Disorder and adolescents without disabilities**

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### **Introduction**

Debate exists about whether sensory processing patterns are a core or secondary feature of ASD (Rogers, Hepburn, & Wehner, 2003). Studies indicate that children with ASDs engage in higher rates of sensory based behaviors when compared to peers (Kientz & Dunn, 1997; Watling, Dietz et al, 2001; Myles, Hagiwara et al, 2004; Tomchek & Dunn, 2007), which interfere with participation in daily life activities.

Researchers are documenting the neurobiological basis of sensory sensitivities in children and adults (Brown, et al, 2001; McIntosh, et al, 1999; Miller, et al., 1998; Schaff, et al, 2001; Schaaf, 2001), and showed extreme patterns of sensory processing had unique neurological response pattern.

Studies also provide evidence that sensory processing and temperament are related (Daniels, 2003; Horsey, 2003; Koenig, 2003). They report significant relationships, e.g., 'positive affect' correlated with 'seeking', 'negative affect' and 'lack of adaptability' was associated with 'avoiding' and 'sensitivity'.

### **Objectives**

We wanted to determine whether behavioral patterns are associated with brain activity for ASD.

### **Methods**

We used correlational and comparative designs. We investigate relationships among behavioral factors (sensory processing and temperament) and brain activity (auditory/visual neuromagnetic responses). We also investigate differences between children with/without Asperger disorder, and children with/without hypersensitivity to sensory experiences.

We included children ages 10 to 18 with and without Asperger Disorder (n=40). Parents complete the Rothbart Temperament scale and demographics, children complete the Adolescent Adult Sensory Profile, and they visited the Hoglund Brain Imaging center for MEG.

### **Results**

Children who have extreme patterns of sensory processing exhibit distinct patterns on the MEG, and have different temperament patterns. This finding is independent of whether the children have Asperger disorder.

### **Conclusion**

These findings suggest that sensory processing patterns reflect brain activity and contribute to how temperament manifests itself.

### **Contribution to practice/ evidence base of OT**

If this study shows relationship between brain and behavior, it will provide evidence about individual differences in ASD; knowing individual differences enables us to design effective OT interventions for subgroups. We will also show similarities among children with and without Asperger disorder. Seeing

the similarities between children will enable us to design effective school, home and the community structures so they support all children to participate successfully.