

Sensory Clusters of Toddlers with Autism: Differences in Child and Parent Affective Symptoms

Ayelet Ben-Sasson¹, Sharon A. Cermak², Gael I. Orsmond², Alice S. Carter^{1,2}, & Mary Beth Kadlec²
 University of Massachusetts Boston¹, Boston University²



Introduction

- There is variability in the sensory modulation behaviors of children with autism spectrum disorders (ASD; Liss et al., 2006)
- Sensory modulation disorders in toddlers are divided into:
 - Under-responsivity**- limited awareness or slow response to sensory input of typical intensity
 - Seeking**- craving of, and interest in sensory experiences that are prolonged or intense
 - Over-responsivity**- exaggerated, rapid onset and/or prolonged reactions to sensory stimulation (Miller et al., 2005)
- Toddlers with a specific sensory profile may be at greater risk for developing internalizing symptoms (Pfeiffer et al., 2005)
- Parental and child stress might interact with each other

Research Goals:

- Identify subgroups of toddlers who share similar **sensory profiles**
- Examine differences between sensory subgroups in child and parent **affective symptoms**

Method

Participants

- 174 toddlers with ASD, 78% boys, CA \bar{X} = 28 months, Early Learning Composite Score \bar{X} = 67 (Mullen 1995).
- 174 parents, CA \bar{X} = 36 years

Measures

Child:

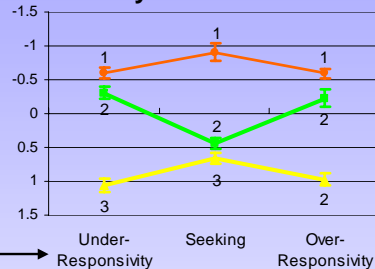
- Infant Toddler Sensory Profile (ITSP; Dunn, 2002):** **Under-responsivity**, **Seeking**, and **Over-responsivity** scores interpreted relative to normative *SD* cut points
- Infant Toddler Social and Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 2005)** Negative Emotionality, Depression/Withdrawal General Anxiety, Separation Distress, Inhibition to Novelty Scale scores interpreted relative to the extreme 10th %ile cut-points

Parent:

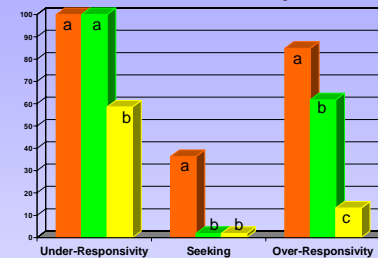
- Parenting Stress Index (PSI; Abidin, 1990)** Parent Distress, Parent-Child Dysfunctional Interaction, and Difficult Child Scale scores interpreted relative to cut-points
- Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977)** total score interpreted relative to cut-point

Results

Sensory Z-Scores by Sensory Clusters



Percentage of Sensory Scores $\geq 1SD$ Above Norms by Cluster



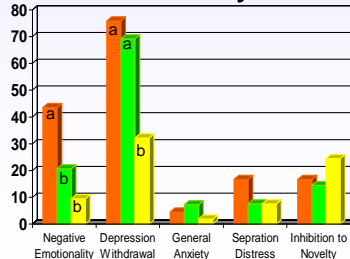
High Frequency Cluster; n=66

Mixed Cluster; n=55

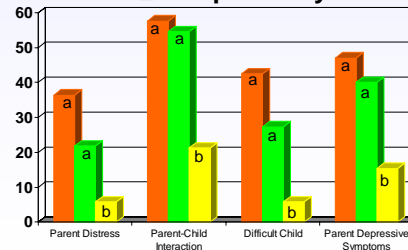
Low Frequency Cluster; n=53

- Lower z -scores = Higher frequency of behaviors
- Clusters with **different numbers** had different ($p < .00$) ITSP raw means in MANOVA
- Clusters with **different letters** differ based on Fisher's Exact tests at $p \leq .05$

Percentage of ITSEA Affective Scores $\geq 90^{\text{th}}$ %ile by Cluster



Percentage of Parent Stress Scores \geq Cut-points by Cluster



Summary

- Toddlers with ASD can be grouped into 3 sensory clusters:
 - A cluster with **High Frequency** of all types of sensory symptoms
 - A **Mixed** cluster with high frequency of under-and-over-responsivity
 - A cluster with a relatively **Low Frequency** of sensory behaviors
- Toddlers in the **High Frequency** and **Mixed** clusters had elevated depression/withdrawal compared with Low Frequency cluster
- Parents of toddlers in the **High Frequency** and **Mixed** clusters had elevated stress and depressive symptoms compared with Low Frequency cluster

Discussion

- Children with under- and over-responsivity may be at greater risk for developing internalizing symptoms
- High rates of clinically relevant Under-responsivity and Depression/Withdrawal scores support their use for identifying young children at risk for ASD
- Child sensory symptoms and parent stress may impact one another in both directions
- Evaluation and intervention efforts must consider the interaction between child and family stress

References

- Liss et al. (2006). Sensory and attention abnormalities in autistic spectrum disorders. *Autism, 10*(2), 155-172.
- Miller et al. (2005). In S.I. Greenspan, S. Wieder (Eds.) *Diagnostic Manual for Interdisciplinary and Early Childhood (ICDL)*; pp. 73-112. Bethesda, MD: ICDL.
- Pfeiffer et al. (2005). Sensory modulation and affective disorders in children and adolescents with Asperger's Disorder. *AJOT, 59*, 335-345.

Acknowledgement

Research supported by a STAART Center grant to Boston University School of Medicine (U54 MH 66398) and by a General Clinical Research Center grant (M01 RR00533) from the National Center for Research Resources

For more information about this study contact ayelet@bu.edu