

Can Sensory Over-Responsivity be Detected in Children without Co-morbid Psychopathology?

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Introduction

Sensory processing disorder (SPD) is a topic of important relevance in today's world, given that it is estimated to affect 5%-13% of children in the general population (Ahn, Miller, Milberger, & McIntosh, 2004). First termed as sensory integrative dysfunction by Dr. A. Jean Ayres in 1963 (Ayres, 1965), this disorder has evolved to encompass a variety of sub-groups including sensory modulation, sensory discrimination and sensory-based motor challenges (DMIC, 2005). Because SPD is so prevalent in today's society, one of the major questions that must be asked is whether SPD is a distinct impairment or if it is a symptom of other psychopathologies such as autism, attention-deficit hyperactivity disorder (ADHD) or generalized anxiety disorder. The answer to this question will help validate screening procedures to allow children to be more accurately diagnosed and receive appropriate therapeutic services. A secondary analysis in a subset of children will investigate whether there is an association between prematurity and SPD-like symptoms in this group of children.

Participants

- Data were collected between 2000 and 2007 as part of the Wisconsin Twin Project, an ongoing longitudinal study of child psychopathology.

- 149 children were eligible for this study from the Wisconsin Twin Project, with 60 of these children screened positive for SPD-like symptoms without any other psychopathology diagnosis on the DISC. These children were identified as the experimental group, with a like number of children (60), matched for age and gender, identified as the control group.

- The data used in our analyses comes from 117 children.

- 76 children within the study were preterm infants, and 41 children were born full-term. There were 34 children born prematurely within the control group and 42 children born prematurely within the experimental group.

- There were 31 females and 27 males in the control group, and 33 females and 26 males in the experimental group. Children in both groups had an mean age of 7.45 years.

Method

Phase 1- Administration of Lab-TAB

Subjects in both the experimental and control group were videotaped while participating in the Lab-TAB, a series of vignettes designed to elicit emotional responses such as frustration, fear, and surprise. The Lab-TAB was administered by Wisconsin Twin Panel student researchers.

Phase 2- Development of the vignette rating scale

Drs. Lucy Miller and Sarah Schoen viewed the videotapes of subjects and developed a vignette rating scale based off of observed behaviors. A grading rubric for the scale was developed by Bridget Stilling, Eva Ortega and Esther Knudson. The vignette rating scale has twelve attributes and is scored as: All or most of the time, Frequently, Sometimes, or Rarely or none of the time.

Phase 3- Reliability Training

Raters were trained by Drs. Miller and Schoen at the SPD Foundation in Greenwood Village, CO. A total of 10 tapes were viewed to confirm reliability. An ICC score of 0.85 was attained by each of the raters.

Phase 3- Data Collection

Videotaped vignettes of the experimental and control group subjects were selected by the Project Director prior to the study to ensure the raters remained blind to diagnosis. Raters viewed and scored selected videotaped vignettes using the vignettes attribute rating scale and grading rubric. The tapes were watched continuously through once to allow the raters to become familiarized with the subject and each vignette was rated at its conclusion.

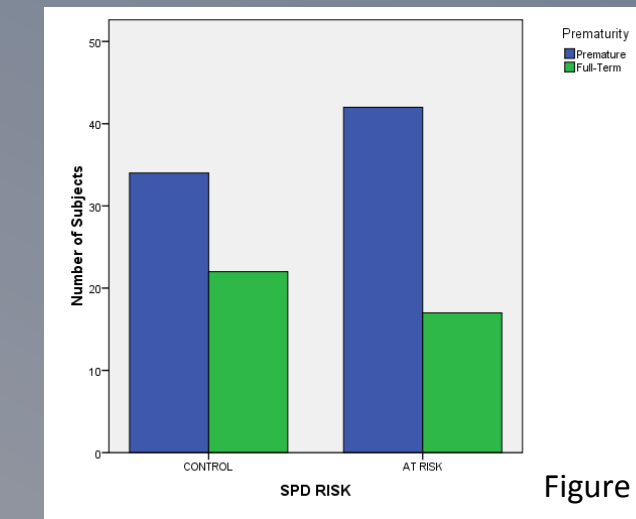
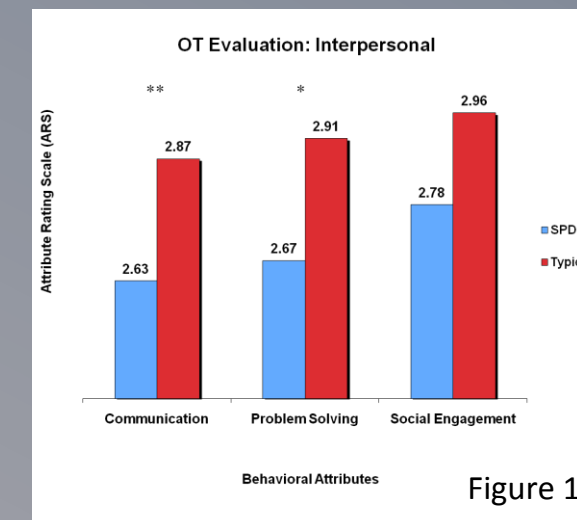
Results

5 Composite Scores previously determined by Drs. Miller and Schoen were subjected to an independent 1-tailed t-test:

Emotional State	Interpersonal	Attention	Sensory-Based Motor Ability	Sensory
Affect, Confidence, Playful	Proximity, Communication, Social Engagement, Problem Solving	Persistence, Behavioral Inhibition	Motor, Postural, Ideation	Sensory Responsivity

It was found that an independent 1-tailed t-test demonstrated that the Interpersonal composite score significantly discriminated between children with SPD-like symptoms and the control group ($t(115)=1.14, p=.048$). Individual attributes with significant findings included communication ($t(115)=2.23, p=.013$), problem solving ($t(115)=1.83, p=.032$), and social engagement ($t(115)=1.58, p=.057$). (See Figure 1)

A Chi-Square test found that the association between prematurity and children identified with SPD-like symptoms was not significant ($p=.236, df=1$). (See Figure 2)



Vignette	Description	Scored For
View Master	Subject, twin & caregiver are given a view-master & slides to share	Proximity, Communication, Social Engagement, Problem Solving, & Behavioral Inhibition
Yarn Tangle	Subject is asked to untangle a knotted ball of yarn	Affect, Confidence, Persistence, & Behavioral Inhibition
Snack	Subject & twin are asked to choose and share a cookie & 8 oz. bottle of juice	Affect, Confidence, Proximity, Communication, Social Engagement, Problem Solving, & Behavioral Inhibition
Free Play	Subject is allowed to play with a trampoline, jump rope, hula-hoop, & punching bag	Affect, Confidence, Playfulness, Motor, Postural, Ideation, Behavioral Inhibition
Balloon Bop	Subject hits balloon back and forth with tester	Affect, Confidence, Motor, Postural, & Behavioral Inhibition
Mask	Subject is left alone in room with a masked person	Affect, Confidence, & Behavioral Inhibition
Palm Print	Prints are taken of subject's palms & fingerprints	Behavioral Inhibition & Sensory Responsivity

Discussion

- We found that mean scores on the Interpersonal Composite differed significantly between the experimental and control group.

- The group with SPD-like symptoms were rated lower on communication, problem solving, and social engagement.

- This link validates that children with SPD-like symptom and no psychopathology still have functional challenges.

- Findings from the Chi-Square test may be limited by the fact that all subjects in this study were twins.

- Limitations of the study were that while MSOT student raters received training on SPD and typical childhood development, there are many subtle symptoms of SPD that the raters were not fully trained in due to time and monetary constraints. Likewise, many children at the age of the subjects have a strong desire to please those initiating the activities and will self-regulate in order to continue participating in the activity to avoid disappointing the tester. This makes grading observed behaviors difficult because a child's behavior may be discordant with their actual feelings. Finally, vignettes were taken from the Lab-TAB, which is primarily a psychological assessment and not designed to elicit SPD symptoms.

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