



Characteristics of Idiopathic Sensory Processing Disorder in Young Children

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Background

Purpose: The purpose of this study was to investigate the behavioral and developmental profiles and characteristics of a cohort of children who did not meet criteria for any neurodevelopmental condition, but who were identified as exhibiting symptomatology related to one or more of the types of sensory processing disorder as described by the Miller et al. (2007) nosology. Associations between specific types and subtypes of sensory processing disorder, adaptive behavior and psychosocial-emotional functioning were examined as a step towards recognizing the complexities, and developmental profiles of these children with what will be referred to as idiopathic sensory processing disorder (ISPD).

Research Methods

Procedures: A retrospective, non-experimental design and correlational analysis was used. Assessment data was collected from preexisting medical records of children who had participated in a developmental and/or diagnostic evaluation from 2014-2017 at an interdisciplinary clinic in the Northeastern US.



Participants: Of 184 child cases, data from 58 males and 20 females (N=78) ranging in age from 15 to 70 months met inclusion criteria. Mean age was 46.5 months (12.8 SD) with children ranging in age from 3 to 5 years (65.4%). The children were primarily from Caucasian families (78.5%).

Measures: Sensory Profile and Sensory Profile 2, Infant/Toddler and Child versions, (Dunn, 2014), Child Behavior Checklist (CBCL, Achenbach, 2000), and Vineland Adaptive Behavior Scales-2, (Sparrow et al., 2005).

Data analyses: Data were analyzed using SPSSver24, and included descriptive statistics, and correlation analyses to examine relations between types and subtypes of sensory processing disorders, and behavioral, and developmental variables.

Results

Child Behavior Checklist Scores

- Mean T-scores for externalizing behaviors, internalizing behaviors, and total behaviors were borderline significant.
- Mean scores fell in the dysfunctional range for externalizing behaviors for all subtypes, and for the DSM Pervasive Developmental Disorder (PDD) scale.
- Behavior profiles across SPD type/subtype were very similar.

CBCL Scores by Type of Sensory System Deficit

CBCL Atypical Behavior Scales	Visual N=17		Auditory N=31		Tactile N=31		Vestibular/Proprioception N=38		TOTAL N=75	
	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys
Externalizing	71.9	14.6 71	71.9	12.5 68	73.8	12.0 77	69.9	11.1 66	65.2	13.8 48
Internalizing	68.7	12.1 59	69.3	9.5 61	70.4	9.1 68	65.8	11.6 53	63.8	11.2 47
Total Probs	73.9	13.9 82	73.3	11.3 77	75.8	10.3 84	70.8	11.2 71	67.0	12.9 55
Affective	68.2	11.9 65	67.4	11.1 61	70.2	9.5 68	65.5	10.4 53	63.7	10.9 45
Anxiety	67.0	12.8 47	66.5	12.0 52	67.7	12.5 56	65.0	13.5 45	62.6	12.2 37
PDD	74.9	8.3 94	74.3	9.1 90	76.7	7.4 93	73.3	8.5 89	70.9	9.5 79
ADHD	67.1	8.8 65	65.9	8.9 58	67.7	8.2 61	65.7	7.9 55	62.4	9.2 41
ODD	67.1	10.3 65	67.7	9.4 58	69.3	9.7 52	66.3	8.7 58	63.8	10.3 45

CBCL Scores by Sensory Processing Disorder Type/Subtype

CBCL Atypical Behavior Scales	Sensory Craving (SC) N=32		Over-reactive (SOR) N=46		Under-reactive (SUR) N=38		Sensory Discrim (SDD) N=22		Sensory-Based Motor (SBMD) N=30		TOTAL N=75	
	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys
Externalizing	73.3	10.1 36	69.1	13.6 27	70.8	12.2 27	74.3	11.3 29	73.3	11.2 40	65.2	13.8 25
Internalizing	67.9	10.9 20	68.1	10.1 14	68.6	10.1 15	71.3	10.0 18	69.0	10.5 28	63.8	11.2 16
Total Problems	73.5	10.4 36	71.4	12.4 22	73.3	11.1 24	75.9	11.9 23	74.7	10.6 36	67.0	12.9 23
Affective	67.7	10.5 13	66.3	11.2 14	68.8	10.5 13	68.8	10.0 13	69.0	10.2 24	63.7	10.9 2
Anxiety	66.3	12.7 13	67.0	12.5 11	67.4	12.7 13	69.5	12.4 6	68.0	13.4 12	62.5	12.2 1
PDD	73.9	8.6 42	74.2	9.2 36	75.1	8.6 38	76.5	8.4 31	75.7	7.1 44	70.9	9.5 40
ADHD	67.4	7.9 46	64.1	9.1 31	65.5	8.5 28	69.2	8.0 38	67.3	8.2 44	62.4	9.2 29
ODD	68.7	8.2 33	66.2	10.2 28	66.8	9.8 28	68.8	8.5 25	68.4	8.6 40	63.8	10.3 25

- Mean CBCL scores were also similar across SPD types/subtypes irrespective of the sensory system impacted.
- Irrespective of the sensory system involved, the PDD behavioral profile was observed in all children that had sensory processing deficits.
- As SPD severity scores increased, so did atypical behaviors.

Discussion

- Most children displayed more than one type/subtype of SDP and there was a large amount of overlap of symptoms and clinical presentations.
- Internalizing and externalizing atypical behaviors, along with behaviors associated with mental disorders were frequently present, regardless of a child's type/subtype(s) of SPD, or the sensory system involved.
- The most common pattern of sensory processing disorder was the over-responsivity sensory modulation disorder subtype.
- As severity of sensory processing deficits or differences increase, behaviors related to mental disorders increase.
- As the severity of SPD increased, adaptive behavior decreased.



Adaptive Behavior

- Mean adaptive behavior scores fell into the dysfunctional, moderately low range for all SPD types/subtypes across all domains (communication, daily living, social, and motor).
- Children with SOR modulation subtype had the highest performance while children with SDD had the poorest.
- There was a higher percentage of children with motor based sensory disorder in the dysfunctional range than any other SPD type/subtype.
- Correlational analysis revealed that as SPD severity scores increased, adaptive behavior scores tended to decrease.

Adaptive Behavior Scores by Sensory Processing Types and Subtypes

Vineland Adaptive Behavior Scale Domains	Seeking N=32		Over-reactive N=46		Under-reactive N=40		Sensory Discrim N=22		Sensory-Based Motor N=30		Total N=77	
	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys	M	SD %dys
Communication	82.2	11.5 47	82.4	11.7 50	81.4	11.6 60	79.2	12.2 59	81.0	11.0 53	82.0	13.3 55
Receptive Lang.	10.4	2.1 69	10.6	2.0 65	10.4	2.0 73	10.3	2.1 68	10.2	2.0 73	11.0	2.3 60
Expressive Lang.	12.7	2.7 25	12.7	2.8 28	12.5	2.8 33	11.9	3.3 32	12.8	3.0 30	12.1	3.3 39
Daily Living	81.1	12.1 56	83.2	12.0 50	82.6	10.9 53	79.6	11.6 64	81.1	11.9 57	84.7	11.4 49
Personal	11.0	2.5 63	11.0	2.5 63	10.9	2.3 65	10.3	2.2 73	10.8	2.5 70	11.2	2.4 57
Domestic	12.5	2.4 47	13.2	2.7 33	12.8	2.4 35	12.5	2.5 41	12.8	2.7 40	13.6	2.6 23
Community	12.6	2.4 34	12.8	2.4 33	12.9	2.3 30	12.6	2.2 32	12.4	2.2 37	12.9	2.3 27
Social	82.3	12.1 56	83.4	12.0 50	81.4	11.4 60	81.0	13.7 60	81.7	12.5 60	83.7	12.5 51
Interpersonal	12.3	3.2 34	12.0	2.7 39	11.6	2.8 50	12.1	3.6 36	11.7	3.3 47	12.4	2.8 40
Play and Leisure	10.4	2.1 69	12.0	2.5 59	10.5	2.3 68	10.3	2.1 68	10.6	2.2 63	11.3	2.6 56
Coping Skills	13.1	2.4 28	13.2	2.7 30	13.1	2.5 28	12.7	2.7 41	13.1	2.6 33	13.7	2.7 23
Motor	83.1	12.3 63	84.6	12.2 54	82.8	12.5 63	81.7	14.2 64	82.1	13.4 63	85.1	12.2 55
Gross	12.1	2.6 47	12.3	2.5 44	12.0	2.4 45	11.7	2.7 55	12.0	2.8 50	12.8	2.4 34
Fine	12.4	2.5 31	12.7	2.6 30	12.3	2.8 40	12.2	2.7 41	12.1	2.7 43	12.4	2.6 40
Composite	79.3	9.9 66	80.7	9.4 61	79.2	9.2 68	77.5	10.8 68	78.7	9.8 70	81.6	10.4 62

Directions for Future Research

- Continued development of a psychometrically sound diagnostic tool for identifying the different types/subtypes of ISPD.
- Further work focused on understanding of the similarities and differences between children with and without ISPD.

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