

National Survey of Sensory Features in Children with ASD: Factor Structure of the Sensory Experience Questionnaire (3.0)

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Introduction

Sensory features are highly prevalent in children with autism spectrum disorder (ASD). The Sensory Experience Questionnaire 3.0 (SEQ; Baranek, 1999a; Baranek et al., 2006), a recently expanded caregiver-report assessment specific to children with ASD, measures behavioral responses to sensory experiences. The SEQ has 105 items that measure frequencies of sensory behaviors across sensory response patterns, modalities, and social or non-social contexts. Lacking in the literature is an instrument with sufficient empirical validation for a factor structure specific to ASD. This study describes the methodology of a large national survey that aims to characterize sensory features in children with ASD using the SEQ 3.0 and presents results from a confirmatory factor analysis used to test a conceptual model of sensory features in ASD.

Method

Data were collected as part of a national online survey from 1312 participants with an ASD diagnosis, ages 2-12 years. ASD symptom severity was assessed using the Social Responsiveness Scale (SRS/SRS-P). The SEQ 3.0 was converted to an electronic format in Qualtrics and distributed through an online national research registry and multiple autism organizations. A subset of 93 items measured on a Likert scale was used for analysis. A factor analytic model with 4 substantive factors of hypothesized sensory response patterns (i.e., hyporesponsiveness, hyperresponsiveness, sensory interests & repetitions, and enhanced perception) and method factors of sensory modalities (i.e., auditory, visual, tactile, gustatory, and vestibular) and social context were tested. Method factors provide a parsimonious technique for modeling shared error variance. Model was fit as a confirmatory factor analysis. Correlations between the substantive factors were freed, but fixed to zero between the method factors, as well as between the method factors and the substantive factors.

Participants Demographics

Primary Diagnosis n=1312

- Autism/Autistic Disorder n=827 (63%)
- Asperger Disorder/Syndrome n=290 (22.1%)
- Pervasive Development Disorder n=320 (24.4%)

Race

- White n=1112 (84.7%)
- Other n=201 (15.4%)

Ethnicity

- Hispanic or Latino Origin n=131 (10%)

Gender

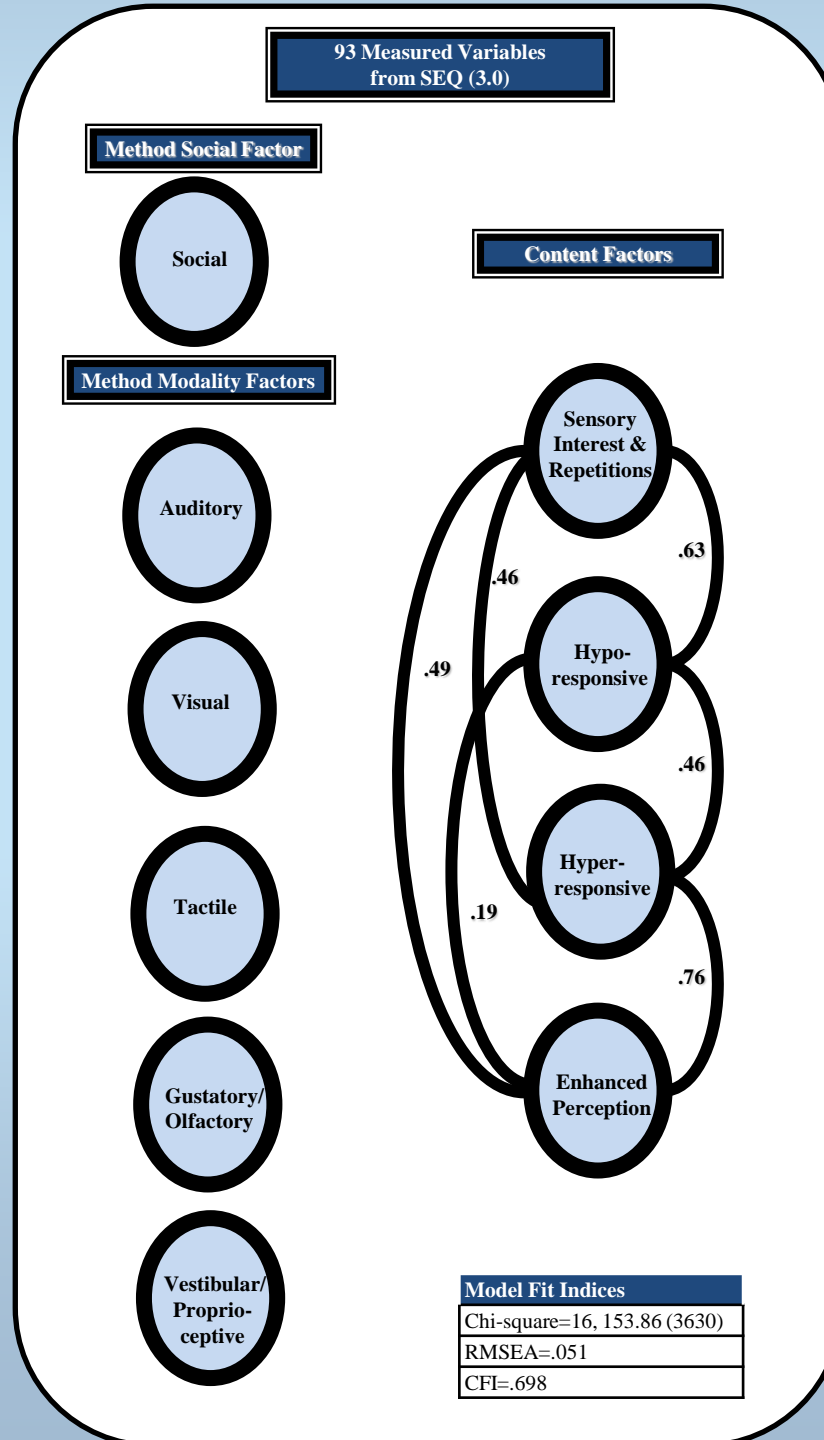
- Female n=232 (17.7%)
- Male n=1081 (82.3%)

IQ Score n=386

- 12.7% Superior (above 130)
- 19.7% Above Average (115 to 130)
- 37.6% Average (86 to 115)
- 12.4% Borderline (71 to 85)
- 10.4% Mild Delayed (56 to 70)
- 4.9% Moderate Delayed (41 to 55)
- 2.3% Severe/Profound Delayed (<40)

Social Responsiveness Scale (SRS/SRS-P) Total Score (SD)

- 107.2 (27.7)



Sample SEQ 3.0 Questions

- * How often does your child seem fascinated with or excited by flickering or scrolling motions on a computer screen or TV?
- * How often does your child ignore you or not notice when you tap him/her on the shoulder for attention?
- * How often does your child seem bothered by everyday sounds (such as a dishwasher, car radio, mixer/blender) that are not bothersome to others?
- * How often does your child notice smells before other people do (such as perfume, smoke, or food)?

Results

The structure was tested as a confirmatory factor analysis. Model fit was assessed using standard fit measures: chi-square = 16,153.86 (3630)***, RMSEA =.051 and CFI=.698. Factor loadings for the items on the latent variables were generally strong and provided support for each of the hypothesized sensory content factors. Between-factor correlations were ranged from .19 to .77, which implies that these factors are distinct and they covary

Correlations

	Sensory Interest & Repetitions	Hypo-responsive	Hyper-responsive	Enhanced Perception
ASD Symptom Severity	.539**	.607**	.583**	.407**
Chronological Age	-.203**	-.176**	.117**	.152**
IQ	-.102**	-.158**	.099	.111*

Discussion

This study demonstrated the feasibility of a national survey for obtaining a large, geographically distributed sample to characterize sensory features in children with ASD. Analysis of the large sample allowed a complex hypothesized model to be confirmed for a specified factor structure, including four sensory response patterns (hyperresponsiveness, hyporesponsiveness, sensory interests & repetitions, and enhanced perception) in ASD. This study provides validation for a 4-factor model and expands previous conceptualizations of sensory features in children with ASD. A confirmatory factor analysis on the SEQ 3.0 was a necessary precursor to identifying sensory subtypes of children with ASD in future studies.

References

- Baranek, G.T. (1999a). Sensory Experiences Questionnaire (SEQ). Unpublished manuscript, University of North Carolina at Chapel Hill.
- Baranek, G., David, F., Poe, M., Stone, W., & Watson, L. (2006). Sensory Experiences Questionnaire: Discriminating sensory features in young children with autism, developmental delays, and typical development. *Journal of Child Psychology and Psychiatry*, 47 (6), 591-601.

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