**Title:** The Social Responsiveness Scale, 2nd Edition in School-Age Children with Down Syndrome

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**Introduction:** Individuals with Down syndrome (DS) often display phenotypic weaknesses in expressive language and strengths in early developing social abilities (Cebula et al., 2010; Fidler, 2006; McDuffie et al., 2017). These skills play vital roles in social communication and interaction, but there is a paucity of research into how the DS phenotype impacts everyday social functioning, especially during the school-age years and beyond. This is especially important because a core symptom of autism spectrum disorder (ASD) is impairment in social communication and interaction, and reported prevalence rates of comorbid ASD in Down syndrome (DS) range from 7% to 18%, varying drastically by method of diagnosis (DiGuiseppi et al., 2010; Kent et al., 1999). Because there is not a clear clinical picture of phenotypic social communication and interaction skills in children with DS, it is difficult to know how the DS phenotype differs between those with and without comorbid ASD, presenting a major barrier to the diagnosis and treatment of comorbid ASD in DS (Glennon et al., 2017). The purpose of this study is to describe patterns of performance across subdomains of social communication and interaction using the Social Responsiveness Scale, 2nd edition (SRS-2; Constantino & Gruber, 2012) within a sample of children with DS at low risk for ASD, thus informing the broader DS phenotype.

In a previous study by Channell et al. (2015), adolescents and young adults with DS for whom a diagnosis of comorbid ASD had been ruled out still displayed elevated levels of ASD-like symptoms on the original version of the SRS. The current study extends Channell et al.’s (2015) work to a sample of younger children with DS and by using the updated SRS-2.

**Method:** A total of 40 participants with DS, ages 6-11 years, completed an in-person battery of linguistic and cognitive assessments, including the Leiter-3 measure of nonverbal cognition, Expressive Vocabulary Test, 2nd Edition (EVT-2), and a narrative language sampling task. Parents completed the Social Communication Questionnaire–Lifetime (SCQ; Rutter et al., 2003) and the SRS-2. We used the SCQ to screen for ASD risk, and participants who scored at or above the clinical cutoff of 15 (recommended for individuals with DS and other intellectual and developmental disabilities; Rutter et al., 2003) were excluded from analyses. Five children (12.5%) screened above the SCQ cutoff score for ASD risk and were excluded. Thus, our final sample consisted of 35 children with DS (Nonverbal IQ Mean = 59.09, SD = 9.72; Age M = 8.47, SD = 1.59; 63% Female).

**Results:** The average SRS-2 T-score was 59.94 (SD = 6.88; Range = 44-72), which is elevated compared to the general population mean T-score of 50 (SD = 10), t(34) = 9.94, p < .001. Thus, despite ruling out the risk of comorbid ASD using the SCQ, 49% of our sample scored at elevated risk on the SRS-2 (29% within the mild symptom range; 20% in the moderate symptom range). Interestingly, expressive language skills (syntax—mean length of utterance during the narrative language sampling task, and vocabulary—EVT-2 standard scores) did not significantly correlate with SRS-2 total T-scores (r = .12, p = .51 and r = -.07, p = .68, respectively), nor did Leiter-3 nonverbal IQ (r = -.22, p = .21). Thus, the elevated pattern of ASD symptomatology did not simply reflect deficits in expressive language or IQ. Finally, closer examination of SRS-2 T-scores across subdomains revealed a wide range of scores within each subdomain. Mean scores fell into the clinically elevated “risk” range only for Social Cognition (M = 62.54, Range = 45-86) and Restricted Interests/Repetitive Behaviors (M = 62.51, Range = 44-80). Mean scores for Social Awareness (M = 59.60, Range = 40-76) and Social Communication (M = 58.23, Range = 44-73) fell within normal limits, despite being statistically significantly different from the normative sample mean of 50. Social Motivation mean scores (M = 51.14, Range = 38-69) also fell within normal limits and did not differ significantly from that of the normative sample.

**Discussion:** About half of our sample of children with DS exhibited elevated ASD-like symptoms on the SRS-2, despite screening at low risk on the SCQ. Thus, many of the symptoms captured by the SRS-2 may be attributed to the broader DS phenotype. These findings extend prior work on older individuals with DS (10-21 years) using the original version of the SRS (Channell et al., 2015). Consistent with those reported in Channell et al. (2015), our findings indicate that the SRS-2 may over-identify ASD risk in school-age children with DS (6-11 years). The pattern across subscales of the SRS-2 in our sample mirrored that found with the SRS in Channell et al.’s (2015) older sample. In addition to providing data on the use of the SRS-2 as a screening tool for comorbid ASD in DS, this study provides important data about the social phenotype of children with DS that can inform clinical practice aimed to support communicative competence in this population.

**References/Citations:**


