# Test Review

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Constantino, J. N., & Gruber, C. P. (2012). *Social Responsiveness Scale–Second Edition (SRS-2)*. Torrance, CA: Western Psychological Services.

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The Social Responsiveness Scale–Second Edition (SRS-2) is a 65-item rating scale measuring deficits in social behavior associated with Autism Spectrum Disorder (ASD), as outlined by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). The scale can be completed by multiple raters who have at least 1 month of experience with the rated individual. An "average reading ability" is said to be necessary to complete the record forms (Constantino & Gruber, 2012, p. 3). Materials include an examiner's manual and record forms. The scale takes approximately 15 to 20 min to complete.

### *Rating Forms*

The SRS-2 consists of four rating forms across three age ranges. The original SRS, now termed the School-Age Form, covers ages 4-0 to 18-0. Age ranges were extended down through preschool and up through adulthood, including a self-report form for individuals age 19 and above. The Preschool Form covers ages 2-6 to 4-6, the School-Age Form ages 4-0 through 18-0, and the Adult Form ages 19 through 89 years. The Preschool Form and School-Age Form can be rated by teachers or parents. The Adult Form allows for ratings by parents, spouses, friends, and relatives and also includes a separate self-report form. Items on each form differ slightly to accommodate the age ranges tested; however, there is considerable overlap across forms. No changes were made to the original SRS items for the School-Age Form. On all forms, items are scored on a 4-point Likert-type scale, ranging from *not true* = 1, *sometimes true* = 2, *often true* = 3, to almost *always true* = 4.

## Scoring

The SRS-2 can be hand or computer scored. Results are reported as *T*-scores ($M = 50$, $SD = 10$) for the treatment subscales: Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behavior and the overall total score. The Social Awareness subscale uses 8 items to measure an individual's ability to recognize social cues of others. Social Cognition is a 12-item subscale that addresses interpretation of social behavior. The Social Communication subscale has 22 items and assesses reciprocal communication in social situations. Social Motivation is an 11-item subscale that assesses the degree to which an individual is motivated to participate in social interactions with others. The Restricted Interests and Repetitive Behavior subscale measures stereotypy and circumscribed interests using 12 items. For the School-Age Form, separate norms are available based on the examinee's gender and the rater's relationship to the examinee (i.e., parent or teacher).

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## Interpretation

The SRS-2 total score is the most reliable measure for social deficits related to ASD. Subscales should be interpreted cautiously because of lack of evidence for their use in clinical decision making. Subscales corresponding to the *DSM-5* diagnostic criteria for ASD are also available.

*T*-scores of 76 or higher are considered severe suggesting that an individual has clinically significant deficits in social functioning that interfere with interactions with others. Scores that fall between 66 and 75 are considered moderate, signaling some clinically significant social deficits. The mild range includes *T*-scores of 60 to 65, which indicate mild to moderate deficiencies in social behavior. *T*-scores of 59 and below indicate an individual probably does not have social difficulties indicative of a possible ASD diagnosis. Reporting *T*-scores using the standard error of measurement is recommended to account for possible variability in calculating a given score.

## Technical Adequacy

### *Standardization*

The normative sample included 4,709 ratings of 1,963 individuals, separated into three independent samples corresponding to the three age groups described above.

The preschool sample included 474 ratings of 247 children. The number in each 6-month age interval ranged from 58 to 70. The sample's demographic characteristics were similar to the 2009 U.S. Census data in terms of gender, race/ethnicity (except for Asian Americans, which yielded 1.6% compared with 4.5%), parent educational level, and geographic region. Urban/rural residence data were not reported.

The school-age sample included 2,025 ratings of 1,014 children across 16 age levels. The number of participants per 1-year age level ranged from 39 to 90. The data closely matched 2009 U.S. Census data for race/ethnicity, geographic region, and parent educational level. No data were reported on urban/rural residence.

The adult sample consisted of 2,210 ratings of 702 adults from 18 years and up. Age groups were in 10-year intervals through age 59, with 122 to 170 per age group. For ages 60 to 89, there were 127 participants. Demographic characteristics of this sample were similar to census data in terms of geographic region, educational level, and gender. This was also true for race/ethnicity, except that Asian Americans were somewhat underrepresented (1.6%-4.7%). Also individuals with a college education were somewhat underrepresented (1.6% vs. 4.7%). Urban/rural residence data were not reported for the adult sample.

### *Reliability*

Salvia, Ysseldyke, and Bolt (2010) recommended reliability correlations of at least .90 when important educational decisions are made regarding an individual student. The SRS-2 was designed to aid in diagnostic decisions, thus the .90 criterion was used to evaluate reliability.

*Internal consistency.* Estimates of internal consistency were calculated for the standardization sample and a clinical sample. Correlations for the three age groups ranged from .94 to .96 for the total sample. Strong internal consistency was found across gender and age and across clinical subgroups within the clinical sample. The clinical sample involved the School-Age Form only and yielded a total reliability coefficient of .95. These results suggest that the SRS-2 has strong consistency across items. Internal consistency was not reported for specific subscales.

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*Test–retest reliability.* No test–retest data were collected for the SRS-2. Studies on the original SRS found correlations ranging from .88 to .95, with test–retest intervals ranging from 3 to 6 months. These results may not be representative of the current norm sample, despite items being the same across the two versions.

*Interrater reliability.* Interrater reliability data were collected for all four rating forms. For the School-Age and Preschool Forms, comparisons were across parent and teacher ratings. Correlations were .77 and .61, respectively. These are adequate correlations considering raters observed the examinees in different environments. Thus, some differences would be expected across raters. The Adult Self-Report Form was compared across various raters including mothers, fathers, spouses, and relatives. Reliability coefficients ranged between .61 and .92.

## *Validity*

Content, criterion-related, construct, and predictive validity were addressed for the SRS-2.

*Content validity.* The content of the SRS-2 is the same as the prior version, now called the School-Age Form. The additional Preschool and Adult Form items were slightly modified to reflect the extended age ranges and informant characteristics (e.g., Self-Report Form). The content areas covered reflect the characteristics of ASD outlined in the *DSM-IV-TR*, including social communication, restrictive interests and repetitive behaviors, and reciprocal social interaction, with a focus on deficits in social reciprocity. Items on the original SRS were reviewed by experts representing various fields including special education, psychology, pediatrics, child neurology and psychiatry, and parents of children on the autism spectrum.

*Mean differences.* An analysis of mean differences was conducted with a clinical sample using the School-Age Form only. Descriptive data and internal consistency were assessed along with mean differences across diagnostic categories associated with ASD. The clinical sample included individuals diagnosed with Autistic Disorder, Asperger's Syndrome, Pervasive Developmental Disorder–Not Otherwise Specified (PDD-NOS), PDD, and ASD. The nonclinical sample included undiagnosed siblings of children in the clinical sample. Affected individuals obtained raw scores considerably higher ($M$ = 106.6) than those who were unaffected ($M$ = 24.6): A large effect size (Cohen's $d$ = 2.7) was reported. Although not included in the clinical sample, published research on the Preschool (Constantino, 2011; Turner-Brown, Baranek, Reznick, Watson, & Crais, 2012) and Adult Forms (Bölte, 2012; Mandell et al., 2012) found large effect sizes when comparing affected individuals with typically developing controls.

*Predictive validity.* Predictive validity was estimated through the use of a Receiver Operating Characteristic (ROC) analysis, yielding sensitivity and specificity estimates of the scale's ability to accurately identify affected and unaffected individuals. This analysis was conducted for the School-Age Form only: The affected sample represented individuals across a range of symptom severity. The analysis resulted in a sensitivity value of .92, suggesting that the scale identifies 92% of those affected, and specificity value of .92, indicating that 92% of individuals not affected will not be identified by the SRS-2 as affected. Thus, the SRS-2 does well in identifying those with and without characteristics of ASD. One published study looked at predictive validity for the Adult Form and found a specificity level of .60 and sensitivity of .86 (Mandell et al., 2012). Thus, initial evidence suggests that the Adult Form may not discriminate as well as the School-Age Form. No predictive data were reported for the Preschool Form.

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*Concurrent validity.* For the School-Age Form, moderate to high correlations were found between other rating scales of social behavior and communication, including the Social Communication Questionnaire (Rutter, Bailey, & Lord, 2001), the Children's Communication Checklist (Bishop, 1998), the Social and Communication Disorders Checklist (Skuse, Mandy, & Scourfield, 2005), and the Childhood Autism Rating Scale (Schopler, Reichler, Devellis, & Daly, 1980). Low to moderate correlations were found with other diagnostic instruments including the Autism Diagnostic Interview–Revised (Rutter, Le Couteur, & Lord, 2003) and the Autism Diagnostic Observation Schedule (Lord, Rutter, DiLavore, & Risi, 2001); according to the test authors, these lower correlations were due to the different types of instruments (i.e., interviews as opposed to rating scales). Although research on concurrent validity with the Preschool Form is limited, one independent study found moderate correlations with the Childhood Autism Rating Scale (Schopler et al., 1980). No concurrent validity data were reported for the Adult Form.

*Construct validity.* Confirmatory factor analysis was conducted to examine the model fit of the two-factor structure with the two-symptom clusters measured by the SRS-2. The analysis demonstrated good fit for the two-factor model, including the social communication and interaction domain and the restricted interests and repetitive behavior domain. The authors described how the model aligns with the symptom criteria proposed for the *DSM-5* (not published at the time of the study).

## Commentary

The SRS-2 makes a unique contribution toward a comprehensive assessment of ASD, because it focuses specifically on aspects of social reciprocity and social communication. However, use of the results for planning instruction and interpretation of treatment subscale results should be conducted with caution because there are so few items within each subscale and stability data are lacking. Thus, this instrument could be used as one component in a more comprehensive evaluation.

As with all rating scales, the utility of the SRS-2 depends on the accuracy of the rater. Thus results could be affected by many factors including preconceived notions, motivation for diagnosis, contextual variables, and halo effects. Unlike other ASD rating scales, no reference to an autism diagnosis is implied or written on the protocols. Thus, the title should not influence ratings. Examiners must be careful when interpreting results to aid in diagnosis and only use the results along with information from observation and other direct assessment methods.

An improvement in the current version is a standardization sample that is more representative of the U.S. population. In addition, the extended age ranges allow for earlier identification of possible social concerns, and provide an assessment tool for adults. However, despite the improved standardization sample, the School-Age Form sample does not have enough individuals at each age level with fewer than 80 participants for most ages. Thus, results for this form are questionable due to inadequate sample size at each age level. In addition, no test–retest data were collected at any age for the current version of the instrument. The only data reported for temporal stability were for the prior version. Thus, the reliability of the SRS-2 results over time is unknown.

Little independent research has been published on the SRS-2; however, research on the previous version suggests that a possible limitation of the instrument is a reduction in specificity in differentiating autism from other childhood behavioral disorders, including Oppositional Defiant Disorder, Conduct Disorder, and Attention Deficit Hyperactivity Disorder (Cholemkery, Kitzerow, Rohrmann, & Freitag, 2013). In addition, children who exhibit high levels of challenging behavior are more likely to receive higher scores on the SRS-2, than those with lower levels of such behavior (Hus, Bishop, Gotham, Huerta, & Lord, 2013). This result suggests that other variables may impact ratings of social behavior.

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## Summary

The SRS-2 provides an indirect assessment of characteristics related to ASD, as perceived by third-party observers and self-report (Adult Form only). From the previous version, age ranges have been extended down to preschool and up through adult ages. A representative national sample was collected for ages 2-6 through 89; however, sample sizes are low for most age levels for the School-Age Form. Although the authors reported adequate internal consistency data and interrater reliability data, test–retest reliability is unknown. Stability data for the prior version of the School-Age form appear adequate. Extensive validity data are provided including predictive validity and mean difference data. Because the SRS-2 is an indirect measure of behavior, it should be used in conjunction with information from interviews, direct observation, direct assessment, and curriculum-based measures.

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