Understanding, Evaluating and Treating Autism Spectrum Disorders: New Data, New Ideas, and the ASRS

AUTISM SPECTRUM RATING SCALES™ (ASRS®)

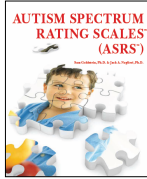Sam Goldstein, Ph.D.
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Relevant Disclosure

‣ Co-author of the Autism Spectrum Rating Scales (MHS, 2009).
‣ Co-author of Assessment of Autism Spectrum Disorders text (Guilford, 2009).
‣ Co-author/presenter Assessment of Autism Spectrum Disorders CEU (APA, 2009).
‣ Co-author of Raising a Resilient Child With Autism Spectrum Disorders (2011, McGraw Hill).
‣ Co-author of Treatment of Autism Spectrum Disorders (2012, Springer).
‣ Co-author of the Autism Spectrum Evaluation Scales (in development, MHS).
‣ Compensated speaker.

Goals

‣ Briefly discuss the historical theories of Autism Spectrum Disorders (ASD).
‣ Define ASD and new DSM 5 criteria.
‣ Briefly discuss symptoms of ASD by age.
‣ Briefly discuss a core theory of ASD.
‣ Briefly review hypothesized causes.
‣ Discuss data from the ASRS, the largest epidemiological/ standardization sample collected of normal children and those with ASD.
‣ Discuss the ASRS and other methods for assessment, diagnosis and treatment of autism.
‣ Discuss issues of diagnosis versus eligibility

We are social beings.

What Benefits Do We Derive From Socialization?

- ‣ Support
- ‣ Survival
- ‣ Affiliation
- ‣ Pleasure
- ‣ Procreation
- ‣ Knowledge
- ‣ Friendship

The social development of autistic children is qualitatively different from other children.

In normal children perceptual, affective and neuroregulatory mechanisms predispose young infants to engage in social interaction from very early on in their lives.

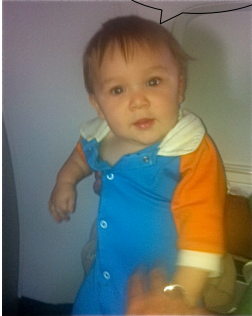Socialization Begins Early

Reina and Her Mother

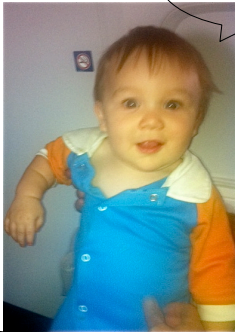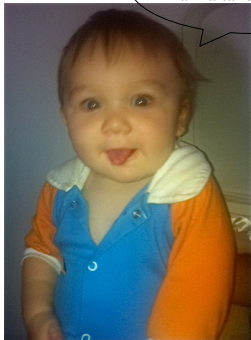Adrian, my seatmate on a recent flight.

Hello!

Adrian

You look like an interesting guy.

Adrian

See what I can do!
Wanna take me home?

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Where are Autism's Roots?

- In the bible?
- In ancient cultures?
- In history?
- In religion?
- Portrayed in art?

Les âges de l'ouvrier

Léon FRÉDÉRIC 1895

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Les âges de l'ouvrier

Léon FRÉDÉRIC 1895

Is this child portrayed as autistic?

Which woman is her mother?

Autism's First Child

AS NEW CASES OF AUTISM HAVE EXPLODED IN RECENT YEARS—SOME FORM OF THE CONDITION AFFECTS ABOUT ONE IN 110 CHILDREN TODAY—EFFORTS HAVE MULTIPLIED TO UNDERSTAND AND ACCOMMODATE THE CONDITION IN CHILDHOOD. BUT CHILDREN WITH AUTISM WILL BECOME ADULTS WITH AUTISM, SOME 500,000 OF THEM IN THIS DECADE ALONE. WHAT THEN? MEET DONALD GRAY TRIPLETT, 77, OF FOREST, MISSISSIPPI. HE WAS THE FIRST PERSON EVER DIAGNOSED WITH AUTISM. AND HIS LONG, HAPPY, SURPRISING LIFE MAY HOLD SOME ANSWERS.

By John Donvan and Caren Zucker

Atlantic Monthly, October 2010

A Brief Research Update

Psychiatric comorbidity in autism spectrum disorder: Correspondence between mental health clinician report and structured parent interview

This study (1) examined correspondence between psychiatric diagnoses reported by mental health clinicians and those derived from a structured diagnostic interview and (2) identified predictors of agreement between clinician-reported and diagnostic interview-derived diagnoses in a sample of 197 children aged 4–14 years with autism spectrum disorder receiving mental health services.

Cohen's kappa was calculated to examine agreement between Mini-International Neuropsychiatric Interview, parent version and clinician-reported diagnoses of comorbid conditions. Children met criteria for an average of 2.83 (standard deviation = 1.92) Mini-International Neuropsychiatric Interview, parent version diagnoses. Agreement was poor across all diagnostic categories (κ values: 0.06–0.18).

Results underscore the need for training mental health clinicians in targeted assessment of specific psychiatric disorders and prioritizing treatment development and testing for specific diagnoses to improve care for children with

Does sex influence the diagnostic evaluation of autism spectrum disorder in adults?

This study reports sex differences in clinical outcomes for 1244 adults (935 males and 309 females) referred for autism spectrum disorder assessment. Significantly, more males (72%) than females (66%) were diagnosed with an autism spectrum disorder of any subtype ($x2 = 4.09$; $p = 0.04$).

Males had significantly more repetitive behaviors/restricted interests than females ($p = 0.001$, $d = 0.3$). A multivariate analysis of variance indicated a significant interaction between autism spectrum disorder subtype (full-autism spectrum disorder/partial-autism spectrum disorder) and sex: in full-autism spectrum disorder, males had more severe socio-communicative symptoms than females; for partial-autism spectrum disorder, the reverse was true.

There were no sex differences in prevalence of co-morbid psychopathologies. The sexes may present with different manifestations of the autism spectrum disorder phenotype and differences vary by diagnostic subtype. Understanding and awareness of adult female repetitive behaviors/restricted interests warrant[23]

Telehealth delivery of cognitive-behavioral intervention to youth with autism spectrum disorder and anxiety: A pilot study

This study details the pilot testing of a telehealth version of an empirically supported intervention targeting anxiety in youth with autism spectrum disorders. The primary focus of this study was on feasibility, with evaluation of outcomes as a starting point for future randomized trials. In all, 33 families of youth with autism spectrum disorders and significant anxiety symptoms participated in this study
(Telehealth Facing Your Fears (FYF) Intervention: n = 17; Wait-list control: n = 16). Youth of all functioning levels were included. Acceptability was strong; however, the usability of the technology was problematic for some families and impeded some sessions significantly. Fidelity of the telehealth version to the critical elements of the original, in vivo version was excellent. More work is needed to improve delivery of exposure practices and parent coaching.
Preliminary efficacy analyses are promising, with improvements observed in youth anxiety over time (relative to a comparison group waiting for live intervention) and parent sense of competence (within group). Clearly, stronger designs are necessary to evaluate efficacy sufficiently; however, this study does[24]

Open-trial pilot study of a comprehensive outpatient psychosocial treatment for children with high-functioning autism spectrum disorder

This study examined the feasibility and initial outcomes of a comprehensive outpatient psychosocial treatment (MAXout) for children aged 7-12 years with high-functioning autism spectrum disorder. The 18-week treatment, two 90-minute sessions per week, included instruction and therapeutic activities targeting social/social communication skills, facial emotion recognition, non-literal language skills, and interest expansion.

A behavioral system was implemented to reduce autism spectrum disorder symptoms and problem behaviors and increase skills acquisition and maintenance. Feasibility was supported via high levels of treatment fidelity and parent, child, and staff satisfaction. Significant post-treatment improvements were found for the children's non-literal language skills and facial emotion recognition skills, and parent and staff clinician ratings of targeted social/social communication skills, broad social skills, autism spectrum disorder symptoms, and problem behaviors.

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The mental health of individuals referred for assessment of autism spectrum disorder in adulthood: A clinic report

High rates of mental health problems have been reported in young people and adults with autism spectrum disorder. However, sampling and methodological issues mean prevalence estimates and conclusions about specificity in psychiatric co-morbidity in autism spectrum disorder remain unclear.

A retrospective case review of 859 adults referred for assessment of autism spectrum disorder compares International Classification of Diseases, Tenth Revision diagnoses in those that met criteria for autism spectrum disorder (n = 474) with those that did not (n = 385). Rates of psychiatric diagnosis (>57%) were equivalent across both groups and exceeded general population rates for a number of conditions.

The prevalence of anxiety disorders, particularly obsessive compulsive disorder, was significantly higher in adults with autism spectrum disorder than adults without autism spectrum disorder. The implications of this study highlight the need for careful consideration of mental health needs in all adults referred for

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Effects of an employer-based intervention on employment outcomes for youth with significant support needs due to autism

The purpose of this study was to develop and investigate an employer-based 9-month intervention for high school youth with autism spectrum disorder to learn job skills and acquire employment. The intervention modified a program titled Project SEARCH and incorporated the use of applied behavior analysis to develop Project SEARCH plus Autism Spectrum Disorder Supports.

A randomized clinical trial compared the implementation of Project SEARCH plus Autism Spectrum Disorder Supports with high school special education services as usual. Participants were 49 high-school-aged individuals between the ages of 18 and 21 years diagnosed with an autism spectrum disorder and eligible for supported employment. Students also had to demonstrate independent self-care. At 3 months post-graduation, 90% of the treatment group acquired competitive, part-time employment earning US$9.53-US$10.66 per hour. Furthermore, 87% of those individuals maintained employment at 12 months post-graduation. The control group's employment outcomes were 6% acquiring employment by 3 months post-graduation and 12% acquiring employment by 12

Employment programs and interventions targeting adults with autism spectrum disorder: A systematic review of the literature

In this systematic review, empirical peer-reviewed studies on employment programs, interventions and employment-related outcomes in individuals with autism spectrum disorder over 18 years with and without intellectual disability were identified and evaluated.

From 32,829 records identified in the initial search, 10 review and 50 empirical articles, comprising N = 58,134 individuals with autism spectrum disorder, were included in the review. Selected articles were organized into the following themes: employment experiences, employment as a primary outcome, development of workplace skills, non-employment-related outcomes, assessment instruments, employer-focused and economic impact. Empirical studies were limited by poor participant characterization, small sample size and/ or a lack of randomization and use of appropriate controls. Poor conceptualization and measurement of outcomes significantly limited study quality and interpretation.

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DSM 5

‣ Combine social and communication categories.
‣ Tighten required criteria reducing the number of symptom combinations leading to a diagnosis.
‣ Omit Retts and Childhood Disintegrative Disorder.
‣ Clarify co-morbidity issues
‣ Eliminate PDD NOS and Aspergers in favor of Autism Spectrum.

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DSM 5

‣ Five criteria.
‣ Seven sets of symptoms in the first two criteria – Social/Communication and Restrictive/Repetitive behaviors, interests or activities.
‣ All three symptoms are required to meet the first criteria (although a typo omits this).
‣ Two out of four are needed for the second criteria.
‣ Some symptoms have been combined. Sensory sensitivity has been added.

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Normally Developing Children:

- Show interest in the human face.
- Demonstrate a differential preference for speech sounds.
- Possess imitative capacity.
- Seek physical comfort.
- Attach to caretakers.

Social competence is an ability to take another's perspective concerning a situation and to learn from past experience and to apply that learning to the ever changing social landscape.

Margaret Semrud–Clikeman

Social competence has been scientifically linked to mental and physical health.

Impairment in Social Competence Caused By:

▸ Aggressive, hostile behavior.
▸ Perceptual deficits in interpreting social behavior.
▸ Executive and self-regulation deficits

Social Information Processing

▸ Encoding of relevant stimuli.
▸ Interpretation of cues (both cause and intent).
▸ Goal setting.
▸ Comparison of the present situation to past experience.
▸ Selection of possible responses.
▸ Acting on a chosen response.

Crick and Dodge (1994)

Between September 23, 2009 and October 12, 2009, Massachusetts Advocates for Children conducted an online survey in hopes of learning more about the extent of bullying of children on the autism spectrum in Massachusetts schools. Parent respondents were informed that data and examples provided would be used to support the passage of H.3804, An Act Addressing Bullying of Children with ASD. Almost 400 parents responded.

88% reported their children had been bullied.

Autism is increasingly referred to as a spectrum disorder in which individuals can present problems ranging from total impairment to near reasonable functioning.

In a Spectrum Disorder genetic and phenotypic factors predispose certain individuals to express certain Central Nervous System vulnerabilities leading to poorly adapted variations in development and behavior.

In a Spectrum Disorder all symptoms are considered relevant to the extent they present in each disorder. Thus a symptom is not exclusive to a disorder.

The form that a Spectrum Disorder assumes is determined by its composite symptoms. These symptoms often have complex relationships.

Core DSM and ICD Autistic Symptoms

‣ Impaired social relations.
‣ Impaired communication skills.
avior.
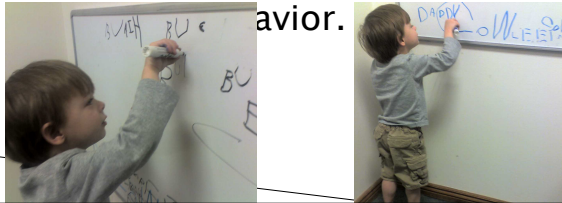
Symptoms Present Before 24 Months: Failure To:

‣ Orient to name
‣ Attend to human voice
‣ Look at face and eyes of others
‣ Imitate
‣ Show objects
‣ Point
‣ Demonstrate
 interest in other children
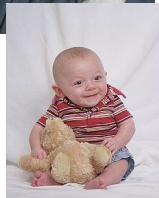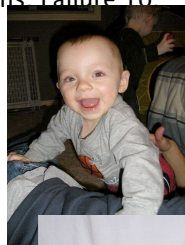
Symptoms Present Before 36 Months

‣ Use of other's body to communicate or as a tool
‣ Stereotyped hand/finger/body mannerisms
‣ Ritualistic behavior
‣ Failure to demonstrate pretend play
‣ Failure to demonstrate joint

Meet Kevin

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Kevin Draws His Family
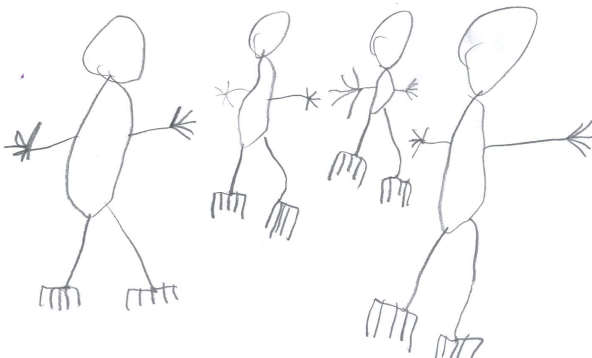
Kevin Adds Faces
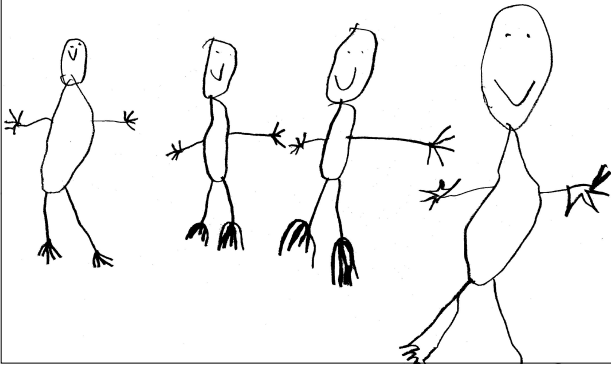
Pretend Play in Autism

- Limited, often absent
- When present usually characterized by: repetitive themes, rigidity, isolated acts, one-sided play, limited imagination.

ASRS

ASRS

(6–18 Years)
TEACHER RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

Instructions for Raters: Read each statement that follows the phrase, "During the past four weeks, how often did the student...," then circle

FULL-LENGTH FORMS

ASRS (2–5)
Ages 2–5 Years (70 items)

ASRS (6–18)
Ages 6–18 Years (71 items)

MHS

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Factor Analysis for 2-5 Years

‣ A two-factor solution was best for parent and teacher raters
  ◦ Factor I: included primarily items related to both socialization and communication (e.g., keep a conversation going, understand how someone else felt) – Social/Communication
  ◦ Factor II: included items related to behavioral rigidity (e.g., insist on doing things the same way each time), stereotypical behaviors (e.g., flap his/her hands when excited), and overreactions to sensory stimulation (e.g., overreact to common smells)– Unusual Behaviors

Factor Analysis for 6-18 Years

‣ A three-factor solution was best for both parent and teachers versions of the ASRS
  ◦ Factor I: included primarily items related to both socialization and communication –Social/Communication
  ◦ Factor II: included items related to behavioral rigidity, stereotypical behaviors and overreactions to sensory stimuli – Unusual Behaviors
  ◦ Factor III: included items related to attention problems (e.g., become distracted), impulsivity (e.g, have problems waiting his/her turn), and compliance (e.g., get into trouble with adults, argue and fight with other children) – Self-Regulation.

Factor Consistency

‣ The consistency of the ASRS scale structure across several demographic groups (gender, age group, race, and clinical status) was studied

‣ The factor loadings for the groups were correlated using the coefficient of congruence
  ◦ results revealed a very high degree of consistency between all groups
  ◦ indicating that the factor structure of the forms generalized across the demographic groups

Current View of ASD In ASRS

▸ Based on the factor analysis, we suggest that ASD is best described as having two clusters of behaviors for children ages 2-5 and three for those aged 6 to 18 years of age.
  ◦ Ages 2 – 5 years
    • Social / Communication
    • Unusual Behaviors
  ◦ Ages 6 – 18 years
    • Social / Communication
    • Unusual Behaviors
    • Self-Regulation
▸ This is the organizational form of the ASRS.
  ◦ .

Goals of the ASRS

AUTISM SPECTRUM RATING SCALES™ (ASRS™)

Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

Goldstein & Naglieri (2009)
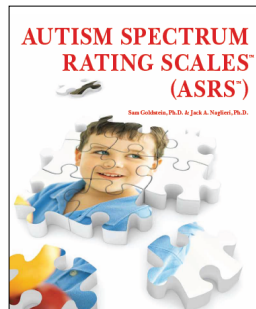
ASRS Scale Goal #1

1. Develop a multi-dimensional scale to adequately reflect the Autism Spectrum based on statistical as well as logical organization of items

▸ Content Scales
  ◦ DSM Scales
  ◦ Treatment Scales

▸ Empirical Scales
  ◦ Ages 2-5
    • Social / Communication
    • Unusual Behaviors
  ◦ Ages 6 – 18 years
    • Social/Communication
    • Unusual Behavior
    • Self -Regulation

Autism Spectrum Rating Scales Forms

FULL-LENGTH FORMS
SHORT FORMS

| ASRS (2–5)
Ages 2–5 Years (70 items) | ASRS (6–18)
Ages 6–18 Years (71 items) | ASRS Short (2–5)
(15 items) | ASRS Short (6–18)
(15 items) |

Total Score

ASRS Scales
▪ Social/Communication
▪ Unusual Behaviors

DSM-IV-TR Scale

▪ Attention/Self-Regulation   ▪ Attention

Treatment Scales
▪ Peer Socialization
▪ Adult Socialization
▪ Social/Emotional Reciprocity
▪ Atypical Language
▪ Stereotypy
▪ Behavioral Rigidity
▪ Sensory Sensitivity
▪ Attention/Self-Regulation

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ASRS Ages 6–18 (70 items)

Total Score

ASRS Scales
▪ Social/Communication
▪ Unusual Behaviors
▪ Self-Regulation

DSM-IV-TR Scale

Treatment Scales
▪ Peer Socialization
▪ Adult Socialization
▪ Social/Emotional Reciprocity
▪ Atypical Language
▪ Stereotypy
▪ Behavioral Rigidity
▪ Sensory Sensitivity
▪ Attention

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ASRS Empirical &Treatment Scales

▸ Treatment Scales
  ◦ Peer Socialization
  ◦ Adult Socialization
  ◦ Social/Emotional Reciprocity
  ◦ Atypical Language
  ◦ Stereotypy
  ◦ Behavioral Rigidity
  ◦ Sensory Sensitivity
  ◦ Attention (Attention/Self-Regulation)
▸ Items were grouped based on content similarity and treatment utility of the groups.

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ASRS Interpretation

▸ The DSM-IV-TR Scale includes items that represent the symptoms used as part of the diagnostic criteria for ASD.

▸ Additional criteria (e.g., age of onset, differential diagnosis, and level of impairment) must be met before a DSM-IV-TR diagnosis can be assigned.

▸ Remember the DSM and ASRS Total scores may be different due to slightly different content.

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ASRS Scale Goal #2

▸ Base the ASRS standard scores on a national sample of individuals aged 2 – 18 years who represent the US on a number of key variables.

▸ Why compare children's scores to a nationally representative sample?

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Importance of a National Norm

▸ Sample was stratified by
  ◦ Sex, age, race/ethnicity, parental education level (PEL; for cases rated by parents), geographic region
  ◦ Race/ethnicity of the child (Asian/Pacific Islander, Black/ African American/African Canadian, Hispanic, White/ Caucasian, Multi-racial by the rater
  ◦ Parents provided PEL of both parents
    • the higher of the two levels was used to classify the parental education level of the child
  ◦ All raters completed the ASRS via the paper-and-pencil or online methods.

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Census Matched National Norm

ASRS Standardization Samples by Age and Rater		
Age Groups	Parent Raters	Teacher Raters
2 - 5 Years	320	320
6 - 11 Years	480	480
12 - 18 Years	480	480
Sub Total n	1,280	1,280
TOTAL N	2,560	

Note: at ages 2-16 years there were 80 subjects (40 girls and 40 boys) per one year age group. At ages 17-18 there were 80 subjects (40 girls and 40 boys) across this two year interval.

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Census Matched National Norm

‣ Validity samples were collected
  ◦ a single primary diagnosis was indicated
  ◦ a qualified professional (e.g., psychiatrist, psychologist) had made the diagnosis
  ◦ Criteria were made using DSM-IV-TR or ICD-10
  ◦ Clinical samples include:
    • ASD (N = 580)
    • ADHD (N = 250)
    • Communication Delay (N = 180)
    • Developmental Delay (N = 140)
    • Anxiety / Depression (N = 100)

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ASRS Scale Goal #3

‣ Produce a rating scale that includes behaviors associated with ASRS that meets the various needs of the clinician.
  ◦ Has different forms for early childhood and school aged populations
  ◦ Uses the same set of questions for parents and teachers
  ◦ Is easy to administer and score
  ◦ Have reliability and validity
‣ Let's look at the forms and their use…

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Forms

‣ Instructions to the raters (parents and teachers) for ages 2 – 18 years

ASRS™ | G&N

(6–18 Years)
TEACHER RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

Instructions for Raters: Read each statement that follows the phrase, *"During the past four weeks, how often did the student...,"* then circle

Instructions for Raters: Read each statement that follows the phrase, *"During the past four weeks, how often did the student...,"* then circle the number under the word that tells how often you saw the behavior. Read each question carefully, then mark how often you saw the behavior in the past four weeks. Answer every question without skipping any. If you want to change your answer, put an X through it and circle your new choice. Be sure to answer every question.

MHS

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ASRS Forms

ASRS™ (6–18 Years)
PARENT RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

G&N
Goldstein & Naglieri

During the past four weeks, how often did the child...	Never	Rarely	Occasionally	Frequently	Very Frequently
1. appear disorganized?	0	1	2	③	4
2. become bothered by some fabrics or tags in clothes?	⓪	1	2	3	4
3. seek the company of other children?	0	1	2	③	4
4. show little emotion?	0	1	2	③	4
5. follow instructions that he/she understood?	0	①	2	3	4
6. argue and fight with other children?	0	1	②	3	4
7. have problems waiting his/her turn?	0	1	2	3	④

‣ Peek at items

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ASRS Forms

‣ Underlying page contains item ratings and separation of items into scales.

ASRS™ (6–18 Years)
PARENT RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

G&N
Goldstein & Naglieri

INSTRUCTIONS: Transfer the circled numbers into the unshaded box(es) to the right of each item. Add the values in each column and write the sum in the Subtotal boxes at the bottom of each page. Sum the corresponding Subtotals for each column to obtain the Raw Scores. Transfer the Raw Scores to page 4 for ages 6–11 years and page 5 for ages 12–18 years.

During the past four weeks, how often did the child...	Never	Rarely	Occasionally	Frequently	Very Frequently													
1. appear disorganized?	0	1	2	③	4	3											3	
2. become bothered by some fabrics or tags in clothes?	⓪	1	2	3	4		0										0	
3. seek the company of other children?	4	3	2	①	0	1			1									
4. show little emotion?	0	1	2	③	4			3										
5. follow instructions that he/she understood?	4	③	2	1	0	3											3	
6. argue and fight with other children?	0	1	②	3	4					2								
7. have problems waiting his/her turn?	0	1	2	④						4								
8. share fun activities with others?	4	3	②	1	0	2			2				2					
Subtotals (items 1–36)						22	13	29	33	8	3	19	2	0	10	1	23	
						SC	UB	SR	DSM	PS	AS	SER	AL	ST	BR	SS	AT	

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ASRS™ (6–18 Years) PARENT RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

AGES 6–11 YEARS

INSTRUCTIONS:

1. *T-scores and Percentile Ranks:* Circle the raw score for each scale in the Raw Score to T-Score and Percentile Rank Conversion Table and follow the row across to find the corresponding T-score, Percentile Rank, and Classification. Transfer these values into the Scale Score Summary Table, below.

2. *Confidence Intervals (CI):* Decide if 90% or 95% CIs will be used, and circle that value in the column heading. Look up the CIs from Appendix X of the *ASRS Technical Manual* and enter the values in the appropriate boxes.

3. *Total Score Calculation:* Sum the T-scores for Social/Communication (SC), Unusual Behaviors (UB), and Self-Regulation (SR), and enter the sum in the box provided in the section titled Total Score, below. Record the Total Score T-score, Percentile Rank, CI, and Classification in the appropriate boxes.

Note: See chapter 3 of the *ASRS Technical Manual* for complete scoring instructions.

Scale Score Summary Table for Ages 6–11 Years

ASRS Scales

Scales	Raw Score	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
Social/Communication (SC)	49	77	99	71 to 79	Very Elevated
Unusual Behaviors (UB)	33	60	84	56 to 63	Slightly Elevated
Self-Regulation (SR)	50	70	98	64 to 73	Very Elevated

Total Score

SC T-Score	UB T-Score	SR T-Score	Sum of SC, UB, & SR T-Scores	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
77 +	60 +	70 =	207	73	99	69 to 75	Very Elevated

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ASRS Forms

Child's Name/ID: Joey D   Gender: (M) F (Circle One)   Today's Date: 2009 / 07 / 02
Parent's Name/ID: Mrs. D   Grade: 5   Birth Date: 1999 / 01 / 02
Did your child acquire language before age 3? (Delay of Communication 1) (Yes) No Don't Know
If Yes, did your child speak in 3 word sentences by age 3? (Delay of Communication 2) (Yes) No Don't Know
Age: 10 / 6 / 0

Raw Score to T–Score and Percentile Rank Conversion Table for Ages 6–11 Years

Percentile Rank	T-Score	TOT	SC	UB	SR	DSM	PS	AS	SER	AL	ST	BR	SS	AT	T-Score	Percentile Rank	Classification
99	85	239–250	64–76	•	•	125–136	36	24	45–52	•	•	•	22–24	44	85	99	
99	84	236–238	62–63	•	•	122–124	35	23	•	•	•	21	43	84	84	99	
99	83	233–235	60–61	96	•	119–121	34	22	44	•	•	20	42	83	83	99	
99	82	230–232	58–59	94–95	67–68	116–118	33	21	43	24	20	•	19	41	82	99	
99	81	227–229	56–57	92–93	65–66	113–115	32	•	42	23	•	32	18	40	81	99	
99	80	224–226	54–55	90–91	64	110–112	31	20	40–41	22	19	31	17	39	80	99	
99	79	221–223	52–53	88–89	63	108–109	30	•	38–39	•	•	30	16	•	79	99	
99	78	218–220	50–51	86–87	61–62	105–107	29	19	37	21	18	29	15	38	78	99	Very Elevated
99	77	215–217	48–49	84–85	59–60	102–104	28	•	36	•	•	•	14	•	77	99	
99	76	213–214	46–47	81–83	57–58	98–101	27	18	35	20	17	28	•	37	76	99	
99	75	211–212	45	77–80	56	94–97	25–26	•	34	19	•	27	13	•	75	99	
99	74	208–210	44	72–76	55	90–93	24	17	•	18	16	26	•	36	74	99	
99	73	207–208	42–43	68–71	54	87–89	23	•	33	17	•	25	12	•	73	99	
99	72	205–206	41	61–65	53	84–86	22	16	32	16	•	24	•	35	72	99	
98	71	203–204	39–40	58–60	52	81–83	21	•	31	15	•	23	11	34	71	98	
98	70	201–202	38	55–57	50–51	78–80	20	15	30	14	14	22	•	33	70	98	
97	69	199–200	37	52–54	49	75–77	19	•	29	13	•	21	10	32	69	97	
96	68	198	35–36	48–51	47–48	72–74	18	14	28	12	13	20	•	31	68	96	Elevated
96	67	195–197	34	46–47	46	69–71	17	•	27	•	•	19	9	30	67	96	
95	66	192–194	33	44–45	45	66–68	16	13	26	11	12	18	•	29	66	95	
93	65	189–191	32	42–43	44	63–65	15	•	25	•	•	17	•	28	65	93	
93	64	187–188	31	40–41	41–43	60–62	•	17	24	10	11	16	8	27	64	93	

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ASRS Forms

▸ T–scores, percentile ranks, and confidence intervals are recorded on the form

ASRS™ (6–18 Years) TEACHER RATINGS
Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

AGES 6–11 YEARS

INSTRUCTIONS:

1. *T-scores and Percentile Ranks:* Circle the raw score for each scale in the Raw Score to T-Score and Percentile Rank Conversion Table and follow the row across to find the corresponding T-score, Percentile Rank, and Classification. Transfer these values into the Scale Score Summary Table, below.

2. *Confidence Intervals (CI):* Decide if 90% or 95% CIs will be used, and circle that value in the column heading. Look up the CIs from Appendix X of the *ASRS Technical Manual* and enter the values in the appropriate boxes.

3. *Total Score Calculation:* Sum the T-scores for Social/Communication (SC), Unusual Behaviors (UB), and Self-Regulation (SR), and enter the sum in the box provided in the section titled Total Score, below. Record the Total Score T-score, Percentile Rank, CI, and Classification in the appropriate boxes.

Note: See chapter 3 of the *ASRS Technical Manual* for complete scoring instructions.

Scale Score Summary Table for Ages 6–11 Years

ASRS Scales

Scales	Raw Score	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
Social/Communication (SC)				to	
Unusual Behaviors (UB)				to	
Self-Regulation (SR)				to	

Total Score

SC T-Score	UB T-Score	SR T-Score	Sum of SC, UB, & SR T-Score	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
+	+	=				to	

DSM-IV-TR Scale

Scale	Raw Score	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
DSM-IV-TR Scale (DSM)				to	

Treatment Scales

Scales	Raw Score	T-Score	Percentile Rank	90/95% CI (circle one)	Classification
Peer Socialization (PS)				to	
Adult Socialization (AS)				to	
Social/Emotional Reciprocity (SER)				to	
Atypical Language (AL)				to	
Stereotypy (ST)				to	
Behavioral Rigidity (BR)				to	
Sensory Sensitivity (SS)				to	
Attention (AT)				to	

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Autism Rating Scales

SHORT FORMS

- **ASRS Short (2–5)** (15 items)
- **ASRS Short (6–18)** (15 items)

ASRS Reliability

≫

ASRS Reliability Ages 2–5 Parents & Teachers (or caregivers)

Scale		Parent Ratings			Teacher Ratings		
		Normative Sample (N = 320)	Clinical Sample (N = 243)	Average	Normative Sample (N = 320)	Clinical Sample (N = 249)	Average
Total Score		.95	.98	.97	.94	.99	.97
ASRS Scales	Social/ Communication	.94	.98	.96	.95	.98	.97
	Unusual Behaviors	.91	.96	.94	.85	.97	.92
DSM-IV-TR Scale		.91	.97	.94	.91	.98	.95
Treatment Scales	Peer Socialization	.77	.96	.89	.85	.95	.91
	Adult Socialization	.67	.85	.76	.78	.85	.81
	Social/Emotional Reciprocity	.83	.96	.91	.88	.96	.93
	Atypical Language	.71	.77	.74	.59	.79	.69
	Stereotypy	.75	.86	.80	.67	.86	.77
	Behavioral Rigidity	.85	.94	.90	.82	.95	.90
	Sensory Sensitivity	.71	.89	.81	.59	.90	.77
	Attention/Self-Regulation	.83	.88	.85	.83	.89	.86

ASRS Reliability Ages 6–18 : Parents

Scale		6 to 11 Years			12 to 18 Years		
		Normative Sample (N = 480)	Clinical Sample (N = 230)	Average	Normative Sample (N = 480)	Clinical Sample (N = 185)	Average
Total Score		.97	.98	.97	.97	.97	.97
ASRS Scales	Social/ Communication	.91	.97	.94	.92	.95	.93
	Unusual Behaviors	.94	.95	.94	.93	.95	.94
	Self-Regulation	.92	.92	.92	.93	.93	.93
DSM-IV-TR Scale		.95	.96	.95	.94	.96	.95
Treatment Scales	Peer Socialization	.84	.92	.87	.84	.91	.86
	Adult Socialization	.77	.77	.77	.79	.77	.78
	Social/Emotional Reciprocity	.85	.94	.89	.88	.91	.89
	Atypical Language	.81	.85	.82	.82	.85	.83
	Stereotypy	.79	.78	.79	.77	.79	.78
	Behavioral Rigidity	.89	.92	.90	.86	.94	.89
	Sensory Sensitivity	.79	.85	.81	.77	.82	.79
	Attention	.90	.91	.90	.89	.91	.90

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ASRS Reliability Ages 6–18 : Teachers

Scale		6 to 11 Years			12 to 18 Years		
		Normative Sample (N = 480)	Clinical Sample (N = 167)	Average	Normative Sample (N = 480)	Clinical Sample (N = 325)	Average
Total Score		.97	.98	.97	.97	.97	.97
ASRS Scales	Social/ Communication	.93	.96	.94	.92	.96	.94
	Unusual Behaviors	.93	.95	.94	.94	.95	.94
	Self-Regulation	.94	.93	.94	.93	.91	.92
DSM-IV-TR Scale		.94	.96	.95	.94	.96	.95
Treatment Scales	Peer Socialization	.84	.90	.86	.83	.90	.86
	Adult Socialization	.80	.81	.80	.77	.77	.77
	Social/Emotional Reciprocity	.89	.92	.90	.89	.92	.90
	Atypical Language	.75	.87	.79	.80	.85	.82
	Stereotypy	.69	.77	.71	.72	.81	.76
	Behavioral Rigidity	.90	.93	.91	.90	.94	.92
	Sensory Sensitivity	.77	.87	.80	.84	.87	.85
	Attention	.92	.92	.92	.91	.92	.91

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ASRS Validity

≫ And an updated view of ASD

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Validity of the Factors

▸ Factor analysis is a valuable tool to understand how items group.

▸ But we also need to know if the items have validity.

▸ Discriminating children with ASD from the regular population is important.

▸ Discriminating children with ASD from those who are not in the regular population but not ASD is very important.

ASRS Profiles

▸ A scale like the ASRS should differentiate children with ASD from the normal population.

▸ Comparison to regular children should show that those with ASDs have high scores.

▸ Comparisons to other clinical groups should also show differences from those with ASDs.

▸ Comparisons of the ASD to regular and other clinical samples gives an essential examination of validity .

ASRS Validity for ages 2-5

ASRS Validity: Ages 6–18 Parents

ASD
ADHD
Clinical
Gen Pop

Total Score | Self-Regulation | Adult Socialization | Stereotypy | Attention
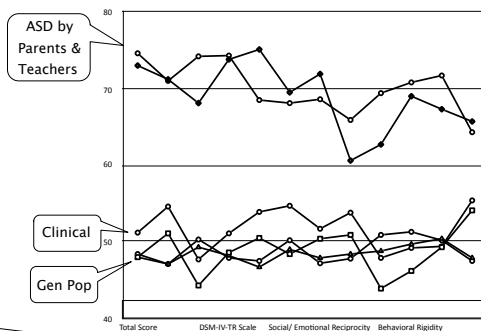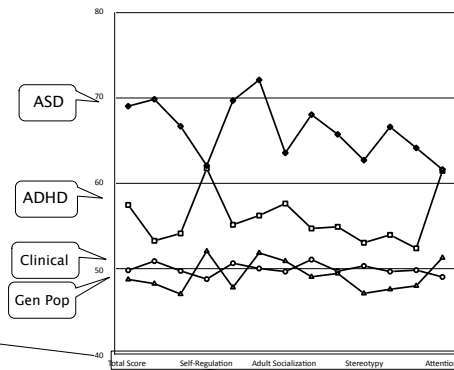
79

ASRS Validity: Ages 6–18 Teachers

ASD
ADHD
Clinical
Gen Pop

Total Score | Self-Regulation | Adult Socialization | Stereotypy | Attention

80

Only through the rest of the values are presented to 1 decimal place, Gill would like Kappa presented to 2 decimal places.
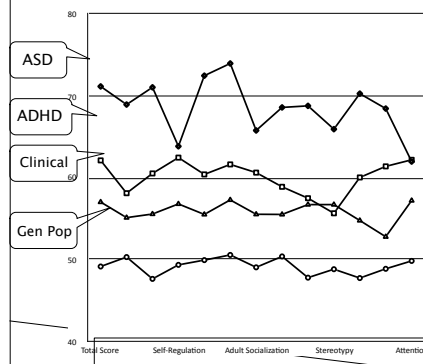
Classification Accuracy ages 2–5 Parents

	Total Score	ASRS Scales		DSM-IV-TR Scale
		Social/ Communication	Unusual Behaviors	
Overall Correct Classification (%)	90.0	93.5	94.8	92.7
Sensitivity (%)	89.8	94.6	95.0	92.3
Specificity (%)	90.3	92.3	94.7	93.3
Positive Predictive Power (%)	91.3	93.2	95.0	93.7
Negative Predictive Power (%)	88.7	93.9	94.7	91.7
False-Positive Rate (%)	9.7	7.7	5.3	6.7
False-Negative Rate (%)	10.2	5.4	5.0	7.8
Kappa	0.80	0.87	0.90	0.95
Autism Spectrum Disorder *(N)*	126	132	129	127
General Population *(N)*	115	115	124	121

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Classification Accuracy ages 2–5 Teachers

	Total Score	ASRS Scales		DSM-IV-TR Scale
		Social/ Communication	Unusual Behaviors	
Overall Correct Classification (%)	**89.4**	**88.0**	**85.2**	**89.7**
Sensitivity (%)	**90.2**	**90.7**	**83.6**	**89.7**
Specificity (%)	**88.6**	**85.4**	**86.8**	**89.7**
Positive Predictive Power (%)	**88.6**	**86.3**	**95.8**	**89.7**
Negative Predictive Power (%)	**90.2**	**90.0**	**84.7**	**89.7**
False-Positive Rate (%)	**11.4**	**14.7**	**13.2**	**10.3**
False-Negative Rate (%)	**9.8**	**9.3**	**16.4**	**10.3**
Kappa	**0.79**	**0.76**	**0.70**	**0.79**
ASD *(N)*	**114**	**124**	**113**	**117**
General Sample *(N)*	**112**	**110**	**124**	**116**

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Classification Accuracy ages 6–18 Parents

	Total Score	ASRS Scales			DSM-IV-TR Scale
		Social/ Communication	Unusual Behaviors	Self-Regulation	
Overall Correct Classification (%)	**91.3**	**91.3**	**88.3**	**86.5**	**91.2**
Sensitivity (%)	**90.3**	**90.0**	**87.7**	**86.1**	**90.5**
Specificity (%)	**92.2**	**92.5**	**88.9**	**86.9**	**91.9**
Positive Predictive Power (%)	**91.8**	**92.3**	**88.6**	**86.6**	**91.8**
Negative Predictive Power (%)	**90.8**	**90.2**	**88.0**	**86.5**	**90.6**
False-Positive Rate (%)	**7.8**	**7.5**	**11.1**	**13.1**	**8.1**
False-Negative Rate (%)	**9.7**	**10.0**	**12.3**	**13.9**	**9.6**
Kappa	**0.83**	**0.83**	**0.77**	**0.74**	**0.82**
ASD *(N)*	**183**	**195**	**201**	**201**	**196**
General Sample *(N)*	**196**	**205**	**209**	**207**	**201**

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Classification Accuracy ages 6–18 Teachers

	Total Score	ASRS Scales			DSM-IV-TR Scale
		Social/ Communication	Unusual Behaviors	Self-Regulation	
Overall Correct Classification (%)	**91.4**	**88.8**	**92.6**	**85.2**	**94.1**
Sensitivity (%)	**92.1**	**87.1**	**95.4**	**85.2**	**92.8**
Specificity (%)	**90.7**	**90.5**	**89.8**	**85.1**	**95.5**
Positive Predictive Power (%)	**90.3**	**90.0**	**90.0**	**84.8**	**95.4**
Negative Predictive Power (%)	**92.5**	**87.8**	**95.3**	**85.5**	**93.0**
False-Positive Rate (%)	**9.3**	**12.9**	**10.2**	**14.9**	**4.5**
False-Negative Rate (%)	**7.9**	**8.9**	**4.6**	**14.8**	**7.2**
Kappa	**0.83**	**0.78**	**0.85**	**0.70**	**0.88**
ASD *(N)*	**206**	**210**	**231**	**217**	**215**
General Sample *(N)*	**212**	**229**	**212**	**221**	**227**

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ASD vs Communication Disorders

ASD vs Communication Disorders

Legend:
- CD-Parents (N=35)
- CD-Teachers (N = 39)

Y-axis: 75, 66, 58, 49, 40

X-axis: Soc/Com, UnBeh, Self-Reg, DSM, Total
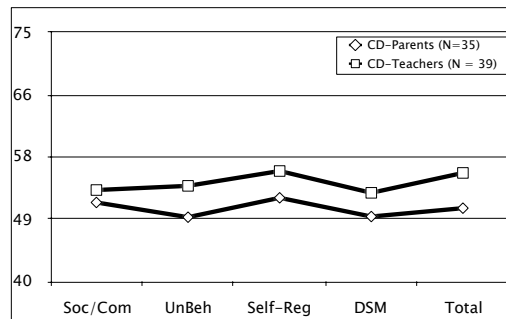
Race / Ethnic Differences

ASRS Race Ethnic Differences

Table 8.26. Differences between Race/Ethnic Groups: ASRS (6–18 Years) Parent Ratings

Scale			African American	Hispanic	White	d-ratio White – African American	d-ratio White-Hispanic
Total Score		M	50.9	45.7	49.3	0.14	0.31
		SE	0.9	1.0	0.5		
		N	122	128	536		
ASRS Scales	Social/ Communication	M	50.8	46.4	49.1	0.15	0.24
		SE	0.9	0.9	0.5		
		N	122	128	536		
	Unusual Behaviors	M	50.6	45.6	49.4	0.11	0.33
		SE	0.9	0.9	0.5		
		N	122	128	536		
	Self-Regulation	M	50.3	46.1	49.1	0.10	0.26
		SE	0.9	1.0	0.5		
		N	122	128	536		
DSM-IV-TR Scale		M	51.0	45.6	49.7	0.13	0.37
		SE	0.9	0.9	0.5		
		N	128	131	549		

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Race Ethnic Differences Short Form

Table 9.12. Effect of Race/Ethnicity: ASRS Short Forms

Age	Rater		AA	HI	WH	d-ratio AA – WH	d-ratio WH-HI
2–5 Years	Parent	M	46.5	49.2	49.9	-0.34	0.06
		SE	1.4	1.7	0.8		
		N	52	57	172		
	Teacher/Childcare Provider	M	48.0	45.6	50.7	-0.18	0.34
		SE	1.7	1.9	1.1		
		N	47	48	195		
6–18 Years	Parent	M	50.6	46.2	49.6	0.09	0.29
		SE	0.9	0.9	0.5		
		N	133	135	560		
	Teacher	M	50.7	51.9	49.8	0.07	-0.16
		SE	0.9	0.9	0.6		
		N	132	152	521		

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DSM IV TR Autism and Asperger Syndrome

ASRS preliminary findings

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Lorna Wing

Gillberg & Wing (1999)

‣ Autism: Not an extremely rare disorder. Acta Psychiatrica Scandinavica
‣ There was a marked difference in prevalence rates between studies that included children born before 1970 (.5 per 1,000) and those that included only children born in 1970 and after (1 per 1,000).
‣ Concluded that autism (including Aspergers) is considerably more common than previously believed

Autism vs Asperger

‣ ASRS means for ages 2-5 years were typically somewhat higher for children with Autism than those with Asperger's syndrome
  ◦ Exception being Unusual Behaviors where the two groups were similar
‣ ASRS means for ages 6-18 years were consistently higher for children with Autism than those with Asperger's syndrome

Autism vs Asperger 2-5 years
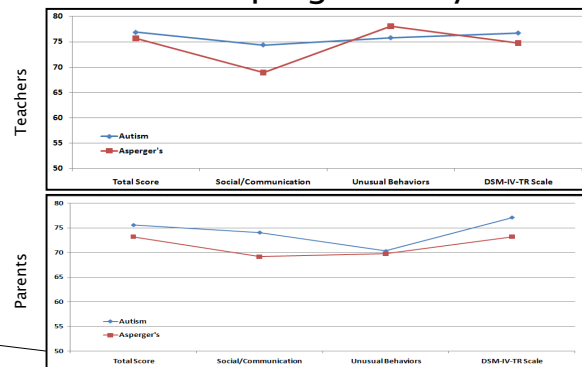
94

Autism vs Asperger 6-18 Years
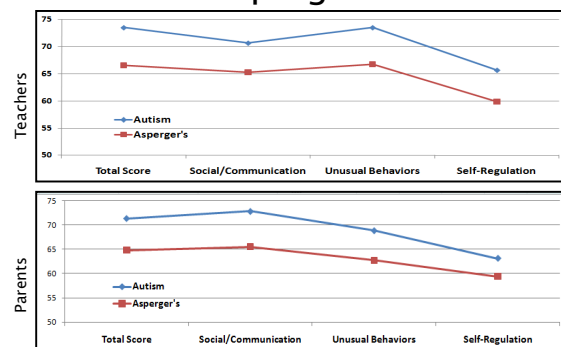
95

Autism vs Asperger 6-18
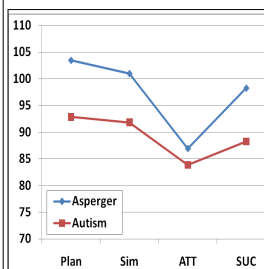
Descriptive Statistics and Comparisons Between Individuals with Autism ($n = 20$) and Asperger Syndrome ($n = 23$).

		Mn	SD	F	Sig	d-ratio
PLAN	Asperger	103.5	31.6	1.71	.20	0.40
	Autism	92.9	19.2			
SIM	Asperger	101.0	15.3	3.33	.08	0.54
	Autism	91.9	17.5			
ATT	Asperger	86.9	17.7	0.30	.59	0.17
	Autism	83.9	18.8			
SUC	Asperger	98.3	15.7	2.46	.12	0.47
	Autism	88.3	25.6			

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ASRS Interpretation Options

⟫

ASRS Interpretation

▸ For ages 2–5 years the ASRS Total T-Score (mean of 50 and SD of 10) is an equally weighted composite of
  ◦ Social/Communication
  ◦ Unusual Behaviors
▸ For ages 6–18 years the Total T-score is an equally weighted composite of
  ◦ Social/Communication
  ◦ Unusual Behaviors
  ◦ Self-Regulation scales

ASRS Interpretation

▸ Description of T scores

Table 4.1. Understanding *T-scores* and Percentiles

T-Score	Percentile	Guideline
70+	98+	Very Elevated Score (Many more concerns than are typically reported)
65–69	93–97	Elevated Score (More concerns than are typically reported)
60–64	84–92	Slightly Elevated Score (Somewhat more concerns than are typically reported)
40–59	16–83	Average Score (Typical levels of concern)
< 40	<16	Low Score (Fewer concerns than are typically reported)

▸ Estimated true score confidence intervals are provided for all scales

ETS Confidence Intervals

Autism Spectrum Rating Scales (ASRS)™

Table A.9. 90% Confidence Intervals: ASRS (6–11 Years) Teacher

T	TOT	SC	UB	SR	DSM	PS	AS	SER	
85	81–87	80–87	79–87	79–87	80–87	75–86	72–85	77–87	
84	80–86	79–86	78–86	78–86	79–86	74–85	71–84	76–86	
83	79–85	78–85	77–85	77–85	78–85	73–84	70–83	75–85	7
82	78–84	77–84	76–84	76–84	77–84	72–83	69–82	74–84	7
81	77–83	76–83	75–83	75–83	76–83	71–82	69–82	74–83	6
80	77–82	75–82	74–82	74–82	75–82	71–82	68–81	73–82	6
79	76–81	74–81	73–81	73–81	74–81	70–81	67–80	72–81	6
78	75–80	73–80	72–80	72–80	73–80	69–80	66–79	71–80	6
77	74–79	72–79	71–79	72–79	72–79	68–79	65–78	70–79	6
76	73–78	71–78	71–78	71–78	71–78	67–78	65–77	69–78	6
75	72–77	70–77	70–77	70–77	70–77	66–77	64–77	68–77	6

A T of 85 on Social Communication has a confidence interval of 80 to 87 (85 minus 5 and 85 plus 2)

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ASRS Interpretation

‣ What do the scales tell you?

Table 4.2. Common Characteristics of Children or Youth with High Scores

Scale		Common Characteristics
Total Score		Has many behavioral characteristics similar to individuals diagnosed with an Autism Spectrum Disorder.
ASRS Scales	Social/Communication	Inappropriate use of verbal and non-verbal communication to initiate, engage in, and maintain social contact.
	Unusual Behaviors	Has trouble tolerating changes in routine. Engages in apparently purposeless, stereotypical behaviors. Overreacts to certain sensory experiences.
	Self-Regulation (ASRS [6–18 Years] only)	Has deficits in attention and/or motor/impulse control; is argumentative.
DSM-IV-TR Scale		Has symptoms associated with the DSM-IV-TR diagnostic criteria for an Autism Spectrum Disorder.

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ASRS Interpretation

Treatment Scales	Peer Socialization	Has limited interest and capacity to successfully engage in activities that develop and maintain relationships with other children.
	Adult Socialization	Has limited interest and capacity to successfully engage in activities that develop and maintain relationships with adults.
	Social/Emotional Reciprocity	Has limited ability to provide an appropriate emotional response to another person in a social situation.
	Atypical Language	Spoken communication may be repetitive, unstructured, or unconventional.
	Stereotypy	Engages in apparently purposeless, repeated movements, noises, or behaviors.
	Behavioral Rigidity	Has difficulty tolerating changes in routine, activities, or behavior; aspects of the environment must remain unchanged.
	Sensory Sensitivity	Overreacts to certain experiences conveyed through touch, sound, vision, smell, or taste.
	Attention/Self-Regulation (ASRS [2–5 Years] only)	Has trouble appropriately focusing attention on one thing while ignoring distractions; appears disorganized. May have deficits in motor/impulse control; is argumentative.
	Attention (ASRS [6–18 Years] only)	Has trouble appropriately focusing attention on one thing while ignoring distractions; appears disorganized.

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Values Needed for Significance When Comparing ASRS T-scores Across Raters for children Aged 2 to 5 Years.

Scale		90% (*p* = .10)			95% (*p* = .05)			Adjusted 90% (*p* = .0		Par t Tea
		Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	
Total Score		5	5	5	5	5	5	7	7	
ASRS Scales	Social/Communication	5	5	5	6	5	6	8	7	
	Unusual Behaviors	6	7	6	7	8	8	10	10	1
DSM-IV-TR Scale		6	6	6	7	7	7	9	9	
Treatment Scales	Peer Socialization	8	7	8	10	9	9	13	12	1
	Adult Socialization	12	10	11	14	12	13	18	17	1
	Social/Emotional Reciprocity	7	7	7	9	8	8	12	10	1
	Atypical Language	12	13	13	15	16	15	19	21	2
	Stereotypy	11	11	11	13	13	13	17	18	1
	Behavioral Rigidity	8	8	8	9	9	9	12	12	1
	Sensory Sensitivity	11	12	11	13	14	13	17	18	1
	Attention/Self-Regulation	9	9	9	11	11	11	15	14	1

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ASRS Scoring Software

ASRS Scoring Software

‣ There are three types of reports:
  ◦ Interpretive
  ◦ Comparative (Parent vs Parent, Teacher vs Parent, Teacher vs Teacher)
  ◦ Progress over time

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ASRS Interpretive Report

Once you click "Generate Report", the report appears on screen. This is the Interpretive Report. From this screen you can print and close the report and access it again later. Or you can save the report in PDF format to you computer.
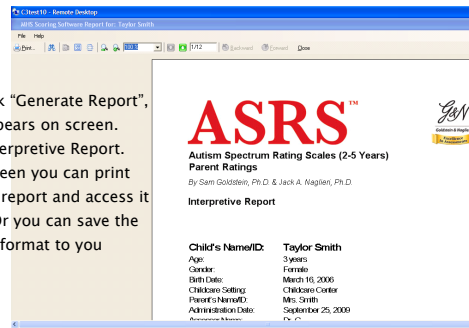
Report Options
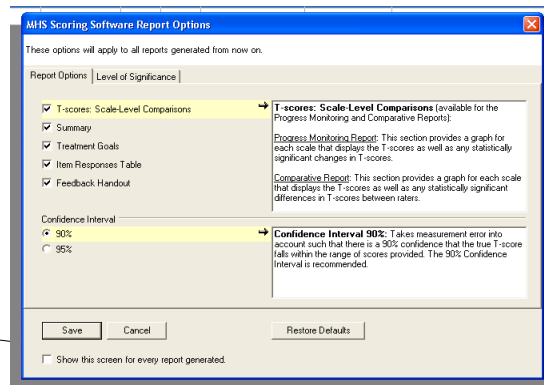
Report Options
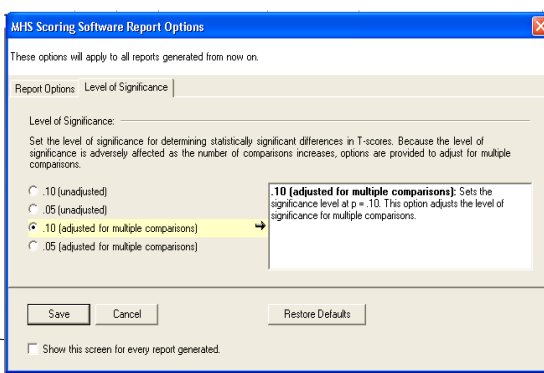
Select Interpretive Report

C3test10 - Remote Desktop
ASRS Parent (2-5 Years): QuikEntry

File   Options   Help

Save and New ▾ | Save and Close | Generate Report ▾ | Clear Form | ⇨ Exit | ❓ Help

Interpretive Report
Progress Monitoring Report
Comparative Report

0 = Never
1 = Rarely
2 = Occasionally
3 = Frequently
4 = Very Frequently
? = Omitted Item

Alternative keying options are Q, W, E, R, T, and Y (or ?) for omitted responses.

38.	2
39.	1
40.	0
41.	1
42.	2
43.	1
44.	3

ASRS Interpretive Report

T-scores

	T-score
TOTAL SCORE	73
ASRS SCALES	
Social/Communication	77
Unusual Behaviors	60
Self-Regulation	70
DSM-IV-TR SCALE	69
TREATMENT SCALES	
Peer Socialization	70
Adult Socialization	58
Social/Emotional Reciprocity	77
Atypical Language	52
Stereotypy	49
Behavioral Rigidity	72
Sensory Sensitivity	44
Attention	72

T-score (25 35 45 55 65 75 85)
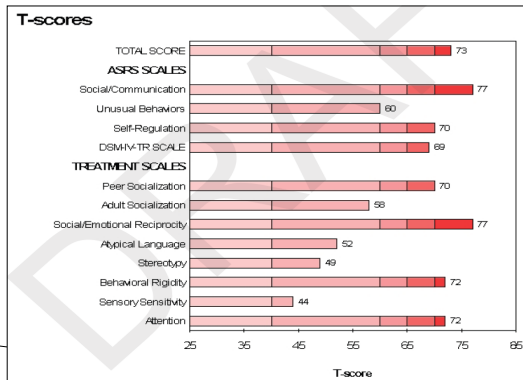
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ASRS Comparative Report

ASRS™
G&N
Goldstein & Naglieri

Autism Spectrum Rating Scales (6-18 Years)
By Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

Comparative Report

Youth's Name/ID: Joey D
Gender: Male
Birth Date: January 02, 1999

	Parent	Teacher
Youth's Name/ID:	Joey D	Joey D
Administration Date:	Jul 02, 2009	Jul 02, 2009
Age:	10 years	10 years
Grade:	5	5
Rater Name/ID:	Mrs. D	Mr. J
Assessor Name:	Dr. G	Dr. G
Data Entered By:	Maria	Maria

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ASRS Comparative Report

T-scores: Comparisons across Raters
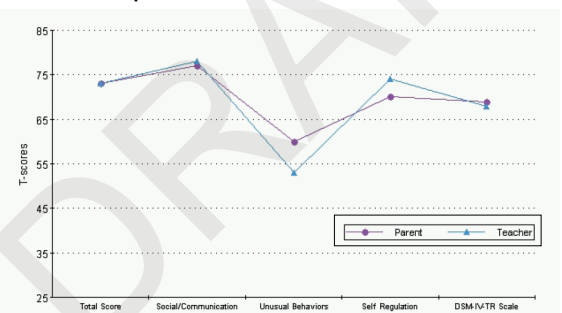
ASRS Comparative Report

T-scores: Scale-Level Comparisons across Raters

Note: P = Parent and T = Teacher.

Total Score — No significant differences between raters.

Social/Communication — No significant differences between raters.
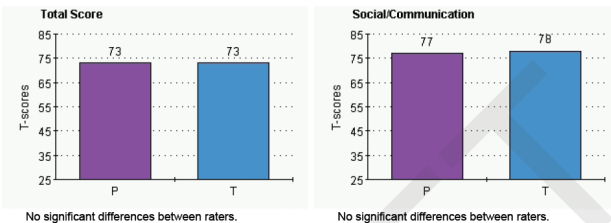
ASRS Interpretation

Values Needed for Significance When Comparing ASRS T-scores Across Raters for children Aged 2 to 5 Years.

Scale		90% (p = .10)			95% (p = .05)			Adjusted 90% (p = .0		
		Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Par t Tea
Total Score		5	5	5	5	5	5	7	7	
ASRS Scales	Social/Communication	5	5	5	6	5	6	8	7	
	Unusual Behaviors	6	7	6	7	8	8	10	10	1
DSM-IV-TR Scale		6	6	6	7	7	7	9	9	
Treatment Scales	Peer Socialization	8	7	8	10	9	9	13	12	1
	Adult Socialization	12	10	11	14	12	13	18	17	1
	Social/Emotional Reciprocity	7	7	7	9	8	8	12	10	1
	Atypical Language	12	13	13	15	16	15	19	21	2
	Stereotypy	11	11	11	13	13	13	17	18	1
	Behavioral Rigidity	8	8	8	9	9	9	12	12	1
	Sensory Sensitivity	11	12	11	13	14	13	17	18	1
	Attention/Self-Regulation	9	9	9	11	11	11	15	14	1

ASRS Comparative Report

TREATMENT SCALES

Peer Socialization	T-score	70	73	No significant difference
	90% CI	62-73	65-75	
	Percentile	98	99	
Adult Socialization	T-score	58	63	No significant difference
	90% CI	49-63	54-67	
	Percentile	79	90	
Social/Emotional Reciprocity	T-score	77	76	No significant difference
	90% CI	69-79	69-78	
	Percentile	99	99	
Atypical Language	T-score	52	44	No significant difference
	90% CI	46-58	39-51	
	Percentile	58	27	
Stereotypy	T-score	49	54	No significant difference
	90% CI	43-56	46-60	
	Percentile	46	66	
Behavioral Rigidity	T-score	72	48	P > T
	90% CI	65-75	44-53	
	Percentile	99	42	
Sensory Sensitivity	T-score	44	48	No significant difference
	90% CI	39-51	42-55	
	Percentile	27	42	
Attention	T-score	72	73	No significant difference
	90% CI	65-75	67-76	
	Percentile	99	99	

ASRS Comparative Report

ASRS (6-18 Years) Comparative Report for Joey D

Summary of Significant Differences Between Raters

The following section summarizes significant differences between raters' assessments of Joey D. **Note:** T = T-score, CI = Confidence Interval.

Total Score

Ratings on the **Total Score** scale indicate the extent to which the youth's behavioral characteristics are similar to the behaviors of individuals diagnosed with an Autism Spectrum Disorder. Ratings on this scale did not result in any significant differences between raters.

ASRS Scales

Ratings on the **Social/Communication** scale indicate the extent to which the youth uses verbal and non-verbal communication to initiate, engage in and maintain social contact. Ratings on this scale did not result in any significant differences between raters.

Ratings on the **Unusual Behaviors** scale indicate the youth's level of tolerance for changes in routine, engagement in apparently purposeless and stereotypical behaviors, and overreaction to certain sensory experiences. Ratings on this scale did not result in any significant differences between raters.

Ratings on the **Self-Regulation** scale indicate how well the youth manages his behavior using a set of internalized rules to efficiently negotiate the environment. Ratings on this scale did not result in any significant differences between raters.

DSM-IV-TR Scale

Ratings on the **DSM-IV-TR Scale** indicate how closely the youth's symptoms match the DSM-IV-TR criteria for an Autism Spectrum Disorder. Ratings on this scale did not result in any significant differences between raters.

ASRS Automated Report

Scale		Parent (Mrs. D)				Teacher (Mr. J)				Significant Differences
		T-score	90% CI	Percentile Rank	Classification	T-score	90% CI	Percentile Rank	Classification	
Total Score		73	70–75	99	Very Elevated	73	70–75	99	Very Elevated	Parent = Teacher
ASRS Scales	Social/ Communication	77	72–79	99	Very Elevated	79	74–81	99	Very Elevated	Parent = Teacher
	Unusual Behaviors	60	56–63	84	Slightly Elevated	51	47–55	54	Average	Parent > Teacher
	Self-Regulation	70	64–73	98	Very Elevated	75	70–77	99	Very Elevated	Parent = Teacher
DSM-IV-TR Scale		69	65–71	97	Elevated	68	64–71	96	Elevated	Parent = Teacher
Treatment Scales	Peer Socialization	70	62–73	98	Very Elevated	73	65–75	99	Very Elevated	Parent = Teacher
	Adult Socialization	58	49–63	79	Average	63	54–67	90	Slightly Elevated	Parent = Teacher
	Social/Emotional Reciprocity	77	69–79	99	Very Elevated	76	69–78	99	Very Elevated	Parent = Teacher
	Atypical Language	52	46–58	58	Average	44	39–51	27	Average	Parent = Teacher
	Stereotypy	49	43–56	46	Average	54	46–60	66	Average	Parent = Teacher
	Behavioral Rigidity	72	65–75	99	Very Elevated	48	44–53	42	Average	Parent > Teacher

ASRS Comparative Report

ASRS (6-18 Years) Comparative Report for Joey D

Detailed Scores: Comparisons across Raters

The following table displays T-scores, Confidence Intervals, and Percentiles for each scale, as well as any statistically significant (p = .10, adjusted for multiple comparisons) changes in T-scores between pairs of raters. If a pair of ratings is not noted in the "Statistically Significant Differences Between Raters" column, then the difference between those two raters did not reach statistical significance. **Note:** CI = Confidence Interval, P = Parent and T = Teacher.

Scale		P	T	Statistically Significant Differences Between Raters
TOTAL SCORE				
Total Score	T-score	73	73	No significant difference
	90% CI	70-75	70-75	
	Percentile	99	99	
ASRS SCALES				
Social/ Communication	T-score	77	78	No significant difference
	90% CI	72-79	73-80	
	Percentile	99	99	
Unusual Behaviors	T-score	60	53	No significant difference
	90% CI	56-63	49-57	
	Percentile	84	62	
Self-Regulation	T-score	70	74	No significant difference
	90% CI	64-73	69-76	
	Percentile	98	99	
DSM-IV-TR Scale				
DSM-IV-TR SCALE	T-score	69	68	No significant difference
	90% CI	65-71	64-71	
	Percentile	97	96	
TREATMENT SCALES				
	T-score	70	73	

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Inter-Rater Consistency: 2-5 Yrs

Across-Rater Correlations: ASRS (2–5 Years) Clinical Sample

Scale	Obtained r	Corrected r	N	Parent M	Parent SD	Teacher M	Teacher SD	d-ratio
Total Score	.96	.73	183	61.5	17.9	63.9	17.9	**0.13**
Social/Communication	.94	.71	191	62.5	16.5	63.6	16.4	**0.07**
Unusual Behaviors	.94	.64	189	57.0	17.4	62.2	19.2	**0.28**
DSM-IV-TR Scale	.95	.67	191	62.1	18.5	63.8	18.3	**0.09**

Across-Rater Correlations: ASRS (2–5 Years) General Population Sample

Scale	Obt r	Corr r	N	Parent M	Parent SD	Teacher M	Teacher SD	d-ratio
Total Score			18					

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Inter-Rater Consistency: 6-18 Yrs

General Population Sample	Obt r	Cor r	N	Parent M	Parent SD	Teacher M	Teacher SD	d-ratio
Total Score	.51	.57	234	46.3	9.1	46.2	9.4	**.01**
Social/Communication	.60	.68	266	46.2	9.1	46.9	9.0	**.08**
Unusual Behaviors	.44	.50	252	48.0	9.2	46.2	9.2	**.20**
Self-Regulation	.57	.62	276	46.7	8.9	46.1	10.0	**.06**
DSM-IV-TR Scale	.55	.61	251	46.7	9.0	47.1	9.6	**.04**

Clinical Sample	Obt r	Cor r	N	Parent M	Parent SD	Teacher M	Teacher SD	d-ratio
Total Score	.84	.67	210	65.4	13.0	63.0	13.1	**.18**
Social/Communication	.84	.61	232	62.2	14.1	62.4	14.4	**.01**
Unusual Behaviors	.78	.63	238	64.9	12.4	60.4	12.5	**.36**

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Important Conclusions

▸ Behaviors associated with Autism Spectrum Disorders should be measured using well developed nationally standardized scales.

▸ DSM-IV and ICD 10 provide a good base for understanding ASDs but require revision.

▸ ASD is best represented by a 3 factor model: Social/Communication, Unusual Behaviors, & Self-Regulation.

▸ The prevalance of ASD appears to be increasing…

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Important Conclusions

▸ BUT, understanding the prevalence of ASD requires
  ◦ Equally valid assessment procedures over time
  ◦ Standardized methods for diagnosis
  ◦ Psychometrically sound measures of behavior

▸ "The question of whether there are really more children with ASD now than in the past cannot be answered definitely" (p. 44).
  ◦ Wing and Potter's Chapter 2 in Assessment of Autism Spectrum Disorders (Goldstein, Naglieri, & Ozonoff, 2009)

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Important Conclusions

▸ Clearly what is needed is well developed tools that
  ◦ Are standardized on a typical sample that represents the US population
  ◦ Represent current understanding of ASDs, especially the role of self-regulation
  ◦ Have good reliability and validity
  ◦ Have relevance to intervention
  ◦ Are relatively easy to administer and score

▸ These were our goals when we developed the ASRS

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ASRS Mean T-Scores (N = 90) for a Sample of Children Diagnosed with ASD

Chart showing T-Scores by category (axis 50 to 70):

- Attention
- Sensory Sensitivity
- Behavioral Rigidity
- Stereotypy
- Atypical Language
- Social Emotional Reciprocity
- Adult Socialization
- Peer Socialization
- DSM
- Self-Regulation
- Unusual Behaviors
- Social Communication
- Total
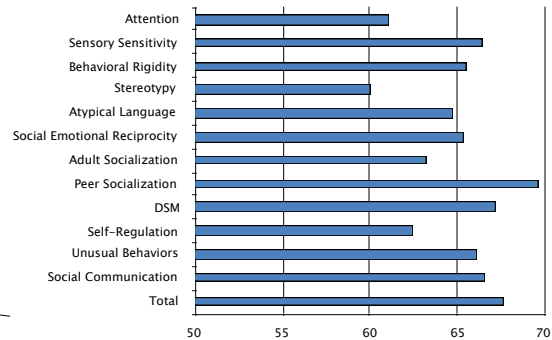
Determining Eligibility as an Autistic Student

Students that have a DSM or ICD diagnosis are not automatically eligible for special education services, according to the Individuals with Disabilities Education Improvement Act (IDEIA).

Educational eligibility and subsequent services are determined by conducting assessments and testing performed by a school's multidisciplinary team and not that of medical diagnostic tests.

These can include observations, history, developmental information, behavior information and a documented

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Special Education
. . . a service, not a place.

Rules for the Provision of Special Education

Chapter 392-172A WAC

Randy I. Dorn
State Superintendent of
Public Instruction

Effective October 25, 2013

WAC 392-172A-03025 Review of existing data for evaluations and reevaluations. As part of an initial evaluation, if appropriate, and as part of any reevaluation, the IEP team and other qualified professionals, as appropriate, must:
(1) Review existing evaluation data on the student, including:
(a) Evaluations and information provided by the parents of the student;
(b) Current classroom-based, local, or state assessments, and classroom-based observations; and
(c) Observations by teachers and related services providers.
(2)(a) On the basis of that review, and input from the student's parents, identify what additional data, if any, are needed to determine:
(i) Whether the student is eligible for special education services, and what special education and related services the student needs; or

(a)(i) Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a student's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

(ii) Autism does not apply if a student's educational performance is adversely affected primarily because the student has an emotional behavioral disability, as defined in subsection (2)(e) of this section.

(iii) A student who manifests the characteristics of autism after age three could be identified as having autism if the criteria in (a)(i) of this subsection are satisfied.

WAC 392-172A-03020 Evaluation procedures. (1) The school district must provide prior written notice to the parents of a student, in accordance with WAC 392-172A-05010, that describes any evaluation procedures the district proposes to conduct.

(2) In conducting the evaluation, the group of qualified professionals selected by the school district must:

(a) Use a variety of assessment tools and strategies to gather relevant functional, developmental, and academic information about the student, including information provided by the parent, that may assist in determining:

(i) Whether the student is eligible for special education as defined in WAC 392-172A-01175; and

(ii) The content of the student's IEP, including information related to enabling the student to be involved in and progress in the general education curriculum, or for a preschool child, to participate in appropriate activities;

(b) Not use any single measure or assessment as the sole criterion for determining whether a student's eligibility for special education and for determining an appropriate educational program for the student; and

(c) Use technically sound instruments that may assess the relative contribution of cognitive and behavioral factors, in addition to physical or developmental factors.


WAC 392-172A-01175

Special education.

(1) Special education means specially designed instruction, at no cost to the parents, to meet the unique needs of a student eligible for special education, including instruction conducted in the classroom, in the home, in hospitals and institutions, and in other settings; and instruction in physical education.

(2) Special education includes:

(a) The provision of speech-language pathology, occupational therapy, audiology, and physical therapy service as defined in WAC 392-172A-01155 when it meets the criteria in WAC 392-172A-01035 (1)(c);

(b) Travel training; and

(c) Vocational education.

(3) The terms in this section are defined as follows:

(a) At no cost means that all specially designed instruction is provided without charge, but does not preclude incidental fees that are normally charged to nondisabled students or their parents as a part of the general education program.

(b) Physical education means the development of:

(i) Physical and motor fitness;

(ii) Fundamental motor skills and patterns; and

(iii) Skills in aquatics, dance, and individual and group games and sports including intramural and lifetime sports; and

(iv) Includes special physical education, adapted physical education, movement education, and motor development.

(c) Specially designed instruction means adapting, as appropriate to the needs of an eligible student, the content, methodology, or delivery of instruction:

(i) To address the unique needs of the student that result from the student's disability; and

(ii) To ensure access of the student to the general curriculum, so that the student can meet the educational standards within the jurisdiction of the public agency that apply to all students.

(d) Travel training means providing instruction, as appropriate, to students with significant cognitive disabilities, and any other eligible students who require this instruction, to enable them to:

(i) Develop an awareness of the environment in which they live; and

(ii) Learn the skills necessary to move effectively and safely from place to place within that environment (e.g., in school, in the home, at work, and in the community).

(e) Vocational education means organized educational programs that are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career not requiring a baccalaureate or advanced degree.
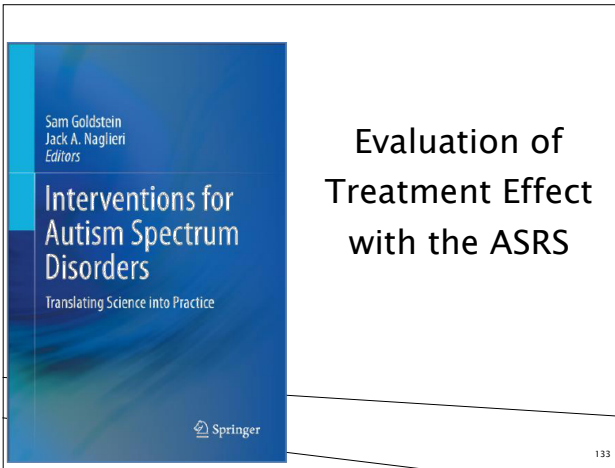
Evaluation of Treatment Effect with the ASRS
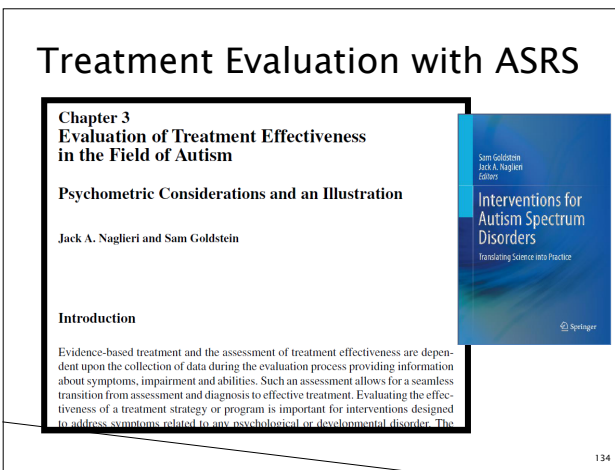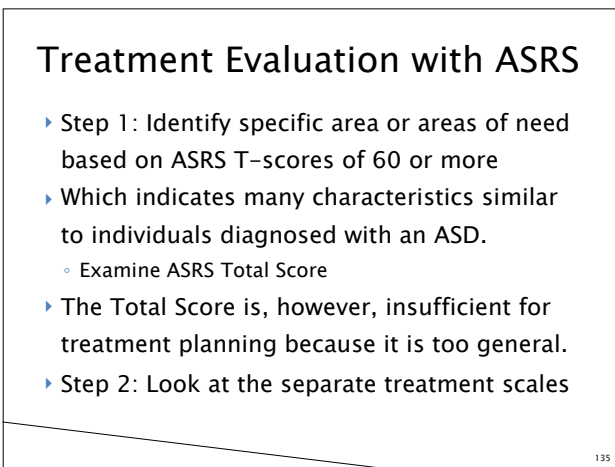

Treatment Evaluation with ASRS

Chapter 3
Evaluation of Treatment Effectiveness in the Field of Autism

Psychometric Considerations and an Illustration

Jack A. Naglieri and Sam Goldstein

Introduction

Evidence-based treatment and the assessment of treatment effectiveness are dependent upon the collection of data during the evaluation process providing information about symptoms, impairment and abilities. Such an assessment allows for a seamless transition from assessment and diagnosis to effective treatment. Evaluating the effectiveness of a treatment strategy or program is important for interventions designed to address symptoms related to any psychological or developmental disorder. The

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Treatment Evaluation with ASRS

▸ Step 1: Identify specific area or areas of need based on ASRS T-scores of 60 or more
▸ Which indicates many characteristics similar to individuals diagnosed with an ASD.
  ◦ Examine ASRS Total Score
▸ The Total Score is, however, insufficient for treatment planning because it is too general.
▸ Step 2: Look at the separate treatment scales

Treatment Evaluation with ASRS

- Total Score of 73 by Parent & Teacher
- Social Communication scores are high for both raters meaning he has problems with appropriate use of verbal and non-verbal communication requiring him to initiate, engage in, and maintain social contact (Social Communication T-scores of 77 and 78)

Table 3.3 Case of Donny: parent and teacher ASRS *T* values needed for significance

	Parent	Teacher
Total score	*73*	*73*
Social communication	*77*	*78*
Unusual behavior	*60*	*53*
Self-regulation	*70*	*74*
DSM-IV scale	*69*	*68*
Treatment scales		
Peer socialization	*70*	*73*
Adult socialization	*58*	*63*
Social/emotional reciprocity	*77*	*76*
Atypical language	*52*	*44*
Stereotypy	*49*	*54*
Behavioral rigidity	*72*	*48*
Sensory sensitivity	*44*	*48*
Attention	*71*	*73*

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing
Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

- … and he struggles with maintaining control over his behavior (i.e., he is very argumentative) and attending in complex settings (Self-Regulation score of 70)

Table 3.3 Case of Donny: parent and teacher ASRS *T* values needed for significance

	Parent	Teacher
Total score	*73*	*73*
Social communication	*77*	*78*
Unusual behavior	*60*	*53*
Self-regulation	*70*	*74*
DSM-IV scale	*69*	*68*
Treatment scales		
Peer socialization	*70*	*73*
Adult socialization	*58*	*63*
Social/emotional reciprocity	*77*	*76*
Atypical language	*52*	*44*
Stereotypy	*49*	*54*
Behavioral rigidity	*72*	*48*
Sensory sensitivity	*44*	*48*
Attention	*71*	*73*

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing
Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

- Raters agree except for Unusual Behavior and Behavioral Rigidity scales

	Parent	Teacher	Difference	Difference needed[a]	
Total score	*73*	*73*	0	5	NS
Social communication	*77*	*78*	1	6	NS
Unusual behavior	*60*	*53*	−7	6	Sig
Self-regulation	*70*	*74*	4	7	NS
DSM-IV scale	*69*	*68*	−1	6	NS
Treatment scales					
Peer socialization	*70*	*73*	3	9	NS
Adult socialization	*58*	*63*	5	12	NS
Social/emotional reciprocity	*77*	*76*	−1	8	NS
Atypical language	*52*	*44*	−8	11	NS
Stereotypy	*49*	*54*	5	13	NS
Behavioral rigidity	*72*	*48*	−24	8	Sig
Sensory sensitivity	*44*	*48*	4	12	NS
Attention	*71*	*73*	2	7	NS

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in
Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

‣ The difference between Donny's Unusual Behavior scores as rated by his mother (60) and teacher (51) suggests that behaviors in the home and the classroom are different; which implies that the exploration of the environmental impact on his odd behaviors could lead to good intervention options.

‣ The significant difference between Donny's Behavioral Rigidity scores as rated by his mother (72) and teacher (48), which also warrants further exploration.

Treatment Evaluation with ASRS

‣ Consistently high scores on Peer Socialization, Social/Emotional Reciprocity and Attention

	Parent	Teacher	Difference	Difference needed[a]	
Total score	*73*	*73*	0	5	NS
Social communication	*77*	*78*	1	6	NS
Unusual behavior	*60*	*53*	−7	6	Sig
Self-regulation	*70*	*74*	4	7	NS
DSM-IV scale	*69*	*68*	−1	6	NS
Treatment scales					
Peer socialization	*70*	*73*	3	9	NS
Adult socialization	58	*63*	5	12	NS
Social/emotional reciprocity	*77*	*76*	−1	8	NS
Atypical language	52	44	−8	11	NS
Stereotypy	49	54	5	13	NS
Behavioral rigidity	72	48	−24	8	Sig
Sensory sensitivity	*44*	48	4	12	NS
Attention	*71*	*73*	2	7	NS

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

‣ Item level analysis within Peer Socialization helps clarify the exact nature of the behaviors that led to the high score

3   Evaluation of Treatment Effectiveness in the Field of Autism   51

Fig. 3.7 Item level analysis from ASRS interpretive report (shaded items indicate scores that are more than 1 *SD* from the normative mean)

Peer Socialization	
Item	**Score**
3. seek the company of other children? (R)	1
14. have trouble talking with other children?	3
19. have social problems with children of the same age?	2
31. play with others? (R)	1
45. understand age-appropriate humor or jokes? (R)	0
50. talk too much about things that other children don't care about?	4
64. choose to play alone?	3
69. show good peer interactions? (R)	2
70. respond when spoken to by other children? (R)	1
Peer Socialization Raw Score =	**17**

Treatment Evaluation with ASRS

Quick Solution Finder

Peer Socialization

Increase ability to seek out other children 51
Initiate conversation with other children 51
Increase ability to play appropriately with other children 51
Increase ability to understand humor 227
Improve ability to carry on normal conversation with peers 174
Respond appropriately when other children initiate 159

Peer Socialization	
Item	**Score**
14. have trouble talking with other children?	3
50. talk too much about things that other children don't care about?	4
64. choose to play alone?	3
69. show good peer interactions? (R)	2

Treatment Evaluation with ASRS

‣ The Quick Solution Guide provides the correspondence of behaviors associated with ASD and specific interventions provided by authors in the chapters that appear in the book.

‣ For example, Donny had a high ASRS T-score on the Social/Emotional Reciprocity scale and one of the items that addressed "looking at others when spoken to" was very high. Interventions for this behavior can be found on pages

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Treatment Evaluation with ASRS

Table 3.4 Parent *T*-scores for ASRS scales obtained over three time periods

	Time 1	Time 2	Time 3	Progress monitoring (Time 2 − 1)		Progress monitoring (Time 3 − 1)	
Total score	73	70	63	−3	NS	10	Sig
Social communication	77	77	66	0	NS	11	Sig
Unusual behavior	60	58	58	−2	NS	2	NS
Self-regulation	70	67	62	−3	NS	8	NS
DSM-IV scale	69	68	63	−1	NS	6	NS
Treatment scales					Sig	0	Sig
Peer socialization	70	69	68	−1	NS	2	NS
Adult socialization	58	58	58	0	NS	0	NS
Social/emotional reciprocity	77	77	63	0	NS	14	Sig
Atypical language	52	52	52	0	NS	0	NS
Stereotypy	49	49	49	0	NS	0	NS
Behavioral rigidity	72	67	67	−5	NS	5	NS
Sensory sensitivity	44	44	44	0	NS	0	NS
Attention	71	68	58	−3	NS	13	Sig

T-scores greater than 59 appear in italic text
Note Differences needed for significance when comparing scores over time for Parent and Teacher ratings are found in Table 4.11 of the ASRS Manual ($p = 0.10$ with Bonferroni correction)

The "Prime Directive" is Independence

‣ Reduce reliance on prompts.
‣ Help individual's predict and control.
  environment and behavior.
‣ Increase self-esteem and self-efficacy.
‣ Develop independence through a "learning to
  swim" mindset.

Final Thoughts About the ASRS

‣ Accurate diagnosis requires well developed tools
  that
  ◦ Are standardized on a typical sample that represents the
    US population
  ◦ Represent current understanding of ASDs, especially the
    role of self-regulation
  ◦ Have good reliability and validity
  ◦ Have relevance to intervention
  ◦ Are relatively easy to administer and score
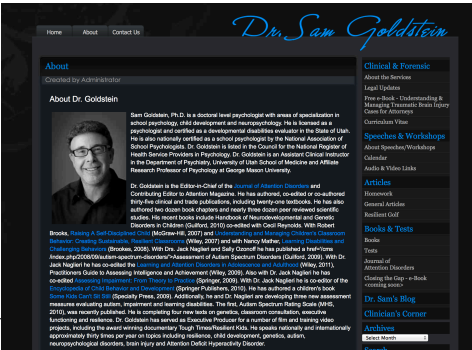‣ These were our goals when we developed the ASRS

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ert
elf
, 2008

Were They but There at Night

There is a bolder field where every stone

Is a glazed, glittering gem, like stars fallen from the sky

All except one, a plain grey rock alone in the center

Feeling excluded and shunned

People come, tourists, painters, photographers, collectors

To view each shining bolder, a pleasure to the beholder

Ooh! Ahh! Look at this one! Come quick!

Pockets bulge with fragments and paint cans run dry

But the grey rock remains ignored

An ugly blotch on a sweeping mural

The sun sets, everyone leaves

And they miss the centerpiece of the field

For when night falls, the grey rock in the center

It glows in the dark

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