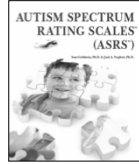


## Understanding, Evaluating and Treating Autism Spectrum Disorders: New Data, New Ideas, and the ASRS

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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.

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## 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

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We are social beings.

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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.




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### Socialization Begins Early Reina and Her Mother



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Adrian, my seatmate on a recent flight.

Hello!



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Adrian

You look like an interesting guy.



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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?

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## Les âges de l'ouvrier



Léon FRÉDÉRIC 1895

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## Les âges de l'ouvrier



Léon FRÉDÉRIC 1895

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Is this child portrayed as autistic?

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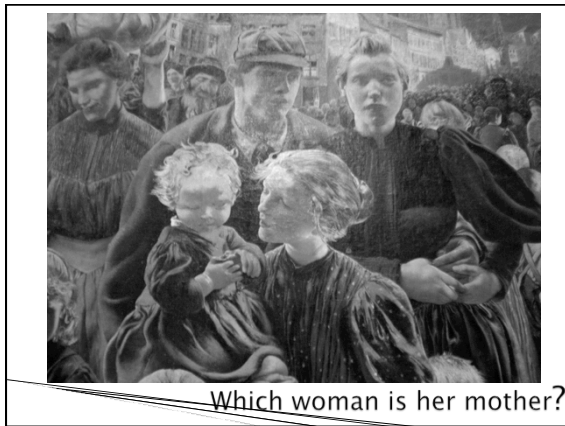
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### Autism's First Child

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 Donovan and Caren Zucker*

Atlantic Monthly, October 2010

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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.




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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

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

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### Impairment in Social Competence Caused By:

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




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### 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)

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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.**

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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.

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

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#### Core DSM and ICD Autistic Symptoms

- ▶ Impaired social relations.
- ▶ Impaired communication skills.
- ▶ Impaired behavior.




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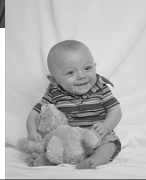
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### Symptoms Present Before 24 Months: Failure To:

- Orient to name
- Attend to human voice
- Look at face and eyes of others
- Imitate
- Show objects
- Point
- Demonstrate interest in other children




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### 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 attention




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### Meet Kevin



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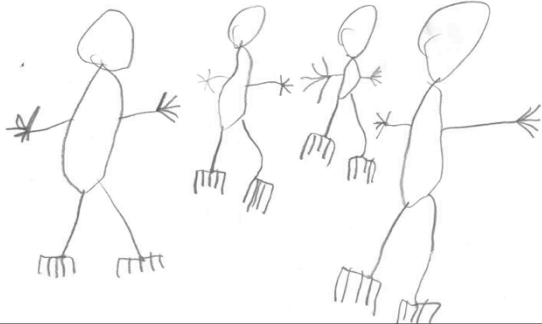
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### Kevin Draws His Family




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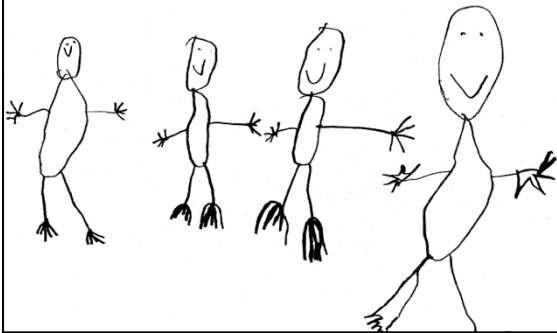
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### Kevin Adds Faces




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### Pretend Play in Autism

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

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## 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

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## 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.
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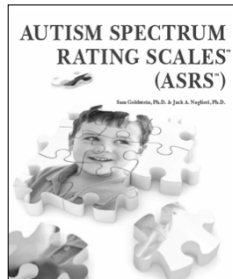
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## Goals of the ASRS

Goldstein & Naglieri  
(2009)



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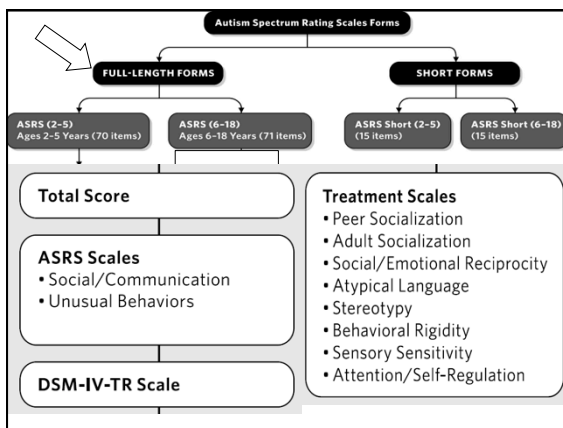
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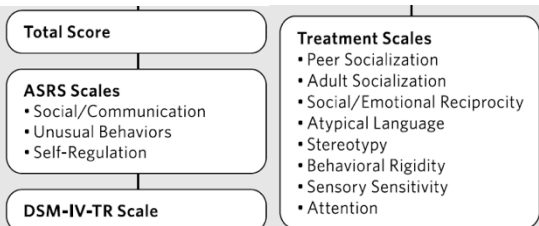
## ASRS Scale Goal #1

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

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## ASRS Ages 6–18 (70 items)



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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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## Importance of a 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
<b>TOTAL N</b>	<b>2,560</b>	

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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## Importance of a 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 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.

**INSTRUCTIONS:** Transfer the circled numbers into the unshaded boxes 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
2. become bothered by loose fabrics or tags in clothes?	0	1	2	3	4
3. seek the company of other children?	4	3	2	1	0
4. show little emotion?	0	1	2	3	4
5. follow instructions that he/she understood?	4	3	2	1	0
6. argue and fight with other children?	0	1	2	3	4
7. have problems waiting his/her turn?	0	1	2	3	4
8. share fun activities with others?	4	3	2	1	0
<b>Subtotals (Items 1–36)</b>	<b>22</b>	<b>13</b>	<b>29</b>	<b>33</b>	<b>8</b>
	SC	UB	SR	DSM	PS
	AS	NER	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:

- 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.
- Confidence Intervals (CI):** Decide if 90% or 95% CI will be used, and circle that value in the column heading. Look up the CI from Appendix X of the ASRS Technical Manual and enter the values in the appropriate boxes.
- 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
77	60	70	207	73	99
					90–95% CI (circle one)
					69 to 75
					Very Elevated

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## ASRS Forms

Child's Name: Joey D Gender: M ( ) F ( ) Today's Date: 2009 / 07 / 02

Parent's Name: Mrs. D Grade: 5 Birth Date: 1999 / 01 / 02

Did your child acquire language before age 3? Yes No Don't Know

If Yes, did your child speak in 3 word sentences by age 3? Yes No Don't Know

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

Percentile Rank	T-Score	TOT	ASRS Scales				Treatment Scales										T-Score	Percentile Rank	Classification
			SC	UB	SR	DSM	PS	AS	SEK	AL	ST	BR	SS	AT					
99	86	239–250	64–70	*	*	125–136	36	24	45–52	*	*	*	22–24	44	85	99			
98	84	236–250	62–63	*	*	122–134	35	23	*	*	*	*	21	43	84	98			
97	83	233–250	60–61	96	*	119–121	34	22	44	*	*	*	20	42	83	97			
96	82	230–250	58–59	95–96	67–68	116–118	33	21	43	24	20	*	19	41	82	96			
95	81	227–229	56–57	93–95	65–66	113–115	32	*	42	23	*	32	18	40	81	95			
94	80	224–226	54–55	90–91	64	110–112	31	20	40–41	22	19	33	17	39	80	94			
93	79	221–223	52–53	88–89	63	108–109	30	*	38–39	*	*	30	16	*	79	93			
92	78	218–220	50–51	86–87	61–62	105–107	29	19	37	21	18	29	15	38	78	92			
91	77	215–217	48–49	84–85	59–60	102–104	28	*	35	*	*	14	*	77	91				
90	76	213–214	46–47	81–83	57–58	99–101	27	18	33	20	17	28	*	37	76	90			
89	75	210–212	45	77–80	56	94–97	26–28	*	34	19	*	27	13	*	75	89			
88	74	208–209	44	73–76	55	90–93	24	17	*	18	16	26	*	36	74	88			
87	73	205–207	42–43	69–71	54	87–89	23	*	16	17	*	25	12	*	73	87			
86	72	203–204	41	61–65	53	84–86	22	16	32	16	15	24	11	35	72	86			
85	71	200–202	39–40	56–60	51	81–83	21	*	31	*	*	23	10	34	71	85			
84	70	201–203	38	55–57	50–51	79–80	20	15	30	14	14	22	*	33	70	84			
83	69	199–200	37	52–54	49	75–77	19	*	29	13	*	21	10	32	69	83			
82	68	198	35–36	48–51	47–48	72–74	18	14	28	12	13	20	*	31	68	82			
81	67	195–197	34	46–47	46	69–71	17	*	27	*	*	19	9	30	67	81			
80	66	193–194	33	44–45	45	66–68	16	13	26	11	12	18	*	29	66	80			
79	65	189–191	32	42–43	44	63–65	15	*	25	*	*	17	*	28	65	79			
78	64	187–188	31	40–41	43–44	60–63	14	12	24	10	11	16	*	17	64	78			

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## ASRS Forms

- ▶ T-scores, percentile ranks, and confidence intervals are recorded on the form

**ASRS™ (6-18 Years) TEACHER RATINGS**  
Los Angeles, NCS & Inc. © Copyright, Inc.

**AGES 6-11 YEARS**

**INSTRUCTIONS:**

1. **Directions and Response Guide:** Circle the appropriate score for each item on the ASRS form. The ASRS form is divided into two sections: **Communication** and **Behavior**. Each section contains 15 items. The items are grouped into three categories: **Communication**, **Behavior**, and **Classroom**. The items are grouped into three categories: **Communication**, **Behavior**, and **Classroom**. The items are grouped into three categories: **Communication**, **Behavior**, and **Classroom**.
2. **Confidence Intervals (CI):** Decide if 95% or 99% CI will be used. The CI for 95% is 1.96 and the CI for 99% is 2.58. The CI for 95% is 1.96 and the CI for 99% is 2.58. The CI for 95% is 1.96 and the CI for 99% is 2.58.
3. **Final Score Calculation:** Sum the scores for each item. The final score is the sum of the scores for each item. The final score is the sum of the scores for each item.

**Scale Score Summary Table for Ages 6-11 Years**

Section	Item	Raw Score	T-Score	Percentile Rank	95% CI	99% CI
Communication	1. Follows directions					
	2. Understands directions					
	3. Follows directions					
	4. Understands directions					
	5. Follows directions					
	6. Understands directions					
	7. Follows directions					
	8. Understands directions					
	9. Follows directions					
	10. Understands directions					
	11. Follows directions					
	12. Understands directions					
	13. Follows directions					
	14. Understands directions					
	15. Follows directions					
Behavior	1. Follows directions					
	2. Understands directions					
	3. Follows directions					
	4. Understands directions					
	5. Follows directions					
	6. Understands directions					
	7. Follows directions					
	8. Understands directions					
	9. Follows directions					
	10. Understands directions					
	11. Follows directions					
	12. Understands directions					
	13. Follows directions					
	14. Understands directions					
	15. Follows directions					
Classroom	1. Follows directions					
	2. Understands directions					
	3. Follows directions					
	4. Understands directions					
	5. Follows directions					
	6. Understands directions					
	7. Follows directions					
	8. Understands directions					
	9. Follows directions					
	10. Understands directions					
	11. Follows directions					
	12. Understands directions					
	13. Follows directions					
	14. Understands directions					
	15. Follows directions					

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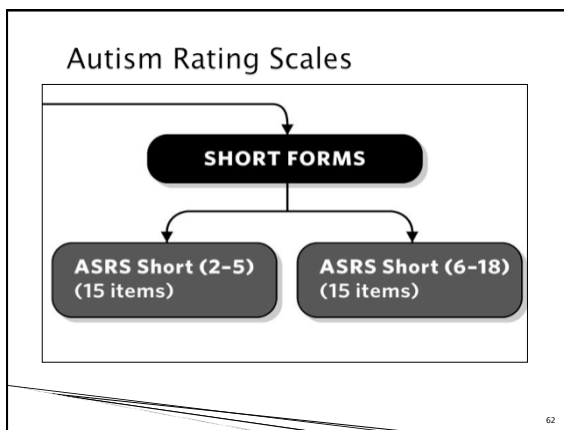
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## ASRS Reliability

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### 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	85	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

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### 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	76
	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

66

## ASRS Validity

»» And an updated view of ASD

67

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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.

68

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## 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 .

69

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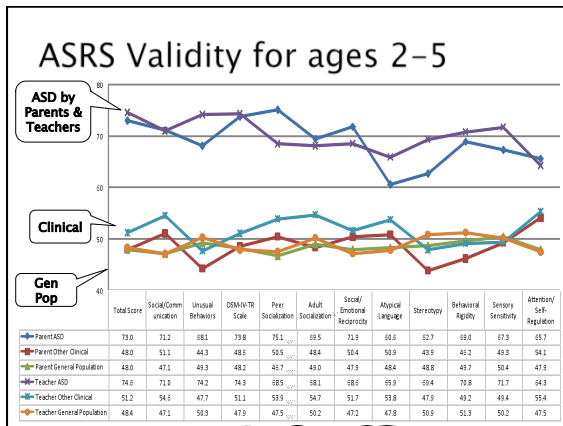
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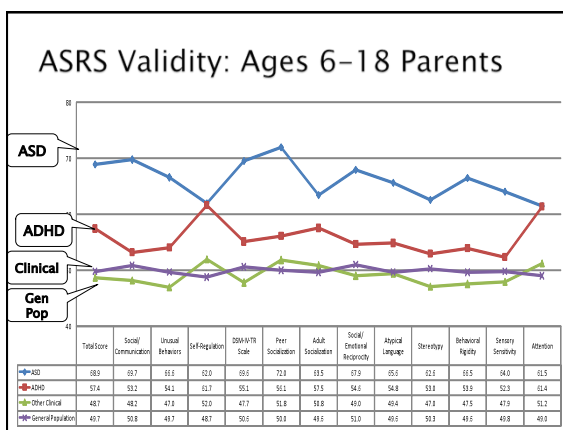
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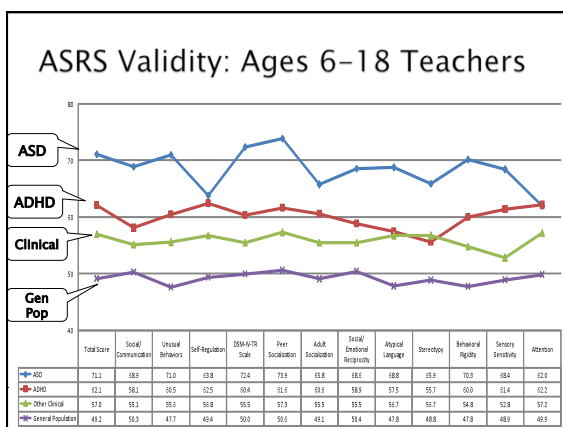
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Although the rest of the values are presented to 1 decimal place, the total score is presented to 2 decimal places.

### 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

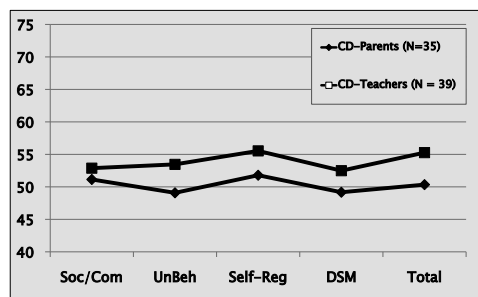
	Total Score	ASRS Scales			DSM-IV-TR Scale
		Social/Communication	Unusual Behaviors	Self-Regulation	
Overall Correct Classification (%)	91.4	88.8	92.6	85.2	94.1
Sensitivity (%)	92.1	87.1	95.4	85.2	92.8
Specificity (%)	90.7	90.5	89.8	85.1	95.5
Positive Predictive Power (%)	90.3	90.0	90.0	84.8	95.4
Negative 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

76

## ASD vs Communication Disorders

77

## ASD vs Communication Disorders



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## Race / Ethnic Differences

79

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

80

## Race Ethnic Differences Short Form

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

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

81

## DSM IV TR Autism and Asperger Syndrome

ASRS preliminary findings

82

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### 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

83

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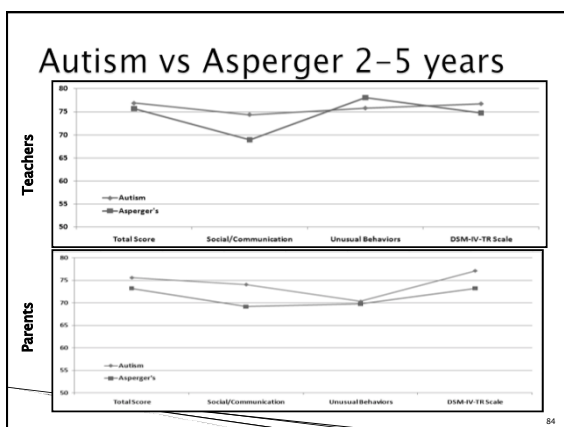
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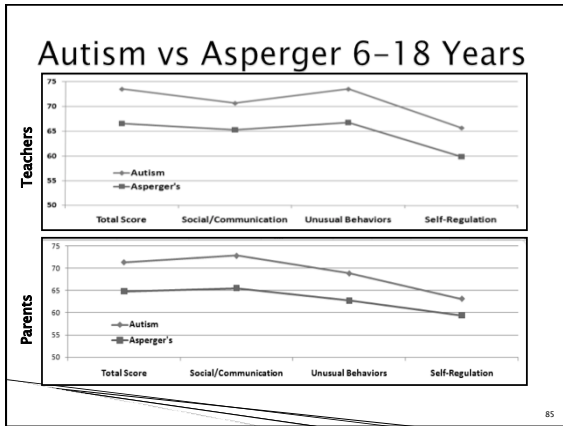
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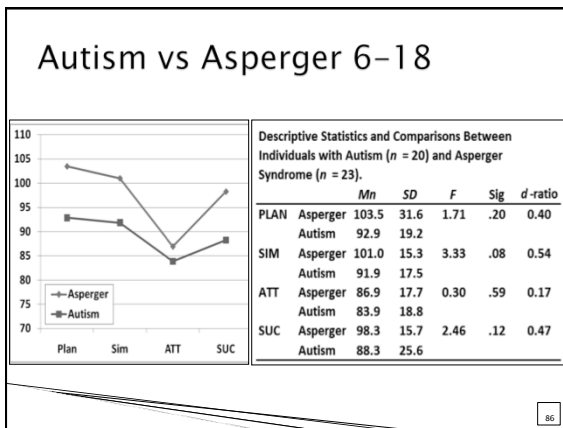
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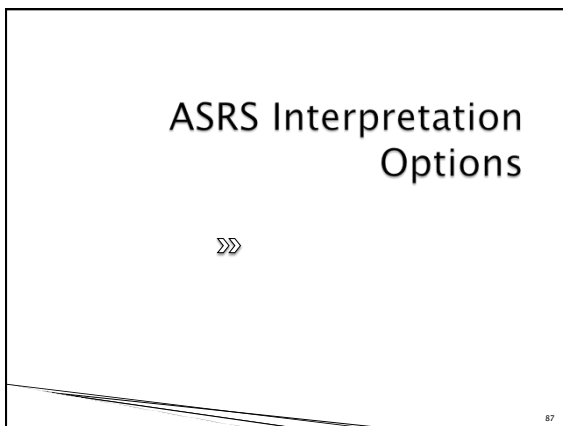
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## ASRS Interpretation

- ▶ 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

88

## 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

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## 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
82	78–84	77–84	76–84	76–84	77–84	72–83	69–82	74–84
81	77–83	76–83	75–83	75–83	76–83	71–82	68–81	73–83
80	77–82	75–82	74–82	74–82	75–82	70–81	67–80	72–82
79	76–81	74–81	73–81	73–81	74–81	69–80	66–79	71–81
78	75–80	73–80	72–80	72–80	73–80	68–79	65–78	70–80
77	74–79	72–79	71–79	71–79	72–79	67–78	64–77	69–79
76	73–78	71–78	70–78	70–78	71–78	66–77	63–76	68–78
75	72–77	70–77	69–77	69–77	70–77	65–76	62–75	67–77

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

90

## ASRS Interpretation

### ► What do the scales tell you?

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

Scale		Common Characteristics
<b>Total Score</b>		Has many behavioral characteristics similar to individuals diagnosed with an Autism Spectrum Disorder.
<b>ASRS Scales</b>	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.
<b>DSM-IV-TR Scale</b>		Has symptoms associated with the DSM-IV-TR diagnostic criteria for an Autism Spectrum Disorder.

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## ASRS Interpretation

<b>Treatment Scales</b>	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.

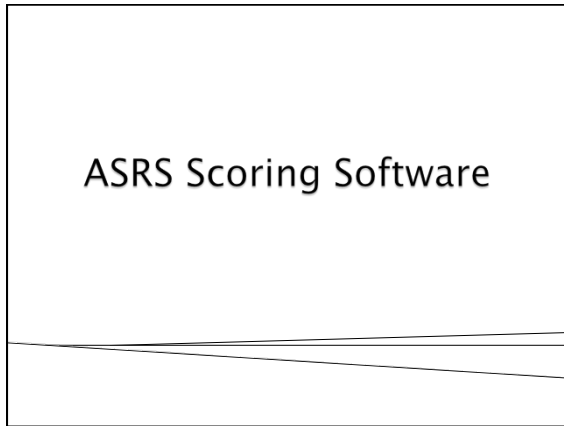
92

## 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% ( $p = .01$ )		
		Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher
Total Score		5	5	5	5	5	5	7	7	7
ASRS Scales	Social/Communication	5	5	5	6	5	6	8	7	7
	Unusual Behaviors	6	7	6	7	8	8	10	10	9
DSM-IV-TR Scale		6	6	6	7	7	7	9	9	9
Treatment Scales	Peer Socialization	8	7	8	10	9	9	13	12	11
	Adult Socialization	12	10	11	14	12	13	18	17	16
	Social/Emotional Reciprocity	7	7	7	9	8	8	12	10	11
	Atypical Language	12	13	13	15	16	15	19	21	20
	Stereotypy	11	11	11	13	13	13	17	18	17
	Behavioral Rigidity	8	8	8	9	9	9	12	12	11
	Sensory Sensitivity	11	12	11	13	14	13	17	18	17
	Attention/Self-Regulation	9	9	9	11	11	11	15	14	14

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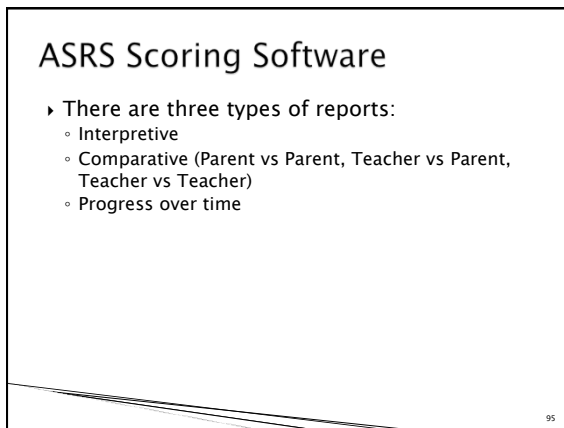
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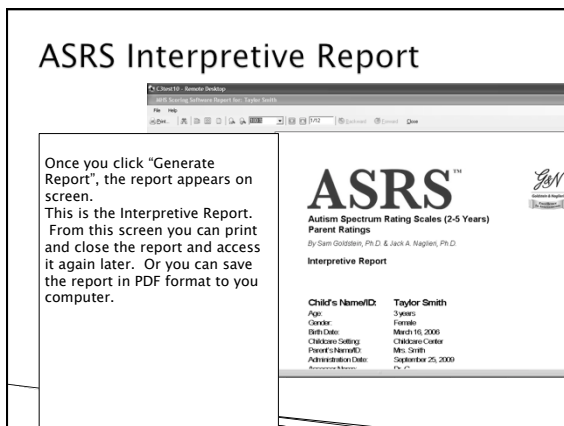
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## Report Options

These options will apply to all reports generated from now on.

Report Options | Level of Significance

☒ T-scores: Scale-Level Comparisons → **T-scores: Scale-Level Comparisons** (available for the Progress Monitoring and Comparative Reports)

☒ Summary

☒ Treatment Goals

☒ Item Responses Table

☒ Feedback Handout

Confidence Interval

☒ 90% → **Confidence Interval 90%:** Takes measurement error into account such that there is a 90% confidence that the true T-score falls within the range of scores provided. The 90% Confidence Interval is recommended.

☐ 95%

Save Cancel Restore Defaults

☐ Show this screen for every report generated.

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## Report Options

These options will apply to all reports generated from now on.

Report Options | Level of Significance

Level of Significance:

Set the level of significance for determining statistically significant differences in T-scores. Because the level of significance is adversely affected as the number of comparisons increases, options are provided to adjust for multiple comparisons.

☐ .10 (unadjusted)

☐ .05 (unadjusted)

☒ .10 (adjusted for multiple comparisons) → **.10 (adjusted for multiple comparisons):** Sets the significance level at  $p = .10$ . This option adjusts the level of significance for multiple comparisons.

☐ .05 (adjusted for multiple comparisons)

Save Cancel Restore Defaults

☐ Show this screen for every report generated.

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## Select Interpretive Report

C3test10 - Remote Desktop

ASRS Parent (2-5 Years): OutEntry

File Options Help

Save and New Save and Close Generate Report Clear Form Exit Help

Interpretive Report

Progress Monitoring Report

Comparative Report

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

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39.	1
40.	0
41.	1
42.	2
43.	1
44.	3
45.	0

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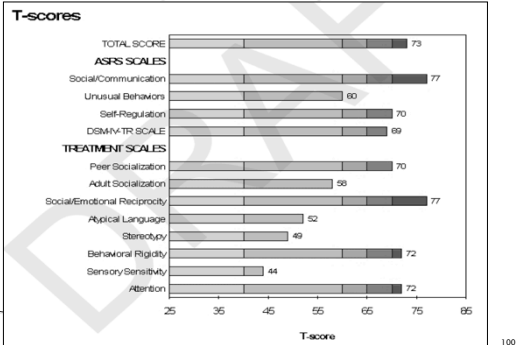
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## ASRS Interpretive Report




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## ASRS Comparative Report

**ASRS™**  
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. S	Dr. S
Data Entered By:	Maria	Maria

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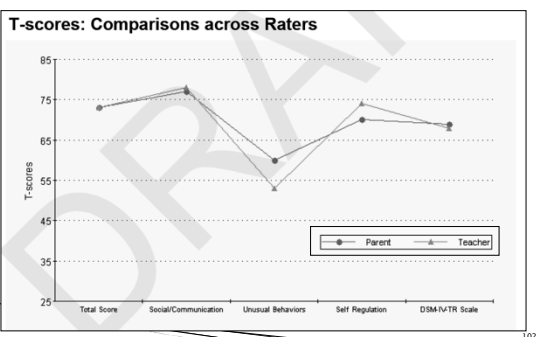
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## ASRS Comparative Report




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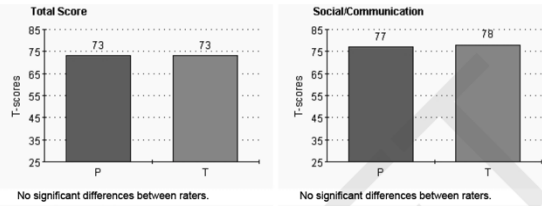
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## ASRS Comparative Report

### T-scores: Scale-Level Comparisons across Raters

Note: P = Parent and T = Teacher.



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## 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 = .01)		
	Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher	Parent to Parent	Teacher to Teacher	Parent to Teacher
Total Score	5	5	5	5	5	5	7	7	7
ASRS Scales									
Social/Communication	5	5	5	6	5	6	8	7	7
Unusual Behaviors	6	7	6	7	8	8	10	10	10
DSM-IV-TR Scale									
Peer Socialization	8	7	8	10	9	9	13	12	12
Adult Socialization	12	10	11	14	12	13	18	17	17
Social/Emotional Reciprocity	7	7	7	9	8	8	12	10	10
Treatment Scales									
Atypical Language	12	13	13	15	16	15	19	21	21
Stereotypy	11	11	11	13	13	13	17	18	18
Behavioral Rigidity	8	8	8	9	9	9	12	12	12
Sensory Sensitivity	11	12	11	13	14	13	17	18	18
Attention/Self-Regulation	9	9	9	11	11	11	15	14	14

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## ASRS Comparative Report

TREATMENT SCALES			
Peer Socialization	T-score	70	73
	90% CI	62-73	65-75
	Percentile	98	99
Adult Socialization	T-score	58	63
	90% CI	49-63	54-67
	Percentile	79	90
Social/Emotional Reciprocity	T-score	77	76
	90% CI	69-79	69-78
	Percentile	99	99
Atypical Language	T-score	52	44
	90% CI	46-58	39-51
	Percentile	58	27
Stereotypy	T-score	49	54
	90% CI	43-56	46-60
	Percentile	46	66
Behavioral Rigidity	T-score	72	48
	90% CI	65-75	44-53
	Percentile	99	42
Sensory Sensitivity	T-score	44	48
	90% CI	39-51	42-55
	Percentile	27	42
Attention	T-score	72	73
	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.

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## 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	72	65-77	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
<b>TOTAL SCORE</b>			
Total Score	T-score: 73 90% CI: 70-75 Percentile: 99	T-score: 73 90% CI: 70-75 Percentile: 99	No significant difference
<b>ASRS SCALES</b>			
Social/Communication	T-score: 77 90% CI: 72-79 Percentile: 99	T-score: 78 90% CI: 73-80 Percentile: 99	No significant difference
Unusual Behaviors	T-score: 60 90% CI: 56-63 Percentile: 84	T-score: 51 90% CI: 47-55 Percentile: 54	No significant difference
Self-Regulation	T-score: 70 90% CI: 64-73 Percentile: 98	T-score: 74 90% CI: 69-76 Percentile: 99	No significant difference
<b>DSM-IV-TR SCALE</b>			
DSM-IV-TR SCALE	T-score: 69 90% CI: 65-71 Percentile: 97	T-score: 68 90% CI: 64-71 Percentile: 96	No significant difference
<b>TREATMENT SCALES</b>			
	T-score: 70 90% CI: 65-73 Percentile: 99	T-score: 73 90% CI: 68-76 Percentile: 99	No significant difference

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## Inter-Rater Consistency: 2-5 Yrs

Across-Rater Correlations: ASRS (2-5 Years) Clinical Sample									
Scale	Obtained	Corrected	N	Parent		Teacher		d - ratio	
	r	r		M	SD	M	SD		
Total Score	.96	.73	183	61.5	17.9	63.9	17.9	<b>0.13</b>	
Social/Communication	.94	.71	191	62.5	16.5	63.6	16.4	<b>0.07</b>	
Unusual Behaviors	.94	.64	189	57.0	17.4	62.2	19.2	<b>0.28</b>	
DSM-IV-TR Scale	.95	.67	191	62.1	18.5	63.8	18.3	<b>0.09</b>	
Across-Rater Correlations: ASRS (2-5 Years) General Population Sample									
Scale	Obtained	Corrected	N	Parent		Teacher		d - ratio	
	r	r		M	SD	M	SD		
Total Score	.66	.63	187	45.7	10.1	48.3	10.6	<b>0.25</b>	
Social/Communication	.66	.66	203	45.3	10.4	46.9	9.6	<b>0.16</b>	
Unusual Behaviors	.65	.63	201	47.1	10.0	49.7	10.5	<b>0.25</b>	
DSM-IV-TR Scale	.63	.62	210	45.9	10.1	47.4	10.2	<b>0.15</b>	

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## Inter-Rater Consistency: 6-18 Yrs

General Population Sample									
Scale	Obtained	Corrected	N	Parent		Teacher		d - ratio	
	r	r		M	SD	M	SD		
Total Score	.51	.57	234	46.3	9.1	46.2	9.4	<b>.01</b>	
Social/Communication	.60	.68	266	46.2	9.1	46.9	9.0	<b>.08</b>	
Unusual Behaviors	.44	.50	252	48.0	9.2	46.2	9.2	<b>.20</b>	
Self-Regulation	.57	.62	276	46.7	8.9	46.1	10.0	<b>.06</b>	
DSM-IV-TR Scale	.55	.61	251	46.7	9.0	47.1	9.6	<b>.04</b>	
Clinical Sample									
Scale	Obtained	Corrected	N	Parent		Teacher		d - ratio	
	r	r		M	SD	M	SD		
Total Score	.84	.67	210	65.4	13.0	63.0	13.1	<b>.18</b>	
Social/Communication	.84	.61	232	62.2	14.1	62.4	14.4	<b>.01</b>	
Unusual Behaviors	.78	.63	238	64.9	12.4	60.4	12.5	<b>.36</b>	
Self-Regulation	.80	.75	233	62.1	11.1	60.9	10.7	<b>.11</b>	
DSM-IV-TR Scale	.83	.62	231	65.6	13.9	62.6	13.5	<b>.22</b>	

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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 prevalence of ASD appears to be increasing...

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## 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** is considerably more common than previously believed

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## Important Conclusions

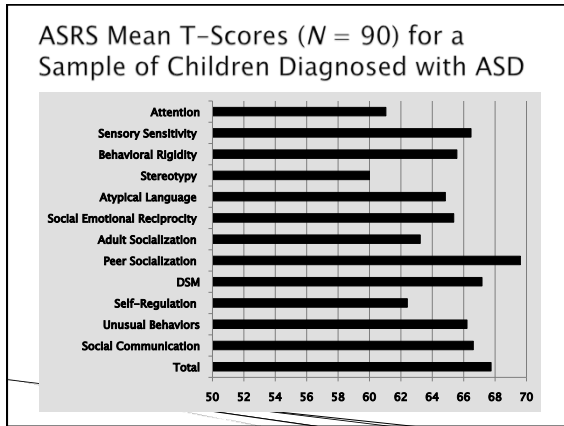
- ▶ BUT, understanding the prevalence of ASD requires
  - Equally valid assessment procedures over time
  - Standardized methods for diagnosis
  - Psychometrically sound measures of behavior
- ▶ “The question of whether there are really more children with ASD now than in the past cannot be answered definitely” (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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## Determining Eligibility as Autistic Student

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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).

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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 prevalence over a period of time.

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

## Rules for the Provision of Special Education

Chapter 392-172A WAC



Ramsey L. Dorn  
State Superintendent of  
Public Instruction

Effective October 25, 2013

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**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

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(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.

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**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.

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**WAC 392-172A-01175** Agency filings affecting this section

**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-01155 (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.

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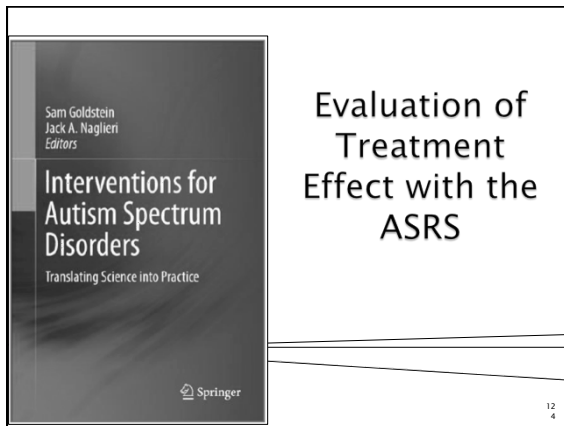
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## Evaluation of Treatment Effect with the ASRS

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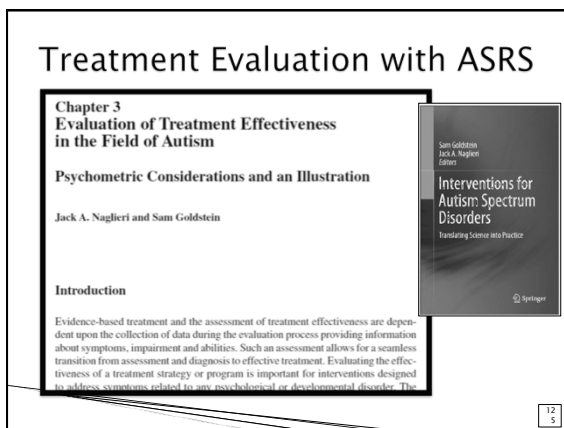
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## Treatment Evaluation with ASRS

### 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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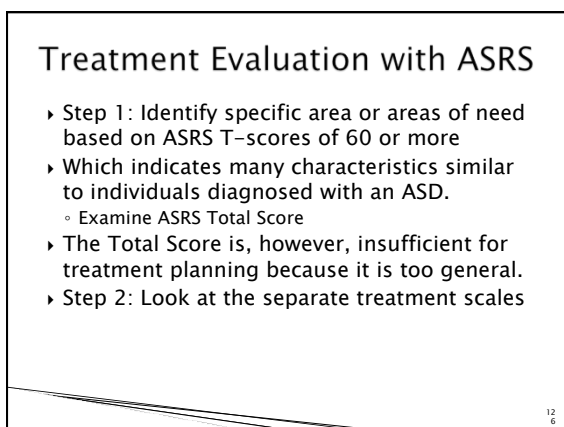
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## Treatment Evaluation with ASRS

- ▶ 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

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## 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  
 \*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  
 \*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 <sup>a</sup>
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  
 \*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.

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## Treatment Evaluation with ASRS

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

	Parent	Teacher	Difference	Difference needed <sup>a</sup>
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	<i>70</i>	<i>73</i>	3	9 NS
Adult socialization	58	63	5	12 NS
Social/emotional reciprocity	<i>77</i>	<i>76</i>	-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	<i>71</i>	<i>73</i>	2	7 NS

<sup>a</sup>T-scores greater than 59 appear in italic text

<sup>a</sup>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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1

## 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

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## 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

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## 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

13  
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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					
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)

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## 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.

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### 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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