

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

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@doctorsamgoldstein  
 @drsamgoldstein



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## Relevant Disclosure

- ▶ Co-author of the Autism Spectrum Rating Scales (MHS, 2009).
- ▶ Co-author of Assessment of Autism Spectrum Disorders 1<sup>st</sup> and 2<sup>nd</sup> Editions (Guilford, 2009, 2018).
- ▶ 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

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



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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 FREDÉRIC 1895

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Is this child portrayed as autistic?

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Which woman is her mother?

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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 Dowan and Caren Zucker



Atlantic Monthly, October 2010

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### A Brief Research Update

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**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 ( $\kappa$  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 autism spectrum disorder served in publicly funded mental health settings.

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**Autism spectrum disorders and their treatment with psychotropic medications in a nationally representative outpatient sample: 1994-2009**

Rates of visits with coded-ASD per 100 outpatient medical visits increased from 0.04% to 0.82% from 1994 to 2009. Factors associated with an ASD diagnosis included male gender, lack of private insurance, white race, and later study period. The most frequent comorbid behavioral diagnoses were ADHD, anxiety, disruptive behavior, and mood disorders. Older age was linked to an increased likelihood of having a comorbid behavioral diagnosis and using psychotropic medications. Geographic region was also associated with having a comorbid behavioral diagnosis, and psychotropic use was linked to have a behavioral comorbidity. Comorbidities with the highest rates of psychotropic use were ADHD, mood, and anxiety disorders.

**Conclusions**

Pediatric outpatient visits with an ASD diagnosis have increased dramatically from 1994 to 2009. Further study is needed to determine the reasons for the observed sociodemographic disparities in ASD diagnosis.

Annals of Epidemiology  
Volume 27, Issue 7, July 2017, Pages  
448-453.e1

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**Use of complementary and alternative medicine in children and adolescents with autism spectrum disorder: A systematic review**

Despite limited evidence, complementary and alternative medicine treatments are popular in autism spectrum disorder. The aim of this review was to summarize the available evidence on complementary and alternative medicine use frequency in autism spectrum disorder. A systematic search of three electronic databases was performed. All research studies in English or German reporting data on the frequency of complementary and alternative medicine use in individuals with autism spectrum disorder were included. Two independent reviewers searched the literature, extracted information on study design and results, and assessed study quality using an established quality assessment tool. Twenty studies with a total of 9540 participants were included. The prevalence of any complementary and alternative medicine use ranged from 28% to 95% (median: 54%). Special diets or dietary supplements (including vitamins) were the most frequent complementary and alternative medicine treatments, ranking first in 75% of studies. There was some evidence for a higher prevalence of complementary and alternative medicine use in autism spectrum disorder compared to other psychiatric disorders and the general population. Approximately half of children and adolescents with autism spectrum disorder use complementary and alternative medicine. Doctors should be aware of this and should discuss complementary and alternative medicine use with patients and their carers, especially as the evidence is mixed and some complementary and alternative medicine treatments are potentially harmful.

Autism, Published May 25, 2016

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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 provide support for further investigation of clinic-to-home videoconferencing as a direct intervention tool for youth with autism spectrum disorders and their parents.

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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.

Results suggested that MAXout was feasible and may yield positive outcomes for children with high-functioning autism spectrum disorder.

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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 autism spectrum disorder diagnosis.

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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 months post-graduation. The positive employment outcomes generated by the treatment group provide evidence that youth with autism spectrum disorder can gain and maintain competitive employment.

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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.

Future research will require a multidisciplinary and multifaceted approach to explore employment outcomes on the individual, the family system, co-workers and the employer, along with the impact of individual differences on outcome.

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Some people with autism have abnormalities at a specific site on the 16th chromosome known as 16p11.2. Deletion or duplication of a small piece of chromosome at this site is one of the most common identified genetic causes of autism spectrum disorder.

MRI reveals striking brain differences in people with genetic autism  
August 8, 2017  
Radiological Society of North America

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Example images for a control participant, a deletion carrier, and a duplication carrier. In the sagittal image of the deletion carrier, the thick corpus callosum, dens and craniocervical abnormality, and cerebellar ectopia are shown. For the duplication carrier, the sagittal image shows the thin corpus callosum and the axial image shows the increased ventricle size and decreased white matter volume.

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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 Rett's 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.

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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.

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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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### 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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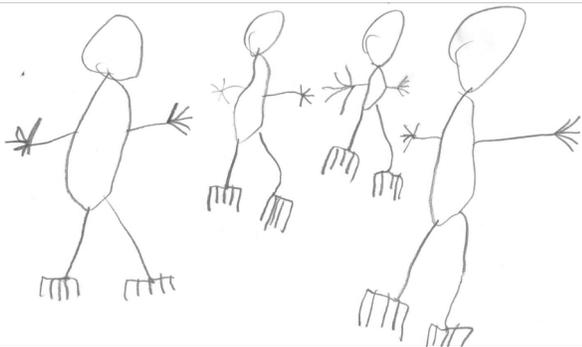
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### Kevin Draws His Family



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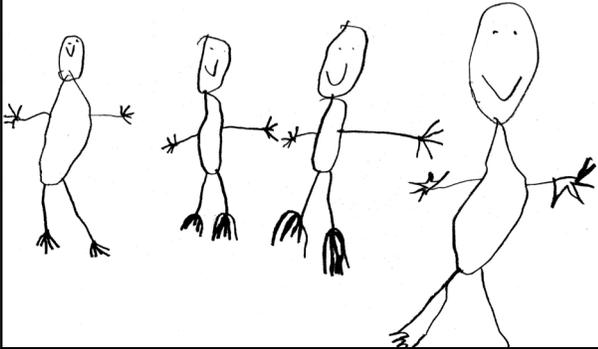
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### Kevin Adds Faces




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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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### ASRS

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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**

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### 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.**

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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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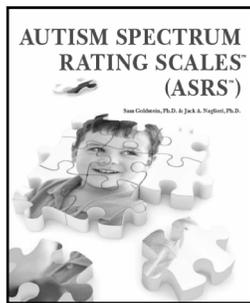
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## Goals of the ASRS

Goldstein & Naglieri (2009)



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## 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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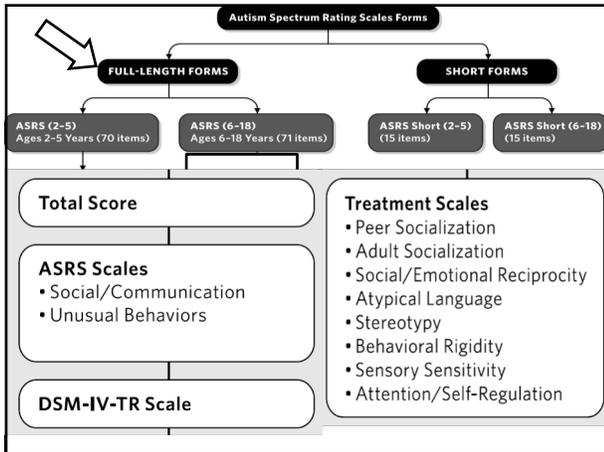
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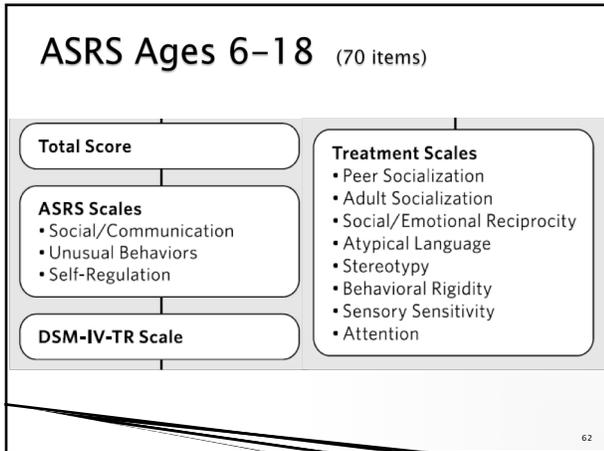
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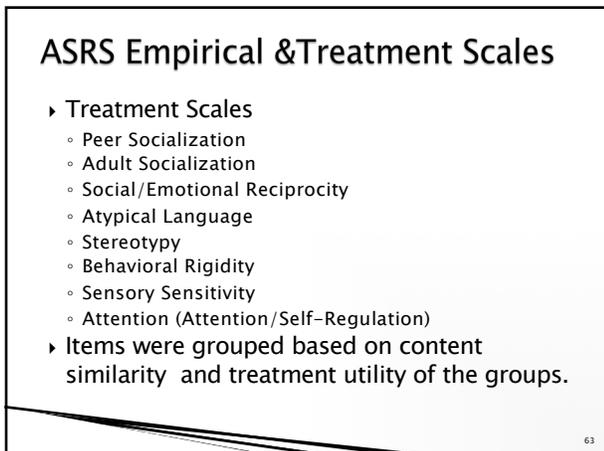
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## ASRS Interpretation

- ▶ The **DSM 5 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 5 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
<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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## 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™ (6-18 Years)

#### TEACHER RATINGS

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

Copyright © 2011 MHS/Brilliance. All rights reserved. MHS/Brilliance, ASRS, and the ASRS logo are trademarks of MHS/Brilliance. All other trademarks are the property of their respective owners.

**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.

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**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.

**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
2. become bothered by some 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

Subtotals (Items 1-36)    22 13 29 33 8 3 19 2 0 10 1 23

SC UB SR DM PS AS SER AL ST BR SS AT

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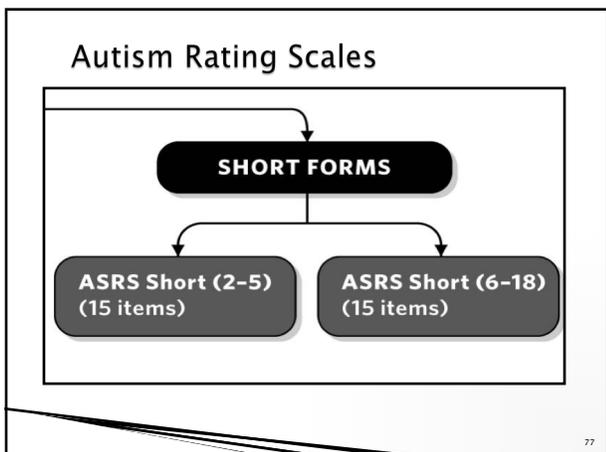
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## ASRS Reliability

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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	.97
	Unusual Behaviors	.91	.96	.94	.85	.97
DSM-IV-TR Scale		.91	.97	.94	.91	.98
Treatment Scales	Peer Socialization	.77	.96	.89	.85	.95
	Adult Socialization	.67	.85	.76	.78	.85
	Social/Emotional Reciprocity	.83	.96	.91	.88	.96
	Atypical Language	.71	.77	.74	.59	.79
	Stereotypy	.75	.86	.80	.67	.86
	Behavioral Rigidity	.85	.94	.90	.82	.95
	Sensory Sensitivity	.71	.89	.81	.59	.90
Attention/Self-Regulation	.83	.88	.85	.83	.89	

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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.

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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 .

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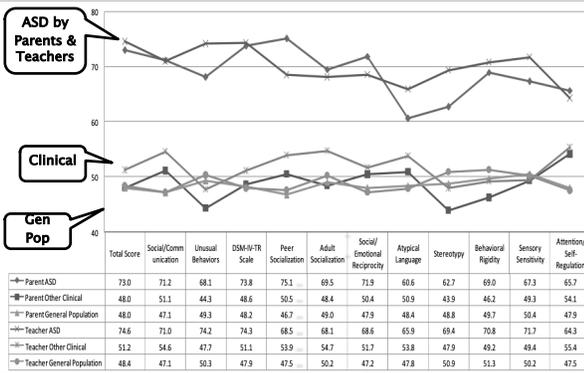
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## ASRS Validity for ages 2-5




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### Classification Accuracy ages 2-5 Teachers

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

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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 (%)	<b>91.3</b>	<b>91.3</b>	<b>88.3</b>	<b>86.5</b>	<b>91.2</b>
Sensitivity (%)	<b>90.3</b>	<b>90.0</b>	<b>87.7</b>	<b>86.1</b>	<b>90.5</b>
Specificity (%)	<b>92.2</b>	<b>92.5</b>	<b>88.9</b>	<b>86.9</b>	<b>91.9</b>
Positive Predictive Power (%)	<b>91.8</b>	<b>92.3</b>	<b>88.6</b>	<b>86.6</b>	<b>91.8</b>
Negative Predictive Power (%)	<b>90.8</b>	<b>90.2</b>	<b>88.0</b>	<b>86.5</b>	<b>90.6</b>
False-Positive Rate (%)	<b>7.8</b>	<b>7.5</b>	<b>11.1</b>	<b>13.1</b>	<b>8.1</b>
False-Negative Rate (%)	<b>9.7</b>	<b>10.0</b>	<b>12.3</b>	<b>13.9</b>	<b>9.6</b>
Kappa	<b>0.83</b>	<b>0.83</b>	<b>0.77</b>	<b>0.74</b>	<b>0.82</b>
ASD (N)	<b>183</b>	<b>195</b>	<b>201</b>	<b>201</b>	<b>196</b>
General Sample (N)	<b>196</b>	<b>205</b>	<b>209</b>	<b>207</b>	<b>201</b>

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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 (%)	<b>91.4</b>	<b>88.8</b>	<b>92.6</b>	<b>85.2</b>	<b>94.1</b>
Sensitivity (%)	<b>92.1</b>	<b>87.1</b>	<b>95.4</b>	<b>85.2</b>	<b>92.8</b>
Specificity (%)	<b>90.7</b>	<b>90.5</b>	<b>89.8</b>	<b>85.1</b>	<b>95.5</b>
Positive Predictive Power (%)	<b>90.3</b>	<b>90.0</b>	<b>90.0</b>	<b>84.8</b>	<b>95.4</b>
Negative Predictive Power (%)	<b>92.5</b>	<b>87.8</b>	<b>95.3</b>	<b>85.5</b>	<b>93.0</b>
False-Positive Rate (%)	<b>9.3</b>	<b>12.9</b>	<b>10.2</b>	<b>14.9</b>	<b>4.5</b>
False-Negative Rate (%)	<b>7.9</b>	<b>8.9</b>	<b>4.6</b>	<b>14.8</b>	<b>7.2</b>
Kappa	<b>0.83</b>	<b>0.78</b>	<b>0.85</b>	<b>0.70</b>	<b>0.88</b>
ASD (N)	<b>206</b>	<b>210</b>	<b>231</b>	<b>217</b>	<b>215</b>
General Sample (N)	<b>212</b>	<b>229</b>	<b>212</b>	<b>221</b>	<b>227</b>

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## ASD vs Communication Disorders

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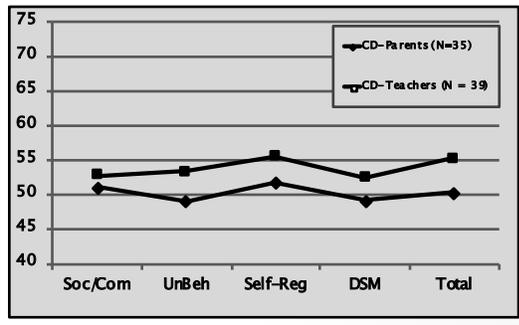
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## ASD vs Communication Disorders



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## Race / Ethnic Differences

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## Lorna Wing



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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** (including Aspergers) is considerably more common than previously believed

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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

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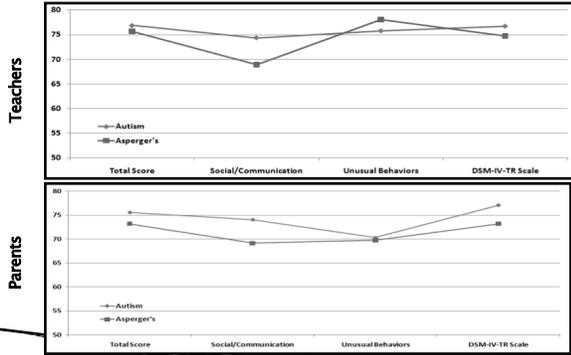
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### Autism vs Asperger 2-5 years




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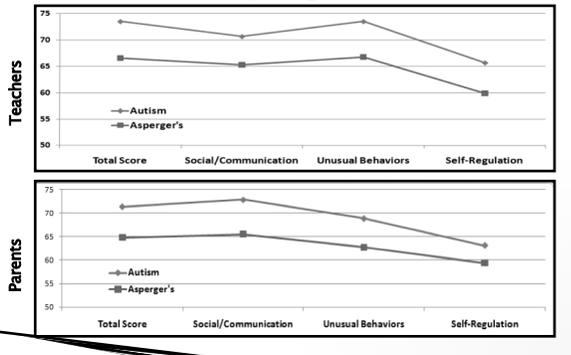
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### Autism vs Asperger 6-18 Years




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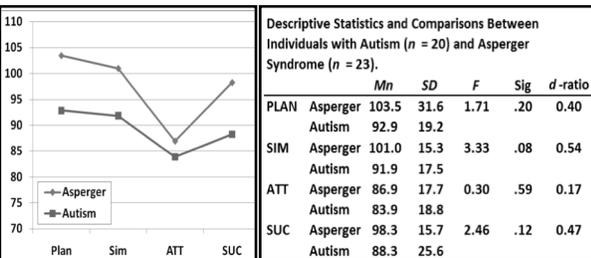
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### Autism vs Asperger 6-18




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## ASRS Interpretation Options

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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

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### ASRS Interpretation

▶ Description of T scores

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)<sup>™</sup>

**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	71–78	71–78	71–78	66–77	63–76	68–78
75	72–77	70–77	70–77	70–77	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)

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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
<b>Total Score</b>	Has many behavioral characteristics similar to individuals diagnosed with an Autism Spectrum Disorder.
<b>ASRS Scales</b>	<b>Social/Communication</b> Inappropriate use of verbal and non-verbal communication to initiate, engage in, and maintain social contact.
	<b>Unusual Behaviors</b> Has trouble tolerating changes in routine. Engages in apparently purposeless, stereotypical behaviors. Overreacts to certain sensory experiences.
	<b>Self-Regulation (ASRS [6–18 Years] only)</b> 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

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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## 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

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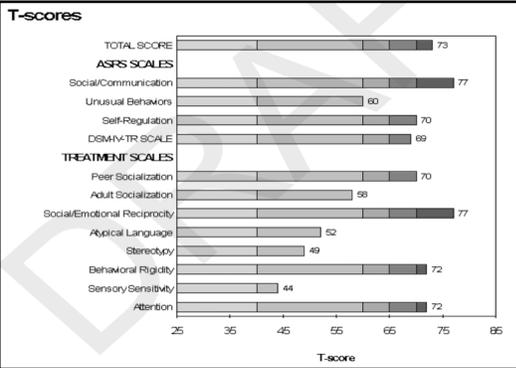
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## ASRS Interpretive Report




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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. G	Dr. G
Data Entered By:	Maria	Maria

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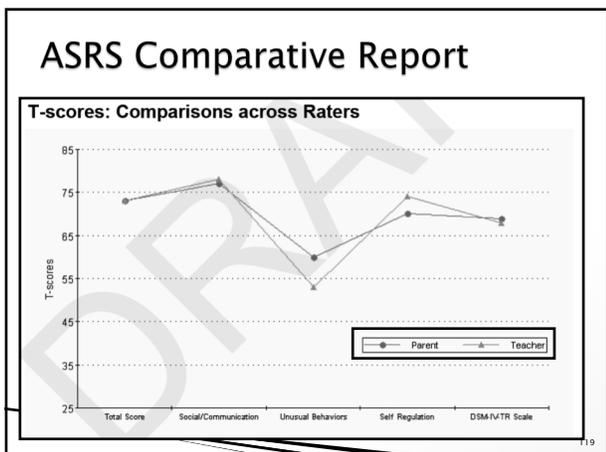
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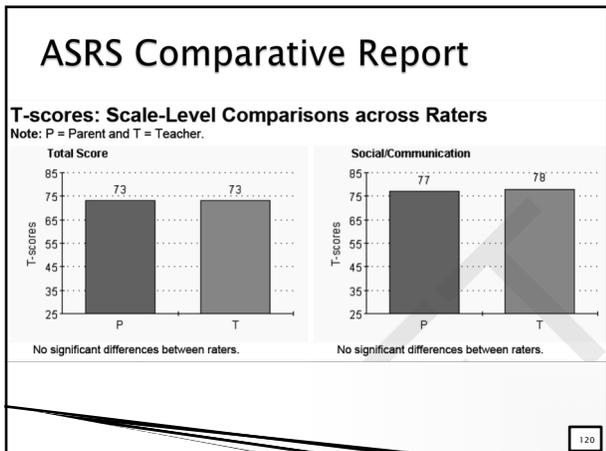
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### ASRS Interpretation

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 = .05)		
	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	
Unusual Behaviors	6	7	6	7	8	8	10	10	
DSM-IV-TR Scale	6	6	6	7	7	7	9	9	
Treatment Scales									
Peer Socialization	8	7	8	10	9	9	13	12	
Adult Socialization	12	10	11	14	12	13	18	17	
Social/Emotional Reciprocity	7	7	7	9	8	8	12	10	
Atypical Language	12	13	13	15	16	15	19	21	
Stereotypy	11	11	11	13	13	13	17	18	
Behavioral Rigidity	8	8	8	9	9	9	12	12	
Sensory Sensitivity	11	12	11	13	14	13	17	18	
Attention/Self-Regulation	9	9	9	11	11	11	15	14	

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### Important Conclusions

- ▶ Behaviors associated with Autism Spectrum Disorders should be measured using well developed nationally standardized scales.
- ▶ DSM-5 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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### 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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## Making the DSM 5 Diagnosis of ASD



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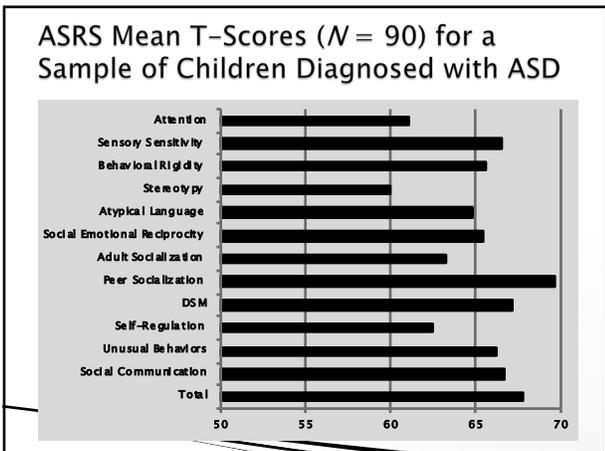
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### DSM 5 Criteria A

- ▶ Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):
  1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
  2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
  3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

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### DSM 5 Criteria B

Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

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*Specify if:*

With or without accompanying intellectual impairment.

With or without accompanying language impairment.

Associated with a known medical or genetic condition or environmental factor.

Associated with another neurodevelopmental, mental, or behavioral disorder.

With catatonia.

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### DSM 5 Criteria C, D, E.

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life)

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make co-morbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

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### Social (Pragmatic) Communication Disorder Criteria A

- ▶ Persistent difficulties in the social use of verbal and nonverbal communication as manifested by all of the following:
  - Deficits in using communication for social purposes, such as greeting and sharing information, in a manner that is appropriate for the social context.
  - Impairment of the ability to change communication to match context or the needs of the listener, such as speaking differently in a classroom than on a playground, talking differently to a child than to an adult, and avoiding use of overly formal language.
  - Difficulties following rules for conversation and storytelling, such as taking turns in conversation, rephrasing when misunderstood, and knowing how to use verbal and nonverbal signals to regulate interaction.
  - Difficulties understanding what is not explicitly stated (e.g., making inferences) and non-literal or ambiguous meanings of language (e.g., idioms, humor, metaphors, multiple meanings that depend on the context for interpretation).

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### Social (Pragmatic) Communication Disorder Criteria B, C, and D

- B. The deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination.
- C. The onset of the symptoms is in the early developmental period (but deficits may not become fully manifest until social communication demands exceed limited capacities).
- D. The symptoms are not attributable to another medical or neurological condition or to low abilities in the domains of word structure and grammar, and are not better explained by autism spectrum disorder, intellectual disability (intellectual developmental disorder), global developmental delay, or another mental disorder.

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### Preliminary Data ASRS vs. ADOS

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### Autism Diagnostic Observation Schedule (ADOS)

- ▶ Age range toddlers to adults.
- ▶ No speech to those who are verbally fluent.
- ▶ Semi-structured assessment.
- ▶ Five modules across age ranges with each requiring 45 minutes to administer.
- ▶ A module is chosen depending upon expressive language and age.
- ▶ Non-verbal teens and adults can't be reliably evaluated.
- ▶ Autism and Autism Spectrum cut off scores are provided for two domains (Social Affective and Restricted Repetitive Behaviors).

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### Autism Diagnostic Observation Schedule

CURRENT

NEW

- |                        |   |
|------------------------|---|
| ▶ Social Domain        | ▶ Social Affect Domain                    |
| ▶ Communication Domain | ▶ Restrictive Repetitive Behaviors Domain |

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### ADOS vs. ASRS

- |   |                        |
|---|------------------------|
| ▶ Social Affect Domain                    | ▶ Social/Communication |
| ▶ Restrictive Repetitive Behaviors Domain | ▶ Unusual Behavior     |
|   | ▶ Self-regulation      |

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## Sample Description

- ▶ University of Virginia *Autism Genetic Resource Exchange (AGRE)* project data
- ▶ Sample selection
  - If the child met criteria for ASD or Autism on the ADOS and met criteria for Autism on the ADI-R, they were considered to be on the autism spectrum – ASD or Autism – (whichever they met according to the ADOS).
  - In the AGRE dataset the ADOS is used in conjunction with the ADI to classify the child

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## Sample Description

- ▶ Sample selection (continued)
  - The ADOS and ADI are used for designating the sample as ASD or Autism.
  - If the child did not meet criteria on either instrument there was a case conference to discuss the case in depth – taking into consideration multiple test results (in addition to ADOS and ADI) and reviewing video of the child. At that time the clinical psychologist and the clinician who administered the ADOS and ADI would come to a decision as to what to classify the child.

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## Sample Description

- ▶ Ages 6–18 (Mean = 10.3; SD = 3.1)
- ▶ N = 90
- ▶ 82% (N = 74) Males, 18% (N = 16) Females

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### ADOS (N = 90)

ADOS Diagnosis Classification	
Autism	63
ASD	18
No Diagnosis	9

	Met Criterion	Did Not Meet
Communication Autism	64	26
Communication Autism Spectrum	83	7
Social Autism	80	10
Social Autism Spectrum	86	4
Communication + Social Autism	66	24
Communication + Social Autism Spectrum	84	6

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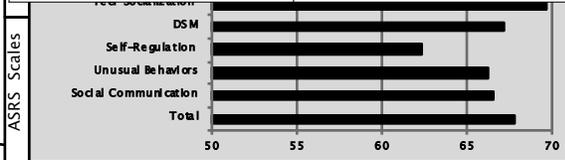
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### ASRS Mean T-Scores (N = 90)

ASRS TOTAL T-Score	
Value	N
70+	35
65+	26
60+	19
<60	10




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### ADOS & ASRS Different Scales

	ADOS Diagnosis	ASRS Total ( T > 59)
Autism or ASD	81	80
No Diagnosis	9	10

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## Determining Eligibility as an 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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## Federal Guidelines For Autism Eligibility

**(a) General.**

**(1) Child with a disability** means a child evaluated in accordance with §§ 300.304 through 300.311 as having mental retardation, a hearing impairment (including deafness), a speech or language impairment, a visual impairment (including blindness), a serious emotional disturbance (referred to in this part as "emotional disturbance"), an orthopedic impairment, autism, traumatic brain injury, an other health impairment, a specific learning disability, deaf-blindness, or multiple disabilities, and who, by reason thereof, needs special education and related services.

**(2)**

**(i)** Subject to paragraph (a)(2)(ii) of this section, if it is determined, through an appropriate evaluation under §§ 300.304 through 300.311, that a child has one of the disabilities identified in paragraph (a)(1) of this section, but only needs a related service and not special education, the child is not a child with a disability under this part.

**(ii)** If, consistent with § 300.39(a)(2), the related service required by the child is considered special education rather than a related service under State standards, the child would be determined to be a child with a disability under paragraph (a)(1) of this section.

**(b) Children aged three through nine experiencing developmental delays.** *Child with a disability* for children aged three through nine (or any subset of that age range, including ages three through five), may, subject to the conditions described in § 300.111(b), include a child -

**(1)** Who is experiencing developmental delays, as defined by the State and as measured by appropriate diagnostic instruments and procedures, in one or more of the following areas: Physical development, cognitive development, communication development, social or emotional development, or adaptive development; and

**(2)** Who, by reason thereof, needs special education and related services.

(Authority: 20 U.S.C. 1401(3); 1401(30))

[ 71 FR 46753, Aug. 14, 2006, as amended at 72 FR 61306, Oct. 30, 2007]



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## Federal Guidelines For Autism Eligibility

**(i) Autism** means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child'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 child's educational performance is adversely affected primarily because the child has an emotional disturbance, as defined in paragraph (c)(4) of this section.

**(iii)** A child who manifests the characteristics of autism after age three could be identified as having autism if the criteria in paragraph (c)(1)(i) of this section are satisfied.

(Authority: 20 U.S.C. 1401(3); 1401(30))

[ 71 FR 46753, Aug. 14, 2006, as amended at 72 FR 61306, Oct. 30, 2007]



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## Intervention

- ▶ Despite strong claims no curative treatment has been studied vigorously.
- ▶ "In the absence of a definitive cure there are a thousand treatments" (Klin).
- ▶ Behavior modification, educational intervention and pharmacology have been studied.



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## Challenges to Treatment

- Concrete thinkers
- Difficulty with humor
- Problems regulating affect
- Difficulty interpreting others' feelings
- Rule-bound
- Diminished empathy
- Decreased desire to please significant others



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## Medications

- › Symptom focused medications: stimulants for attention, anti-depressants for mood, anti-psychotics for "oddities".
- › Condition focused medications?



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Drugs that increase serotonin transmission may be useful in reducing interfering repetitive behaviors and aggression as well as improving social relatedness (few controlled studies).

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### Promoting Social Behavior With Oxytocin in High-Functioning Autism Spectrum Disorders

- ▶ Published (2/10) online in the Proceedings of the National Academy of Sciences.
- ▶ Oxytocin is a hormone known to promote mother-infant bonds.
- ▶ A French research group investigated the behavioral effects of oxytocin in 13 subjects with autism.
- ▶ Under oxytocin, children with ASD responded more strongly to others and exhibited more appropriate social behavior and affect, suggesting a therapeutic potential of oxytocin through its action on a core dimension of autism.

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### Oxytocin May Have Many Effects

**Personality and Social Psychology Review**

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**Oxytocin and Human Social Behavior**

Anne Campbell  
Durham University, Durham, UK, a.c.campbell@durham.ac.uk

**Abstract**

Despite a general consensus that oxytocin (OT) has prosocial effects, there is no clear agreement on how these effects are achieved. Human research on OT is reviewed under three broad research initiatives: attachment and trust, social memory and fear reduction. As an organizing perspective for scholars' current knowledge, a tentative model of the causes and effects of alterations in OT level is proposed. The model must remain provisional until conceptual and methodological problems are addressed that arise from a failure to distinguish between traits and states, differing research paradigms used in relation to OT as an independent versus dependent variable, and the possibility that OT effects depend on the initial emotional state of the individual. Social and personality psychologists have important roles to play in developing more rigorous and creative research designs.

**This Article**

Published online before print April 20, 2010, doi: 10.1177/1088828010382884  
Pers Soc Psychol Rev August 2010 vol. 14 no. 3 281-295

▶ Abstract First  
Full Text (PDF)

All Versions of this Article:  
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10.1177/1088828010382884

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### Medication and Parent Training in Children With Pervasive Developmental Disorders and Serious Behavior Problems: Results From a Randomized Clinical Trial

MICHAELG. AMAN, PH.D., CHRISTOPHERJ. MCDUGLE, M.D. et al.

Conclusions: Medication plus PT resulted in greater reduction of serious maladaptive behavior than Medication alone in children with PDDs, with a lower risperidone dose.

J. AM. ACAD. CHILD ADOLESC. PSYCHIATRY, 48:12, DECEMBER 2009J.

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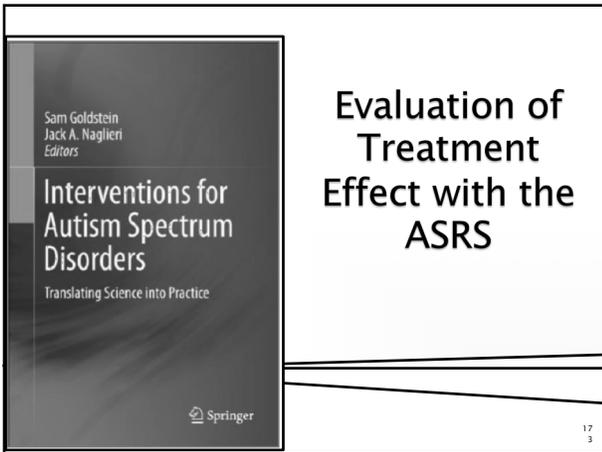
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## Evaluation of Treatment Effect with the ASRS

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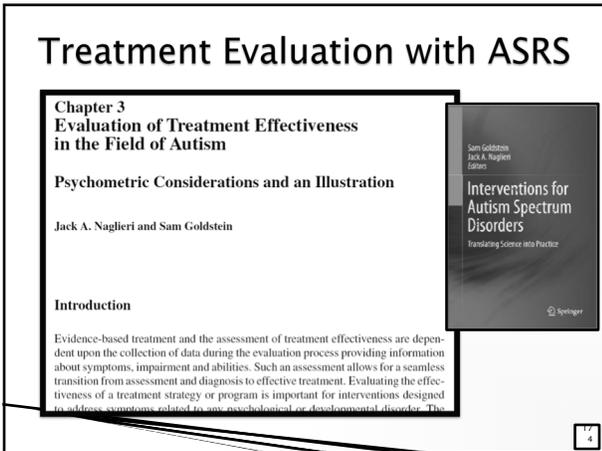
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## Treatment Evaluation with ASRS

### 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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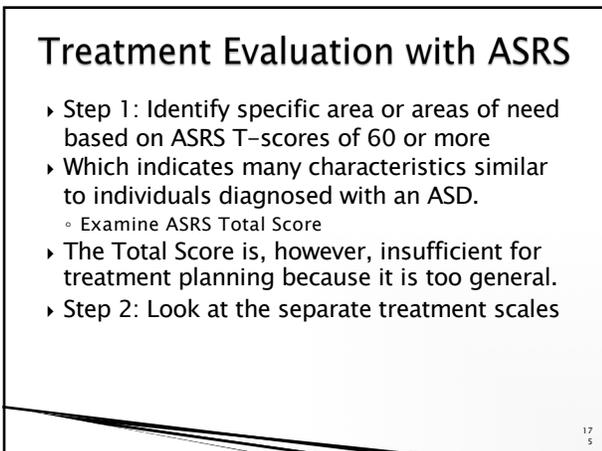
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## Treatment Evaluation with ASRS

- ▶ 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

- ▶ 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
<b>Treatment scales</b>					
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

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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## 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
<b>Peer Socialization Raw Score =</b>	<b>17</b>

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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

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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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### 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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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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