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

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GEORGIA ASSOCIATION OF SCHOOL PSYCHOLOGISTS

Caring for Children in Georgia Since 1970!

Relevant Disclosure

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

Goals

- Briefly discuss the historical theories of Autism Spectrum Disorders (ASD).
- Define ASD and new DSM 5 criteria.
- Briefly discuss symptoms of ASD by age.
- Discuss the ASRS and other methods for assessment, diagnosis and differential diagnosis and treatment monitoring in ASD cases.

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.

Socialization Begins Early
Reina and Her Mother

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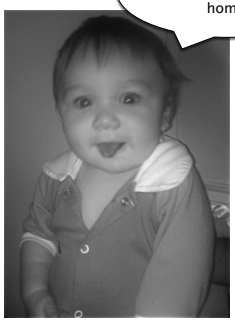
Adrian, my seatmate on a recent flight.

Adrian

Adrian



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Normally Developing Children:

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

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

Margaret Semrud-Clikeman

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

Impairment in Social Competence Caused By:

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

Social Information Processing

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

Crick and Dodge (1994)

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

88% reported their children had been bullied.

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Where are Autism's Roots?

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

Les âges de l'ouvrier

Léon FRÉDÉRIC 1895

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Les âges de l'ouvrier

Léon FRÉDÉRIC 1895

Is this child portrayed as autistic?

Which woman is her mother?

Kanner's Description (1943)

- first physician in the world to be identified as a child psychiatrist
- founder of the first child psychiatry department at Johns Hopkins University Hospital
- Wrote *Child Psychiatry* (1935), the first English language textbook to focus on the psychiatric problems of children.

Leo Kanner who introduced the label *early infantile autism* in 1943 in his paper : Kanner, L. (1943). Autistic disturbances of affective contact. Nervous Child, 2, 217–250.

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Kanner's Description (1943)

- His seminal 1943 paper, "Autistic Disturbances of Affective Contact", together with the work of Hans Asperger, forms the basis of the modern study of autism.
- Leo Kanner was the Editor for *Journal of Autism and Developmental Disorders*, then called *Journal of Autism and Childhood Schizophrenia*

Leo Kanner who introduced the label *early infantile autism* in 1943 in his paper : Kanner, L. (1943). Autistic disturbances of affective contact. Nervous Child, 2, 217–250.

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Kanner's Description (1943)

- Inability to relate to others
- Disinterest in parents and people
- Language difficulties
- Fascination with inanimate objects
- Resistance to change in routine
- Purposeless repetitive movements
- A wide range of cognitive skills
- Where they possess an innate inability for emotional contact

Leo Kanner who introduced the label *early infantile autism* in 1943 in his paper : Kanner, L. (1943). Autistic disturbances of affective contact. Nervous Child, 2, 217-250.

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

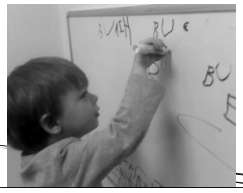
In a Spectrum Disorder genetic and phenotypic factors predispose certain individuals to express certain Central Nervous System vulnerabilities leading to poorly adapted variations in development and behavior.

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

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

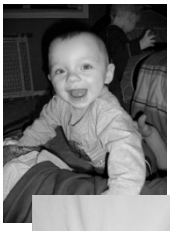
Core DSM and ICD Autistic Symptoms

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



Symptoms Present Before 24 Months: Failure To:

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



Symptoms Present Before 36 Months

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

Pretend Play in Autism

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

Meet Kevin

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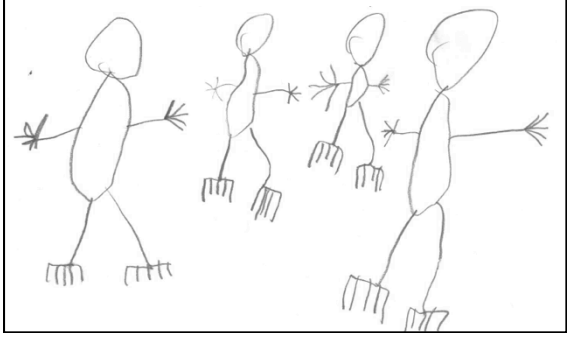
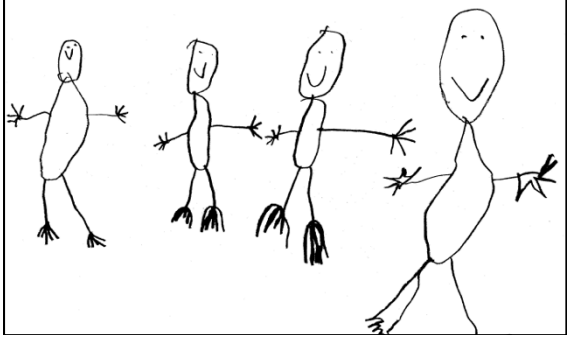
Kevin Draws His Family



Kevin Adds Faces



Why Might Early Intervention Work?

- Intervene before adverse behaviors are reinforced.
- Capitalize on the early experience-expectant plasticity of the brain.
- Impact gene expression.
- Employed at point social behaviors develop.
- Promote complex neural networks and connectivity through thematic, multi-sensory and multi-domain teaching approaches.

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Is There a Core Cognitive Theory to Explain ASD?

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Joint Attention

- Behaviors that focus the attention of the self and others on the same object (e.g. pointing,sharing emotion, etc.)
- Develops between 6 and 9 months
- Precursor of more advanced social and communication skills

Joint Attention

- This abnormality thought to be one of the earliest signs of autism
- Present in children with developmental delays absent autism
- This ability when present in preschoolers with autism predicts better prognosis for language development

Weak Central Coherence

Frith & Happe 1994

Characterized by:

- Cognitive bias toward local versus global processing
- Failure to use context to aid understanding

Supported by:

- Performance on Block Design and Embedded figures tasks
- Influence of context in perceptual behaviour

Accounts for:

- Repetitive and stereo-typed behaviour
- Cognitive style and differences in perception
- Strengths

Theory of Mind

Baron-Cohen-Leslie-Frith 1985

Characterized by:

- Deficits in theory of mind or ability to understand mental state of others
- Leads to social deficits

Supported by:

- Research demonstrating deficits in understanding others mental stage – False belief/Sally-Ana
- Even when they show understanding – poor generalization to real life

Accounts for:

- Social and communication deficits

Does not account for:

- Cognitive style, strengths, stereotypic behaviours

Mirror Neuron System

Characterized by:

- Mirror neurons act as emulators – copy actions/behaviors

Supported by:

- Research into single cell recordings in monkeys
- Human correlate is proposed to exist in parietal lobe, STS, amygdalate, striate, cortex and cerebellum
- More research is required to substantiate

Accounts for:

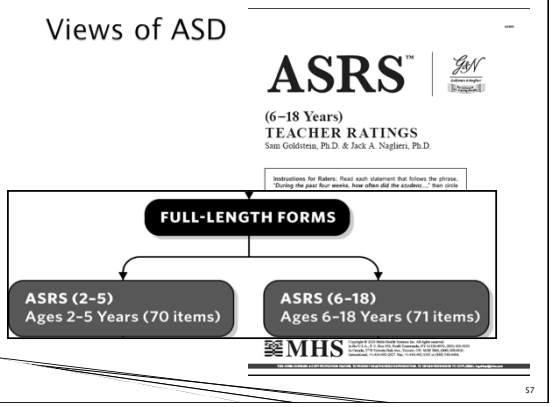
- Connections in neurological regions that underlie complex behaviors including imitation, recognition, social cognizance and language

Executive Dysfunction Hypothesis

Problems with self-regulation and perseveration make it difficult to cope with changing social situations.

Pennington and Ozonoff (1996)

Views of ASD



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Factor Analysis for 2-5 Years

- A two-factor solution was best for parent and teacher raters.
  - **Factor I was defined by items that involved both social and communication behaviors**
  - **Items …**

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Social/Communication Factor

Table 8.18. Exploratory Factor Analysis Results: ASRS (2-5 Years) Parent Ratings

Item		Social/Communication	Unusual Behaviors
29.	keep a conversation going?	**-.916**	.128
28.	start conversations with others?	**-.909**	.149
3.	understand how someone else felt?	**-.908**	.245
40.	respond when spoken to by other children?	**-.873**	.000
54.	share his/her enjoyment with others?	**-.865**	.038
50.	show an interest in the ideas of others?	**-.859**	.039
14.	understand the point of view of others?	**-.831**	.153
4.	play with others?	**-.830**	-.052
16.	share fun activities with others?	**-.829**	.004
52.	understand age-appropriate humor or jokes?	**-.820**	.043
49.	seek the company of other children?	**-.816**	-.073
19.	care about what other people think or feel?	**-.812**	.153
21.	respond when spoken to by adults?	**-.802**	-.007
5.	look at others when talking with them?	**-.778**	-.050
61.	show good peer interactions?	**-.768**	-.145
13.	look at others when interacting with them?	**-.766**	-.156
57.	follow instructions that he/she understood?	**-.735**	.019
7.	point to objects when asked to?	**-.730**	.057
18.	use make believe play?	**-.708**	-.018
25.	listen when spoken to?	**-.707**	-.044
15.	have trouble talking with other children?	**.698**	.123

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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Unusual Behaviors Factor

Item		Social/Communication	Unusual Behaviors
27.	focus too much on details?	-.052	.735
8.	insist on doing things the same way each time?	.114	.730
56.	insist on certain routines?	.166	.698
9.	need things to happen just as expected?	.177	.698
10.	have a strong reaction to any change in routine?	.221	.689
70.	repeat or echo what others said?	-.058	.683
39.	become fascinated with parts of objects?	.079	.660
12.	overreact to common smells?	.034	.653
47.	focus on one subject for too much time?	.220	.651
20.	become upset if routines were changed?	.286	.617
53.	repeat certain words or phrases out of context?	.012	.608
2.	become bothered by some fabrics or tags in clothes?	.118	.586
65.	twirl, spin, or bang objects?	.144	.573
46.	overreact to loud noises?	.352	.559
26.	talk too much about things that other children don't care about?	-.093	.558
64.	flap his/her hands when excited?	.148	.535
69.	overreact to touch?	.337	.533
11.	line up objects in a row?	-.065	.530
41.	talk too much about things that adults don't care about?	-.169	.518
42.	use an odd way of speaking?	.353	.512
45.	resist being touched or held?	.329	.468

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**

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Social / Communication Factor

Table 8.20. Exploratory Factor Analysis Results: ASRS (6–18 Years) Parent Ratings

Item		Unusual Behaviors	Self-Regulation	Social/ Communication
56.	start conversations with others?	.051	.082	.861
42.	share his/her enjoyment with others?	.113	-.074	.827
23.	keep a conversation going?	.027	.012	.803
43.	show an interest in the ideas of others?	.038	-.141	.765
70.	respond when spoken to by other children?	-.070	.012	.759
8.	share fun activities with others?	.006	-.038	.752
31.	play with others?	-.072	.019	.740
69.	show good peer interactions?	-.072	-.165	.690
39.	care about what other people think or feel?	.066	-.090	.686
3.	seek the company of other children?	-.092	.157	.666
28.	understand how someone else felt?	-.044	-.173	.616
9.	look at others when talking with them?	-.144	-.076	.608
45.	understand age-appropriate humor or jokes?	-.263	.008	.602
61.	look at others when interacting with them?	-.108	-.067	.599
33.	respond when spoken to by adults?	-.006	-.167	.599
55.	smile appropriately?	-.131	-.032	.590
32.	notice social cues?	-.160	-.083	.573
12.	play with toys appropriately?	-.173	.047	.466

Unusual Behaviors Factor

Table 8.20. Exploratory Factor Analysis Results: ASRS (6–18 Years) Parent Ratings

Item	Unusual Behaviors	Self-Regulation	Social/ Communication
51. insist on certain routines?	**.842**	.001	.023
24. insist on doing things the same way each time?	**.785**	.056	.063
63. become upset if routines were changed?	**.755**	.089	-.015
22. become obsessed with details?	**.745**	-.011	-.016
40. focus too much on details?	**.736**	-.035	.070
49. need things to happen just as expected?	**.722**	.087	.029
62. overreact to loud noises?	**.680**	.019	-.089
13. have a strong reaction to any change in routine?	**.677**	.172	-.024
54. line up objects in a row?	**.670**	-.120	.001
26. repeat or echo what others said?	**.637**	.047	-.025
21. repeat certain words or phrases out of context?	**.637**	.050	-.113
29. overreact to common smells?	**.636**	.001	-.015
48. focus on one subject for too much time?	**.628**	.058	-.067
65. insist on keeping certain objects with him/her at all times?	**.628**	-.100	-.181
25. overreact to touch?	**.590**	.051	-.106
2. become bothered by some fabrics or tags in clothes?	**.560**	.120	.088
68. reverse pronouns (eg, you for me)?	**.521**	-.019	-.128
46. flap his/her hands when excited?	**.484**	-.059	-.183
50. talk too much about things that other children don't care about?	**.481**	.298	-.006
67. twirl, spin, or bang objects?	**.473**	.071	-.177
20. use an odd way of speaking?	**.456**	.078	-.305

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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Self-Regulation Factor

Table 8.20. Exploratory Factor Analysis Results: ASRS (6–18 Years) Parent Ratings

Item	Unusual Behaviors	Self-Regulation	Social/ Communication
57. fail to complete tasks?	-.081	**.852**	-.060
44. leave homework or chores unfinished?	-.141	**.847**	-.012
35. have problems paying attention when doing homework or chores?	-.053	**.800**	-.116
36. make careless mistakes in school work?	-.079	**.783**	-.055
30. become distracted?	.027	**.743**	-.063
1. appear disorganized?	-.054	**.728**	-.056
18. get into trouble with adults?	.001	**.681**	.006
60. interrupt or intrude on others?	.256	**.647**	.113
71. appear fidgety when asked to sit still?	.194	**.609**	-.040
7. have problems waiting his/her turn?	.162	**.595**	-.064
58. ask questions that were off-topic?	.365	**.545**	.104
6. argue and fight with other children?	.118	**.476**	.096
52. have problems paying attention to fun tasks?	.085	**.464**	-.255
16. learn simple tasks but then forget them quickly?	.116	**.445**	-.204
34. avoid looking at an adult when there was a problem?	.142	**.441**	-.192
5. follow instructions that he/she understood?	-.048	**-.418**	.276
66. have social problems with adults?	.205	**.380**	-.294

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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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Research in Autism Spectrum Disorders 6 (2012) 277–285

Contents lists available at ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Autism and ADHD: Overlapping and discriminating symptoms

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ARTICLE INFO

Article history:
Received 17 May 2011
Received in revised form 19 May 2011
Accepted 23 May 2011
Available online 17 June 2011

Keywords:
Autism
ADHD
Differential diagnosis

ABSTRACT

Children with ADHD and autism have some similar features, complicating a differential diagnosis. The purpose of our study was to determine the degree to which core ADHD and autistic symptoms overlap in and discriminate between children 2–16 years of age with autism and ADHD. Our study demonstrated that 847 children with autism were easily distinguished from 158 children with ADHD. All children with autism had 15 or more of the 30 Checklist for Autism Spectrum Disorder symptoms (mean 22), and none of the children with ADHD did (mean 4). Three of the symptoms were present only in children with autism. Almost all 30 symptoms were found in over half of the children with autism, whereas none were present in the majority of children with ADHD-Inattentive type (ADHD-I) or in children with ADHD-Combined type (ADHD-C) without comorbid oppositional-defiant disorder. In contrast, ADHD symptoms were common in autism. Children with low and high functioning autism and ADHD-C did not differ on maternal ratings of attention deficit, impulsivity, and hyperactivity. For children with normal intelligence, nonsignificant differences were found between children with autism, ADHD-C, and ADHD-I on neuropsychological tests including measures of attention, working

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This View is Well Supported by Current Research

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ASRS Validity

- And an updated view of ASD

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Validity of the Factors

- Factor analysis is a valuable tool to understand how items group.
- But we also need to know if the items have validity.
- Discriminating children with ASD from the regular population is important.
- Discriminating children with ASD from those who are not in the regular population but not ASD is very important.

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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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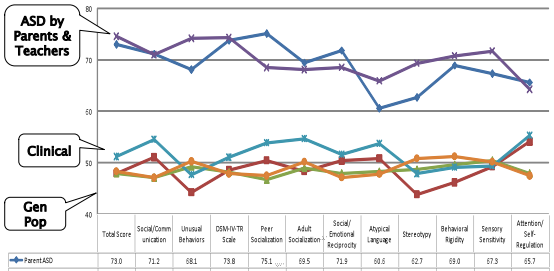
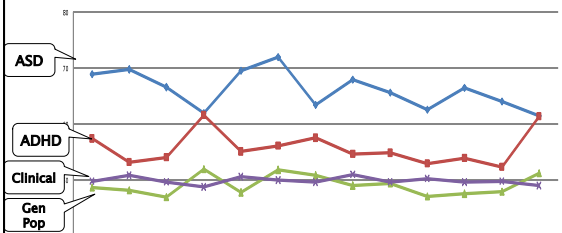
ASRS Validity for ages 2-5



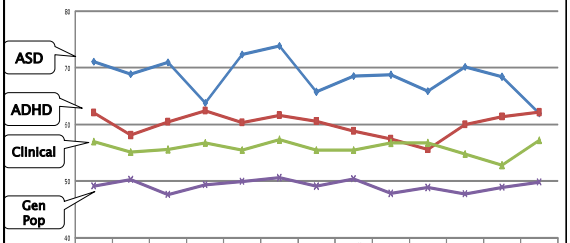
	Total Score	Social/Communication	Unusual Behaviors	DSM-IV-TR Scale	Peer Socialization	Adult Socialization	Social/ Emotional Reciprocity	Atypical Language	Stereotypy	Behavioral Rigidity	Sensory Sensitivity	Attention/ Self-Regulation
Parent ASD	73.0	71.2	68.1	73.8	75.1	69.5	71.9	68.6	62.7	69.0	67.9	65.7
Parent Other Clinical	48.0	51.1	44.3	48.6	50.5	48.4	50.4	50.9	43.9	46.2	49.3	54.1
Parent General Population	48.0	47.1	49.3	48.2	46.7	49.0	47.9	48.4	48.8	49.7	50.4	47.9
Teacher ASD	74.6	71.8	74.2	74.3	68.5	68.1	68.6	65.9	69.4	70.8	71.7	64.3
Teacher Other Clinical	51.2	54.6	47.7	51.1	53.9	54.7	51.7	53.8	47.9	49.2	49.4	55.4
Teacher General Population	48.4	47.1	50.3	47.9	47.5	50.2	47.2	47.8	50.9	51.3	50.2	47.5

ASRS Validity: Ages 6-18 Parents



	Total Score	Social/ Communication	Unusual Behaviors	Self-Regulation	DSM-IV-TR Scale	Peer Socialization	Adult Socialization	Social/ Emotional Reciprocity	Atypical Language	Stereotypy	Behavioral Rigidity	Sensory Sensitivity	Attention
ASD	68.9	69.7	65.6	62.0	69.6	72.8	69.5	67.9	65.6	62.6	66.5	64.0	61.5
ADHD	57.4	53.2	54.1	61.7	55.1	56.1	57.5	54.6	54.8	53.8	53.9	52.3	61.4
Other Clinical	48.7	48.2	47.6	52.0	47.7	51.8	50.8	49.0	49.4	47.0	47.5	47.9	51.2
General Population	49.7	50.8	49.7	48.7	50.6	50.0	49.6	51.0	49.6	50.3	49.6	49.8	49.0

ASRS Validity: Ages 6-18 Teachers



	Total Score	Social/ Communication	Unusual Behaviors	Self-Regulation	DSM-IV-TR Scale	Peer Socialization	Adult Socialization	Social/ Emotional Reciprocity	Atypical Language	Stereotypy	Behavioral Rigidity	Sensory Sensitivity	Attention
ASD	71.1	69.9	71.0	63.8	72.4	73.9	65.8	69.6	69.8	65.9	70.3	69.4	62.0
ADHD	62.1	59.1	60.5	62.5	60.4	61.6	60.6	59.9	57.5	55.7	60.0	61.4	62.2
Other Clinical	57.6	55.1	55.6	56.8	55.5	57.3	55.5	55.5	56.7	56.7	54.8	52.8	57.2
General Population	49.2	50.3	47.7	49.4	50.0	50.6	49.1	50.4	47.8	48.8	47.8	48.9	49.9

Classification Accuracy ages 2-5 Parents

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

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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	.89	.85	.95	.91
	Adult Socialization	.67	.85	.76	.78	.85	.81
	Social/Emotional Reciprocity	.83	.96	.91	.88	.96	.93
	Atypical Language	.71	.77	.74	.59	.79	.69
	Stereotypy	.75	.86	.80	.67	.86	.77
	Behavioral Rigidity	.85	.94	.90	.82	.95	.90
	Sensory Sensitivity	.71	.89	.81	.59	.90	.77
	Attention/Self-Regulation	.83	.88	.85	.83	.89	.86

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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	.78
	Social/Emotional Reciprocity	.85	.94	.89	.88	.91	.89
	Atypical Language	.81	.85	.82	.82	.85	.83
	Stereotypy	.79	.78	.79	.77	.79	.78
	Behavioral Rigidity	.89	.92	.90	.86	.94	.89
	Sensory Sensitivity	.79	.85	.81	.77	.82	.79
	Attention	.90	.91	.90	.89	.91	.90

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ASRS Reliability Ages 6–18 : Teachers

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

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Components of an ASD Evaluation

- History
- Questionnaires
- Observation
- Interaction
- Cognitive and language data
- Adaptive functioning
- Emotional functioning
- Consideration of differential diagnosis and/or comorbidity
- Rating Scale (ASRS)
- Direct measures (e.g., ADOS)

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Cognitive Ability Profiles for Children with ASD

Planning, Attention, Simultaneous, Successive (PASS) Cognitive Processes from Cognitive Assessment System (Naglieri & Das, 1997)

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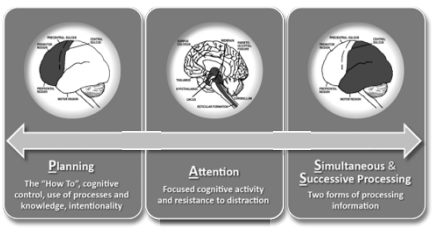
PASS: A neuropsychological approach to intelligence

Three Functional Units described by A. R. Luria (1972)



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PASS Defined

- Planning: Evaluate, select, strategize and monitor.
- Attention: Focus on relevant detail and resist distraction.
- Simultaneous: Appreciate the big picture. Relate parts into the whole.
- Sequence: Use information in a specific order.

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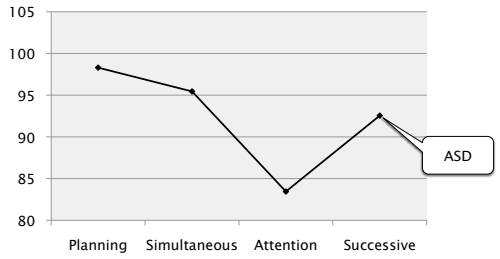
PASS Processing Scores



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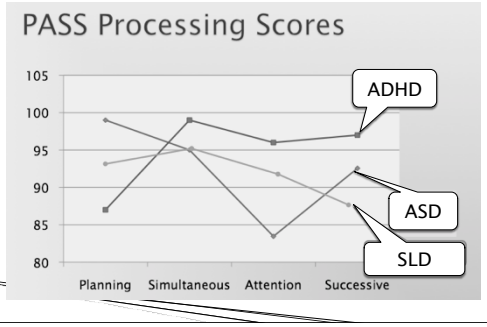
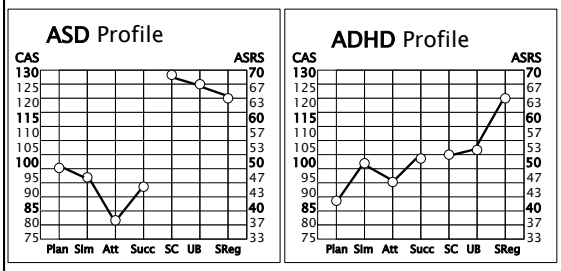
They Struggle With Planning



ASD vs. ADHD

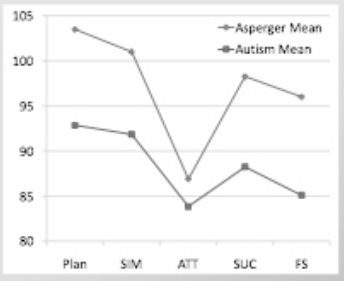
91

Differential Diagnosis: ADHD vs ASD



PASS Scores

- CAS Scores also show that the children with Asperger Syndrome (N = 23) earned higher PASS scores (intellectually higher) than those with Autism (N = 20)



ASD vs Communication Disorders

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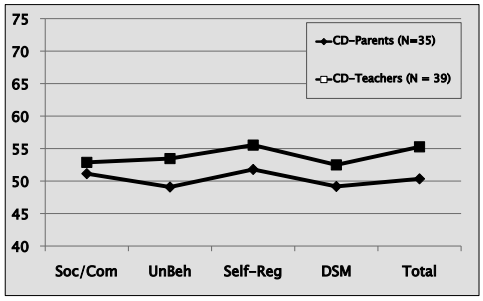
ASD vs Communication Disorders



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DSM IV TR 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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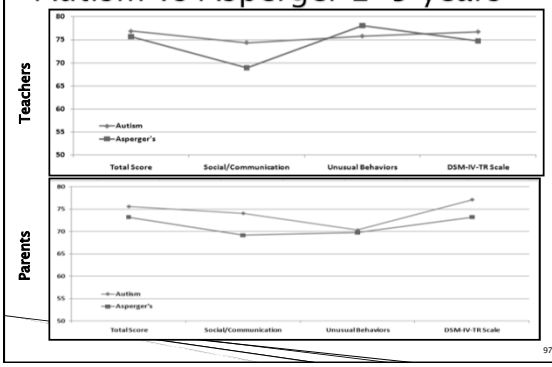
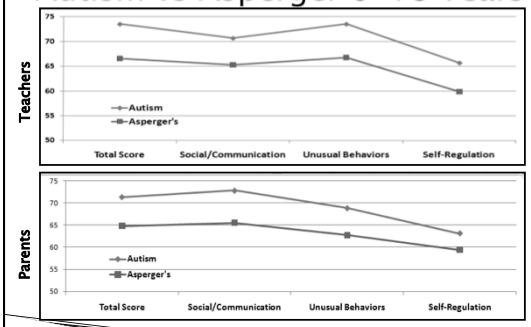
Autism vs Asperger 2–5 years



97

Autism vs Asperger 6–18 Years



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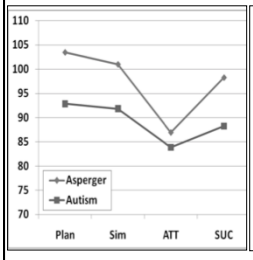
Autism vs Asperger 6–18



Descriptive Statistics and Comparisons Between Individuals with Autism (n = 20) and Asperger Syndrome (n = 23).

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

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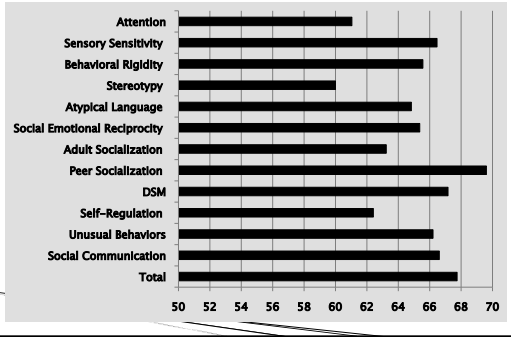
Making the Diagnosis of A PDD

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



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).

Autism Diagnostic Observation Schedule

CURRENT	NEW
Social Domain	Social Affect Domain
Communication Domain	Restrictive Repetitive Behaviors Domain

ADOS vs. ASRS

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

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

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.

Sample Description

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

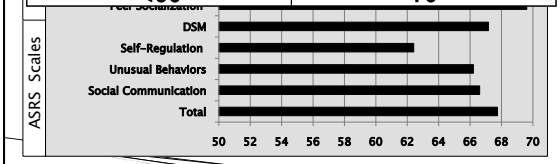
ADOS (N = 90)

	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
Commmunication + Social Autism	66	24
Communication + Social Autism Spectrum	84	6

ASRS Mean T-Scores (N = 90)

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



ADOS & ASRS Different Scales

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

ADOS	TOTAL
0	69
0	39
0	62
0	73
0	77
0	75
0	54
0	65
0	69

Note: 0 = Not identified on ADOS

Conrad

Conrad was evaluated at my Center in April 2010 and August 2012. He was recently reevaluated.

Conrad met DSM-IV-TR diagnostic criteria for Autistic Disorder; Depressive Disorder, Not Otherwise Specified; Anxiety Disorder, Not Otherwise Specified; and Oppositional/Defiant Disorder.

At the current time, Conrad is struggling in both home and school environments.

Ms. Keever Conrad's mother is concerned about perseverative and impulsive behaviors as well as depressive and anxious symptomology.

An evaluation was recommended to better define current concerns as well as assist in treatment planning.

Conrad

Conners CBRS Content Scale Detailed Scores: Comparison across Raters

The following table summarizes the results for each scale, as well as any statistically significant ($p < .10$) differences in T-scores between pairs of raters. If a pair of ratings is not noted in the "Statistically Significant Differences" column, then the difference between those two raters did not reach statistical significance.

Scale	T-score Guideline				Statistically Significant Differences
	P	T1	T2	T3	
Emotional Distress	90 Very Elevated	90 Very Elevated	99 Very Elevated	90 Very Elevated	No significant differences
Upsetting Thoughts[1,2]	90 Very Elevated	90 Very Elevated	99 Very Elevated	85 Very Elevated	T2 > T1
Worrying[1]	90 Very Elevated	-	-	-	Comparison not possible
Social Problems[3]	90 Very Elevated	72 Very Elevated	83 Very Elevated	69 Elevated	P > T1; P > T3; T2 > T3
Separation Fears[3]	58 Average	46 Average	79 Very Elevated	65 Very Elevated	T3 > T2; T3 > P; T3 > T1; T2 > P; T2 > T1; P > T1
Social Anxiety[3]	-	67 Elevated	74 Very Elevated	67 Elevated	No significant differences
Defiant/ Aggressive Behaviors	48 Average	90 Very Elevated	93 Very Elevated	77 Very Elevated	T1 > T3; T1 > P; T2 > T3; T2 > P; T3 > P
Academic Difficulties[4]	46 Average	48 Average	54 Average	55 Average	T2 > T1; T2 > P; T2 > T1; T2 > P
Language[4]	42 Average	46 Average	54 Average	57 Average	T3 > T1; T3 > P; T2 > T1; T2 > P
Math[4]	44 Average	49 Average	45 Average	45 Average	No significant differences
Hyperactivity/ Impulsivity[5]	90 Very Elevated	76 Very Elevated	89 Very Elevated	88 Very Elevated	P > T1; T2 > T1; T3 > T1
Perfectionistic and Compulsive Behaviors	90 Very Elevated	86 Very Elevated	90 Very Elevated	90 Very Elevated	No significant differences
Violence Potential Indicator	61 High Average	58 Elevated	66 Elevated	57 Average	T1 > T3; T2 > T3
Physical Symptoms	90 Very Elevated	67 Average	88 Very Elevated	60 High Average	P > T3; P > T1; T2 > T3; T2 > T1; T3 > T1

Note(s):
[1]Subscale of Emotional Distress on the Parent form.
[2]Upsetting Thoughts/Physical Symptoms subscale of Emotional Distress on the Teacher form.
[3]Subscale of Emotional Distress on the Teacher form.
[4]Subscale of Academic Difficulties on the Parent and Teacher forms.
[5]Hyperactivity on the Teacher form.

Conrad

Detailed Scores: Comparison across Raters

The following table summarizes the results for each DSM-5 Symptom scale, as well as any statistically significant ($p < .10$) differences in T-scores between pairs of raters. If a pair of ratings is not noted in the "Statistically Significant Differences" column, then the difference between those two raters did not reach statistical significance.

Scale	T-score Guideline				Statistically Significant Differences
	P	T1	T2	T3	
ADHD Predominantly Inattentive Presentation	96 Very Elevated	57 Average	79 Very Elevated	64 High Average	P > T2; P > T3; P > T1; T2 > T3; T2 > T1; T3 > T1
ADHD Predominantly Hyperactive-Impulsive Presentation	90 Very Elevated	79 Very Elevated	90 Very Elevated	83 Very Elevated	P > T1; T2 > T3; T2 > T1
Conduct Disorder	51 Average	70 Very Elevated	70 Very Elevated	53 Average	T1 > T3; T1 > P; T2 > T3; T2 > P
Oppositional Defiant Disorder	74 Very Elevated	90 Very Elevated	90 Very Elevated	69 Very Elevated	T1 > P; T2 > P; T3 > P
Major Depressive Episode	96 Very Elevated	65 High Average	65 High Average	65 High Average	P > T1; P > T2; P > T3
Manic Episode	77 Very Elevated	81 Very Elevated	90 Very Elevated	81 Very Elevated	No significant differences
Generalized Anxiety Disorder	90 Very Elevated	90 Very Elevated	90 Very Elevated	90 Very Elevated	No significant differences
Separation Anxiety Disorder	56 Average	86 Very Elevated	86 Very Elevated	69 Very Elevated	T3 > P; T1 > P; T3 > P
Social Anxiety Disorder (Social Phobia)	69 Elevated	91 Very Elevated	90 Very Elevated	69 Elevated	T2 > P; T2 > T3; T1 > P; T1 > T3
Obsessive-Compulsive Disorder	46 Average	90 Very Elevated	90 Very Elevated	90 Very Elevated	T1 > P; T2 > P; T3 > P
Autism Spectrum Disorder	90 Very Elevated	84 Very Elevated	90 Very Elevated	67 Very Elevated	No significant differences

3

Conrad

Detailed Scores: Comparison across Raters

The following table summarizes the results for each DSM-5 Symptom scale, as well as any statistically significant ($p < .10$) differences in T-scores between pairs of raters. If a pair of ratings is not noted in the "Statistically Significant Differences" column, then the difference between those two raters did not reach statistical significance.

Scale	T-score Guideline				Statistically Significant Differences
	P	T1	T2	T3	
ADHD Predominantly Inattentive Presentation	96 Very Elevated	57 Average	79 Very Elevated	64 High Average	P > T2; P > T3; P > T1; T2 > T3; T2 > T1; T3 > T1
ADHD Predominantly Hyperactive-Impulsive Presentation	90 Very Elevated	79 Very Elevated	90 Very Elevated	83 Very Elevated	P > T1; T2 > T3; T2 > T1
Conduct Disorder	51 Average	70 Very Elevated	70 Very Elevated	53 Average	T1 > T3; T1 > P; T2 > T3; T2 > P
Oppositional Defiant Disorder	74 Very Elevated	90 Very Elevated	90 Very Elevated	69 Very Elevated	T1 > P; T2 > P; T3 > P
Major Depressive Episode	96 Very Elevated	65 High Average	65 High Average	65 High Average	P > T1; P > T2; P > T3
Manic Episode	77 Very Elevated	81 Very Elevated	90 Very Elevated	81 Very Elevated	No significant differences
Generalized Anxiety Disorder	90 Very Elevated	90 Very Elevated	90 Very Elevated	90 Very Elevated	No significant differences
Separation Anxiety Disorder	56 Average	86 Very Elevated	86 Very Elevated	69 Very Elevated	T3 > P; T1 > P; T3 > P
Social Anxiety Disorder (Social Phobia)	69 Elevated	91 Very Elevated	90 Very Elevated	69 Elevated	T2 > P; T2 > T3; T1 > P; T1 > T3
Obsessive-Compulsive Disorder	46 Average	90 Very Elevated	90 Very Elevated	90 Very Elevated	T1 > P; T2 > P; T3 > P
Autism Spectrum Disorder	90 Very Elevated	84 Very Elevated	90 Very Elevated	67 Very Elevated	No significant differences

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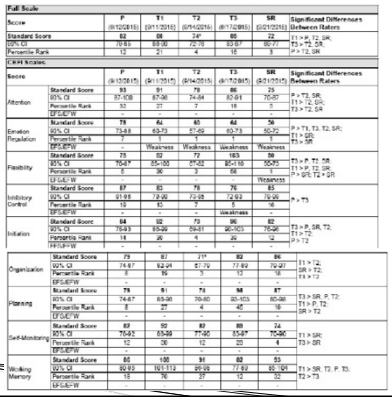
Conrad



Full Scale							
Score		P (8/12/2015)	T1 (8/11/2015)	T2 (8/14/2015)	T3 (8/17/2015)	SR (8/21/2015)	Significant Differences Between Raters
Standard Score		82	88	74*	85	72	P1 > P, T2, SR; T3 > T2, SR
90% CI		78-86	83-93	70-78	82-87	69-77	
Percentile Rank		12	21	4	16	3	P > T2, SR
CAS Scales:							
Score		P (8/12/2015)	T1 (8/11/2015)	T2 (8/14/2015)	T3 (8/17/2015)	SR (8/21/2015)	Significant Differences Between Raters
Attention	Standard Score	93	91	79	86	79	P > T2, SR; T1 > T2, SR; T3 > T2, SR
	90% CI	87-100	87-96	74-84	82-91	76-87	
	Percentile Rank	32	27	7	18	8	
	EFS/EFW	-	-	-	-	-	
Emotion Regulation	Standard Score	78	84	80	84	76	P > T1, T3, T2, SR; T1 > SR; T3 > SR
	90% CI	73-83	80-75	77-83	80-73	80-72	
	Percentile Rank	7	-	9	14	5	
	EFS/EFW	-	Weakness	Weakness	Weakness	Weakness	
Flexibility	Standard Score	75	82	72	103	59	T1 > P, T2, SR; T3 > P, T2, SR; P > SR; T2 > SR
	90% CI	70-87	85-100	67-82	85-116	55-75	
	Percentile Rank	5	36	3	58	1	
	EFS/EFW	-	-	-	-	Weakness	
Inhibitory Control	Standard Score	87	83	78	76	83	P > T3
	90% CI	81-98	78-90	72-88	74-93	79-90	
	Percentile Rank	19	13	7	5	16	
	EFS/EFW	-	-	-	Weakness	-	
Initiation	Standard Score	84	92	73	96	82	T3 > P, SR, T2; T1 > T2; P > T2
	90% CI	78-93	85-99	69-81	90-103	76-90	
	Percentile Rank	14	30	4	39	12	
	EFS/EFW	-	-	-	-	-	
Organization	Standard Score	79	87	71*	92	86	T1 > T2; SR > T2; T3 > T2
	90% CI	74-87	82-95	67-76	77-99	79-97	
	Percentile Rank	8	19	3	12	18	
	EFS/EFW	-	-	-	-	-	
Planning	Standard Score	79	91	74	98	87	T3 > SR, P, T2; T1 > P, T2; SR > T2
	90% CI	74-87	83-98	70-80	85-103	80-96	
	Percentile Rank	8	27	4	45	19	
	EFS/EFW	-	-	-	-	-	
Self-Monitoring	Standard Score	89	99	89	89	74	T1 > SR; T3 > SR
	90% CI	76-93	85-99	77-95	83-97	70-90	
	Percentile Rank	12	36	12	23	4	
	EFS/EFW	-	-	-	-	-	
Working Memory	Standard Score	85	100	91	82	83	T1 > SR, T2, P, T3; T2 > T3
	90% CI	82-93	101-113	85-98	77-89	80-104	
	Percentile Rank	18	76	27	12	32	
	EFS/EFW	-	-	-	-	-	

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Conrad

Module 3 of the Autism Diagnostic Observation Schedule was administered as a semistructured interview of communication and social interaction to examine the presence of autism.

Social Affect Total 14
Restrictive and Repetitive Behavior Total 2
(Autism Cutoff) (Autism Spect Cutoff)
Overall Total 16 (Cutoffs – 9 Autism; 7 ASD ASD)
ADOS-2 comparison score: 9
ADOS classification: High

11
6

Conrad

	I.Q. (mean = 100; s.d = 15)	Percentiles (mean = 50)	90% Confidence Interval
Planning	104	61st	97-110
Simultaneous	95	37th	89-101
Attention	88	21st	82-97
Successive	106	66th	99-112
EF without Working Memory	88	21st	81-98
EF with Working Memory	89	24th	83-97
Working Memory	94	34th	88-101
Verbal Content	95	37th	88-102
Nonverbal Content	95	37th	89-102
FULL SCALE	97	42nd	93-101

Visual-Auditory Comparison - Significant visual/auditory with stronger visual than auditory.

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Conrad

Standard Scores (mean = 100; s.d= 15)

	2010	2012	2015
Planning	82	100	104
Simultaneous	103	120	95
Attention	74	106	88
Successive	108	105	106
Full Scale	89	111	97

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Standard Scores (mean = 100; s.d= 15)

	2010	2012	2015
Letter/Word Identification	129	109	117
Applied Problems	150	127	132
Spelling	134	122	104
Passage Comprehension	107	122	117
Calculation	158	131	110
Writing Samples	105	114	110
Word Attack	117	109	94
Sentence Reading Fluency	126	122	137
Math Facts Fluency	123	98	111
Sentence Writing Fluency	77	104	104
Spelling of Sounds	112	104	101
Reading	n/a	n/a	109
BROAD READING	122	119	133
BASIC READING SKILLS	125	110	108
MATHEMATICS	165	133	122
BROAD MATHEMATICS	162	130	120
MATH CALCULATION SKILLS	152	122	112
WRITTEN LANGUAGE	121	123	108
BROAD WRITTEN LANGUAGE	112	119	108
WRITTEN EXPRESSION	95	112	109
ACADEMIC SKILLS	139	124	112
ACADEMIC FLUENCY	106	112	126
ACADEMIC APPLICATIONS	127	129	126
PHONEME/GRAPHEME KNOWLEDGE	116	108	97
BRIEF ACHIEVEMENT	143	122	121
BROAD ACHIEVEMENT	133	126	125

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Conrad

	T-scores
Total Score	**90**
Anxiety Probability Score	Very high
Separation Anxiety/Phobias	**84**
Generalized Anxiety Disorder Index	**90**
Social Anxiety Total	**78**
Humiliation/Rejection	74
Performance Fears	73
Obsessions and Compulsions	**90**
Physical Symptoms Total	**90**
Panic	90
Tense/Restless	85
Harm Avoidance	**60**

120

Conrad

Resiliency Scale

	T-Scores (mean = 50; s.d = 10)
Sense of Mastery	25
Sense of Relatedness to Others	27
Sense of Emotional Reactivity	79
Resource Index	**24**
Vulnerability Index	**82**

12 1

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DSM-5 Diagnostic Overview

Autism Spectrum Disorder without accompanying intellectual or language impairment
Generalized Anxiety Disorder
Unspecified Depressive Disorder
Attention-Deficit/Hyperactive Disorder, Combined Presentation
Oppositional Defiant Disorder

12 2

Interagency Autism Coordinating Committee 2011 Strategic Plan for ASD Research

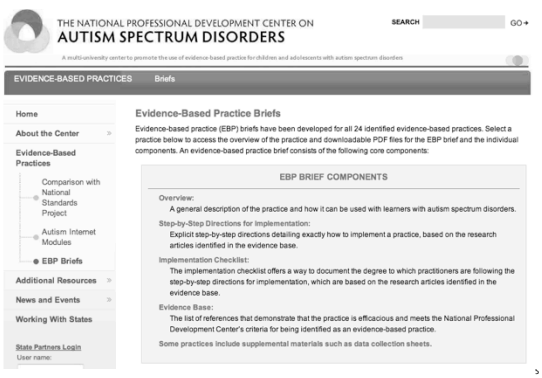
- http://iacc.hhs.gov/strategic-plan
- Update mandated by Combating Autism Act of 2006 authorizing one billion to be spent over 5 years on ASD research.
- Provides a set of research recommendations.
- New areas of focus include: augmentative communication, related health concerns and mental health issues.
- Efforts directed at creating public and private joint projects.

12 3

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.

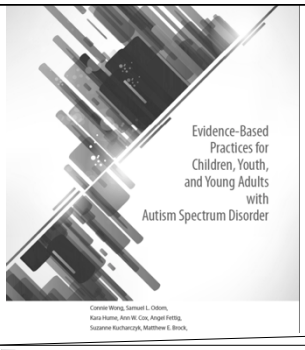
http://autismpdc.fpg.unc.edu/content/briefs



http://autismpdc.fpg.unc.edu/content/briefs

EVIDENCE-BASED PRACTICES FOR CHILDREN AND YOUTH WITH ASD

Antecedent-Based Interventions (ABI)
Computer-Aided Instruction
Differential Reinforcement
Discrete Trial Training
Extinction
Functional Behavior Assessment
Functional Communication Training
Naturalistic Intervention
Parent-Implemented Interventions
Peer-Mediated Instruction and Intervention
Picture Exchange Communication System (PECS)
Pivotal Response Training
Prompting
Reinforcement
Response Interruption/Redirection
Self-Management
Social Narratives
Social Skills Groups
Speech Generating Devices/VOCA
Structured Work Systems
Task Analysis
Time Delay
Video Modeling
Visual Supports



http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/2014-EBP-Report.pdf

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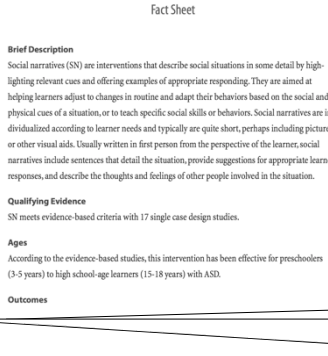
Social Narratives
Fact Sheet

Brief Description

Social narratives (SN) are interventions that describe social situations in some detail by highlighting relevant cues and offering examples of appropriate responding. They are aimed at helping learners adjust to changes in routine and adapt their behaviors based on the social and physical cues of a situation, or to teach specific social skills or behaviors. Social narratives are individualized according to learner needs and typically are quite short, perhaps including pictures or other visual aids. Usually written in first person from the perspective of the learner, social narratives include sentences that detail the situation, provide suggestions for appropriate learner responses, and describe the thoughts and feelings of other people involved in the situation.

Qualifying Evidence

SN meets evidence-based criteria with 17 single case design studies.

Ages

According to the evidence-based studies, this intervention has been effective for preschoolers (3-5 years) to high school-age learners (15-18 years) with ASD.

Outcomes

12
8

Why Might Early Intervention Work?

- Intervene before adverse behaviors are reinforced.
- Capitalize on the early experience-expectant plasticity of the brain.
- Impact gene expression.
- Employed at point social behaviors develop.
- Promote complex neural networks and connectivity through thematic, multi-sensory and multi-domain teaching approaches.

12
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Components of an Effective Treatment Program

- Structured behavioral treatment
- Parent involvement
- Treatment at an early age
- Intensive intervention
- Social skill development
- Focus on generalization of skills
- Appropriate school setting
- Medication?

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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1

Medications

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

New Drug May Treat ASD

Sci Transl Med 19 September 2012:
Vol. 4, Issue 152, p. 152ra127
Sci. Transl. Med. DOI: 10.1126/scitranslmed.3004214

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RESEARCH ARTICLE

FRAGILE X SYNDROME

Effects of STX209 (Arbaclofen) on Neurobehavioral Function in Children and Adults with Fragile X Syndrome: A Randomized, Controlled, Phase 2 Trial

Elizabeth M. Berry-Kravis[1], David Hessl[2], Barbara Rathmell[3], Peter Zarevics[3], Maryann Cherubini[3], Karen Walton-Bowen[3], Yi Mu[4], Danh V. Nguyen[4], Joseph Gonzalez-Heydrich[5], Paul P. Wang[3,*], Randall L. Carpenter[3], Mark F. Bear[6] and Randi J. Hagerman[7]

+ Author Affiliations

*To whom correspondence should be addressed. E-mail: pwang@seasidetherapeutics.com

ABSTRACT

Research on animal models of **fragile X** syndrome suggests that STX209, a γ-aminobutyric acid type B ($GABA_B$) agonist, might improve neurobehavioral function in affected patients. We evaluated whether STX209 improves behavioral symptoms of **fragile X** syndrome in a randomized, double-blind, placebo-controlled crossover study in 63 subjects (55 male), ages 6 to 39 years, with a full mutation in the *FMR1* gene (>200 CGG triplet repeats). We found no difference from placebo on the primary endpoint, the Aberrant Behavior Checklist—Irritability (ABC–I) subscale. In the other analyses specified in the protocol, improvement was seen on the visual analog scale ratings of parent-nominated problem behaviors, with positive trends on multiple global measures. Post hoc analysis with the ABC—Social Avoidance scale, a newly validated scale for the assessment of **fragile X** syndrome, showed a significant beneficial treatment effect in the full study population. A post hoc subgroup of 27 subjects with more severe social impairment showed improvements on the Vineland II-Socialization raw score, on the ABC—Social Avoidance scale, and on all global measures. STX209 was well tolerated, with 8% incidences of sedation and of headache as the most frequent side effects. In this exploratory study, STX209 did not show a benefit on irritability in **fragile X** syndrome. Nonetheless, our results suggest that $GABA_B$ agonists have potential to improve social function and behavior in patients with **fragile X** syndrome.

Psychostimulants for ADHD-like symptoms in individuals with autism spectrum disorders.

Cortese S, Castelnau P, Morcillo C, Roux S, Bonnet-Brilhault F.

Institute for Pediatric Neuroscience, NYU Child Study Center, Langone Medical Center, 215 Lexington Avenue, 14th Floor, 10016 NY, USA. samuele.cortese@gmail.com.

Expert Rev Neurother. 2012 Apr;12(4):461-73.

We conducted a comprehensive review of studies assessing the efficacy and tolerability of psychostimulants for ADHD-like symptoms in individuals with autism spectrum disorder (encompassing autism disorder, Asperger's syndrome and pervasive developmental disorders not otherwise specified). PubMed, Ovid, EMBASE, Web of Science, ERIC and CINHAL were searched through 3 January 2012. From a pool of 348 potentially relevant references, 12 citations (11 studies) were retained as pertinent. Four of the included studies had a randomized controlled design. Most of the studies assessed methylphenidate immediate release. Despite inter-study heterogeneity, taken together, the results of the selected reports suggest that psychostimulants may be effective for ADHD-like symptoms in autism spectrum disorder individuals. The most common adverse events reported in the included trials were appetite reduction, sleep-onset difficulties, irritability and emotional outbursts. We discuss future directions in the field, including the need for trials assessing more ecological outcomes and combined treatment strategies tailored to the specific individual features.

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Positive Effects of Methylphenidate on Social Communication and Self-Regulation in Children with Pervasive Developmental Disorders and Hyperactivity

Laudan B. Jahromi, Connie L. Kasari, James T. McCracken, Lisa S-Y. Lee, et. al.

Journal of Autism and Developmental Disorders, 2009)

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

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

- Just 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.

13 7

Oxytocin May Have Many Effects

13 8

Biological Psychiatry
Available online 2 July 2015
In Press, Accepted Manuscript — Note to users

Oxytocin treatment, circuitry and autism: a critical review of the literature placing oxytocin into the autism context

Adam J. Guastella, Ian B. Hickie

"For the autism field, the therapeutic challenges will be resolved by a range of treatment strategies, including greater focus on specific interventions, such as oxytocin, that have a strong basis in the fundamental neurobiology of social behaviour. More sophisticated and targeted clinical trials utilising such approaches are now required, placing oxytocin into the autism context."

13 9

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. MCDOUGLE, 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.

14 0

Comorbid ADHD and Anxiety Affect Social Skills Group Intervention Treatment Efficacy in Children With Autism Spectrum Disorders

Kevin M. Antshel, PhD, Carol Polacek, PhD, NP, Michele McMahon, CSW, Karen Dygert, NP, Laura Spenceley, MA, Lindsay Dygert, BS, Laura Miller, BA, Fatima Faisal

ABSTRACT: ***Objective*: To assess the influence of psychiatric comorbidity on social skill treatment outcomes for children with autism spectrum disorders (ASDs). *Methods:* A community sample of 83 children (74 males, 9 females) with an ASD (mean age = 9.5 yr; SD = 1.2) and common comorbid disorders participated in 10-week social skills training groups. The first 5 weeks of the group focused on conversation skills and the second 5 weeks focused on social problem solving skills. A concurrent parent group was also included in the treatment. Social skills were assessed using the Social Skills Rating System. Ratings were completed by parents at pre- and posttreatment time periods. *Results:* Children with ASD and children with an ASD and comorbid anxiety disorder improved in their parent reported social skills. Children with ASD and comorbid attention deficit/hyperactivity disorder failed to improve. *Conclusion:* Psychiatric comorbidity affects social skill treatment gains in the ASD population.**

(J Dev Behav Pediatr 32:439–446, 2011) **Index terms:** autism spectrum, social skills, ADHD.

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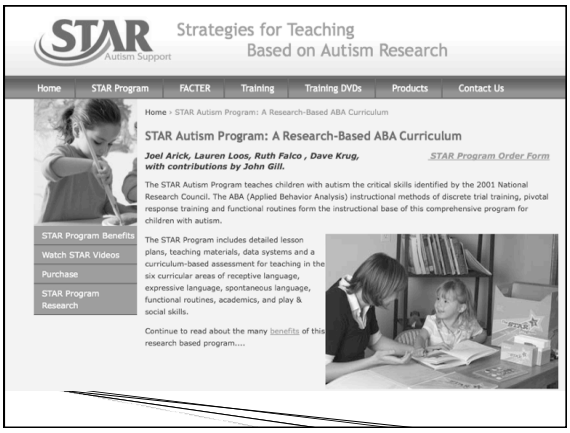

The first randomized, controlled trial for comprehensive autism treatment for children as young as 18 months old.

While certainly not a cure for the condition, the study did find that intense early treatment yields major improvements in IQ scores, language processing, and in the ability to manage everyday tasks essential for early childhood development and education.

Published in *Pediatrics* the University of Washington study was funded by the National Institute of Mental Health. It involved 48 children ages 18 to 30 months, half of whom were randomly assigned to receive the Early Start Denver Model, an intensive autism therapy protocol. The other half were assigned to a control group and received less intensive therapy.

After two years, those who participated in the Denver Model group had average IQ scores 17.6 points higher than the control group, putting them within the range of normal intelligence, while those in the other group gained just seven points, remaining in the zone of intellectual disability.

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The SCERTS® Model

(Prizant, Wetherby, Rubin & Laurent, 2007)

What is SCERTS?

SCERTS® is an innovative educational model for working with children with autism spectrum disorder (ASD) and their families. It provides specific guidelines for helping a child become a competent and confident social communicator, while preventing problem behaviors that interfere with learning and the development of relationships. It also is designed to help families, educators and therapists work cooperatively as a team, in a carefully coordinated manner, to maximize progress in supporting a child.

The acronym "SCERTS" refers to the focus on:

"SC" - Social Communication – the development of spontaneous, functional communication, emotional expression, and secure and trusting relationships with children and adults;

"ER" - Emotional Regulation - the development of the ability to maintain a well-regulated emotional state to cope with everyday stress, and to be most available for learning and interacting;

"TS" – Transactional Support – the development and implementation of supports to help partners respond to the child's needs and interests, modify and adapt the environment, and provide tools to enhance learning (e.g., picture communication, written schedules, and sensory supports). Specific plans are also developed to provide educational and emotional support to families, and to foster teamwork among professionals.

The SCERTS model targets the most significant challenges faced by children with ASD and their families. This is accomplished through family-professional partnerships (family-centered care), and by prioritizing the abilities and supports that will lead to the most positive long-term outcomes as indicated by the National Research Council (2001; Educating Children with Autism). As such, it

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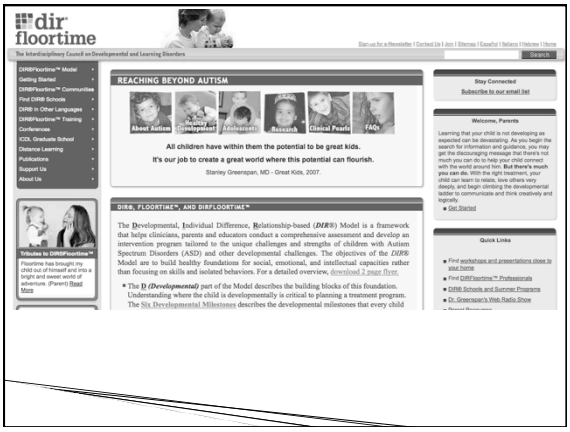

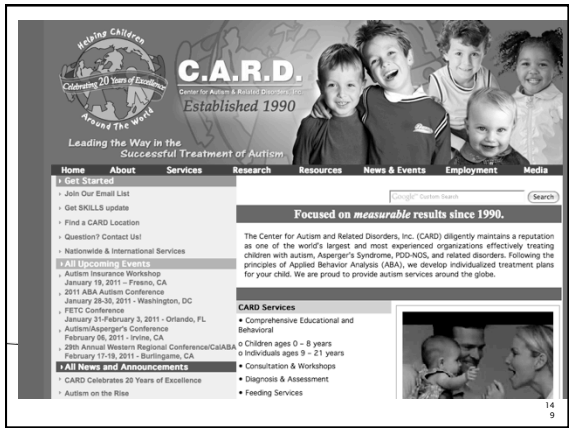

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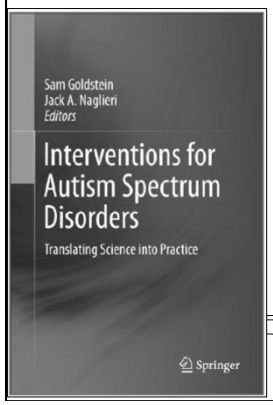

Evaluation of Treatment Effect with the ASRS

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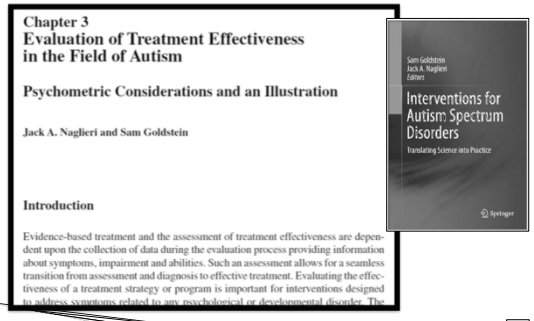
Treatment Evaluation with ASRS



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

15 1

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

15 2

Treatment Evaluation with ASRS

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

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

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

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

15 3

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		
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Stereotypy	49	54
Behavioral rigidity	72	48
Sensory sensitivity	*44*	48
Attention	*71*	*73*

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

15
4

Treatment Evaluation with ASRS

- Raters agree except for Unusual Behavior and Behavioral Rigidity scales.

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

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

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Treatment Evaluation with ASRS

- The difference between Donny's Unusual Behavior scores as rated by his mother (60) and teacher (51) suggests that behaviors in the home and the classroom are different; which implies that the exploration of the environmental impact on his odd behaviors could lead to good intervention options.
- The significant difference between Donny's Behavioral Rigidity scores as rated by his mother (72) and teacher (48), which also warrants further exploration.

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Treatment Evaluation with ASRS

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

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

T-scores greater than 59 appear in italic text

[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

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

3 Evaluation of Treatment Effectiveness in the Field of Autism 51

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

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

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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.

Clinical Psychology Review
Volume 34, Issue 1, February 2014, Pages 73–86

Cognitive, language, social and behavioural outcomes in adults with autism spectrum disorders: A systematic review of longitudinal follow-up studies in adulthood

Iliana Magiati[a], Xiang Wei Tay[a], Patricia Howlin[b, c]

Highlights

- Twenty five adult outcome studies of individuals with ASD were identified.
- Overall, cognitive scores were stable; adaptive skills and ASD symptoms improved.
- Social outcomes were generally poor for many participants.
- Early IQ and language predicted outcomes; but with large individual differences.
- Quality of life and socio-emotional factors should be considered in future work.

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lf
, 2008

Were They but There at Night

There is a bolder field where every stone
Is a glazed, glittering gem, like stars fallen from the sky
All except one, a plain grey rock alone in the center
Feeling excluded and shunned
People come, tourists, painters, photographers, collectors
To view each shining bolder, a pleasure to the beholder
Ooh! Ahh! Look at this one! Come quick!
Pockets bulge with fragments and paint cans run dry
But the grey rock remains ignored
An ugly blotch on a sweeping mural
The sun sets, everyone leaves
And they miss the centerpiece of the field
For when night falls, the grey rock in the center
It glows in the dark

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