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Autism Spectrum Disorders (ASD) in the Schools: Evidence-Based Screening and Assessment

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Presentation Objectives
- Present evidence-based criteria to guide school psychologists in the selection, use, and interpretation of screening and assessment tools for ASD.
- The autism spectrum disorders.
- Educational vs clinical definition of autism.
- DSM-IV-TR.
- Individuals with Disabilities Education Act (IDEA).
- Prevalence in the schools.
- Special education law.
- Best practice parameters for screening and assessment.
- Future directions.

Autism Spectrum Disorders (ASD)
- The clinical terms Autism Spectrum Disorder (ASD) and Pervasive Developmental Disorder (PDD) refer to a continuum of associated neurobehavioral disorders.
- A brain disorder that impacts communication, social interaction, cognitive development and behavior.
- Primarily a social-communication disability.
- The PDD/ASD category is one of the fastest growing disability categories in the world. ASD is now more prevalent in the pediatric population than cancer, diabetes, spina bifida, and Down syndrome.

What We Know
- Autism is not an emotional or conduct disorder.
- Autism is not a mental illness.
- Co-existing (comorbid) disorders include ADHD, seizure disorder, oppositional defiant disorder, obsessive-compulsive disorder, and other anxiety disorders, tic disorders, and mood disorders.
- Level of cognitive and language functioning is related to symptom severity and outcome.
- There are no medical tests that can diagnose autism.
- Autism has no racial, ethnic, or social boundaries.

What We Know
- Family income, lifestyle, and educational levels do not affect the chance of occurrence.
- Autism is 4 times more prevalent in boys than girls.
- There are gender differences in phenotypic expression.
- There is a broad autism phenotype.
- Siblings of people with autism have an 18 percent increase of being diagnosed with an ASD.
- The US is facing $90 billion annually in costs for autism.
- Costs can be reduced by 2/3 with early diagnosis/intervention.

Acknowledgement
Adapted from:
ASD in 100 Words or Less

- Autism spectrum disorders (ASD) occur in 1-2% of the population, are strongly heritable, and result from atypical neurodevelopment. They are characterized by an uneven developmental profile and a pattern of qualitative impairments in communication and socialization, and by a limited (and often unusual) range of activities or interests. This triad of impairments exists on a continuum that varies in severity of symptoms, age of onset, and association with other childhood disorders. Although many children are not identified until school age, ASD is a life-long condition that has implications for education, social development, and community adjustment.

- Adapted from Baron-Cohen, 2008

The Autistic Triad

- Triad of impairments:
  1) Reciprocal social interactions;
  2) Verbal and nonverbal communication;
  3) Restricted and repetitive behaviors or interests.

- These delays/atypicality in social development, communication, neurocognition, and behavior vary in severity of symptoms, age of onset, and association with other childhood disorders.

We will focus on Autistic Disorder, Asperger’s Disorder, and PDD-NOS

Characteristics of Autism Spectrum Disorders

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Autistic Disorder*</th>
<th>Asperger’s Disorder</th>
<th>PDD-NOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Skills</td>
<td>Very poor</td>
<td>Poor</td>
<td>Variable</td>
</tr>
<tr>
<td>Language and Communication</td>
<td>Usually poor</td>
<td>Fair</td>
<td>Fair to good (a)</td>
</tr>
<tr>
<td>Repetitive manner and activities</td>
<td>Variable</td>
<td>Marked</td>
<td>Variable (a)</td>
</tr>
<tr>
<td>Intellectual Ability</td>
<td>Severe ID to normal</td>
<td>Mild ID to normal</td>
<td>Mild ID to normal</td>
</tr>
<tr>
<td>Age of Onset</td>
<td>0 to 36 Months</td>
<td>Usually &gt; 36 Months</td>
<td>Variable</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>M &gt; F</td>
<td>M &gt; F</td>
<td>M &gt; F</td>
</tr>
<tr>
<td>Overall Degree of Impairment</td>
<td>Variable</td>
<td>Mild</td>
<td>Mild</td>
</tr>
</tbody>
</table>

Note: * Includes high-functioning autism (HFA).
(a) At least one of these two features must be present.


Clinical vs Educational Classification

- The specific criteria for autism differ among the various diagnostic and classification schemes. Although a variety of systems exist, the Individuals with Disabilities Education Act of 2004 (IDEA) and the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) have made the greatest impact on the assessment and classification of children with autism

DSM-IV-TR

- DSM-IV-TR is concerned with classifying mental disorders.
- The classification process depends upon the clinical judgment of the mental health professional.
- The DSM-IV-TR uses a medical model.
- The DSM-IV-TR was written primarily by physicians and intended primarily for use by physicians.
- School psychologists should have a broad understanding of the DSM IV-TR multiaxial diagnostic system.
- School psychologists are capable of making competent psychiatric classifications.
DSM-5 Proposal

- A new category of autism spectrum disorder, incorporating autistic disorder (autism), Asperger’s disorder, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified (PDD-NOS).
- The autistic triad will now become a dyad:
  1) Social/communication deficits
  2) Fixated interests and repetitive behaviors
- A consideration of severity with the diagnosis (Levels).

IDEA

- Unlike the DSM-IV, IDEA specifies 13 disability categories to determine eligibility for special educational services.
- The educational definition of autism is considered sufficiently broad and operationally acceptable to accommodate both the clinical and educational descriptions of autism and related disorders.
- A student can have a psychiatric diagnosis yet not be eligible for special education under IDEA.
- In many respects, these disability categories may be considered de facto diagnoses.

IDEA Definition

- (c)(1)(i) Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, that adversely affects a student’s educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. The term does not apply if a student’s educational performance is adversely affected primarily because the student has an emotional disturbance, as defined in this section.
- (ii) A student who manifests the characteristics of “autism” after age 3 could be diagnosed as having “autism” if the criteria in paragraph (c)(1)(i) of this section are satisfied.

Florida Definition

- Autism Spectrum Disorder is defined to be a range of pervasive developmental disorders that adversely affects a student's functioning and results in the need for specially designed instruction and related services. Autism Spectrum Disorder is characterized by an uneven developmental profile and a pattern of qualitative impairments in social interaction, communication, and the presence of restricted repetitive and/or stereotyped patterns of behavior, interests, or activities. These characteristics may manifest in a variety of combinations and range from mild to severe. Autism Spectrum Disorder may include Autistic Disorder, Pervasive Developmental Disorder Not Otherwise Specified, Asperger’s Disorder, or other related pervasive developmental disorders.

Categorical vs Dimensional

- The DSM-IV-TR lists specific criteria for each disorder that must be met to receive a diagnostic classification. Similarly, the Individuals with Disabilities Education Act (IDEA) specify categories of special education disability. Both are categorical rather than dimensional systems of classification (e.g., a child meets or does not meet criteria) and both focus on a description of behavior rather than function.
- Children with the same diagnostic classification are likely to be heterogeneous and many childhood disorders, including autism, fall along a continuum in the general population.

Symptom Severity

- Autistic behaviors are continuously distributed in the school age population

- Skuse et al 2009; Baron-Cohen 2008
Waiting for a Diagnosis

- A survey of parents of school-age children with ASD across five countries (including the US) found an average diagnosis age of 7.5 years for higher functioning ASD such as Asperger syndrome.
- Parents reported visiting, on average, between four and five clinicians en route to an ASD diagnosis.
- In many instances, parents waited more than 5 years before a diagnosis was confirmed.
- Nearly half of the families reported that the school system and other parents were the major source of assistance.
- A recent study examining the timing of identification among children with autism using a population-based sample in the US found the gap between potential and actual age of identification to be in the range of 2.7 to 3.7 years. More than one quarter of cases were never identified as having ASD through age 8.

ASD in the Schools

- Not all cases will be identified prior to school.
- Average age of autistic disorder is 5.6 years.
- Average age of higher functioning ASDs is 11 years.
- Only 3% of children with ASD are identified solely by non-school resources.
- All other children are identified by a combination of school and non-school resources (57%), or by school resources alone (40%).

ASD in the Schools

- While the number of students, ages 6-21, served under IDEA, Part B, in the U.S. remained generally constant for most disability categories between Fall 1999 and Fall 2008, the number of students served who were classified with autism increased four fold from 66,043 in 1999 to 292,818 in 2008.
- Compared with general population estimates, children with mild to moderate autistic traits continue to be an underidentified and underserved population in our schools.
- There are many students with social-communication impairments who do not meet the clinical definition of ASD.

Prevalence Trends

![Prevalence rates for mental retardation, developmental delay, and Autism for eight year olds for the years 1990-2007 (5th-8th grades 1990-2005). Source: U.S. Dept. of Education (IDEA) and CDC (BRH) data.](chart)

Identification

- There are no specific biological or test markers.
- Diagnosis is made by behavioral criteria.
- A team approach is essential.
- Comprehensive developmental model.
- No single measure provides a definitive diagnosis.
- Assessment of symptom severity.
- Assessment is a continuing process, rather than a single event.

By the Numbers
Screening, Diagnosis, and Assessment

- **Screening** refers to the process of identifying school children most likely to have an ASD and/or developmental delay.
- **Referral** is the process of initiating an evaluation of a child in this age group.
- The terms **diagnostic evaluation**, **diagnosis**, and **classification** refer to the process of assigning a specific diagnostic or special education label.
- **Assessment** describes the process of evaluating the child’s level of functioning in multiple developmental areas and his or her unique pattern of strengths and weaknesses.

Why Assess

- **Four** principal reasons to conduct an ASD assessment:
  1) To verify the presence of the disorder and quantify symptom severity.
  2) To generate interventions for educational programming.
  3) To establish a baseline for progress monitoring.
  4) To determine whether an ASD has been overlooked or misclassified, describe coexisting (comorbid) disorders, or identify an alternative classification.

Who Should Assess?

- School districts must ensure that comprehensive individualized evaluations are completed by school professionals who have **knowledge, experience, and expertise in ASD**. If qualified personnel are not available, school districts should provide the appropriate training or retain the services of a consultant.
- School psychologists are exceptionally well-qualified to conduct behavioral screening and assess students at risk for ASD.
- Brock et al., 2006; Yell et al., 2003

The Diagnosis Problem

- **Definition**: *di-ag-no-sis* (noun)
  a) investigation or analysis of the cause or nature of a condition, situation, or problem
  - Merriam-Webster
  b) a statement or conclusion from such an analysis
  - Merriam-Webster

Evaluation Components

- **Four** components of minimum student evaluation:
  1) Documented and dated behavioral observations.
  2) Comprehensive social/developmental history addressing the core features of ASD.
  3) Comprehensive psychological evaluation.
  4) Comprehensive speech/language evaluation.

  Medical information provided by a licensed physician shall be considered –
  -Florida Department of Education

Eligibility Criteria

- There must be evidence of all of the following:
  - An uneven developmental profile across the domains of social interaction, adaptive behavior, and/or cognitive skills.
  - Impairment in social interaction evidenced by delayed, absent, or atypical ability to relate to people or the environment.
  - Impairment in verbal and/or nonverbal language or social communication skills.
  - Restricted repetitive and/or stereotyped patterns of behavior, interests, or activities.

  -Florida Department of Education
Special Education Law

- IDEA definition is the controlling authority with regard to eligibility decisions for special education.
- While the DSM-IV-TR criteria are helpful, they are neither legally required nor sufficient for determining educational placement.
- When it comes to special education, it is state and federal education codes and regulations (not DSM IV-TR) that drive eligibility decisions.
- School psychologists should make sure that children meet the criteria for autism as outlined by IDEA and use the DSM-IV to the extent that the diagnostic criteria include the same core behaviors (e.g., difficulties with social interaction, difficulties with communication, and the frequent exhibition of repetitive behaviors or circumscribed interests).

Evidence-Based Assessment

- Evidence-based tools provide a reliable and valid assessment of the autistic triad. They are problem-specific and based on relevance to identification, differential diagnosis and classification, intervention planning and monitoring, outcome, professional experience, psychometric adequacy, and/or a combination of these in both the research and practice literature. All provide information critical to the delivery of services to children with ASD.

- Fogt et al., 2003; Mandlawitz, M. R. 2002

Diagnostic Accuracy/Validity

- **Sensitivity**: Percentage of cases with a disorder that test positive.
- **Specificity**: Percentage of cases without a disorder that test negative.
- **False negative**: Percentage of cases with a disorder who test negative.
- **False positive**: Percentage of cases without a disorder who test positive.
- **Positive Predictive Value (PPV)**: The power of an instrument to identify a disorder. Instruments are expected to have high PPV with a known high-risk group.

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Selected Screening Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age Range</th>
<th>Informant</th>
<th>No. of Items</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Time to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASRS (a)</td>
<td>2 to 18</td>
<td>Parent/Teacher</td>
<td>15 (Likert Scale)</td>
<td>.94</td>
<td>.92</td>
<td>10 min</td>
</tr>
<tr>
<td>ASSQ (b)</td>
<td>6 to 17</td>
<td>Parent/Teacher</td>
<td>27 (Likert Scale)</td>
<td>.91</td>
<td>.80</td>
<td>10-20 min</td>
</tr>
<tr>
<td>SCQ (c)</td>
<td>4 to Adult</td>
<td>Parent</td>
<td>40 (yes/no)</td>
<td>.96</td>
<td>.80</td>
<td>10 min</td>
</tr>
<tr>
<td>SCDC (d)</td>
<td>4 to 16</td>
<td>Parent</td>
<td>12 (yes/no)</td>
<td>.88</td>
<td>.91</td>
<td>10 min</td>
</tr>
<tr>
<td>SRS (e)</td>
<td>4 to 18</td>
<td>Parent and/or Teacher</td>
<td>65 (Likert Scale)</td>
<td>.85</td>
<td>.75</td>
<td>10-20 min</td>
</tr>
</tbody>
</table>

Note: ASRS - Autism Spectrum Rating Scales; ASSQ- Autism Spectrum Screening Questionnaire; SCQ - Social Communication Questionnaire; SCDC - Social Communication Disorders Checklist; SRS - Social Responsiveness Scale.

Availability: (a) Purchase: Multi-Health Systems (MHS); (b) Appendix: Ehlers et al., 1999; (c) Purchase: Western Psychological Services; (d) Appendix: Skuse et al., 2005; (e) Purchase: Western Psychological Services.

Multi-Tier Screening Model

- **Tier One**: The initial step is case finding. Students who present with elevated developmental risk factors and/or warning signs of ASD.
- **Tier Two**: Once screened, scores on the ASRS, ASSQ, SCQ, SCDC, and SRS can be used as an indication of the approximate severity of ASD symptomatology.
- **Tier Three**: Students who meet the threshold criteria in Tier Two may then be referred for an in-depth assessment and intensive intervention. Because the ASRS, SCQ, and SRS report good reliability and high levels of diagnostic validity, results from these screening measures can be integrated into a comprehensive developmental assessment.
Comprehensive Developmental Assessment

- Components:
  - Record review
  - Developmental and medical history
  - Medical screening and/or evaluation
  - Parent/caregiver interview
  - Parent/teacher ratings of social competence
  - Direct child observation
  - Cognitive assessment
  - Academic assessment
  - Adaptive behavior assessment
  - Communication and language assessment

Additional Domains

Behavioral/Emotional Problems: Research indicates that children with ASD have a high risk for meeting criteria for other disorders, such as disruptive behavior disorders, mood, and anxiety disorders, all which contribute to overall impairment. These problems should be assessed whenever significant behavioral issues become evident or when major changes in behavior are reported.

Executive Function and Attention: Research evidence suggests that deficits in executive function may be an important feature of ASD. School-age children with ASD frequently demonstrate symptoms associated with attention-deficit/hyperactivity disorder. Research indicates that ADHD is a common initial diagnosis for many children with ASD; An assessment of ADHD characteristics may be included when notation and/or impulsivity are indicated in presenting problems.

Family System: Research has shown that parents of children with autism exhibit a characteristic stress profile related to the child's unique interpersonal problems. Deficits in social skills, stressors, and long-term care are correlated. Because stress can directly influence the parent or caregiver's ability to support the child with disabilities, the identification of parenting stress and parent-child relationship problems can also alert the assessment team to the need for additional support and counseling.

Motor: Although motor skills are often less affected in autism than are other developmental skills, many children with ASD have problems in fine and/or gross motor functioning and visual-motor integration. Some students may demonstrate arthrogrypous motor development, poor coordination, or deficits in praxis (motor planning, execution, and sequencing).

Sensory Processing: Although sensory issues are considered a “nontriadic” characteristic and often overlooked in many ASD assessment procedures, attention to sensory problems can be an important component of a screening or evaluation.

Core Assessment Domains

Direct Observation: Direct observation should take place throughout the assessment and intervention planning process. The specific format can be either formal or informal.

Parent/Teacher Report: Because social impairment is a defining core feature of ASD, the determination of social functioning is fundamental to the assessment and evaluation of the student. Questionnaires completed by parents and teachers are one of the most valid sources of information about the child's social responsiveness and social-communication skills.

Achievement: The assessment of academic ability is necessary for the purposes of educational decision making and planning. Assessment of academic functioning will often reveal a profile of strengths and weaknesses.

Cognitive: A critical domain of the core assessment is intellectual or cognitive functioning. The level of intellectual functioning is associated with the severity of autistic symptoms, skill acquisition and learning ability, and level of adaptive functioning.

Communication: The assessment of communication skills is a vital component of a comprehensive ASD assessment. The level of expressive language, together with IQ, is a good predictor of long-term outcome, so it is an especially important domain to measure in terms of intervention planning. Particular attention should be given to the pragmatics, social communicative functions of language (e.g., tone taking, understanding of references and figurative expression) as well as to the instrumental skills needed to communicate and regulate interaction.

Adaptive Behavior: This domain is a fundamental component of the core ASD assessment battery. Assessment of adaptive behavior should always accompany intellectual testing. Measuring adaptive behavior is also important for setting appropriate goals in treatment and intervention planning.

Selected ASD-Specific Tools

<table>
<thead>
<tr>
<th>Measure</th>
<th>Format</th>
<th>Age Range</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Observation/Interaction:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADOS</td>
<td>Direct Testing</td>
<td>2 years to adult</td>
<td>30 to 60 min</td>
</tr>
<tr>
<td>ADI-R</td>
<td>Interview</td>
<td>16 months to adult</td>
<td>1 to 2.5 hrs</td>
</tr>
<tr>
<td>CARIS-2</td>
<td>Observation</td>
<td>2 years to adult</td>
<td>5 to 10 min</td>
</tr>
<tr>
<td>Parent/Teacher Report:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASRS</td>
<td>Questionnaire</td>
<td>2 to 18 years</td>
<td>5 to 15 min</td>
</tr>
<tr>
<td>SCQ</td>
<td>Questionnaire</td>
<td>4 to 18 years</td>
<td>10 to 15 min</td>
</tr>
<tr>
<td>SRS</td>
<td>Questionnaire</td>
<td>4 to 18 years</td>
<td>10 to 15 min</td>
</tr>
</tbody>
</table>


Gender Differences

- Gender differences should be considered in screening and assessment.
- Lower symptom severity scores for girls.
- Referrals for evaluation for boys are nearly 10x higher than for girls.
- Over reliance on the male model with regard to diagnostic criteria may result in test bias.
- Higher functioning girls on the spectrum are less impaired than boys.
- Qualitative difference in social connectedness and reciprocity.
- Gender-specific differences on the ASRS and SCQ. Gender differences should be considered in screening and assessment.
- A higher threshold cut-off scores for boys might be considered.

Autism Diagnostic Observation Scale (ADOS)

- Semi-structured assessment consisting of a standard set of interactions and activities that sample social, communication, and play behaviors.
- Four modules for use with different developmental and language levels.
- Activities vary based on language level and chronological age.
- Scoring algorithm results in a Communication score, a Reciprocal Social Interaction score, and a Total score (a sum of the Communication and Reciprocal Social Interactions scores). Algorithm cut-off score for Autism or the more broadly defined ASD in each of these areas.
- Does not include an algorithm for restricted and repetitive behaviors.
- Training in administration and coding is required.
- Should be used within the context of a comprehensive evaluation.
Other Popular Tools

- Popular third party rating scales such as the Gilliam Autism Rating Scale (GARS/GARS2), Asperger Syndrome Diagnostic Scale (ASDS), and Gilliam Asperger’s Disorder Scale (GADS) should be used with caution due to questions concerning standardization and norming procedures.

- Practitioners who are using or considering using the GARS/GARS2 should be aware of the instrument's poor sensitivity (.38 to .53) and underidentification of higher functioning ASD.

- Given its high false negative rate, the GARS2 is not recommended for inclusion as a primary phenotypic instrument in a comprehensive developmental assessment battery for ASD.

-Mazefsky & Oswald, 2006; Norris & Lecavalier, 2010

School Personnel

- Question: What are the levels of factual knowledge concerning autism (e.g., definition, assessment/diagnosis, and treatment) among school personnel (teachers, counselors, and Paraprofessionals)?

- Overall school personnel's factual knowledge about the definition of autism was correct only 51.7% of the time while 48.3% of the time they shared erroneous information.

- School personnel's perceived and factual knowledge about the assessment/diagnosis and treatment of autism was low.

- Williams et al. (2011)

Implications for School Psychologists

- School psychologists should be cautious about assuming that general and special education teachers, school counselors, and paraprofessionals have a factual understanding of autism.

- This limits effective communication, accurate assessment, and most importantly, improved student outcomes.

- While consulting and collaborating with school personnel, school psychologists should assess and determine whether an education/training workshop is needed.

- Address misinformation and the research to practice gap.

Future Research Directions

- Screening measures for moderate to severe levels of functioning.

- Direct comparison of screens and instruments.

- Explore sensitivity and specificity of particular items or group of items.

- Independent validation and replication of findings.

- Identification of ASD subtypes (e.g., PDD-NOS).

- Incremental validity of assessment domains.

- Interactive screening/test instruments.

References and Resources


References and Resources


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American Academy of Pediatrics <http://www.pediatrics.org>

Association for Science in Autism Treatment <http://www.nationalautismcenter.org>

Center for Autism and Related Disabilities (CARD) <http://www.coe.fau.edu/card>

Center for Disease Control and Prevention (CDC) <www.cdc.gov/ncbdd/autism/index.html>


National Information Center for Children and Youth with Disabilities (NICHCY) <http://www.nichcy.org>

National Institute of Student Health and Human Development Autism Site <http://www.nichd.nih.gov/autism

National Institutes of Health Autism Research Network <http://www.nationalautismcenter.org>

Contact Information

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