Identifying, Screening, & Assessing Autism at School

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Acknowledgement

Adapted from…
Presentation Outline

- Introduction: Reasons for Increased Vigilance
- Diagnostic Classifications and Special Education Eligibility
- Educator Roles, Responsibilities, and Limitations
- Case Finding
- Screening and Referral
- Assessment: Causes, Diagnosis, Prognosis, Special Education Evaluation
Introduction: Reasons for Increased Vigilance

- Autistic spectrum disorders are much more common than previously suggested.
  - 60 (vs. 4 to 6) per 10,000 in the general population (Chakrabarit & Fombonne, 2001).
  - 600% increase in the numbers served under the autism **IDEA** eligibility classification (U.S. Department of Education, 2003).
  - 95% of school psychologists report an increase in the number of students with ASD being referred for assessment (Kohrt, 2004).
Increased Prevalence in California

*Figure 1. Distribution of birth dates of regional center eligible persons with autism*

Report to the Legislature on the Principal Findings from The Epidemiology of Autism in California: A Comprehensive Pilot Study. M.I.N.D. Institute, University of California, Davis. October 17, 2002
Increased Prevalence (CA and U.S.)

Source: Autism Society of America (2003)
Explanations for Changing ASD Rates in the General Population

- Changes in diagnostic criteria.
- Heightened public awareness of autism.
- Increased willingness and ability to diagnose autism.
- Availability of resources for children with autism.
- Yet to be identified environmental factors.
Increased Prevalence in Special Education (U.S. Department of Education, 2005)

Total Number of Students Classified as Autistic and Eligible for Special Education Under IDEA by Age Group

- 6 – 11 years
- 12 – 17 years
- 18 – 21 years
Increased Prevalence in Special Education (U.S. Department of Education, 2005)

Student Classified as Autistic Under IDEA as a Percentage of all Students with Disabilities: 1991 to 2004
Explanations for Changing ASD Rates in Special Education

- Classification substitution
  - IEP teams have become better able to identify students with autism.
  - Autism is more acceptable in today’s schools than is the diagnosis of mental retardation.
  - The intensive early intervention services often made available to students with autism are not always offered to the child whose primary eligibility classification is mental retardation.
Increased Prevalence in Special Education (U.S. Department of Education, 2005)

School Population Rates of Mental Retardation and Autism Special Education Eligibility Classifications: 1991 to 2004

- **Mental Retardation**
  - 1991: 9.33
  - 1992: 9.94
  - 1993: 9.19
  - 1994: 9.4
  - 1995: 9.5
  - 1996: 9.45
  - 1997: 9.39
  - 1998: 9.28
  - 1999: 9.01
  - 2000: 8.81
  - 2001: 8.67
  - 2002: 8.43
  - 2003: 8.29
  - 2004: 8.16

- **Autism**
  - 1991: 0.09
  - 1992: 0.25
  - 1993: 0.32
  - 1994: 0.38
  - 1995: 0.48
  - 1996: 0.55
  - 1997: 0.67
  - 1998: 0.84
  - 1999: 1.01
  - 2000: 1.21
  - 2001: 1.49
  - 2002: 1.79
  - 2003: 2.13
  - 2004: 2.51
Increased Prevalence in Special Education (U.S. Department of Education, 2005)

Annual Changes in Autism and Mental Retardation IDEA Special Education Eligibility Category Rates (Children ages 6-21, 50 States, D.C., BIA Schools): 1990 to 2004
Reasons for Increased Vigilance

- Autism can be identified early in development, and...

- Early intervention is an important determinant of the course of autism.
Reasons for Increased Vigilance

- Not all cases of autism will be identified before school entry.
  - Average Age of Autistic Disorder identification is 5 1/2 years of age.
  - Average Age of Asperger’s Disorder identification is 11 years of age Howlin and Asgharian (1999).
Reasons for Increased Vigilance

- Most children with autism are identified by school resources.
  - Only three percent 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 %) Yeargin-Allsopp et al. (2003).
Reasons for Increased Vigilance

- Full inclusion of children with ASD in general education classrooms.
  - Students with disabilities are increasingly placed in full-inclusion settings.
  - In addition, the results of recent studies suggesting a declining incidence of mental retardation among the ASD population further increases the likelihood that these children will be mainstreamed (Chakrabarti & Fombonne, 2001).
  - Consequently, today’s educators are more likely to encounter children with autism during their careers.
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Evolution of the Term “Autism”

- First used by Swiss psychiatrist Eugen Bleuler in 1911.
  - Derived from the Greek *autos* (self) and *ismos* (condition), Bleuler used the term to describe the concept of “turning inward on oneself” and applied it to adults with schizophrenia.
- In 1943 Leo Kanner first used the term “infantile autism” to describe a group of children who were socially isolated, were behaviorally inflexible, and who had impaired communication.
- Initially viewed as a consequence of poor parenting, it was not until the 1960’s, and recognition of the fact that many of these children had epilepsy, that the disorder began to be viewed as having a neurological basis.
Evolution of the Term “Autism”

- In 1980, infantile autism was first included in the third edition of the *Diagnostic and Statistical Manual* (DSM), within the category of Pervasive Developmental Disorders.
- Also occurring at about this time was a growing awareness that Kranner’s autism (also referred to as classic autism) is the most extreme form of a spectrum of autistic disorders.
- Autistic Disorder is the contemporary classification used since the revision of *DSM*’s third edition (APA, 1987).
Autism Spectrum Disorders (ASD)
- A diagnostic category found in DSM IV-TR.
- Placed within the subclass of Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence known as Pervasive Developmental Disorders (PDD).
- PDD includes Autistic Disorder, Asperger’s Disorder, Rett’s Disorder, Childhood Disintegrative Disorder, and PDD Not Otherwise Specified (PDD-NOS).
Diagnostic Classifications

In this workshop the terms “Autism,” or “Autistic Spectrum Disorders (ASD)” will be used to indicate these PDDs.
Diagnostic Classifications

- **Autistic Disorder**
  - Markedly abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activity and interests.

- **Asperger’s Disorder**
  - Markedly abnormal or impaired development in social interaction and a markedly restricted repertoire of activities and interests (language abilities and cognitive functioning is not affected).

- **PDD-NOS**
  - Experience difficulty in at least two of the three autistic disorder symptom clusters, but do not meet diagnostic criteria for any other PDD.
Diagnostic Classifications

● Rett’s Disorder
  - Occurs primarily among females and involves a pattern of head growth deceleration, a loss of fine motor skill, and the presence of awkward gait and trunk movement.

● Childhood Disintegrative Disorder
  - Very rare. A distinct pattern of regression following at least two years of normal development.
Special Education Eligibility: Proposed Regulations

- IDEIA 2004 Autism Classification
  - P.L. 108-446, Individuals with Disabilities Education Improvement Act (IDEIA), 2004
  - Proposed USDOE Regulations for IDEA 2004 [§ 300.8(c)(1)]
  - Autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child’s education performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotypical movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. (i) Autism does not apply if a child’s educational performance is adversely affected primarily because the child has an emotional disturbance, as defined in paragraph (c)(4) of this section. (ii) A child who manifest the characteristics of autism after age three could be identified as having autism if the criteria in paragraph (c)(1)(i) of this section are satisfied.
Special Education Eligibility

• CA Autism Classification
  - Title 5, CCR 3030(g):
    • A pupil exhibits **any combination** of the following autistic-like behaviors, **to include but not limited to**: (1) an inability to use oral language for appropriate communication; (2) a history of extreme withdrawal or relating to people inappropriately and continued impairment in social interaction from infancy through early childhood; (3) an obsession to maintain sameness; (4) extreme preoccupation with objects or inappropriate use of objects or both; (5) extreme resistance to controls; (6) displays peculiar motoric mannerisms and motility patterns; (7) self-stimulating, ritualistic behavior.
Special Education Eligibility

- For special education eligibility purposes distinctions among PDDs have been suggested by some to not be relevant.
- While the diagnosis of Autistic Disorder requires differentiating its symptoms from other PDDs, Shriver et al. (1999) suggest that for special education eligibility purposes “the federal definition of ‘autism’ was written sufficiently broad to encompass children who exhibit a range of characteristics” (p. 539) including other PDDs.
Special Education Eligibility

- However, it is less clear if students with milder forms of ASD are always eligible for special education.
- Adjudicative decision makers almost never use the *DSM IV-TR* criteria exclusively or primarily for determining whether the child is eligible as autistic” (Fogt et al., 2003).
- While *DSM IV-TR* criteria are often considered in hearing/court decisions, *IDEA* is typically acknowledged as the “controlling authority.”
- When it comes to special education, it is state and federal education codes and regulations (not *DSM IV-TR*) that drive eligibility decisions.
Legal Information

- For additional information...
- [GAO report.pdf](http://www.gao.gov/new.items/d05220.pdf)
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Educator Roles, Responsibilities, and Limitations

- School personnel need to be more vigilant for symptoms of autism among the students that they serve, and better prepared to assist in the process of identifying these disorders.

- **Case Finding**
  - YES: Screening Indicated
  - NO: Continue to monitor development

- **Autism Screening**
  - YES: Autism Indicated
  - NO: Refer for assessment as indicated

- **Diagnostic Assessment**

- **Special Education Assessment**
Educator Roles, Responsibilities, and Limitations

● Case Finding
  - *All special educators should be expected to participate in case finding* (i.e., routine developmental surveillance of children in the general population to recognize risk factors and identify warning signs of autism).
    ● This would include training general educators to identify the risk factors and warning signs of autism.
Educator Roles, Responsibilities, and Limitations

• Screening
  - Most special education staff (and all school psychologists) should be prepared to participate in the behavioral screening of the student who has risk factors and/or displays warning signs of autism (i.e., able to conduct screenings to determine the need for diagnostic assessments).
  - All special education staff should be able to distinguish between screening and diagnosis.
Educator Roles, Responsibilities, and Limitations

- Only those special education assessment teams with appropriate training and supervision should diagnose a specific autism spectrum disorder.
Special Education Eligibility
- All educators should be expected to participate in the evaluations that are a part of the diagnostic process and that determine educational needs.
- All special educators should be expected to conduct the evaluations that are a part of the diagnostic process and that determine educational needs.

The ability to conduct such assessments will require special educators to be knowledgeable of the accommodations necessary to obtain valid test results when working with the child who has an ASD.
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Case Finding

- **Looking**
  - for risk factors and warning signs of atypical development.

- **Listening**
  - REALLY LISTENING to parental concerns about atypical development.

- **Questioning**
  - caregivers about the child’s development.
Case Finding: Looking for Risk Factors

- Known Risk Factors
  - High Risk
    - Having an older sibling with autism.
  - Moderate Risk
    - The diagnosis of tuberous sclerosis, fragile X, or epilepsy.
    - A family history of autism or autistic-like behaviors.
Currently there is no substantive evidence supporting any one non-genetic risk factor for ASD. However, given that there are likely different causes of ASD, it is possible that yet to be identified non-heritable risk factors may prove to be important in certain subgroups of individuals with this disorder.

- There may be an interaction between the presence of specific genetic defects and specific environmental factors.
- Individuals with a particular genetic predisposition for ASD may have a greater risk of developing this disorder subsequent to exposure to certain non-genetic risk factors.
- In particular, it has been suggested that prenatal factors such as maternal infection and drug exposure deserve further examination.
Case Finding: Looking for Warning Signs

- **School-Age Children** (preschool through upper grades)
  - **Social/Emotional Concerns**
    - Poor at initiating and/or sustaining activities and friendships with peers
    - Play/free-time is more isolated, rigid and/or repetitive, less interactive
    - Atypical interests and behaviors compared to peers
    - Unaware of social conventions or codes of conduct (e.g., seems unaware of how comments or actions could offend others)
    - Excessive anxiety, fears or depression
    - Atypical emotional expression (emotion, such as distress or affection, is significantly more or less than appears appropriate for the situation)

Citations: Adapted from Asperger’s Syndrome A Guide for Parents and Professionals (Attwood, 1998), Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (APA, 1994), and The Asperger Syndrome Diagnostic Scale (Myles, Bock and Simpson, 2000)
Case Finding: Looking for Warning Signs

- **School-Age Children** (preschool through upper grades)
  - Communication Concerns
    - Unusual tone of voice or speech (seems to have an accent or monotone, speech is overly formal)
    - Overly literal interpretation of comments (confused by sarcasm or phrases such as “pull up your socks” or “looks can kill”)
    - Atypical conversations (one-sided, on their focus of interest or on repetitive/unusual topics)
    - Poor nonverbal communication skills (eye contact, gestures, etc.)

Case Finding: Looking for Warning Signs

- **School-Age Children** (preschool through upper grades)
  - **Behavioral Concerns**
    - Excessive fascination/perseveration with a particular topic, interest or object
    - Unduly upset by changes in routines or expectations
    - Tendency to flap or rock when excited or distressed
    - Unusual sensory responses (reactions to sound, touch, textures, pain tolerance, etc.)
    - History of behavioral concerns (inattention, hyperactivity, aggression, anxiety, selective mute)
    - Poor fine and/or gross motor skills or coordination

Case Finding: **Looking** for atypical development

- **Staff Development**
  - Special education staff efforts to educate teachers about the risk factors and warning signs of ASD would also be consistent with Child Find regulations [see 17 CCR 52040(b)(7)]. Giving teachers the information they need to look for ASD (such as is presented in this workshop) will facilitate case finding efforts.
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Case Finding

Screening Indicated

Autism Screening

Autism indicated

Diagnostic Assessment

Special Education Assessment

Continue to monitor development

Refer for assessment as indicated
Screening and Referral

- Screening is designed to help determine the need for additional diagnostic assessments.
- Screening should include medical testing, audiological evaluation, and behavioral assessment.
Medical (Lead Screening)

- From research suggesting that individuals with ASD have higher blood lead concentrations, and the hypothesis that lead poisoning may contribute to the onset or acceleration of the development of autistic symptoms, lead screening is recommended for all children referred for an autism screening.
- Such would be especially critical if there are reports of the student displaying pica and/or those who live in environments with an increased risk for lead exposure.
To the extent that hearing loss explains autistic-like behaviors, referrals should be made.

To the extent that there are other warning signs of an ASD that are not explained by a hearing loss (i.e., social and behavioral concerns), additional evaluation should take place.

It is important to keep in mind that autism can co-occur with hearing loss.

While a hearing loss would argue against the need for additional ASD evaluations, educators working with the student should continue to be vigilant for indicators of autism and make additional diagnostic referrals as indicated.
Behavioral Screening for ASD

- School psychologists are exceptionally well qualified to conduct the behavioral screening of students suspected to have an ASD.
- Several screening tools are available
- Initially, most of these tools focused on the identification of ASD among infants and preschoolers.
- Recently screening tools useful for the identification of school aged children who have high functioning autism or Asperger’s Disorder have been developed.
Behavioral Screening of School Age Children

- *Autism Spectrum Screening Questionnaire (ASSQ)*
Behavioral Screening of School Age Children

- **Autism Spectrum Screening Questionnaire (ASSQ)**
  - The 27 items rated on a 3-point scale.
  - Total score range from 0 to 54.
  - Items address social interaction, communication, restricted/repetitive behavior, and motor clumsiness and other associated symptoms.
  - The initial ASSQ study included 1,401 7- to 16-year-olds.
    - Sample mean was 0.7 (SD 2.6).
    - Asperger mean was 26.2 (SD 10.3).
  - A validation study with a clinical group \((n = 110)\) suggests the ASSQ to be “a reliable and valid parent and teacher screening instrument of high-functioning autism spectrum disorders in a clinical setting” (Ehlers, Gillber, & Wing, 1999, p. 139).
Behavioral Screening of School Age Children

- **Autism Spectrum Screening Questionnaire (ASSQ)**
  - Two separate sets of cutoff scores are suggested.
    - Parents, 13; Teachers, 11: = socially impaired children
      - Low risk of false negatives (especially for milder cases of ASD).
      - High rate of false positives (23% for parents and 42% for teachers).
      - Not unusual for children with other disorders (e.g., disruptive behavior disorders) to obtain ASSQ scores at this level.
      - Used to suggest that a referral for an ASD diagnostic assessment, while not immediately indicated, should not be ruled out.
    - Parents, 19; Teachers, 22: = immediate ASD diagnostic referral.
      - False positive rate for parents and teachers of 10% and 9% respectively.
      - The chances are low that the student who attains this level of ASSQ cutoff scores will not have an ASD.
      - Increases the risk of false negatives.
# Autism Spectrum Screening Questionnaire

Different parent and teacher ASSQ cutoff scores with true positive rate (% of children with an ASD who were rated at a given score), false positive rate (% of children without an ASD who were rated at a given score), and the likelihood ratio a given score predicting an ASD.

<table>
<thead>
<tr>
<th>Cutoff Score</th>
<th>True Positive Rate (%)</th>
<th>False Positive Rate (%)</th>
<th>Likelihood Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent</strong></td>
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<tr>
<td>7</td>
<td>95</td>
<td>44</td>
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<td>13</td>
<td>91</td>
<td>23</td>
<td>3.8</td>
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<td>76</td>
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<td>3.9</td>
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<td>5.5</td>
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<td>20</td>
<td>48</td>
<td>8</td>
<td>6.1</td>
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<tr>
<td>22</td>
<td>42</td>
<td>3</td>
<td>12.6</td>
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<tr>
<td><strong>Teacher</strong></td>
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<td>9</td>
<td>95</td>
<td>45</td>
<td>2.1</td>
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<td>11</td>
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<td>9</td>
<td>7.5</td>
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<tr>
<td>24</td>
<td>65</td>
<td>7</td>
<td>9.3</td>
</tr>
</tbody>
</table>
Behavioral Screening of School Age Children

- **Childhood Asperger Syndrome Test (CAST)**
    - A screening for mainstream primary grade (ages 4 through 11 years) children.
    - Has 37 items, with 31 key items contributing to the child’s total score.
    - The 6 control items assess general development.
    - With a total possible score of 31, a cut off score of 15 “NO” responses was found to correctly identify 87.5 (7 out of 8) of the cases of autistic spectrum disorders.
    - Rate of false positives is 36.4%.
    - Rate of false negatives is not available
Childhood Asperger Syndrome Test

Childhood Asperger Syndrome Test (CAST)

1. Does s/he join in playing games with other children easily?  YES  NO
2. Does s/he come up to you spontaneously for a chat?  YES  NO
3. Was s/he speaking by 2 years old?  YES  NO
4. Does s/he enjoy sports?  YES  NO
5. Is it important to him/her to fit in with the peer group?  YES  NO
6. Does s/he appear to notice unusual details that others miss?  YES  NO
7. Does s/he tend to take things literally?  YES  NO
8. When s/he was 3 years old, did s/her spend a lot of time pretending (e.g. play- acting begin a superhero, or holding a teddyÓ tea parties)?  YES  NO
9. Does s/he like to do things over and over again, in the same way all the time?  YES  NO
10. Does s/he find it easy to interact with other children?  YES  NO
11. Can s/he keep a two-way conversation going?  YES  NO
12. Can s/he read appropriately for his/her age?  YES  NO
13. Does s/he mostly have the same interest as his/her peers?  YES  NO
14. Does s/he have an interest, which takes up so much time that s/he does little else?  YES  NO
15. Does s/he have friends, rather than just acquaintances?  YES  NO
16. Does s/he often bring you things s/he is interested in to show you?  YES  NO

From Scott et al. (2002, p. 27)
# Childhood Asperger Syndrome Test

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>Does s/he enjoy joking around?</td>
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<tr>
<td>Does s/he have difficulty understanding the rules for polite behavior?</td>
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<tr>
<td>Does s/he appear to have an unusual memory for details?</td>
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<tr>
<td>Is his/her voice unusual (e.g., overly adult, flat, or very monotonous)?</td>
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<td>Are people important to him/her?</td>
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<td>Can s/he dress him/herself?</td>
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<td>Is s/he good at turn-taking in conversation?</td>
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<td>Does s/he play imaginatively with other children, and engage in role-play?</td>
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<td>Does s/he often do or say things that are tactless or socially inappropriate?</td>
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<tr>
<td>Can s/he count to 50 without leaving out any numbers?</td>
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<tr>
<td>Does s/he make normal eye-contact?</td>
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<tr>
<td>Does s/he have any unusual and repetitive movements?</td>
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<tr>
<td>Is his/her social behaviour very one-sided and always on his/her own terms?</td>
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<tr>
<td>Does s/he sometimes say “You” or “He” when s/he means “I”?</td>
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<tr>
<td>Does s/he prefer imaginative activities such as play-acting or story-telling, rather than numbers or lists of facts?</td>
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<td>Does s/he sometimes lose the listener because of not explaining what s/he is talking about?</td>
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<td>Can s/he ride a bicycle (even if with stabilizers)?</td>
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<td>Does s/he try to impose routines on him/herself, or on others, in such a way that it causes problems?</td>
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<tr>
<td>Does s/he care how s/he is perceived by the rest of the group?</td>
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<tr>
<td>Does s/he often turn the conversations to his/her favorite subject rather than following what the other person wants to talk about?</td>
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<tr>
<td>Does s/he have odd or unusual 1 phrases?</td>
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</tbody>
</table>

From Scott et al. (2002, pp. 27-28)
Childhood Asperger Syndrome Test

http://www.autismresearchcentre.com/tests/cast_test.asp
Behavioral Screening of School Age Children

- **Australian Scale for Asperger’s Syndrome (A.S.A.S.)**
  - Parent/Teacher rating scale
  - 24 questions, 1-6 scale
  - 10 behavioral characteristics, yes/no
    - If most questions are 2 to 6
    - If a majority of questions are yes
    - Then diagnostic referral is indicated
Australian Scale for Asperger’s Syndrome (ASAS)

Behavioral Screening of School Age Children

- **Social Communication Questionnaire (SCQ)**
Behavioral Screening of School Age Children

- Social Communication Questionnaire (SCQ)
Behavioral Screening of School Age Children

- **Social Communication Questionnaire (SCQ)**
  - The questionnaire can be used to evaluate anyone over age 4.0, as long as his or her mental age exceeds 2.0 years.
  - Two forms of the SCQ: a *Lifetime* and a *Current* form.
    - **Current** ask questions about the child’s behavior in the past 3-months, and is suggested to provide data helpful in understanding a child’s “everyday living experiences and evaluating treatment and educational plans.”
    - **Lifetime** ask questions about the child’s entire developmental history and provides data useful in determining if there is need for a diagnostic assessment.
  - Consists of 40 Yes/No questions asked of the parent.
  - The first item of this questionnaire documents the child’s ability to speak and is used to determine which items will be used in calculating the total score.
Behavioral Screening of School Age Children

- **Social Communication Questionnaire (SCQ)**
  - An “AutoScore” protocol converts the parents’ Yes/No responses to scores of 1 or 0.
  - The mean SCQ score of children with autism was 24.2, whereas the general population mean was 5.2.
  - The threshold reflecting the need for diagnostic assessment is 15.
  - A slightly lower threshold might be appropriate if other risk factors (e.g., the child being screened is the sibling of a person with ASD) are present.
Behavioral Screening of School Age Children

- **Social Communication Questionnaire (SCQ)**
  - While it is not particularly effective at distinguishing among the various ASDs, it has been found to have good discriminative validity between autism and other disorders including non-autistic mild or moderate mental retardation.
  - The SCQ authors acknowledge that more data is needed to determine the frequency of false negatives (Rutter et al., 2003).
  - This SCQ is available from Western Psychological Services.
Presentation Outline

- Introduction: Reasons for Increased Vigilance
- Diagnostic Classifications and Special Education Eligibility
- Educator Roles, Responsibilities, and Limitations
- Case Finding
- Screening and Referral
- Assessment: Causes, Diagnosis, Prognosis, Special Education Evaluation
Causes of Autism

- While Kanner initially suggested ASD to have a biological basis, most early efforts to identify the causes of autism focused on inadequate nurturance by emotionally cold and indifferent parents.
- Today it is now accepted that the behavioral manifestations of autism are a consequence of abnormal brain development, structure, and function.
Causes of Autism

Causes of Autism

- While it is clear that autism has an organic etiology, the underlying causes of these neurological differences, and exactly how they manifest themselves, is much more controversial.

- The etiology of autism is complex and multifaceted; likely resulting from the interaction of genetic, neurological, and environmental factors.

- It has been suggested that some combination of...
  1. genetic predisposition(s) and
  2. gene by environmental interaction(s)
  3. result in the brain abnormalities, which in turn are the causes of the range of behaviors we currently refer to as autism spectrum behaviors.
Causes of Autism

**Genetic Factors**
- Gene x Environment Interactions
- e.g., Rett’s Syndrome

**Environmental Factors**
- e.g., rubella virus, valporic acid, thalidomide

**Neurobiological Pathologies**

**ASD Behaviors**
Causes of Autism

- **Genetics**
  - ASD runs in families
    - Identical Twins (60 to 90 percent concordance)
    - Siblings (3 to 6% increased risk)
  - However, with the exception of Rett’s Syndrome, there is no conclusive evidence that ASD is associated with a specific genetic deficit.
  - Thus, multiple genetic factors likely cause most cases of autism.
  - The variability of ASD manifestations among even identical twins argues strongly that simple models of inheritance do not account for this spectrum of disorders.
Causes of Autism

- Environment
  - To the extent the environment does have a role in causing autism, it has been suggested that it does so by interacting with certain genes. In other words, a certain gene or gene combinations may generate a susceptibility to autism that is in turn triggered by a certain environmental factor or factors.
  - Environmental factors currently being considered include obstetric suboptimality, prenatal, and postnatal factors.
Causes of Autism

• Neurobiology
  – Brain Size
    • Rapid and excessive increase in head circumference during the first year
    • MRI data suggests brain size discriminates ASD children from typically developing peers
    • More rapid growth/larger brain size is associated with more severe ASD.
Causes of Autism

Causes of Autism

● Neurobiology
  - Brain Structure
    ● Postmortem and MRI research that has documented most major brain structures are affected. These areas include the hippocampus and amygdala, cerebellum, cerebral cortex, limbic system, corpus callosum, basal ganglia, and brain stem.
    ● Individuals with autism differed from normally developing people in the size, number, and arrangement of minicolumns in the prefrontal cortex and in the temporal lobe.
    ● Minicolumns are considered to be the basic anatomical and physiological unit of the brain; it takes in, processes, and then responds to stimuli. They have been compared minicolumns to information processing computer chips.
Causes of Autism

Causes of Autism

- **Neurobiology**
  - **Brain Chemistry**
    - Abnormal serotonin levels.
    - Serotonin is involved in the formation of new neurons in the brain ("neurogenesis"), and is thought to be important in the regulation of neuronal differentiation, synaptogenesis, and neuronal migration during development.
    - Supporting the hypothesis that abnormal serotonin metabolism is common among individuals with ASD, is the finding that depletion of tryptophan (a precursor of serotonin) in the diet worsens the behavior of a substantial percentage children of children with ASD.
A. A total of six (or more) items for (1), (2), and (3), with at least two from (1), and one each for (2) and (3):

(1) qualitative impairment in social interaction, as manifested by at least two of the following:

a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

b) failure to develop peer relationships appropriate to developmental level

c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by lack of showing, bringing, or pointing out objects of interest)

d) lack of social or emotional reciprocity
Autistic Disorder Diagnostic Criteria

A. A total of six (or more) items for (1), (2), and (3), with at least two from (1), and one each for (2) and (3):

   (2) qualitative impairments in communication as manifested by at least one of the following:

   a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)

   b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others

   c) stereotyped and repetitive use of language or idiosyncratic language

   d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level
Autistic Disorder Diagnostic Criteria

A. A total of six (or more) items for (1), (2), and (3), with at least two from (1), and one each for (2) and (3):

(3) restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
b) apparently inflexible adherence to specific, nonfunctional routines or rituals
c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
d) persistent preoccupation with parts of objects
B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

C. The disturbance is not better accounted for by Rett’s Disorder or Childhood Disintegrative Disorder.
Other ASDs

- Asperger’s Disorder
  - The criteria for Asperger’s Disorder are essentially the same as Autistic Disorder with the exception that there are no criteria for a qualitative impairment in communication.
  - In fact Asperger’s criteria require “… no clinically significant general delay in language (e.g., single words used by 2 years, communicative phrases used by 3 years”).
Other ASDs

- Childhood Disintegrative Disorder (CDD)
  - Criteria are essentially the same as Autistic Disorder.
  - Difference include that in CDD there has been …
    (a) “Apparently normal development for at least the first 2 years after birth as manifested by the presence of age-appropriate verbal and nonverbal communication, social relationships, play, and adaptive behavior;” and that there is
    (b) “Clinically significant loss of previously acquired skills (before age 10 years) in at least two of the following areas:
      1. expressive or receptive language;
      2. social skills or adaptive behavior;
      3. bowel or bladder control;
      4. play;
      5. motor-skills.”
Other ASDs

- Rett’s Disorder
  - Both Autistic Disorder and Rett’s Disorder criteria include delays in language development and social engagement (although social difficulties may not be as pervasive).
  - Unlike Autistic Disorder, Rett’s also includes
    - (a) head growth deceleration,
    - (b) loss of fine motor skill,
    - (c) poorly coordinated gross motor skill, and
    - (d) severe psychomotor retardation.
Symptom Onset

- Autistic Disorder is before the age of three years.
  - Before three years, there must be “delays or abnormal functioning” in at least one of the following areas: (a) social interaction, (b) social communicative language, and/or (c) symbolic or imaginative play.

- Asperger’s Disorder may be somewhat later.

- Childhood Disintegrative Disorder is before the age of 10 years.
  - Preceded by at least two years of normal development.

- Rett’s Disorder is before the age of 4 years.
  - Although symptoms are usually seen by the second year of life.
Developmental Course

- **Autistic Disorder:**
  - Parents may report having been worried about the child’s lack of interest in social interaction since or shortly after birth.
  - In a few cases the child initially developed normally before symptom onset.
  - However, such periods of normal development must not extend past age three.
  - Duration of Autistic Disorder is typically life long, with only a small percentage being able to live and work independently and about 1/3 being able to achieve a partial degree of independence.
  - Even among the highest functioning adults symptoms typically continue to cause challenges.
Developmental Course

- Asperger’s Disorder:
  - Motor delays or clumsiness may be some of the first symptoms noted during the preschool years.
  - Difficulties in social interactions, and symptoms associated with unique and unusually circumscribed interests, become apparent at school entry.
  - Duration is typically lifelong with difficulties empathizing and modulating social interactions displayed in adulthood.

- Rett’s and Childhood Disintegrative Disorders:
  - Lifelong conditions.
  - Rett’s pattern of developmental regression is generally persistent and progressive. Some interest in social interaction may be noted during later childhood and adolescence.
  - The loss of skills associated with Childhood Disintegrative Disorder plateau after which some limited improvement may occur.
Associated Features

- Asperger’s Disorder is the only ASD not typically associated with some degree of mental retardation.
- Autistic Disorder is associated with moderate mental retardation. Other associated features include:
  - unusual sensory sensitivities
  - abnormal eating or sleeping habits
  - unusual fearfulness of harmless object or lack of fear for real dangers
  - self-injurious behaviors
- Childhood Disintegrative Disorder is associated with severe mental retardation.
- Rett’s Disorder is associated with severe to profound mental retardation.
Age Specific Features

- Chronological age and developmental level influence the expression of Autistic Disorder.
  - Thus, assessment must be developmentally sensitive.
  - For example, infants may fail to cuddle; show indifference or aversion to affection or physical contact; demonstrate a lack of eye contact, facial responsiveness, or socially directed smiles; and a failure to respond to their parents’ voices.
  - On the other hand, among young children, adults may be treated as interchangeable or alternatively the child may cling to a specific person.
Gender Related Features

- With the exception of Rett’s Disorder, which occurs primarily among females, all other ASDs appear to be more common among males than females.
  - The rate is four to five times higher in males than in females.
## Differential Diagnosis

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rett’s Disorder</td>
<td>- Affects primarily girls&lt;br&gt;- Head growth deceleration&lt;br&gt;- Loss of fine motor skill&lt;br&gt;- Awkward gait and trunk movement&lt;br&gt;- Mutations in the MECP2 gene</td>
</tr>
<tr>
<td>Childhood Disintegrative Disorder</td>
<td>- Regression following at least two years of normal development</td>
</tr>
<tr>
<td>Asperger’s Disorder</td>
<td>- Expressive/Receptive language not delayed&lt;br&gt;- Normal intelligence&lt;br&gt;- Later symptom onset</td>
</tr>
</tbody>
</table>
## Differential Diagnosis

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenia</td>
<td>- Years of normal/near normal development</td>
</tr>
<tr>
<td></td>
<td>- Symptoms of hallucinations/delusions</td>
</tr>
<tr>
<td>Selective Mutism</td>
<td>- Normal language in certain situations or settings</td>
</tr>
<tr>
<td></td>
<td>- No restricted patterns of behavior</td>
</tr>
<tr>
<td>Language Disorder</td>
<td>- No severe impairment of social interactions</td>
</tr>
<tr>
<td></td>
<td>- No restricted patterns of behavior</td>
</tr>
</tbody>
</table>
# Differential Diagnosis

<table>
<thead>
<tr>
<th>Condition</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>- Distractible inattention related to external (not internal) stimuli</td>
</tr>
<tr>
<td></td>
<td>- Deterioration in attention and vigilance over time</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td>- Relative to developmental level, social interactions are not severely impaired</td>
</tr>
<tr>
<td></td>
<td>- No restricted patterns of behavior</td>
</tr>
<tr>
<td>OCD</td>
<td>- Normal language/communication skills</td>
</tr>
<tr>
<td></td>
<td>- Normal social skills</td>
</tr>
<tr>
<td>Reactive Attachment Disorder</td>
<td>- History of severe neglect and/or abuse</td>
</tr>
<tr>
<td></td>
<td>- Social deficits dramatically remit in response to environmental change</td>
</tr>
</tbody>
</table>
Developmental and Health History

- Prenatal and perinatal risk factors
  - Greater maternal age
  - Maternal infections
    - Measles, Mumps, & Rubella
    - Influenza
    - Cytomegalovirus
    - Herpes, Syphilis, HIV
  - Drug exposure
  - Obstetric suboptimality
Developmental and Health History

- Postnatal risk factors
  - Infection
    - Case studies have documented sudden onset of ASD symptoms in older children after herpes encephalitis.
    - Infections that can result in secondary hydrocephalus, such as meningitis, have also been implicated in the etiology of ASD.
    - Common viral illnesses in the first 18 months of life (e.g., mumps, chickenpox, fever of unknown origin, and ear infection) have been associated with ASD.
  - Chemical exposure?
  - MMR?
Developmental and Health History

- Developmental Milestones
  - Language development
    - Concerns about a hearing loss
  - Social development
    - Atypical play
    - Lack of social interest
  - Regression
Medical History
- Vision and hearing
- Chronic ear infections (and tube placement)
- Immune dysfunction (e.g., frequent infections)
- Autoimmune disorders (e.g., thyroid problems, arthritis, rashes)
- Allergy history (e.g., to foods or environmental triggers)
- Gastrointestinal symptoms (e.g., diarrhea, constipation, bloating, abdominal pain)
Developmental and Health History

- Diagnostic History
  - ASD is sometimes observed in association with other neurological or general medical conditions.
    - Mental Retardation (up to 80%)
    - Epilepsy (3-30%)
      - May develop in adolescence
      - EEG abnormalities common even in the absence of seizures
  - Genetic Disorders
    - 10-20% of ASD have a neurodevelopmental genetic syndrome
      - Tuberous Sclerosis (found in 2-4% of children with ASD)
      - Fragile X Syndrome (found in 2-8% of children with ASD)
Developmental and Health History

- Family History
  - Epilepsy
  - Mental Retardation
  - Genetic Conditions
    - Tuberous Sclerosis Complex
    - Fragile X Syndrome
    - Schizophrenia
    - Anxiety
    - Depression
    - Bipolar disorder
  - Other genetic condition or chromosomal abnormality
Diagnostic Assessments

- **Indirect Assessment**
  - Interviews and Questionnaires/Rating Scales
    - Easy to obtain
    - Reflect behavior across settings
    - Subject to interviewee/rater bias

- **Direct Assessment**
  - Behavioral Observations
    - More difficult to obtain
    - Reflect behavior within limited settings
    - Not subject to interviewee/rater bias
Diagnostic Assessments

Autism Diagnostic Evaluation Questionnaire
Indirect Assessment: Rating Scales

- The *Gilliam Autism Rating Scale* (GARS)
Indirect Assessment: Rating Scales

- **The Gilliam Autism Rating Scale (GARS-2)**
  - Normative group, 1107 children, adolescents, and young adults reported by parent or teacher to be a person with autism.
  - Age range 3 to 22.
  - 5 to 10 minutes to score
  - Designed for use by parents, teachers, and professionals
  - 42 items, 3 scales.
  - Social Interaction, Communication, and Stereotyped Behavior scales assesses current behavior.
  - A structured parent interview form replaces the Early Development subscale, providing examiners with diagnostically significant information about the child's development during early childhood.
  - Yields an Autism Index (AI)
Indirect Assessment: Rating Scales

- The *Gilliam Autism Rating Scale* (First Edition)
  - Among a sample of 119 children with “strict DSM-IV diagnoses of autism,” the “GARS consistently underestimated the likelihood that autistic children in this sample would be classified as having autism.
  - The South et al. (2002) sample mean (90.10) was significantly below the GARS mean (100).
Indirect Assessment: Rating Scales

- The Asperger Syndrome Diagnostic Scale (ASDS)
Indirect Assessment: Rating Scales

- The *Asperger Syndrome Diagnostic Scale* (ASDS)
  - Age range 5-18.
  - 50 yes/no items that cover 5 areas: (a) Language, (b) Social, (c) Maladaptions, (d) Cognition, and (d) Sensory-motor.
  - 10 to 15 minutes.
  - Normed on 227 persons with Asperger Syndrome, autism, learning disabilities, behavior disorders and ADHD.
  - ASQs are classified on an ordinal scale ranging from “Very Low” to “Very High” probability of autism. A score of 90 or above specifies that the child is “Likely” to “Very Likely” to have Asperger’s Disorder.
Indirect Assessment: Interview

- The *Autism Diagnostic Interview-Revised* (ADI-R)
Indirect Assessment: Interview

- The *Autism Diagnostic Interview-Revised* (ADI-R)
  - Semi-structured interview
  - Designed to elicit the information needed to diagnose autism.
  - Primary focus is on the three core domains of autism (i.e., language/communication; reciprocal social interactions; and restricted, repetitive, and stereotyped behaviors and interests).
  - Requires a trained interviewer and caregiver familiar with both the developmental history and the current behavior of the child.
  - The individual being assessed must have a developmental level of at least two years.
Indirect Assessment: Interview

- The *Autism Diagnostic Interview-Revised* (ADI-R)
  - The 93 items that comprise this measure takes approximately 90 to 150 minutes to administer.
  - Solid psychometric properties.
    - Works very well for differentiation of ASD from nonautistic developmental disorders in clinically referred groups, provided that the mental age is above 2 years.
    - False positives very rare,
    - Reported to work well for the identification of Asperger’s Disorder.
      - However, it may not do so as well among children under 4 years of age.
    - According to Klinger and Renner (2000): “The diagnostic interview that yields the most reliable and valid diagnosis of autism is the ADI–R” (p. 481).
Direct Assessments: ADOS

- The *Autism Diagnostic Observation Schedule* (ADOS)
Direct Assessments: ADOS

- A standardized, semi-structured, interactive play assessment of social behavior.
  - Uses “planned social occasions” to facilitate observation of the social, communication, and play or imaginative use of material behaviors related to the diagnosis of ASD.

- Consists of four modules.
  - Module 1 for individuals who are preverbal or who speak in single words.
  - Module 2 for those who speak in phrases.
  - Module 3 for children and adolescents with fluent speech.
  - Module 4 for adolescents and adults with fluent speech.
Direct Assessments: ADOS

- Administration requires 30 to 45 minutes.
- Because its primary goal is accurate diagnosis, the authors suggest that it may not be a good measure of treatment effectiveness or developmental growth (especially in the later modules).
- Psychometric data indicates substantial interrater and test-retest reliability for individual items, and excellent interrater reliability within domains and internal consistency.
- Mean test scores were found to consistently differentiate ASD and non-ASD groups.
Direct Assessments: CARS

- The *Childhood Autism Rating Scale* (CARS)
Direct Assessments: CARS

- 15-item structured observation tool.
- Items scored on a 4-point scale ranging from 1 (normal) to 4 (severely abnormal).
- In making these ratings the evaluator is asked to compare the child being assessed to others of the same developmental level.
  - Thus, an understanding of developmental expectations for the 15 CARS items is essential.
- The summary rating is used to determine a total score and the severity of autistic behaviors
  - Non-autistic, 15 to 29
  - Mildly-moderately autistic 30-37
  - Severely autistic, 37
Direct Assessments: CARS

- Data can also be obtained from parent interviews and student record reviews.
- When initially developed it attempted to include diagnostic criteria from a variety of classification systems and it offers no weighting of the 15 scales.
- This may have created some problems for its current use.
- Currently includes items that are no longer considered essential for the diagnosis of autism (e.g., taste, smell, and touch response) and may imply to some users of this tool that they are essential to diagnosis (when in fact they are not).
- Psychometrically, the CARS has been described as “acceptable,” “good,” and as a “well-constructed rating scale.”
### Direct Assessments: CARS (sample item)

#### Relating to People

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No evidence of difficulty or abnormality in relating to people. The child's behavior is appropriate for his or her age. Some shyness, fussiness, or annoyance at being told what to do may be observed, but not to an atypical degree.</td>
</tr>
<tr>
<td>1.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>2</td>
<td>Mildly abnormal relationships. The child may avoid looking the adult in the eye, avoid the adult or become fussy if interaction is forced, be excessively shy, not be as responsive to the adult as is typical, or cling to parents somewhat more than most children of the same age.</td>
</tr>
<tr>
<td>2.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>3</td>
<td>Moderately abnormal relationships. The child shows aloofness (seems unaware of adult) at times. Persistent and forceful attempts are necessary to get the child's attention at times. Minimal contact is initiated by the child.</td>
</tr>
<tr>
<td>3.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>4</td>
<td>Severely abnormal relationships. The child is consistently aloof or unaware of what the adult is doing. He or she almost never responds or initiates contact with the adult. Only the most persistent attempts to get the child's attention have any effect.</td>
</tr>
</tbody>
</table>
# Direct Assessments: CARS (sample item)

## Body Use

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age appropriate body use. The child moves with the same ease, agility, and coordination of a normal child of the same age.</td>
</tr>
<tr>
<td>1.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>2</td>
<td>Mildly abnormal body use. Some minor peculiarities may be present, such as clumsiness, repetitive movements, poor coordination, or the rare appearance of more unusual movements.</td>
</tr>
<tr>
<td>2.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>3</td>
<td>Moderately abnormal body use. Behaviors that are clearly strange or unusual for a child of this age may include strange finger movements, peculiar finger or body posturing, staring or picking at the body, self-directed aggression, rocking, spinning, finger-wiggling, or toe-walking.</td>
</tr>
<tr>
<td>3.5</td>
<td>(if between these points)</td>
</tr>
<tr>
<td>4</td>
<td>Severely abnormal body use. Intense or frequent movements of the type listed above are signs of severely abnormal body use. These behaviors may persist despite attempts to discourage them or involve the child in other activities.</td>
</tr>
</tbody>
</table>
Prognosis

- Symptoms may become worse in adolescence (e.g., they may become more hyperactive or aggressive).
- Early intervention, higher cognitive functioning (i.e., IQ above 70), higher expressive language skills predict better outcome.
- One in 10 or 20 can live independently
  - But even these individuals find human relations challenging
- 15% attain partial independence
- Two-thirds require significant sheltering

Prognosis

- At age 20...
  - 30% are living with families
  - 69% are in sheltered living environments
    - Most of these individuals have limited speech (e.g., 50% of institutionalize persons with autism have no intelligible speech).

Prognosis

- **Adult outcome** (IQ 50 or higher; Howlin et al., 2004)
  - Most remained dependent on families/social services.
  - Few lived alone, had close friends, permanent employment.
  - Stereotyped behaviors/interests frequently persisted.
  - Overall, 12% were rated as having “very good” outcome, 10% were rated as “good,” 19% as “fair.” The majority were rated as having “poor” or “very poor” outcomes.

Source: Howlin et al. (2004).
Purposes of Special Education Assessment

- Develop goals and objectives (which are similar to those developed for other children with special needs).
  - To make progress in social and cognitive proficiencies, verbal and nonverbal communication abilities, and adaptive skills.
  - To minimize behavioral problems.
  - To generalize competencies across multiple environments.
Testing Accommodations

- The core deficits of autism can significantly impact test performance.
  - Impairments in communication may make it difficult to respond to verbal test items and/or generate difficulty understanding the directions that accompany nonverbal tests.
  - Impairments in social relations may result in difficulty establishing the necessary joint attention.

- Examiners must constantly assess the degree to which tests being used reflect symptoms of autism and not the specific targeted abilities (e.g., intelligence, achievement, language, psychological processes).
Testing Accommodations

- It is important to acknowledge that the autistic population is very heterogeneous.
- There is no one set of accommodations that will work for every student with autism.
- It is important to consider each student as an individual and to select specific accommodations to meet specific individual student needs.
Testing Accommodations

- Prepare the student for the testing experience.
- Place the testing session in the student’s daily schedule.
- Minimize distractions.
- Make use of pre-established physical structures and work systems.
- Make use of powerful external rewards.
- Carefully pre-select task difficulty.
- Modify test administration and allow nonstandard responses.
Behavioral Observations

- Students with ASD are a very heterogeneous group, and in addition to the core features of ASD, it is not unusual for them to display a range of behavioral symptoms including hyperactivity, short attention span, impulsivity, aggressiveness, self-injurious behavior, and (particularly in young children) temper tantrums.

- Observation of the student with ASD in typical environments will also facilitate the evaluation of test taking behavior.

- Observation of test taking behavior may also help to document the core features of autism.
Choice of Assessment Instruments

- Child’s level of verbal abilities.
- Ability to respond to complex instructions and social expectations.
- Ability to work rapidly.
- Ability to cope with transitions during test activities.

- In general, children with autism will often perform best when assessed with tests that require less social engagement and verbal mediation.
Cognitive Functioning

- Assessment of cognitive function is essential given that, with the exception of Asperger’s Disorder, a significant percentage (as high as 80 percent) of students with ASD will also be mentally retarded.
- Severity of mental retardation can also provide some guidance regarding differential diagnosis among ASDs.
- IQ is associated with adaptive functioning, the ability to learn and acquire new skills, and long-term prognosis.
  - Thus, level of cognitive functioning has implications for determining how restrictive the educational environment will need to be.
Cognitive Functioning

- A powerful predictor of ASD symptom severity.
- However, given that children with ASD are ideally first evaluated when they are very young, it is important to acknowledge that it is not until age 5 that childhood IQ correlates highly with adult IQ.
  - Thus, it is important to treat the IQ scores of the very young child with caution when offering a prognosis, and when making placement and program planning decisions.
  - However, for school aged children it is clear that the appropriate IQ test is an “…excellent predictor of a student’s later adjustment and functioning in real life” (Frith, 1989, p. 84).
Cognitive Functioning

- Regardless of the overall level of cognitive functioning, it is not unusual for the student being tested to display an uneven profile of cognitive abilities.
- Thus, rather that simply providing an overall global intelligence test score, it is essential to identify these cognitive strengths and weaknesses.
- At the same time, however, it is important to avoid the temptation to generalize from isolated or “splinter” skills when forming an overall impression of cognitive functioning, given that such skills may significantly overestimate typical abilities.
Cognitive Functioning

- Selection of specific tests is important to obtaining a valid assessment of cognitive functioning (and not the challenges that are characteristic of ASD).
- The *Wechsler* and *Stanford-Binet* scales are appropriate for the individual with spoken language.
Cognitive Functioning

- On the other hand, for students who have more severe language delays measures that minimize verbal demands are recommended (e.g., the Leiter International Performance Scale – Revised, Universal Nonverbal Intelligence Test)
Given that diagnosing mental retardation requires examination of both IQ and adaptive behavior, it is also important to administer measures of adaptive behavior when assessing students with ASD.

Other uses of adaptive behavior scales when assessing students with ASD are:

- Obtain measure of child’s typical functioning in familiar environments, e.g. home and/or school.
- Target areas for skills acquisition.
- Identifying strengths and weaknesses for educational planning and intervention.
- Documenting intervention efficacy.
- Monitoring progress over time.
Adaptive Behavior

- Profiles of students with ASD are unique.
  - Individuals with only mental retardation typically display flat profiles across adaptive behavior domains
  - Students with ASD might be expected to display relative strengths in daily living skills, relative weaknesses in socialization skills, and intermediate scores on measures of communication abilities.

- To facilitate the use of the *Vineland Adaptive Behavior Scales* in the assessment of individuals with ASD, Carter et al. (1998) have provided special norms for groups of individuals with autism.
Adaptive Behavior

- Other tools with subtests for assessing functional/adaptive behaviors:
  - Scales of Independent Behavior-Revised.
  - AAMD Adaptive Behavior Scale.
  - Social Skills Rating System.
Social Functioning

- Tools that provide an overview of social functioning (i.e., social needs and current repertoire)
  - Vineland Adaptive Behavior Scales.
  - Scales of Independent Behavior-Revised.
- Typical problem areas/issues:
  - Understanding facial expressions and gestures
  - Knowing how and when to use turn-taking skills, including focusing on the interest of others
  - Interpreting non-literal language such as idioms and metaphors
  - Recognizing that others’ intentions do not always match their verbalizations
  - Understanding the hidden curriculum – those complex social rules that often are not directly taught (Myles & Simpson, 2001, p. 6)
Language Functioning (AACAP, 1999)

- Measures of single word vocabulary (receptive and expressive).
- Actual use of language (receptive and expressive).
- Articulation and Oral-Motor skills as indicated.
- Pragmatic Skills (the child’s capacities for use of whatever level of communication skills he/she has in relation to the social context).
Language Functioning

- Specific Tests (Myles & Adreon, 2001)
  - Clinical Evaluation of Language Fundamentals – Third Edition
  - Comprehensive Receptive and Expressive Vocabulary Test
  - Peabody Picture Vocabulary Test – Third Edition
  - Test of Language Competence – Expanded Edition (Level 2)
  - Test of Pragmatic Language
  - Test of Problem Solving - Adolescent
Psychological Processes

- Helps to further identify learning strengths and weakness.
- Depending upon age and developmental level, traditional measures of such processes may be appropriate.
- It would not be surprising to find relatively strong rote, mechanical, and visual-spatial processes; and deficient higher-order conceptual processes, such as abstract reasoning.
- While IQ test profiles should never be used for diagnostic purposes, it would not be surprising to find the student with Autistic Disorder to perform better on non-verbal (visual/spatial) tasks than tasks that require verbal comprehension and expression.
  - The student with Asperger’s Disorder may display the exact opposite profile.
Academic/Developmental Assessment

- Assessment of academic functioning will often reveal a profile of strengths and weaknesses.
  - It is not unusual for students with ASD to be hyperverbal/hyperlexic, while at the same time having poor comprehension and difficulties with abstract language. For others, calculation skills may be well developed, while mathematical concepts are delayed.

- For students who are very severely cognitively delayed, the Adolescent and Adult Psychoeducational Profile (AAPEP) may be an appropriate choice.
Academic/Developmental Assessment

- Adolescent and Adult Psychoeducational Profile (AAPEP)
For older, higher functioning students, the *Woodcock-Johnson Tests of Achievement* and the *Wechsler Individual Achievement Test* would be appropriate tools.
Academic/Developmental Assessment

- Curriculum-based assessment
  - Reading decoding (often a strength) should be compared to comprehension (often a weakness).
  - Comprehension may be related to
    - Subject matter
    - Instructional setting (large group vs. individual work)
    - Stress level
  - Written language skills to be assessed
    - Organization and coherence
    - Provision of sufficient background
    - Creativity
  - Computer generated writing samples should be compared to handwritten samples (fine motor often weak).
Emotional Functioning

- 65% present with symptoms of an additional psychiatric disorder such as AD/HD, oppositional defiant disorder, obsessive-compulsive disorder and other anxiety disorders, tics disorders, affective disorders, and psychotic disorders.

- AH/HD is the most common comorbid diagnosis among adolescents and adults.

- Disorders of mood (both depression and mania) are the second most common co-existing diagnosis and are seen particularly in higher-functioning individuals among individuals latency age and beyond.
  - 16.9% of CBCL (parent) ratings have elevated depression subscales.
Emotional Functioning

- There are occasional reports of schizophrenia developing in adolescence.
- Given these possibilities, it will also be important for the school psychologist to evaluate the student’s emotional/behavioral status.
- Traditional measures such as the Behavioral Assessment System for Children would be appropriate as a general purpose screening tool, while more specific measures such as The Children’s Depression Inventory and the Revised Children’s Manifest Anxiety Scale would be appropriate for assessing more specific presenting concerns.
When to consider comorbidity in ASD (Hendren, 2003, p. 39)

1. When signs of problems outside the autism spectrum are apparent.
2. When there is an abrupt change in behavior from “baseline.”
3. When there is a severe and incapacitating problem behavior.
4. When there is a worsening of symptoms already present.
5. When student does not respond as expected to intervention.
Sensory Assessments

- Occupational Therapy Assessments
  - Particularly if there is some degree of sensory hyper or hyposensitivity or difficulties in motor development.
    - *The Sensory Profile* (Dunn, 1999)
    - *Short Sensory Profile* (McIntosh et al., 1999)
    - *Sensory Integration Inventory – Revised* (Reisman & Hanschu, 1992)
Functional Behavioral Assessment

- Identify and describe target behavior
- Describe establishing operations and immediate antecedents
- Collect baseline data/work samples
- Determine the function of the behavior
- Develop a behavior intervention plan
- Assessment tools
  - http://www.csus.edu/indiv/b/brocks/Courses/EDS%20240/student_materials.htm
Assessment Resources

- http://info.med.yale.edu/chldstdy/autism/asdiagnosis.html
- http://www.medicine.uiowa.edu/autismservices/bestpractices/assmt_guidelines.htm
- http://www.swsc.org/ClassLibrary/Page/Information/DataInstances/184/Files/2531/GUIDE_TO_RECOMMENDED_EDUCATIONA.pdf
- http://www.aacap.org/clinical/parameters/fulltext/Autism.doc
- http://www.ijppediatricsindia.org/article.asp?issn=0019-5456;year=2005;volume=72;issue=1;spage=45;epage=52;aulast=Lancaster
Special Education Report

Recommendations

- Target specific areas of need and strive to build upon learning assets.
- **Sample recommendations**
Concluding Comments

- The increasing incidence of ASDs, combined with the importance of early identification create the need for school psychologists to become better prepared to identify these disorders.
- With appropriate intervention there is hope that the students will be able to achieve significant degrees of independence. These interventions, however, can only be provided if the student with ASD is identified.
- It is hoped that this paper has provided information that will assist school psychologists in the important identification tasks
- **Resources**
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