Presentation Outline

- Introduction to Autism Spectrum Disorders (ASD): Incidence and Causes
- The School Psychologists Role in the Identification of ASDs
- Diagnostic Assessment
- Psycho-educational Evaluation
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.
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).
Contemporary Classification of Autism Spectrum Disorders

- Pervasive Developmental Disorder (PDD) is a diagnostic category found in DSM IV-TR (APA, 2000).
  - Placed within the subclass of Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence known as Pervasive Developmental Disorders (PDD).
  - PDD includes Autistic Disorder (most similar to classic autism), Asperger’s Disorder, Rett’s Disorder, Childhood Disintegrative Disorder, and PDD Not Otherwise Specified (PDD-NOS).
Contemporary Classification of Autism Spectrum Disorders

Pervasive Developmental Disorders

- Autistic Disorder
- Asperger's Disorder
- PDD-NOS
- Rett's Disorder
- Childhood Disintegrative Disorder

In this presentation the terms “Autism,” or “Autistic Spectrum Disorders (ASD)” will be used to indicate these PDDs.
Overview of Autism Spectrum Disorders

- **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.
Overview of Autism Spectrum Disorders

- **Rett’s Disorder**
  - Occurs only 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.
How Common is Autism?

- Autistic spectrum disorders are much more common than they were once thought to be.
  - 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

Autism Growth Comparison Chart

(Source: Autism Society of America)

273% -- Autism (California)
172% -- Autism (U.S.)
16% -- All Disabilities (U.S.)
13% -- U.S. Population


Student Classified as Autistic Under IDEA as a Percentage of Students with Disabilities: 1994 to 2003
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

Gene X Environment Interactions

Genetic Factors
- e.g., Rett Syndrome

Environmental Factors
- e.g., rubella virus, valproic 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

- Obstetric Suboptimality
  - The lack of any specific factor as being the cause of autism, has lead to the study of summary measures of the pregnancy and delivery’s “optimality” (e.g., maternal age, maternal disease, neonatal respiratory distress, etc.).
  - Most studies that have considered obstetric suboptimality have found lower optimality among ASD individuals as compared to normal controls.
  - However, whether this is a cause or a consequence of ASD remains unknown, and Hansen and Hagerman (2003) suggest that these variables “…likely represent additive brain trauma to a vulnerable child rather than a distinct etiology of ASD” (p. 99).
Causes of Autism

- **Prenatal Factors**
  - Rubella, cytomegalovirus, herpes, and HIV.
  - Thalidomide during the 20th to 24th weeks, valporic acid (Depakene and Depakote) and alcohol abuse.

- **Postnatal Factors**
  - Herpes encephalitis and other infections that result in secondary hydrocephalus.
  - Exposure to, and clinical illness from, common viruses (e.g., chickenpox).
  - No data regarding the potential role of chemical exposures, the measles-mumps-rubella vaccine, nor mercury and thimerosal-containing vaccines.
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.
Presentation Outline

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School Psychologist Roles, Responsibilities, and Limitations

- The school psychologist’s role in the identification of autistic spectrum disorders.
  - School psychologists need to be more vigilant for symptoms of autism among the students that they serve, and better prepared to engage in case finding, screening, and referral.
  - School psychologists need to become better prepared to assist in the process of diagnosing autistic spectrum disorders.

1. Case Finding
   - Screening Indicated
     - YES
     - Autism Indicated
       - YES
       - Refer for assessment as indicated
       - NO
       - Continue to monitor development
     - NO
     - Continue to monitor development
   - NO
   - Continue to monitor development
School Psychologist Roles, Responsibilities, and Limitations

- Case Finding
  - *All school psychologists should be expected to participate in case finding* (i.e., routine developmental surveillance of children in the general population to identify risk factors and warning signs of autism).
    - This would include training general educators to identify the risk factors and warning signs of autism.
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 school psychologists should be able to distinguish between screening and diagnosis.

Only those school psychologists with appropriate training and supervision should diagnose autism.
CDDS Guidelines

1. Qualification to render a diagnosis of autistic spectrum disorder (ASD) under the provision of California state licensure.

2. Documented appropriate and specific supervision and training in ASD as well as experience in the diagnosis of ASD. This would include the following:

Source:
CDDS Guidelines

a. Graduate and/or postgraduate studies in a psychology, education and/or child development program with particular emphasis in developmental disabilities, including autism and related neurodevelopmental disorders

AND

Source:
CDDS Guidelines

b. Supervised experience in a graduate training program (e.g. predoctoral, postdoctoral) in a clinic and/or treatment setting serving children with ASD. Specific residency or fellowship training should have specific didactic training and clinical experience in the diagnosis and treatment of ASD. This would necessarily include training in the diagnosis of ASD as well as the administration of measurement tools specific to ASD.

OR

Source:
CDDS Guidelines

Documented fellowship in a credentialed medical training program in pediatrics, child neurology or child psychiatry. This would extend beyond the typical four week rotation through developmental/pediatrics in general pediatric training, which encompasses a broad range of developmental difficulties in addition to autism. Specific residency or fellowship training should have specific didactic training and clinical experience in the diagnosis and treatment of ASD.

Source:
CDDS Guidelines

3. Clinical experience with the variability within the ASD population as well as extensive knowledge of typical child development.

Source:
School Psychologist Roles, Responsibilities, and Limitations

- **Special Education Eligibility**
  - All school psychologists should be expected to conduct the psycho-educational evaluation that is a part of the diagnostic process and that determines educational needs.
  - The ability to conduct such assessments will require school psychologists 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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DSM & Special Education Eligibility

IDEA Autism Classification

- P.L. 105-17, Individuals with Disabilities Education Act [IDEA], 1997:
  - 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. The term does not apply if a child’s educational performance is adversely affected primarily because the child has an emotional disturbance. (sec. 300.7)
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.
For special education eligibility purposes, distinctions among PDDs may 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.
DSM & Special Education Eligibility

- However, it is less clear if students with milder forms of ASD are 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.
Given the IDEA requirement that autism must “adversely affects a child’s education performance” before a given student can be found eligible, some generalizations about the likelihood that a specific ASD will result in special education eligibility can be made.

- Childhood Disintegrative and Rett’s Disorders: Almost always eligible
- Autistic Disorder: typically eligible
  - High functioning autism: will require careful consideration
- Asperger’s Disorder: will require careful consideration
- PDD-NOS: will require careful consideration
Autistic Disorder

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

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

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
Autistic Disorder

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.
## Range of Symptom Expression

### Communication Skills

<table>
<thead>
<tr>
<th></th>
<th>No Language System</th>
<th>Limited Language System</th>
<th>Idiosyncratic Language System</th>
<th>Grammatical Language System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonverbal</td>
<td>Mostly echolalic</td>
<td>Replies if approached</td>
<td>Spontaneous &amp; two way</td>
<td></td>
</tr>
<tr>
<td>Noncommunicative</td>
<td>One-way</td>
<td>Incorrect pronoun &amp; preposition usage</td>
<td>Tends to be one sided</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used to meet needs</td>
<td>Odd constructions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Range of Symptom Expression

### Social Interaction Skills

<table>
<thead>
<tr>
<th>Socially Unaware</th>
<th>Limited Social Interaction</th>
<th>Tolerates Social Interactions</th>
<th>Interested in Social Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aloof</td>
<td>One-way interactions</td>
<td>Two-way interactions</td>
<td>Two-way &amp; spontaneous</td>
</tr>
<tr>
<td>Indifferent</td>
<td>To meet own needs</td>
<td>Accepts approaches</td>
<td>One-sided</td>
</tr>
<tr>
<td>Interaction may be aversive</td>
<td>Treats others as tools &amp; interchangeable</td>
<td>Replies if approached</td>
<td>Awkward</td>
</tr>
<tr>
<td>Solitary play</td>
<td>Prefers solitary play</td>
<td>Parallel play</td>
<td>Associative play</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Simple &amp; Body Directed</th>
<th>Simple &amp; Object Directed</th>
<th>Complex Routines, Manipulations, &amp; Movements</th>
<th>Verbal Abstract Behavior/Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>External</td>
<td>External</td>
<td>External</td>
</tr>
<tr>
<td>Very restricted range</td>
<td>Restricted range</td>
<td>Restricted ranged</td>
<td>Restricted range</td>
</tr>
<tr>
<td>Very marked, stereotyped, repetitive behavior</td>
<td>Marked, stereotyped, repetitive behavior</td>
<td>Occasional, repetitive behavior</td>
<td>Minimal, stereotyped, repetitive behavior</td>
</tr>
</tbody>
</table>

Most Severe | Least Severe

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 only 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>Differentiating Features from Autistic Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rett's Disorder</strong></td>
<td>• Affects only girls.</td>
</tr>
<tr>
<td></td>
<td>• Head growth deceleration.</td>
</tr>
<tr>
<td></td>
<td>• Loss of fine motor skill.</td>
</tr>
<tr>
<td></td>
<td>• Awkward gait and trunk movement.</td>
</tr>
<tr>
<td></td>
<td>• Mutations in the MECP2 gene.</td>
</tr>
<tr>
<td><strong>Childhood Disintegrative Disorder</strong></td>
<td>• Regression following at least two years of normal development.</td>
</tr>
<tr>
<td><strong>Asperger's Disorder</strong></td>
<td>• Language development is not delayed.</td>
</tr>
<tr>
<td></td>
<td>• Normal intelligence.</td>
</tr>
<tr>
<td></td>
<td>• Later symptom onset.</td>
</tr>
<tr>
<td><strong>Schizophrenia</strong></td>
<td>• Years of normal or near normal development.</td>
</tr>
<tr>
<td></td>
<td>• Symptoms of hallucinations and delusions.</td>
</tr>
<tr>
<td><strong>Selective Mutism</strong></td>
<td>• Normal language in certain situations/settings.</td>
</tr>
<tr>
<td></td>
<td>• No restricted patterns of behavior.</td>
</tr>
<tr>
<td><strong>Language Disorders</strong></td>
<td>• No severe impairment of social interactions.</td>
</tr>
<tr>
<td></td>
<td>• No restricted patterns of behavior.</td>
</tr>
<tr>
<td><strong>Attention-deficit/Hyperactivity Disorder</strong></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><strong>Mental Retardation</strong></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><strong>Obsessive Compulsive Disorder</strong></td>
<td>• Normal language and communication skills.</td>
</tr>
<tr>
<td></td>
<td>• Normal social skills.</td>
</tr>
<tr>
<td><strong>Reactive Attachment Disorder</strong></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>

*Note.* Adapted from APA (2000), Filipek et al. (1999), Hendren (2003), and National Research Council (2001).
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
Developmental and Health History

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
Indirect Assessment: Rating Scales

The Gilliam Autism Rating Scale (GARS)

Indirect Assessment: Rating Scales

The *Gilliam Autism Rating Scale* (GARS)

- Normative group, 1092 children, adolescents, and young adults reported by parent or teacher to be a person with autism.
- Age range 3 to 22.
- Designed for use by parents, teachers, and professionals
- 56 items, 4 scales.
- Social Interaction, Communication, and Stereotyped Behavior scales assess current behavior.
- Developmental Disturbances scale assesses maladaptive behavior history.
- Behaviors are rated on a 4-point scale (“Never Observed” to “Frequently Observed”).
Indirect Assessment: Rating Scales

The *Gilliam Autism Rating Scale* (GARS)

- Yields an Autism Quotient (AQ)
- AQs 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 “probably autistic.”
The Gilliam Autism Rating Scale (GARS)

  
  - 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.
  - 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 sum ratings 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.”
Presentation Outline

- Introduction to Autism Spectrum Disorders (ASD): Incidence and Causes
- The School Psychologists Role in the Identification of ASDs
- Diagnostic Assessment
- Psycho-educational Evaluation
Purposes of ASD 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.
Principles of ASD Assessment

- Developmentally based assessments provide a source of information for program planning.
- Need to understand child’s strengths and weaknesses across developmental areas. Children’s profiles are heterogeneous.
- Children with autism present particular challenges and programming needs.
Principles of ASD Assessment

- Assess multiple areas of functioning.
- Recognize variability of skills.
- Recognize variability of behavior across settings and consider the impact of a social disability on behavior.
- Examine functional adjustment/adaptive skills and consider behavioral difficulties as they affect daily functioning and suggested interventions.
- Maintain a developmental perspective.
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, 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.
Powerful Testing Reinforcers

- Bubbles
- Tickles
- Vibrating toys (Bumble Ball, Squiggle Writer)
- Tape
- Spinning Toys (Top)
- Light-up things (flashlight)
- Anything Tomas the Tank Engine

- Slinky
- Mini-fan
- Squishy toys (stress ball, Koosh)
- Noisy toys (speak-n-say)
- Gross Motor Stimulators (spinning or rocking office chair)
- Mirror

From Vanessa Gatewood
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.
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, Raven Coloured Progressive Matrices)
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:

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

- Other tools with subtests for assessing functional/adaptive behaviors:
  - Brigance Inventory of Early Development.
  - Early Learning Accomplishment Profiles.
  - Scales of Independent Behavior-Revised.
  - AAMD Adaptive Behavior Scale.
  - Learning Accomplishments Profile.
  - Developmental Play Assessment Instrument.
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.

- More specific information may be obtained from:
  - Preschool curriculum assessments that contain social subscales.
  - Battelle Developmental Inventory.
  - Learning Accomplishment Profile.
  - Michigan Scales.
Language Functioning

- **Peabody Picture Vocabulary Test – Third Edition**
- **Expressive One-Word Picture Vocabulary Test**
  - When interpreting the results of such measures, it is important to keep in mind that these tests may overestimate language abilities as they do not require sentence production or comprehension, nor do they assess social language or pragmatics.
  - Also, in many higher functioning students with ASD receptive language may be lower than expressive language.
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 Achievement

- Assessment of academic functioning will often reveal a profile of strengths and weaknesses.
  - It is not unusual for students with ASD 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 functioning at or below the preschool range and with a chronological age of 6 months to 7 years, the *Psychoeducational Profile – Revised* may be an appropriate choice.

- For older, higher functioning students, the *Woodcock-Johnson Tests of Achievement* and the *Wechsler Individual Achievement Test* would be appropriate tools.
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.

- 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.
The Psycho-educational Report

For a sample Psycho-educational Report template useful in assessing students with ASD contact Adinda Poitz at

snowcat075@aol.com
Sample Recommendations

- **Comprehensive Programs**
  - Employ discrete trial training methods (applied behavior analysis).
    - A model of behavior modification that makes use of a short interactive sequence employed to teach a new specific target behavior. DT is intensive and highly structured method of teaching.

From [http://www.esd189.org/autism/interventions.html](http://www.esd189.org/autism/interventions.html)
Sample Recommendations

Comprehensive Programs

- Consider the use of a program such as *Treatment and Education of Autistic and related Communication Handicapped Children* (TEACCH)
  - TEACCH develops social, language, attention, organizational, and transitioning skills; and auditory processing. It builds on the student with autism’s strengths and makes use of rote memorization skills, a child’s special interests, and visual processing abilities.

From [http://www.esd189.org/autism/interventions.html](http://www.esd189.org/autism/interventions.html)
Sample Recommendations

- **Functional/Adaptive Behavior**
  - Employ behavioral intervention techniques to facilitate the teaching adaptive skills and self-care. When employing these techniques it is important to emphasize the generalization of skills being taught.
  - Peer tutoring paired with direct instruction may facilitate the development of adaptive behavior (Blew et al., 1985).
  - Physical exercise may decreased self-stimulatory behavior (Kern et al., 1982).
Sample Recommendations

- **Functional/Adaptive Behavior**
  - Emphasize/employ visual cues to improve comprehension skills. For example,…
    - Make a visual schedule of the daily routine
    - Give visual information for following directions
    - Give visual cues that warns the student when an activity is going to end, stop, be all done, and/or change.
    - Place visual icons representing important rules on the student’s desk.

Sample Recommendations

Interventions for Teaching Social Behavior

- Modify/Structure daily activities to teach the student to increase the frequency and variety of play skills.
- Structure child-parent interactions, child-adult interactions, child-child interactions to teach social behavior (e.g., via peer tutoring, adult instruction in social games, social stories).
- Use social stories. These are short stories that are special to the student. The story explains a problematic social situation, provides recognizable cues and appropriate responses.
- Use social scripts. These are similar to social stories, except a script is made for a certain situation (specific to social situations that are problematic for the student).

Sample Recommendations

Language Interventions (Preverbal)

- Play games that involve turn-taking.
  - Use turn-taking cards that visually represent and mark whose turn it is.
- Practice appropriate social greetings.
- Make use of signing to facilitate the use of language.

From Vanessa Gatewood
Sample Recommendations

Language Interventions (Preverbal)

- Use “wait” cards to visually teach the concept of waiting.
- Use “help” cards to assist in teaching the student to raise his/her hand to indicate they need help or assistance. This can be gradually shaped into hand raising behavior.
- Use “break” cards to assist the student in communicating that he/she needs a break from on-task behavior.

Sample Recommendations

Language Interventions (Preverbal)

- Make use of “choice” cards, which allow the student to indicate their choice from a prearranged set of possibilities.
- Make use of “all-done” cards, which help the student to tell others that he/she has finished a task.

Sample Recommendations

- Language Interventions (Verbal, single words)
  - Develop word and gesture imitation skills.
  - Develop requesting and protesting verbalizations.
  - Develop the ability to expand and comment upon another persons verbalizations.

From Vanessa Gatewood
Sample Recommendations

- **Language Interventions (Verbal, multiple words)**
  - Develop the ability to establish and maintain a conversation.
  - Develop the ability to ask specific questions to obtain specific information.
  - Develop the ability to establish and maintain appropriate peer interactions.

From Vanessa Gatewood
Sample Recommendations

- **For motor problems…**
  - Provide occupational therapy.

- **For auditory problems…**
  - Keep directions short and concise.
  - Teach listening skills.
  - Pair verbal direction with visual cues.
  - Break tasks into smaller pieces

- **For attention problems…**
  - Minimize visual and auditory distractions.
  - Preplan opportunities for movement.
  - Provide frequent reinforcement.

From Vanessa Gatewood
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.
Contact Information

- Stephen E. Brock, Ph.D.
  - Associate Professor
  - Department of Special Education, Rehabilitation, and School Psychology
  - CSU, Sacramento
  - brock@csus.edu
  - 916-278-5919

Contact me for additional resources:
- Prevalence and Associated Conditions
- Causes
- Case Finding and Screening
- Diagnostic Assessment
- Psycho-Educational Assessment