



**Therapeutic Horseback Riding and School-Age Children and Adolescents with Autism Spectrum Disorders**

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**Presentation Outline:**

- Understanding autism spectrum disorders (Dr. Gabriels)
- Behavior management and interventions for unique ASD learning styles (Dr. Gabriels)
- THR study background (Dr. Gabriels/Amy)
- THR study design and methods (Dr. Gabriels)
- Implementing best practices in a therapeutic riding setting (Amy)
- THR study results and future directions (Dr. Gabriels).

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**Understanding Autism Spectrum Disorders (ASDs)**

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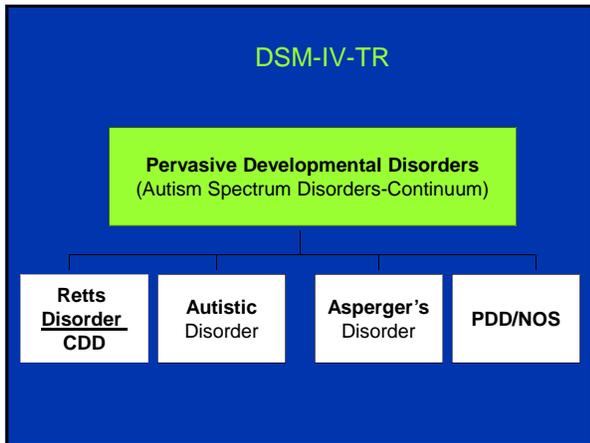
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- ASDs: Triad of Impairments
- Social Interaction & Understanding
  
  - Communication
  
  - Restricted/Repetitive Behaviors & Interests

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**Diagnostic Tools:**  
**"Gold Standard"**

**Interview with Parents : ADI-R**  
 Autism Diagnostic Interview – Revised  
 (Rutter, Le Couter, & Lord, 2003)  
*Developmental history of behaviors*

**Assessment of Child: ADOS**  
 Autism Diagnostic Observation Schedule  
 (Lord, Rutter, DiLavore, Risi, 1999)  
*Creates a semi-structured context to observe diagnostic behaviors*

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**Autistic Disorder:**  
*Current Understanding*

Highly heritable (approximately 90%)  
(Eichler & Zimmerman 2008; Weiss, 2008)

Involves biologic and brain irregularities that have implications for the ASD behavior patterns and learning styles  
(Picket & London 2005; Weiss 2008)

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**Autistic Disorder**  
**(DSM-IV-TR)**

Onset before 36 months in at least 1 of the following areas:

1. Social interaction
2. Language as used in social communication
3. Symbolic and imaginative play

Not better accounted for by Rett's or Childhood Disintegrative Disorder

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**Social & Communication**  
**Red Flags**

- Shared positive affect (social smiles) & expressiveness
- Social interaction
- Social anticipation
- Eye contact/gaze shifting
- Response to name
- Social babbling
- Use of gestures and words, loss of words
- Imitation
- Joint attention (initiating and responding to)

Decreased frequency in these areas evidenced as early as 14 mos.

By 24 mos. these differentiate autism vs. DD and LD  
(Landa et al., 2007)

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Ozonoff, et al (2010) A prospective study of the emergence of early behavioral signs of autism J Am Acad Child Adol. Psych. 49: 256–66

Social disengagement symptoms began at 6 months of age and continued a gradual regression through 3 yrs. (N = 50)

83% of parents did not notice decline in their child's face-gazing, vocalizations and social engagement until well into child's second year.

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Autistic Disorder DSM-IV-TR

### A. Social Impairment (at least 2)

1. **Nonverbal behaviors to regulate social interactions**  
(e.g., gaze, expression, gestures, body posture)
2. **Peer relationships appropriate to developmental level**  
(e.g., Few/no friends, limited understanding of the nature of social relationships)
3. **Shared enjoyment**  
(e.g., showing, bringing, pointing out interests)
4. **Social-emotional reciprocity**  
(e.g., Limited understanding of others' emotional states)

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## Cognitive Theories of Social Deficits

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## Theory of Mind (ToM)

(Baron-Cohen, 1995; Baron-Cohen, Tager-Flusberg, & Cohen, 2000)

"Mind blindness"

Difficulties:

- Generating possibilities based on available information
  - Reflecting on how their own behaviors may affect others
  - Problem-solving ways to change their behaviors to improve social relationships

➤ Often impaired in the social use of language (conversations), despite sometimes good rote language skills

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## The Weak Central Coherence theory

(Frith, 2003)

Focuses on detail at the expense of context and holism "big picture" .

Social world heavily dependent on integration of details (facial expression, vocal intonation, gestures and body language, & verbal content in context)

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## Executive Dysfunction

(Ozonoff, 1995; Russell, 1997)

Deficit in executive functions including:

- Cognitive flexibility
- An ability to apply social rules flexibly
- Control impulses
- Organize/sequencing
- Initiate activities (time concepts)

Also found in (e.g., Schizophrenia, ADHD, Tourettes Syndrome)

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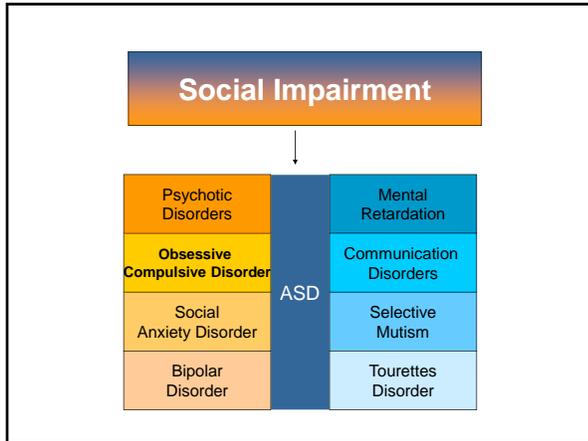
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**Social Impairments**

Follow-up studies from childhood:

ASD adolescents and adults with a variety of intellectual abilities indicate persistent problems with social-emotional reciprocity.

(Ballaban-Gill, Rapin, Tuchman, and Shinnar, 1996; Billstedt, Gillberg, and Gillberg, 2007; Shattuck et al., 2007)

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Autistic Disorder DSM-IV-TR  
**B. Communication Impairment**  
 (AT LEAST 1)

1. Language acquisition
2. Conversational reciprocity
3. Idiosyncratic/stereotyped language
4. Imagination, play, imitation

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Pre-linguistic skills

*Joint attention*

*Affect sharing*

*Intention-reading*

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**Joint Attention:  
Precursor to communication/language  
development**

Ability to coordinate one's own attention between an object and another person to communicate a need and share an interest.

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**Joint Attention (Typical Development)**

- 2 mos....reciprocal smiling
- 5 mos....attachment to caregiver
- 8 mos....gaze monitoring
- 10 mos....follows a point
- 12 mos....proto-imperative pointing (indicate a need)
- 14 mos....shows object
- 14 mos....proto-declarative pointing (share an interest)

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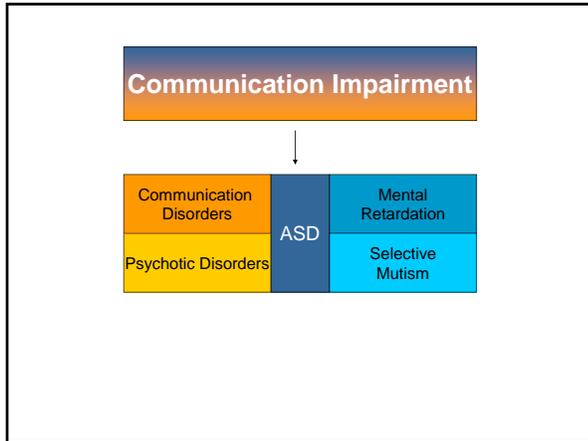
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### Communication

Follow-up studies of ASD adolescents and adults with a range of intellectual ability levels:

- Most common problem area: Communication
  - Lack of reciprocal verbal communication
  - Use of non-verbal communication skills

(Billstedt, Gillberg & Gillberg, 2007; Shattuck et al., 2007)

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Autistic Disorder DSM-IV-TR

### C. Restricted, repetitive and stereotyped behavior, interests, activities (at least 1)

1. Circumscribed/highly focused interests
2. Routines and rituals
3. Motor stereotypies
4. Preoccupations

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## Circumscribed Interests



Limited range of focus, interest or activity



Fascination/preoccupation with one subject or activity



Strongly attached to one specific object



Fascination/preoccupation with movement/things that move (e.g., fans, clocks)



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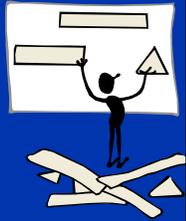
## Routines and Rituals

Inflexible adherence to specific nonfunctional routines or rituals

Compulsive behaviors (e.g. arranging/ordering)

Insistence that things remain the same (e.g., furniture, daily living routines, transportation routes)

Resists changing activities



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## Motor Stereotypies

Apparently purposeless movements or actions that are repetitive

Hand or finger flapping, shaking, waving

Self-injurious behaviors

Whole body movements



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## Preoccupations

Persistent preoccupation with parts of object rather than the whole object (e.g., buttons on clothes, wheels on toy cars)



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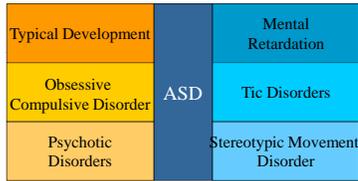
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## Restricted and Repetitive Behavior (RBs)



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## Same or Different? HFA vs. Asperger's

Numerous studies continue to find limited empirical support for separate disorders.

Multiple studies fail to find group differences in visual spatial, memory, motor, TOM, & executive function skills.

Most researchers consider HFA and Asperger's more similar than different.

See Kasari & Rotheram-Fuller, 2005 for review

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## HFA vs. AS: Evidence

Similar genetic causes: both occur in same families  
(Bolton et al., 1994; Volkmar et al., 1998)

HFA who develop language have similar outcomes  
to AS and are indistinguishable by school-age  
(Howlin 2003; Macintosh & Dissanayake, 2004; Szatmari et al., 2000)

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Autism Spectrum Disorders (DSM IV/ICD-10)

## Asperger's Disorder

Social deficits like autism

Restricted, repetitive, stereotyped Behavior interests and activities

*Disturbance causes clinically significant impairments (social, occupation, or other imp. areas of functioning)*

### By exclusion

- Not autism
- Not language-delayed (can have language disorder)
- No significant cognitive or adaptive behavior delay (other than social)

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Autism Spectrum Disorders (DSM IV/ICD-10)

## Atypical Autism/PDD-NOS

- Must have social deficits like autism
- Must have either or both communication or repetitive behaviors like autism
- **By exclusion**
  - Must have social deficits
  - May meet 2 criteria but not the third (e.g., have communication deficits or restricted, repetitive behaviors) or may fall sub threshold on all 3 domains
  - May have late onset

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## Autism Population Characteristics

Male/Female Ratio: 4:1

Siblings of children with autism: increased genetic risk for developing ASD variants

Equally distributed among social classes, ethnic & racial groups, and nationalities

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## Autism Population Characteristics

Est. 66 (who meet strict autism criteria) also meet criteria for mental retardation/intellectual disability and est. 30% for ASDs (Fombonne 2006).

Parents' views of MR/ID differ significantly from professionals (12.6% co-occurrence in autism) (Goin-Kochel, Peters, & Tredwell-Deering, 2007).

Autism Severity = Level of intellectual functioning (Ozonoff, Goodlin-Jones, & Solomon, 2005).

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## Associated Symptoms

Adaptive functioning markedly lower than intelligence levels

Pattern unique to ASD

(e.g., Boloc & Pousika, 2002; Gabriels et al., 2007)



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## DSM-V: Big Changes

- Name change (ASD)
- # of symptom sets
- No age of onset criterion
- Removal of Asperger's
- Removal of CDD & Rett Disorder

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## Co-morbid & Differential Diagnoses

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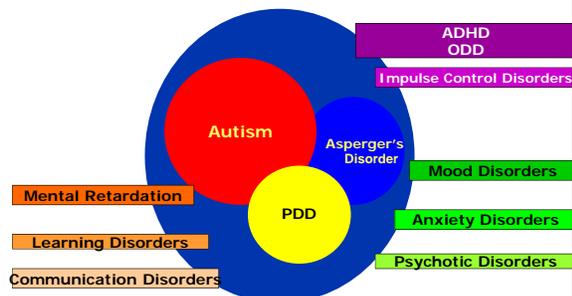
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### Discriminating ASD from other disorders:

- Discriminations become more difficult with very young or older children with varying levels of mental retardation and language delay.



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## Co-morbid psychiatric diagnoses

Higher rates in Autism/MR vs. MR groups

(Bradley et al., 2004; Matson et al., 1996)

High rates of affective (depression/BP) and anxiety disorders

(Leyfer et al., 2006; Lecavalier, 2006; Leyfer et al., 2006; Kerbeshian et al., 1996)

Affective disorders peak in ASD adolescents and young adults - signaled by behavior deterioration.

(Ghaziuddin et al., 2002; Gilberg, 1999)

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## Co-morbidity Challenges in ASD

Assessing vague aggressive/irritable behaviors

- Mood issues?
- Reaction to environmental issues/PTSD?
- Medical issues?
- Other causes?

Limited ability to describe internal states

ASD medication response less robust and higher rates of adverse events (e.g., Posey et al., 2006)

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## Medical Conditions



Need vigilant consideration for the presence of underlying medical conditions that may lead to insidious behavioral deterioration.

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## Medical Considerations

Medication side-effects (Constipation)  
Gastrointestinal Symptoms (Constipation, flatus, diarrhea, bloating, Reflux esophagitis)  
Sleep problems (poor quality of sleep)  
Ear infections/hearing impairments  
Dental problems  
Migraine or pain of any kind  
Seizures (25-33%) (Tuchman & Rapin, 2002)

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## Seizures

Substantially higher rates than the general population (1-3%)  
(Anderson , 2008)

ASD seizures risks:

- prior to age 5 or beginning around puberty.
- severe cognitive, motor, and language impairments
- Female
- family history of seizures

Puberty associated with worsening of autism symptoms  
(Hyperactivity, aggression, destruction, self-injury, insistence on sameness).

Possible interaction of low IQ, presence of seizures and worsening of symptoms in puberty.

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## Sleep Problems

Caregivers report significant differences in the *quality* of sleep.

- Screaming
- Sleepwalking
- Breathing cessation
- Teeth grinding

Sleep problems may exacerbate autism symptoms (stereotypic behavior and communication problems)

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**Sleep disruptions can signal a variety of medical and clinical issues**

- Seizures
- Abuse
- undetected injuries
- GERD
- sleep apnea
- urinary tract infection

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