Neuropsychology and Autism

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Objectives

1. Define Autism Spectrum Disorder and outline assessment approach (including domain specific instruments and considerations)
2. Identify most common diagnostic differentials and review some of the associated challenges
3. Review treatment and recommendations for ameliorating common neuropsychological–related challenges in autism
4. Identify cultural diversity and health disparities associated with autism diagnosis and treatment and their impact on diagnosis and access to services

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Before we get started today, I would love to know who is in the audience! Please choose the life role that best describes you:

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We are going to create a word cloud. Type in a word or short phrase that comes to mind when you think of neuropsychological / psychological assessment and autism:

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To Begin…

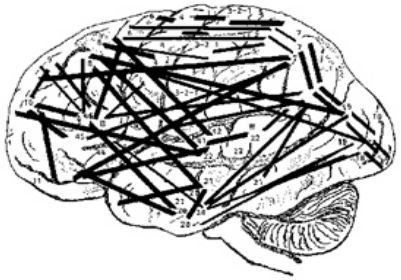
- https://autism.sesamestreet.org/video/nassaiahs-day/

It’s all about perspective!

- “If you’ve met one person with autism, you’ve met one person with autism.” – Dr. Stephen Shore.
- “The concept of neurodiversity provides a paradigm shift in how we think about mental functioning. Instead of regarding large portions of the American public as suffering from deficit, disease, or dysfunction in their mental processing, neurodiversity suggests that we instead speak about differences in cognitive functioning.” – Dr. Thomas Armstrong

What is Autism Spectrum Disorder?

- “A developmental disability that can cause significant social, communication, and behavioral challenges. There is often nothing about how people with ASD look that sets them apart from other people, but people with ASD may communicate, interact, behave, and learn in ways that are different from most other people. The learning, thinking, and problem-solving abilities of people with ASD can range from gifted to severely challenged. Some people with ASD need a lot of help in their daily lives; others need less.” -Centers for Disease Control (CDC)
- “Autism is a system-wide brain disorder limiting coordination and integration between brain areas” -Carnegie Melon & U. of Pittsburgh
- “Autism isn't a disorder of social skills. It’s a condition of core processing differences involving movement, language, and sensory aspects. Those things affect ability to deploy conventional social skills, but don’t make social skills impossible to have.” -Emily Paige Ballou (a mom on Facebook)



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Strengths

- Children can be quite loving, caring, thoughtful, and creative.
- See and process things differently, not necessarily poorly.

Autism Spectrum Disorder

Diagnostic Criteria:

- Persistent deficits in social communication and social interaction
- Restricted, repetitive patterns of behavior, interest, or activities
- Symptoms must be present in the early developmental period
- Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning

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True or false: Persistent deficits in social communication and social interaction is a diagnostic criteria for autism spectrum disorder (ASD).

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Autism Spectrum Disorder - Criteria

- Persistent deficits in social communication and social interaction
- Deficits in social-emotional reciprocity
- Deficits in nonverbal communicative behaviors used in social interactions
- Deficits in developing, maintaining, and understanding relationships

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Autism Spectrum Disorder – Criteria (1)

- Restricted, repetitive patterns of behavior, interests, or activities
- Stereotyped or repetitive motor movements, use of objects, or speech
- Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior
- Highly restricted, fixated interests that are abnormal in intensity or focus
- Hyper-or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment

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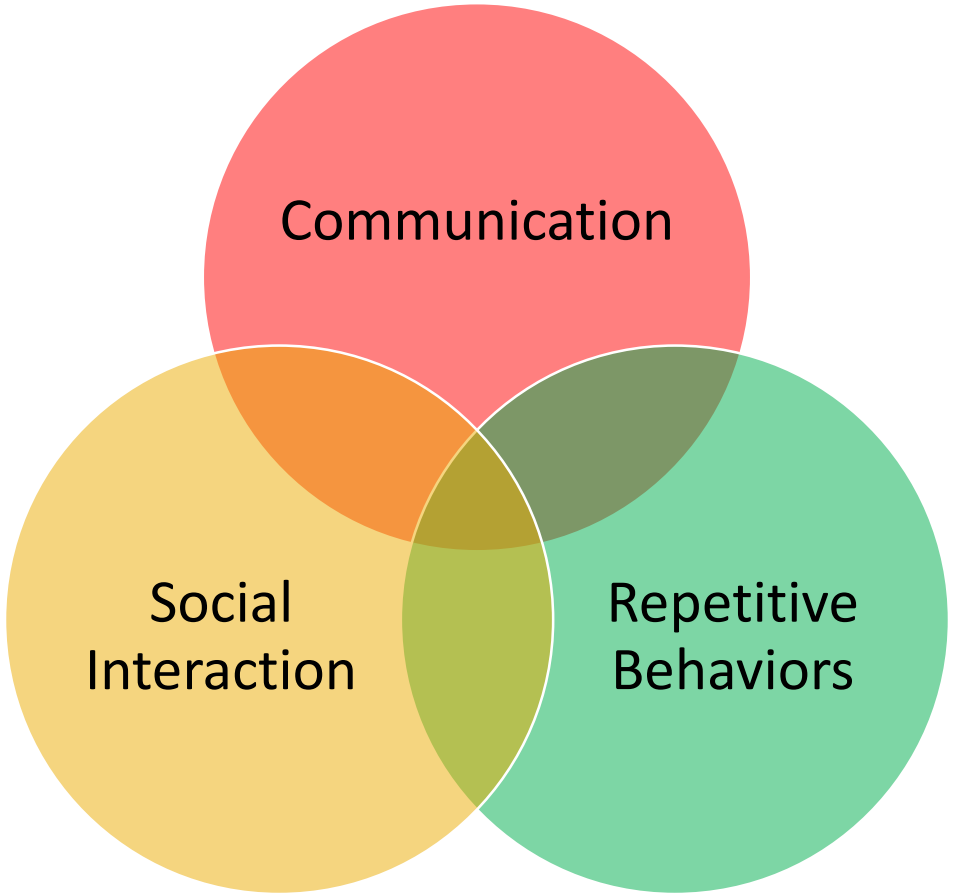
What is Autism?



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Identification and evaluation of ASD

Very early indicators that require evaluation by an expert include:

- no babbling or pointing by age 1
- no single words by age 16 months or two-word phrases by age 2
- no response to name
- loss of language or social skills previously acquired
- poor eye contact
- excessive lining up of toys or objects
- no smiling or social responsiveness

Later indicators include:

- impaired ability to make friends with peers
- impaired ability to initiate or sustain a conversation with others
- absence or impairment of imaginative and social play
- repetitive or unusual use of language
- abnormally intense or focused interest
- preoccupation with certain objects or subjects
- inflexible adherence to specific routines or rituals

http://www.ninds.nih.gov/disorders/autism/detail_autism.htm

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True or false: No babbling by 12 months is associated with a high probability of a developmental disability.

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Assessment Procedures

- Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)
- Tool for assessing and diagnosing autism across age, developmental level, and language skills
- Ages 12 months through adulthood
- Semi-structured standardized assessment of: communication, social interaction, play, and restricted and repetitive behaviors

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The Autism Diagnostic Interview-Revised (ADI-R)

- Semi-structured parent/caregiver interview for use in children and adults
  - Mental age of 18 months or higher
  - Can be used for both verbal and nonverbal individuals
- Provides a diagnostic algorithm for Autism only
- Utilizes diagnostic criteria consistent with both ICD-10 and DSM-5
- Usually takes 2-3 hours total

ADI-R

- Early Development
- Acquisition/Loss of Language
- Language/Communication Functioning
- Social Development and Play
- Interests and Behaviors
- General Behaviors (and Isolated Skills)

Neuropsychological Assessment of ASD

Domain-Specific Considerations in Assessment

- COGNITION/INTELLIGENCE

Neuropsychological Assessment of ASD

- Cognitive Ability
- Patients with ASD tend to exhibit cognitive profiles with a high degree of variability between domains and subtests, and yet there is no prototypical profile
- Strengths in nonverbal domains (compared to verbal) has been associated with ASD. Opposite pattern has been associated in higher functioning individuals (e.g., the old Asperger's syndrome)
- However, not all patients show this pattern; therefore, IQ profiles should not inform diagnostic decisions

Intellectual Functioning in HFASD

- Variability is typical
- Processing Speed and Working Memory are often low
- Verbal skills are somewhat higher on the WISC-V, as Comprehension is not included
- IQ scores are fairly stable by school age years
- Low IQ is a robust predictor of poor outcomes, but high IQ is not a strong predictor of better outcome (only 13% living independently, and 45% had ever worked- Howlin et al. 2013)

Neuropsychological Assessment of ASD

- ADAPTIVE BEHAVIOR

Neuropsychological Assessment of ASD

- Adaptive Skills
- Evaluation of adaptive skills is a critical component of an autism assessment
- Patients with ASD display a highly variable profile, with the most pronounced deficits in socialization
- Adaptive functioning are useful in planning interventions (i.e., targeting the development of functional adaptive life skills

Adaptive Functioning in HFASD

- Typically lower than what would be expected based on other cognitive domains
- Likely a result of multiple weaknesses
  - Poor planning/organization, seeing the big picture
  - Social motivation
  - language
- Adult outcomes

Neuropsychological Assessment of ASD

- LANGUAGE

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Neuropsychological Assessment of ASD

- Language cont.

- Most children with ASD have very low levels of language in toddlerhood and preschool, yet these very same children may become quite verbal with time and treatment

- Verbal patients with ASD show relative strengths in phonology and articulation, basic grammar, and single-word receptive vocabulary

- Patients with ASD experience the most severe difficulties with semantics, output and comprehension of formulated speech, and pragmatic language

Neuropsychological Assessment of ASD

- Language cont.

- A comprehensive speech/language evaluation is an important component in evaluating a child with ASD (e.g., Clinical Evaluation of Language Fundamentals; Comprehensive Assessment of Spoken Language)

- For less verbal patients with ASD, measures of single-word vocabulary can provide a basic estimate of receptive single-word knowledge (e.g., Peabody Picture Vocabulary Test)

- Measures of pragmatic language (e.g., Test of Pragmatic Language) can be helpful in planning social skills interventions

Language Functioning in HFASD

- Basic skills generally intact:
  - Phonology and syntax generally commensurate with overall level of functioning
  - Basic understanding/receptive language
  - Breadth of vocabulary
  - Rapid retrieval of overlearned information
- Impairments in more complex formulation and expression (e.g., Vocabulary usually lower than Similarities)
- Pragmatics (partially related to expressive weaknesses)

Neuropsychological Assessment of ASD

- ATTENTION

Neuropsychological Assessment of ASD

- Attention, cont.

- The attentional abilities of individuals with ASD are highly variable

- Patients with ASD may show impairments in many aspects of attention
  - Automatic allocation of attention
  - Controlled attention
  - Working memory

- At the same time, patients with ASD may have heightened attention to stimuli that are salient to them

- Sustained attention in patients with ASD improves when strong incentives are used

Neuropsychological Assessment of ASD

- Attention, cont.

- Children with ASD show reduced social attention from a very young age
  - Patients with ASD may not be motivated to attend to social information
  - They may fail to pick up on subtle cues that would direct their attention toward social information
  - They may find attending to social information anxiety-arousing and therefore aversive

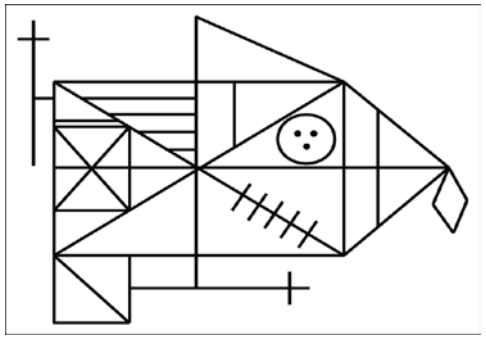
- These various possibilities highlight the importance of a neuropsychological evaluation to determine what may underlie the social attention difficulties and in turn inform intervention
  - Measure of visual attention
  - Observation of social motivation
  - Psychological assessment (anxiety)

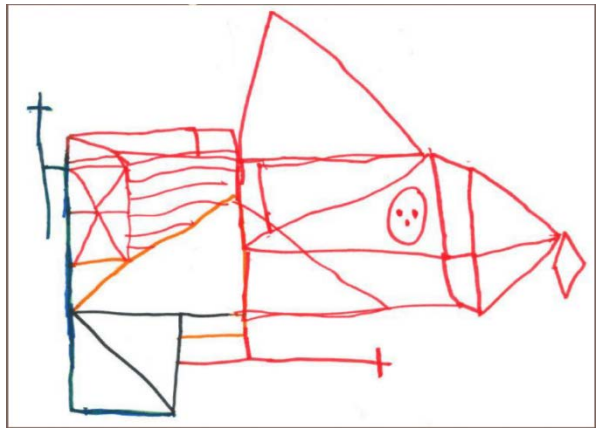
Attention in HFASD…without comorbid ADHD

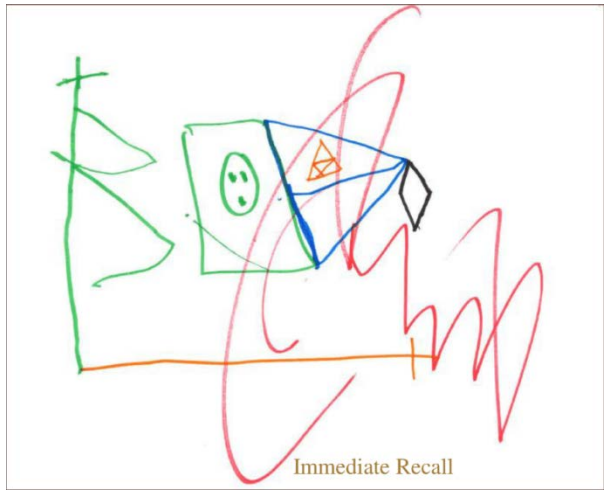
- Often less distractible and fewer utilization behaviors
- Instead, more internally distracted
- Can often perform typically on tasks of immediate attention, but difficulty with sustained and divided attention
- “Impairment in the relatively automatic allocation of attention that occurs without conscious thought…type of “sticky” attention in which individuals with ASD do not flexibly adjust their focus of attention to attend to relevant information.” (Travers, Klinger, & Klinger 2011- in The Neuropsychology of Autism- Fein)

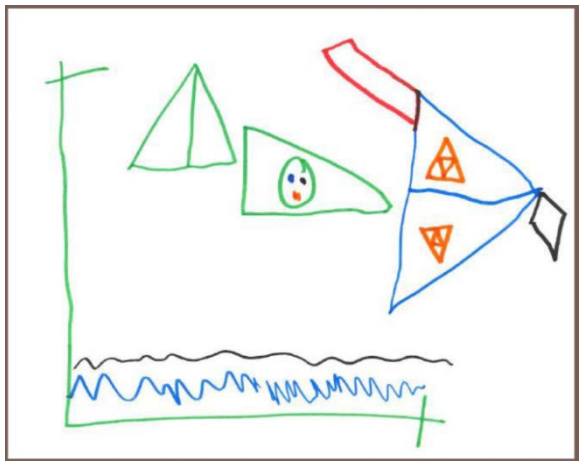
Neuropsychological Assessment of ASD

- EXECUTIVE FUNCTIONING









Neuropsychological Assessment of ASD

- Executive Function

- Problems with planning, shifting attention, monitoring performance, and cognitive flexibility are almost universally reported as difficulties that patients with ASD experience in their everyday lives

Neuropsychological Assessment of ASD

- Executive Function, cont.
- A number of comprehensive batteries exist for assessing EF skills (Delis-Kaplan Executive Function System) that includes tasks of
  - Planning, organization, fluency, attention, mental flexibility, set shifting, and concept formation

- It should be noted, however, that EF deficits may be subtle and therefore difficult to detect on testing

- Furthermore, children may perform well on measures of EF in the structured testing environment, and yet show impairments in their ability to implement these skills in naturalistic settings

Neuropsychological Assessment of ASD

- MOTOR SKILLS

Neuropsychological Assessment of ASD

- Motor Function

- Patients with ASD often have motor difficulties, including impairments in fine motor skills, gross motor skills, basic motor skills, and more complex motor skills

- Grooved Pegboard, Physical and Neurological Examination for Soft Signs are useful measures for assessing motor functioning

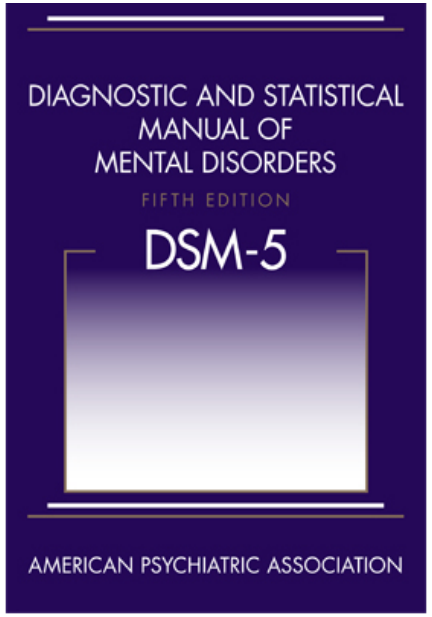
- If motor difficulties are suspected, assessment by a neurologist, physical therapist, or occupational therapist is suggested

Memory in ASD

- Motor Function
- Patients with ASD often have motor difficulties, including impairments in fine motor skills, gross motor skills, basic motor skills, and more complex motor skills
- Grooved Pegboard, Physical and Neurological Examination for Soft Signs are useful measures for assessing motor functioning
- If motor difficulties are suspected, assessment by a neurologist, physical therapist, or occupational therapist is suggested

Differential Diagnoses

- One or more comorbid (co-occurring) psychiatric disorders are common in children with autism
- >70% of children with autism have at least one additional psychiatric diagnosis
- The most common conditions are…
-



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Differential Diagnoses

- The most common conditions:
  - Attention-Deficit/Hyperactivity Disorder (ADHD)
  - Oppositional Defiant Disorders
  - Anxiety Disorders
  - Depression

Differential Diagnoses

- Diagnostic Issues
- Is it symptom overlap or is it a distinctly different disorder?
- How do you know?

Other Childhood Disorders can Look Like Autism (Rule-outs)

- Receptive/Expressive Language Disorder
- Attention Deficit/Hyperactivity Disorder
- Anxiety
  - Specific Phobia
  - Social Phobia
- Intellectual Disability
- Learning Disability
- Tourette Syndrome
- Giftedness
- Many more…

Other Childhood Disorders that Come Along with Autism (Co-occurring)

- Receptive/Expressive Language Disorder
- Attention Deficit/Hyperactivity Disorder
- Anxiety
  - Specific Phobia
  - Social Phobia
- Intellectual Disability
- Learning Disability
- Tourette Syndrome
- Giftedness
- Many more…

Social Difficulties: Similar but Different…

Autism

- Limited nonverbal communication
- Limited spontaneous seeking to share enjoyment
- Limited social reciprocity
- Limited reciprocal play

ADHD

- Interrupts and intrudes on others
- Difficulty listening when spoken to directly
- Talks excessively
- Difficulty playing quietly
- Difficulty sustaining attention to tasks or play

Social Difficulties: Similar but Different…

Autism

- Stereotyped motor movements
- Lining up toys
- Flipping objects

ADHD

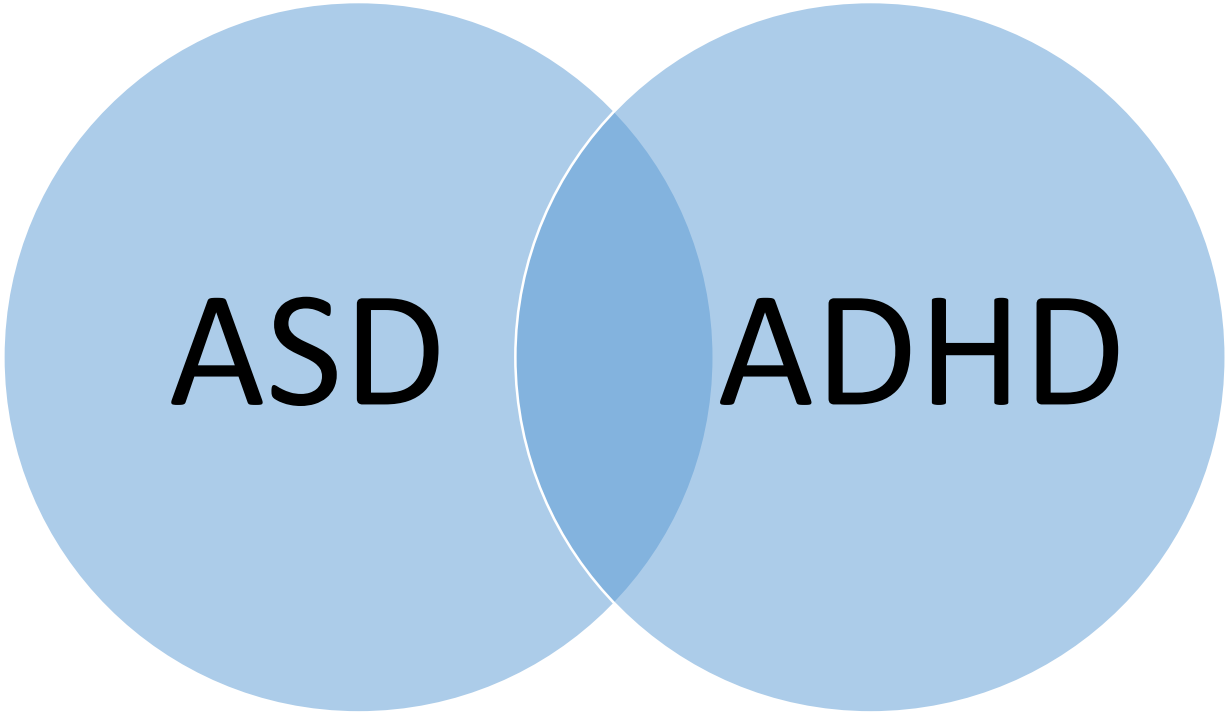
- On the go, as if driven by a motor
- Taps hands or feet
- Trouble sitting still
- Messy or disorganized work

Similar and Shared: Biological Factors

Sex distribution (predominantly male)

Genetics

Brain involvement



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Similar & Shared: Behavioral Factors

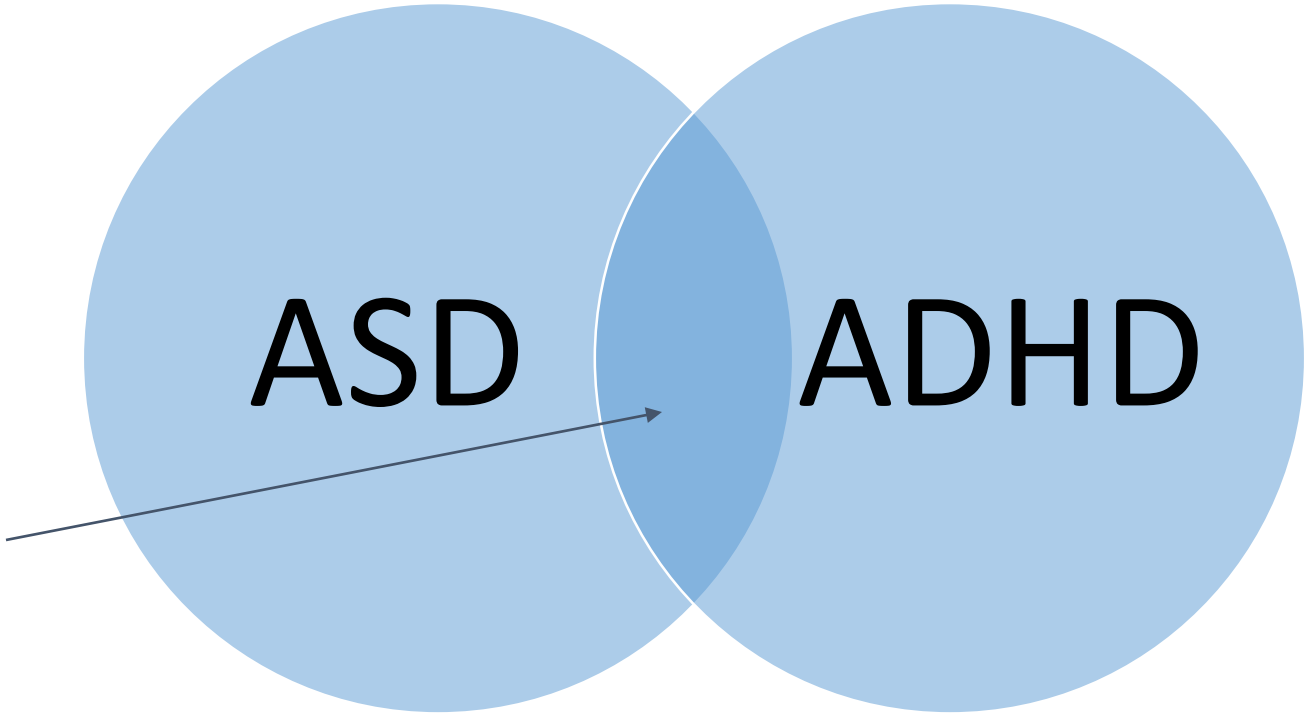
Executive Dysfunction

Inattention

Hyperactivity

Social Difficulties

Sensory Behavior



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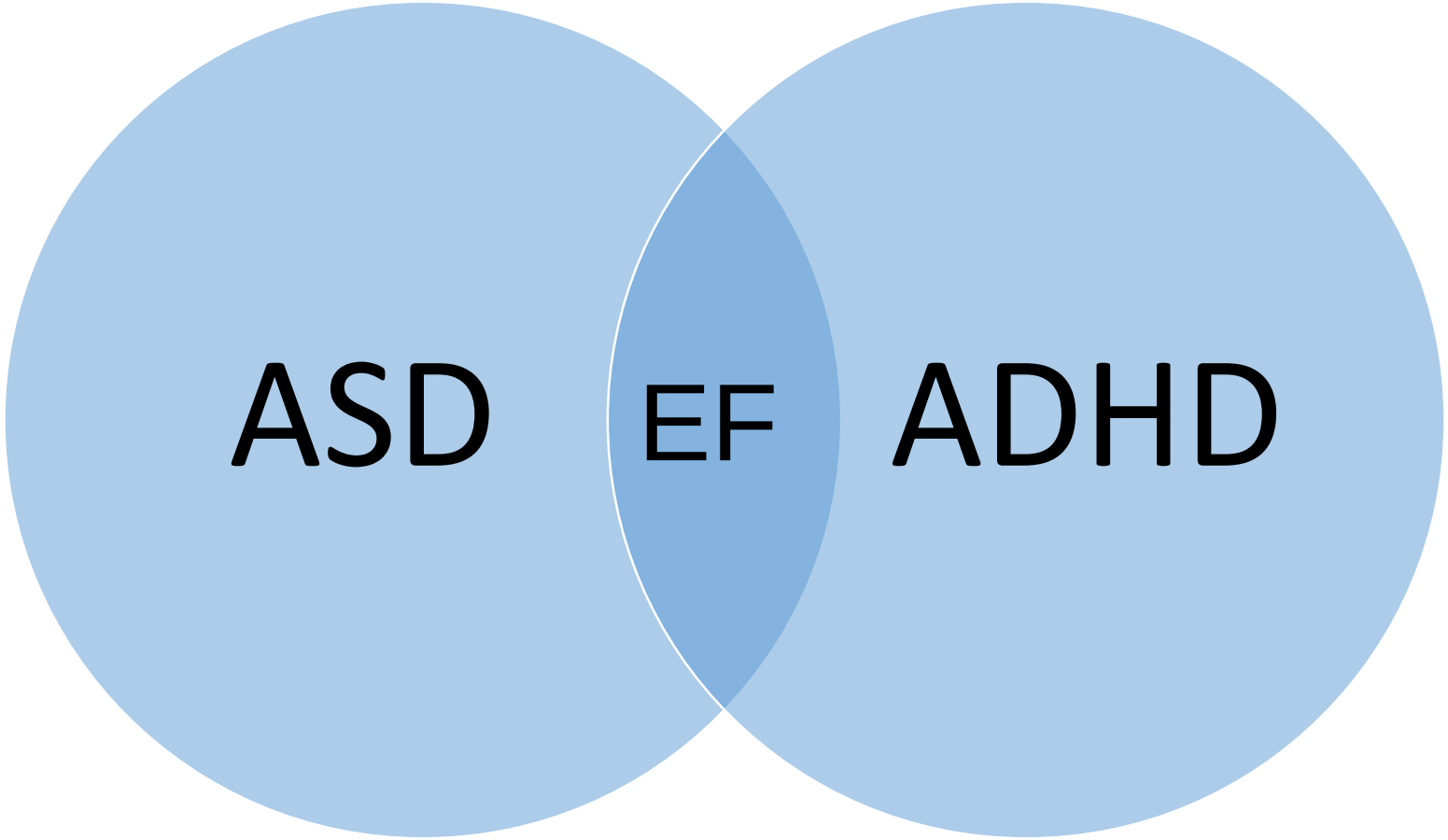
How EF presents in ASD +/- ADHD

- Rigid and routine bound ways of thinking
- Hyper-focused interests
- Behavioral inflexibility/preferred activities
- Rigidity in social dynamics
- Efficient and abstract reasoning (vs. getting stuck in the details)

So, what does this mean for our kids with multiple diagnoses and executive functioning challenges?



So what works best!?!

- Evidence for these approaches is growing; however, there is certainly challenge to evaluating behavioral approaches.

- Historically (first published in 1999), the Multimodal Treatment Study of Children with ADHD (not necessarily ASD) found that combination treatment (medication and behavioral therapy) was the most successful approach.

- In the end, the best treatment for an individual child is best selected on evaluation of the child's needs, considered within the larger environment in which that child needs to function. Often, these techniques are implemented by parents under the guidance of a professional.

Treatments: Many from Which to Choose

- ABA
- DTT
- TEACCH
- DIR/Floortime
- Augmentative Communication
- CBT
- Social Skills
- Sensory Therapies
- Medication
- Family Therapy

- Psychologists
- Speech/Language Pathologists
- Occupational Therapists
- Social Workers
- Physicians

Treatment

- Early diagnosis of ASD often is catalyst for obtaining appropriate intervention and educational services
- Early intervention (Stoelb et al. 2004)
- Up to 50% of children acquire near normal functioning when using the Intensive Behavioral Intervention model; working better with children with language disorders (Couper, 2004)

Treatment, cont.

- Individuals with autism spectrum disorder (ASD) experience increased morbidity and decreased life expectancy compared to the general population, and these disparities are likely exacerbated for those individuals who are otherwise disadvantaged (Bishop-Fitzpatrick & Kind 2017)
- Seven of nine studies identified racial disparities in access to general medical services for children with ASD (Bishop-Fitzpatrick & Kind 2017)

Health Disparities and Access to Services

- Significant disparities in the referral rate and clinical diagnosis of autism among racial/ethnic groups (Begeer, et al., 2009; Mandell et al., 2009)
- Racial and ethnic minorities receive lower quality services than nonminority groups and these disparities are related to historical inequalities such as discrimination and contemporary inequalities (e.g., lack of insurance, fewer services offered by Medicaid providers) (Smedley, Stith, & Nelson, 2003)

Health Disparities and Access to Services

- Health disparities are caused by a complex interaction of multiple factors including individual, genetic and environmental risk factors (Olden & White, 2005).
- Pervasive structural inequities and social determinants of health are believed to be the primary cause of health disparities (World Health Organization, 2011)

Health Disparities and Access to Services

- In 2017, 10.6 % of African Americans were uninsured compared with 5.9 % of non-Hispanic whites (Berchick, Hood, Barnett 2017)
- 12.1 percent of Africans Americans under the age of 65 reported having no health insurance coverage (CDC 2017)
- 44.1 % of African Americans had government health insurance coverage in 2017 (CDC 2017)

Health Disparities and Access to Services

- Parents in some groups may be less concerned or aware about autism, and may not seek out a diagnosis for their child (Newschaffer C.J. 2017)
- Black parents report fewer concerns about social problems, repetitive behaviors and other autism features than white parents do (Donohue M.R. et al. 2017)

Health Disparities and Access to Services

- Prevalence among white children is 7 percent higher than African-American children and 22 percent higher than Hispanic children (Autism Speaks/CDC 2019)
- Advanced paternal age is associated with an increase in autism risk, and fathers of white children tend to be older than those of black or Hispanic children (McGrath J.J. et al. 2013)

Health Disparities and Access to Services

- Black children typically diagnosed with ASD on average 1 ½ years later than White children, and require 3 times the number of visits as White children before receiving an ASD diagnosis (Mandell et al., 2009)
- On average African American children were almost 5½ years old at the time of diagnosis, despite the fact that parents had first expressed concerns about their kids' development more than three years earlier. (Constantino, J.N., et al 2020)

Health Disparities and Access to Services

- When minority children are eventually diagnosed with ASD they are more likely to have initially received a diagnosis other than autism (Mandell et al. 2007)
- Some pediatricians attribute autistic features (e.g., communicative and social deficits) to language and culture rather than to ASD (Begeer et al. 2009)
- 22% of white children with autism also have intellectual disability. Among African American children, the rate of intellectual disability in those with autism tops 44% (CDC 2020)

Health Disparities and Access to Services

- Schools identified as the most important source of diagnosis for African American children with younger mothers and those with mothers with <12 years of education (Yeargin-Allsopp et al. 2003)
- 40% of all children diagnosed with autism living in the Atlanta area were diagnosed only at educational facilities (Yeargin-Allsopp et al. 2003)

Health Disparities and Access to Services

- Children from higher income households are more likely to be diagnosed with ASD than children from lower SES homes (Durkin et al. 2010; Fountain et al. 2010)
- Children whose parents are highly educated are usually diagnosed at a younger age (Fountain, King, & Bearman, 2011)
- SES was a stronger predictor of receipt of state services than symptom severity (Fountain, King, & Bearman, 2011)
- Prevalence of ASD in Medicare higher for Asian and White (1%) than Black beneficiaries (0.6%) (CMS 2016)

Health Disparities and Access to Services

- Autism prevalence rose almost evenly among high-, middle- and low-socioeconomic groups between 2002 and 2010 (Durkin M.S. et al. 2017)
- The rate of autism among black children in the high socioeconomic group was higher than that among white or Latino children between 2002 and 2010 (Durkin M.S. et al. 2017)
- White children are about 19 percent more likely than black children and 65 percent more likely than Latino children to be diagnosed with autism (Durkin M.S. et al. 2017)

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True or false: Higher family SES and parent education results in earlier diagnosis of ASD.

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Test Performance Differences

- ADOS
- Minority children (relative to majority) have a different symptom profile (i.e., lower scores in language, communication & cognitive composite scores (Tek & Landa 2012)
- White children (compared to Black) more likely to have certain ASD symptoms (e.g., inflexible adherence to nonfunctional routines/rituals, persistent preoccupation with parts of objects (Sell et al. 2012)

Test Performance Differences

- ADOS
- Holding ADOS subdomain (Social Communication; Repetitive and Stereotyped Behaviors) scores constant, Black children were more likely to have higher (i.e., more atypical) ratings on the ADOS items assessing levels of Unusual Eye Contact, Stereotyped or Idiosyncratic Word Use, and Immediate Echolalia, and Latino children were more
- likely to have higher ratings on the item assessing levels
- of Usual Eye Contact (Harrison et al. 2017)

Anecdotal/Experiential Data

- Discrepancy in data shared by parents during parent interview
- Black children diagnosed with ID by White clinicians
- Difficulty with White clinician’s ability to get their message across

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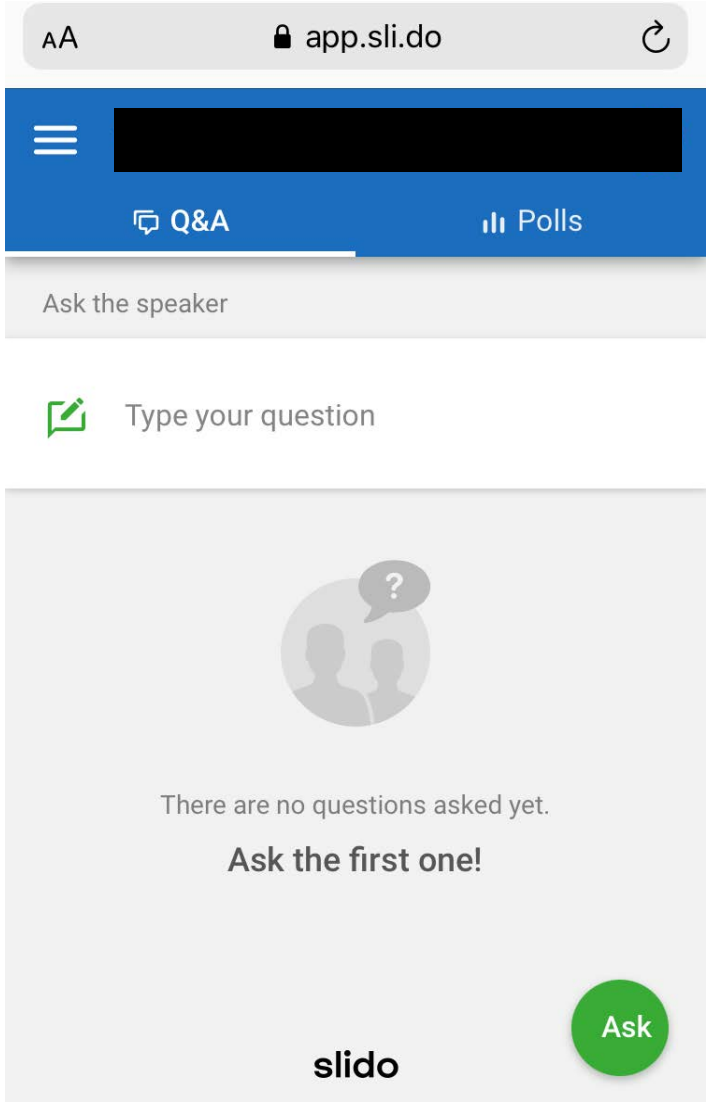
Question & Answer (Q&A) Segment.

Instructions: Toggle over to the Q&A section in Slido to enter questions.

Questions are selected at random by the moderator. We cannot guarantee your question will be answered during the Q&A segment.

The moderator may make small changes to a question for clarification purposes.

The Q&A segment is not anonymous. Please refrain from sharing any personal health information (PHI) or any other identifying information.



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