

HFA, AS, and NVLD: Differential Diagnosis by the SLP

Tina K. Veale, Ph.D.
Eastern Illinois University

American Speech-Language-Hearing Association

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Disorders of Interest

- High-functioning autism (HFA)
- Asperger syndrome (AS)
- Nonverbal learning disorder (NVLD)

Same Disorder or Different?

- Professionals are divided on this issue:
Are HFA and AS different disorder?
 - No, they are the Same!
 - Attwood, Frith, Gillberg, Gray, Schopler, Wing
 - Yes, they are Different!
 - Baker, Grandin, Kowalski, Richard, Rubin, Simpson, Smith-Myles, Szatmari, Tsai, Veale, Volkmar

Why Differentiate?

- To understand individuals with the disorders
- To define their learning styles
- To improve accuracy of diagnosis
- To develop targeted, effective interventions
- To plan for the future

High-Functioning Autism

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Autism

- According to the DSM-IV-TR (APA, 2000) and ICD-10 (WHO, 2007), individuals with autism present deficits in three domains:
 - Social interaction
 - Communication
 - Behavior
- Symptoms must be present by 3 years of age.
- Whole brain is affected.
 - Left hemisphere
 - Right hemisphere
 - Cerebellum
 - Diencephalon--limbic system
- One of five identified autism spectrum disorders

Autism: Social Interaction

- Low to absent social drive
- Absent or reduced initiation
- Absent or diminished reciprocity
- Interrupted emotional connectedness
- Lack of showing off or sharing behaviors
- Few to no peer relationships
- Failure to use facial expression, eye gestures, body language, or gestures (nonverbal communication) when interacting with others
- Absent or deficient theory of mind

HFA: Friends?

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- Vague concept of friendship
- Lack of knowledge about how to make/keep friends
- Poor concept of qualities most desired in a friend

- Devaluation of friendship
- Poor social judgment/ problem solving
- Avoids social interaction

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HFA: Low Social Drive

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- Prefers to spend time alone
- Chooses solitary activities
- Focuses on things and activities over people

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Theory of Mind?

- Underdeveloped concept of emotions
- Lack of perception of emotional state of others
- Difficulty reading and sending appropriate nonverbal messages

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Autism: Communication

- Significant delays in emergent language
- Diminished verbal fluency and/or facility
- Infrequent initiation of communicative exchanges
- Limited range of communicative functions
- Limited reciprocity
- Difficulty with topic maintenance
- May be echolalic
- May use idiosyncratic phrases

Autism: Communication

- Poor understanding of figurative language or indirect messages; very literal thinker
- Restricted word knowledge
- Word finding problems
- Receptive and expressive deficits
- Odd vocal prosody
- May have imprecise speech patterns, poor sound discrimination, and/or apraxia

HFA: Talking is Hard

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- Underdeveloped initiation and reciprocity
- Given the complexity of the task, communicate as little as necessary.

- Language formulation problems
- Significant language processing deficits
- Comprehension issues

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Global Communication Disorder

- Poor eye contact
- Lack of eye referencing
- Poor attention to conv partner
- Needs prompts to answer

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- Poor concept development
- Underdeveloped word knowledge
- Misses main ideas
- Difficulty putting thoughts into words

Autism: Behavior

- Cognitive inflexibility
- Ritualistic
- Intense interest in one or more topics
- Stereotypies
- Preoccupation with parts of objects
- Obsessive-compulsive behavior patterns
- Repeats behaviors over and over again
- Noncompliant
- Adaptive behavior delays

What Behavior Problem?

- Highly inflexible
- Anxiety in response to change
- Requires support for activities of daily living
- Weak self-evaluation

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Autism: Other Indicators

- Peculiar play patterns
 - Tendency to play with construction toys rather than make-believe toys
 - Solitary to parallel play; non-interactive
 - Limited interest in toys
 - Restricted play schema
- Severe attention deficit disorder
- Information processing differences
 - Sequential processors
 - Poor simultaneous processing

Autism: Other Indicators

- Perceptual differences
 - Strong visual processing
 - Poor auditory processing
- Sensory integration dysfunction
 - Hypersensitive hearing
 - Crave vestibular and proprioceptive input
 - Tactile defensiveness
- Organizational skills
 - Varies from very neat to indifferent
 - Needs help to organize
- Time/Space judgment
 - Usually excellent sense of time and space

Autism: Other Indicators

- Motor skills
 - Emergent skills on time to delayed
 - Balance may be excellent to average
 - Fine motor may be excellent to delayed
 - Handwriting problems
- Intestinal hyperpermeability
 - Gluten-casein sensitivity-> “Brain fog”
 - Constipation
 - Yeast overgrowth

High-Functioning Autism

- Normal or near normal intelligence
- Competent communication ability
 - Participates in verbal conversation
 - Follows verbal directions
 - Reads and writes
- Social deficits
- Repetitive behaviors

Asperger Syndrome

Asperger Syndrome

- According to DSM-IV-TR (APA, 2000) and ICD-10 (WHO, 2007), individuals with Asperger syndrome present deficits in two areas:
 - Social interaction
 - Behavior
- Language is relatively spared
- Right hemisphere disorder (frontal lobe)
- One of five identified autism spectrum disorders

Asperger Syndrome

- According to Attwood, AS involves:
 - The pursuit of knowledge and truth, which leads to...
 - Alternative priorities and perceptions, which leads to...
 - Talents and vulnerabilities.
- AS is a different way of thinking.

AS: Social Skills

- Modest to high social drive
- Over-initiation
- Command of reciprocity
- Emotionally present
- Shows off and shares accomplishments with others
- Few friends; superficial relationships
- Unusual facial expressions eye gestures, body language, and gestures (nonverbal communication)
- Deficient theory of mind
- Often perceived as abrupt or rude

These are my Friends.....

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- A friend is...
 - “There for you.”
 - “Fun!”
 - “Someone you can count on.”
 - “Some you can hang out with.”

➤ My friends are:

- Unusual
- In trouble
- Developmentally disabled

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Tons of Friends!

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➤ Problems knowing how to
interact

➤ Difficulty taking the
perspective of others

- Poorly defined concept of
friendship
- Impaired social perception
- Focus on self rather than
others

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Drive to Socialize!

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- Strong desire for friends and intimate relationships
- Prefers to spend time with friends
- Understands the concept of friendship
- Difficulty selecting friends

- Social difficulties common
- Need to lead
- Lack of compromise
- Deficient social problem solving

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Theory of Mind?

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Social Struggle

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AS: Behavior Issues

- Cognitive inflexibility
- Ritualistic; adheres to routines
- Intense interest in one or more topics
- Obsessive-compulsive behavior patterns
- Policing behavior--makes sure others follow rules
- Demand that rules are applied equally to all

Obsessions? What Obsessions?

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AS: Other Indicators

- No clinically significant delay in language development
- Effortless verbal expression
- May demonstrate pedantic speech
- No clinically significant delay in cognitive development
- Self help skills developed at appropriate times
- Appropriate adaptive behaviors (other than social interaction)
- Gross and fine motor deficits, including handwriting

Other Indicators

- Curious about the environment
- Visual learner, but auditory skills may also be strong
- Organization difficulties
- Time/space estimation and management issues
- Sensory processing differences

Adapting to Life

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Organized? Not so Much!

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Nonverbal Learning Disorder

Nonverbal Learning Disorder

- Individuals with NVLD present difficulty in these developmental domains:
 - Social
 - Language
 - Motor
 - Visual-spatial
- Right hemisphere disorder
- Not an identified autism spectrum disorder, but may present similarly in severe cases

NVLD: Social Skills

- Intact social drive
- Interpret social behaviors of others inaccurately
- May engage in incessant in social attempts
- Perceived as “annoying” or “attention-seeking”
- Often do not understand what is happening or what is expected
- May appear withdrawn or out of place in novel social contexts
- Social naiveté

Socially Driven

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- From early age, desires to be social
- Plans to have social relationships throughout lifetime
- Knows desired qualities in friends
- Engages easily with others

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Social Perspective

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- Misreads social information; perplexed by actions of others
- Feels empathy; often does not know how to react

Interested in Others

- Asks about other people
- Works to engage the listener
- Remembers information relative to other people
 - Uses this information in conversation

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NVLD: Communication

- May present as an early talker
- May speak like a “little adult”
 - Average vocabulary; complex sentences
 - Flat tone of voice
 - Fails to adjust discourse to audience
- Literal interpretation of language
 - Poor comprehension of humor; figurative language
 - Difficulty with multiple meaning words; nuance
- Difficulty providing opinions
- Pragmatic language deficits
 - Poor interpretation of nonverbal language
 - Often sends unintended messages via body language, tone of voice, proximity, or other nonverbal signals

Language Profile

- Language appears on time
- Syntax well developed
- Comprehension problems appear as child ages
- Nonverbal deficits (pragmatic difficulties) apparent from early age
- Connected language suffers from lack of organization; word finding and sentence formulation problems
- Language deficits translate to deficits in reading comprehension and composing written documents.

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NVLD: Motor Skills

- Motor clumsiness
- Slow reaction times
- Lack of speed in movement
- Difference between dominant and non-dominant sides of body
- Early in development, may avoid crossing midline
- Dysgraphia
- Impaired tactile discrimination, including finger agnosia

NVLD: Motor Skills

- Lack of awareness of body position in space
- At risk for personal injury; frequent falling
- As toddler, may be hesitant to explore motorically. Instead, explores his world verbally.
- Balance problems; balance perception differences
- Fear of heights; gravitational insecurity

Sort of Clumsy!

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NVLD: Visual-Spatial

- Visual perceptual deficits
- Visual imagery problems
- Visual-motor integration problems
- Visual-spatial confusion
- Visual memory deficits

How to Fix a Messy Closet

- Poor organization of personal spaces
- Hard to think about how to begin organizing

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NVLD: Other Indicators

- No early indications of developmental delay, except in psychomotor area
- May show remarkable rote memory for auditory information
- Does not like constructive play
- May have problems dressing self
 - Other adaptive skills average
- Prone to excess daydreaming
- May develop stories or fantasies
 - Highly creative
- May be highly anxious (panic and phobic disorders)
- Anger control issues
- Depression common in adolescence and adulthood

NVLD: Other Indicators

- May be considered gifted
- May struggle to learn effectively
- Early letter/number recognition, reading & spelling
 - Difficulty in math, history, social studies
- Performance IQ at least 10 points less than verbal IQ
- Cognitive inflexibility
- Logical thinker
 - Concrete topics easier than abstract ones
- Poor executive function
 - Difficulty prioritizing and organizing thoughts and work
- Does not naturally generalize learned information or skills
- Difficulty adapting to changes in routine
 - Cannot “wing it”

Differential Diagnosis

Social Skills: Similarities

	HFA	AS	NVLD
Few Friends	*	*	*
Poor Reading NV Signals	*	*	*
Poor Sending NV Signals	*	*	*
Peculiar/Odd	*	*	*
Social Naiveté	*	*	*

Social Skills: Differences

	HFA	AS	NVLD
Social Drive	Low	Mod-High	High
Initiates interactions	Low	Mod-High	High
Shows off; Shares	Low	High	Mod
Theory of Mind	Low	Low-Mod	Mod-High
Emotionally Connected	Low	Mod	Mod-High

Communication: Similarities

	HFA	AS	NVLD
Figurative Lang Deficits	*	*	*
Odd Prosody	* (Peculiar)	* (Peculiar)	* (Flat-Normal)
Receptive Lang Deficits	*	*	*
Pragmatic Deficits	*	*	*
Word finding difficulties	*	*	*

Communication: Differences

	HFA	AS	NVLD
Expressive Delays	Severe	Mild-None	None (Early Dev)
Verbal Facility	Poor	Good	Good
Variety of Com Functions	Low	Average	Average
Reciprocity	Poor	Average	Average
Echolalia	Ongoing	Periodic-None	None

Behavior: Similarities

	HFA	AS	NVLD
Difficulty w/ Change	*	*	*
Ritualistic	*	*	*
Restricted Interests	*	*	*
Anxious	*	*	*
Noncompliant	*	*	*

Behavior: Differences

	HFA	AS	NVLD
Stereotypies	Yes	Yes	No
OCD	Yes	Yes	No
Policing Behavior	No	Yes	No
Fantasizing/ Daydreaming	No	No	Yes
Depression	No	Yes	Yes

Learning Style: Similarities

	HFA	AS	NVLD
ADD	*	*	*
Cognitive Inflexibility	*	*	*
Sequential Processor	*	*	*
Problem w/ Salient Details	*	*	*
Logical Thinker	*	*	*
Poor Generalization	*	*	*

Learning Style: Differences

	HFA	AS	NVLD
Visual Learner	Yes	Yes	No
Auditory Learner	No	Yes	Yes
Tactile Learner	Yes	No	No
Overfocus on Details	Yes	No	No
Spatial/Temporal Orientation Prob	No	Yes	Yes
Cognitive Ability	Low average- Above Ave	Average- Gifted	Average- Gifted
Perf IQ < Verbal IQ	No	Yes	Yes

Other Similarities

	HFA	AS	NVLD
Excellent Rote Memory	*	*	*
Psychomotor Delays	* Maybe	*	*
Executive Function Disorder	*	*	*
Sensory Integration Disorder	*	*	*

Other Differences

	HFA	AS	NVLD
Constructive Play	Yes	Yes	No
Interactive/Pretend Play	No	Some	Yes
Play Schema	Reduced	Reduced to Average	Average
Curious	No	Yes	Yes
Adaptive Behavior	Delayed	Average (except dressing)	Average (except dressing)

Assessment

The Process of Differential Diagnosis

Assessment Planning

- Formal assessment
 - Setting: Therapy room or some other quiet setting
 - Format: Select battery of tests to help determine diagnosis
 - Communication
 - Receptive vs. Expressive skills
 - Syntax vs. Semantics and pragmatics
 - Social-pragmatics
 - Play
 - Behavior
 - Autism inventories

Assessment Planning

- Informal Assessment
 - Setting: No less than three relevant contexts
 - Format
 - Observations (video recommended)
 - Completion of checklists
 - Communication analysis
 - Parent/teacher interviews
 - Client interview

Formal Assessment

- No single test instrument is designed to differentiate between these disorders
- Due to similarity in many symptoms, formal tests to identify autism spectrum disorders may not be helpful.
- Given their relative strength in cognition, most individuals with HFA, AS, and NVLD perform relatively well on formal communication tests.
- Formal test batteries can be compiled to evaluate key areas of known deficits.

Formal Test Battery: Autism Identification

- Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 1999)
- Childhood Autism Rating Scale (CARS; Schopler, E., Reichler, R., & Rochen-Renner, B., 1988)
- Gilliam Autism Rating Scale-2nd Edition (GARS; Gilliam, 2006)
- Checklist for Autism in Toddlers (CHAT; Baron-Cohen, 1992)
- Autism Behavior Checklist (ABC; Krug, Arick, & Almond, 1993)

Formal Test Battery: Overall Language Skills

- Clinical Evaluation of Language Fundamentals-4th Edition (CELF-4; Semel, Wiig, & Secord, 2003)
- Comprehensive Assessment of Spoken Language (CASL, Carrow-Wolfolk, 1999)
- Test of Adolescent and Adult Language-4th Edition (TOAL-4, Hammill, Brown, Larsen, & Wiederholt, 2007)
- Oral and Written Language Scales (OWLS; Carrow-Woolfolk, 1996)
- Test of Written Language-4th Edition (TOWL-4; Hammill & Larsen, 2009)

Formal Test Battery: Overall Language Skills

- Communication and Symbolic Behavior Scales (CSBS; Wetherby & Prizant, 1993)
- Preschool Language Scale-4th Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002)
- Clinical Evaluation of Language Fundamentals-Preschool-2nd Edition (CELF-P:2; Semel, Wiig, & Secord, 2004)

Formal Test Battery: Social-Pragmatic Skills

- Test of Problem Solving--Elementary-3rd Edition (Huisingsh, Bowers, & LoGiudice, 2005)
- Test of Problem Solving--Adolescent-2nd Edition (Huisingsh, Bowers, & LoGiudice, 2007)
- The Social Language Development Test (Bowers, Huisingsh, & LoGiudice, 2008)
- Diagnostic Analysis of Nonverbal Accuracy-2nd Edition (Nowicki & Duke, 2006)
- Test of Pragmatic Skills-Revised (Shulman, 1986)
- Pragmatic Protocol (Prutting & Kirchner, 1987)

Formal Test Battery: Social-Pragmatic Skills

- Children's Communicative Checklist-2nd Edition (Bishop, 2003)
- Social Skills Rating System (SSRS; Gresham & Elliott, 1990)
- Test of Pragmatic Language-2nd Edition (Phelps-Terasaki & Phelps-Gunn, 2007)
- Reading the Mind in the Eyes Test (Baron-Cohen, 1997)
- The Strange Stories Test (Happe', 1994)
- The Theory of Mind Test (Muris, Steerneman, Meesters, Merckelbach, & Horselenberg, 1999)

Formal Test Battery: Play Development

- Play Observation Scale-Revised
(Rubin, 1984)
- Symbolic Play Checklist
(Westby, 1980)
- Symbolic Play Scale
(Westby, 1988)

Formal Test Battery: Semantic Language Skills

- The Language Processing Test-3rd Edition (LPT-3; Hanner & Richard, 2005)
- The Word Test-2nd Edition-Elementary (Bowers, Huisingsh, LoGiudice, & Orman, 2004)
- The Word Test-2nd Edition-Adolescent (Huisingsh, Bowers, LoGiudice, & Orman, 2004)
- Test of Word Knowledge (Wiig & Secord, 1992)
- Test of Semantic Skills-Primary (Bowers, Huisingsh, LoGiudice, & Orman, 2002)
- Test of Semantic Skills-Intermediate (Huisingsh, Bowers, LoGiudice, & Orman, 2004)

Formal Test Battery: Semantic Language Skills

- Test of Auditory Comprehension of Language-3rd Edition (TACL-3; Carrow-Wolfolk, 1999)
- The Listening Comprehension Test-2nd Edition (Huisingsh, Bowers, & LoGiudice, 2006)
- The Listening Comprehension Test-Adolescent (Bowers, Huisingsh, & LoGiudice, 2009)

Formal Test Battery: Behavior Profile

- Connors Comprehensive Behavior Rating Scales (CBRS; Connors, 2008)
- Behavior Dimensions Rating Scale (BDRS; Bullock & Wilson, 1989)
- Behavior Assessment System for Children-2nd Edition (BASC-2; Reynolds & Kamphaus, 1992)
- Vineland Adaptive Behavior Scales-2nd Edition (Sparrow, Cicchetti, & Balla, 2005)

Formal Test Battery: Other Components

- Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000)
- Behavior Rating Inventory of Executive Function-Preschool (BRIEF-P; Gioia, Espy, & Isquith, 2008)
- Woodcock-Johnson Tests of Achievement (Woodcock, McGrew, & Mather, 2001)
- Woodcock-Johnson III Tests of Cognitive Abilities (Woodcock, McGrew, Schenk, 2007)
- Rivermeade Behavioral Memory Test (RBMT-3; Wilson, Greenfield, Clare, Cockburn, Baddeley, Watson Tate, Sopena, Nannery, & Crawford, 2008)

Informal Evaluation Components

- Social-Pragmatics
 - Eye contact
 - Eye referencing
 - Joint attention; joint engagement
 - Reciprocity
 - Initiation
 - Responding
 - Communicative functions (requesting; protesting; social routine; calling; greeting; giving information; asking permission/information; commenting)
 - Discourse modalities (description; narration; humor; persuasion; etc.)

Informal Evaluation Components

- Social-Pragmatics (con't)
 - Presupposition
 - Giving appropriate information--not too much or too little
 - Taking listener knowledge into account when formulating utterances
 - Cohesion
 - Nonverbal communication--receptive and expressive
 - Eye messages
 - Voice messages
 - Space (proximity) messages
 - Body messages

Informal Evaluation Components

- Semantics
 - Concept knowledge
 - Word knowledge
 - Age-appropriate vocabulary
 - Synonyms; antonyms; homonyms
 - Multiple meaning words
 - Word-level comprehension
 - Sentence-level comprehension
 - Paragraph-level comprehension
 - Following complex directions (oral and written)
 - Expository vs. narrative information (oral and written)
 - Reading aloud vs. listening to passages read by another

Informal Evaluation Components

- Syntax
 - Basic and complex sentence structures (oral and written)
 - Embedded adjectives
 - Relative clauses
 - Adverbial clauses
 - Coordinating conjunctions
 - Cohesion devices
 - Pronominal reference

Informal Evaluation Components

- Behavior
 - Obsessive interests or thoughts
 - Repetitive acts or sequences
 - Compulsive behaviors
 - Rituals
 - Stereotypies

Making the Diagnosis

- Take time to review all information
 - Formal measures
 - Informal data
 - Video records
- Summarize the differential indicators
- Note other symptoms
- What diagnosis is the best-fit for this individual?

Let's Practice Making the Differential Diagnosis



Meet Sara

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Meet Matthew

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are needed to see this picture.

Meet Shannon

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Meet Alex

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Meet Jacob

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Intervention

Is Specificity Important?

Customizing Interventions

- Many interventions are useful for individuals with HFA, AS, or NVLD
 - Some are not useful in one or more population
 - Most work differently from population to population
 - Important to know how to apply specific interventions appropriately for the diagnostic group
- Begin customizing techniques based on your knowledge of the disorders.
 - Further individualize for each client.

Schedules

- HFA
 - Ensure predictability; sameness
 - Facilitate transitions
 - Mark completion
- AS/NVLD
 - Cue order of events
 - Facilitate transitions
 - Support organization



Timers



- HFA
 - Signal/encourage completion
 - Signal transition
 - Visualize abstract concept
- AS/NVLD
 - Judge time increments
 - Teach time management
 - Organizational strategy
 - Encourage completion
 - Visualize abstract concept

Organizers

• **HFA--Make it Visual**

- Communicate verbal info between home/school
- Cue memory--directions for multiple assignments
- Cue memory--directions for multiple supplies
- Problem solve steps needed; Plan sequence
- Self check for completion--visual cue to finish

• **AS--Make it Visual**

- Get most important info between home and school
- Plan what to take home
- Note what needs to be done and estimate how long
- Self check for completion--visual cue to finish

• **NVLD--Make it Auditory** (otherwise same as AS)



Social Stories

- HFA/AS
 - Tells the individual how to behave
 - Gives a rationale for behavior
 - Explains potential feelings of others
 - Makes social interaction logical
- NVLD
 - Most important elements are description of social behavior and rationale
 - Will be able to predict how others feel



Comic Strip Conversations

- HFA/AS/NVLD
 - Work out various solutions to problems
 - Cue nonverbal communication--facial expression, tone of voice, etc.
 - Colors cue emotionality of words
- HFA
 - Keep the language level targeted to the individual
 - Draw cartoon one step at a time, then insert language
- NVLD
 - Able to finish on own due to perspective taking abilities



Social Autopsies

- HFA
 - May involve too much language
 -
- AS/NVLD
 - AS--Keep it visual
 - NVLD--Keep it auditory
 - Helps organize social behavior
 - Allows client to see that s/he has responsibility for social choices

Cognitive Behavior Therapy

- HFA
 - Must be supported with visuals
- AS/NVLD
 - Auditory approach, or “talk therapy,” often effective
 - Encourages the client to participate actively in analysis of social behavior and plans for future behavior
 - Values the client’s input

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Contact Information

Tina K. Veale, Ph.D., CCC-SLP
Eastern Illinois University
2207 Human Services Center
600 Lincoln Ave.
Charleston, IL 61920
(217) 581-7445
tkveale@eiu.edu