


**Assessment and Intervention
in Augmentative and
Alternative Communication for
Autism Spectrum Disorders**

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Part 1


Program: Morning


- Introduction to Autism Spectrum Disorders (ASD)
 - Communication, Speech, & Language
- General Issues of ASD Diagnosis and Assessment
- AAC Assessment in ASD
- Science versus Pseudoscience in AAC Intervention



Disclosure Statement


Oliver Wendt is Chief Science Officer
for SPEAK MODalities, LLC.





AAC and ASD

**COMMUNICATION,
SPEECH, AND LANGUAGE
CHARACTERISTICS IN ASD**



Video Clip

- What atypical behaviors do you notice in the children that are shown?
- Think about motor, cognitive, linguistic and behavioral domains!



Video Clip
“The Doctor is In: Autism”



Autistic Disorder


Diagnostic and Statistical Manual of Mental Disorders (2000)
DSM-IV: Triad of symptoms with

1. Impairments in language and communication
 - Deficits in language can range from completely nonverbal to acquiring the ability to speak.
2. Impairments in social interaction
 - Results in lack of motivation to communicate with other people – even when these individuals have acquired some language competence and use.
3. Restricted and repetitive patterns of behavior
 - Pre-occupation with restricted patterns of interest can impede social and communicative development.




Core Characteristics

1. Social Interaction
 - Impairment in the use of nonverbal behavior
 - Lack of spontaneous sharing
 - Lack of socioemotional reciprocity
 - and/or failure to develop peer relationships



Core Characteristics (cont.)

2. Verbal and Nonverbal Communication
 - Delay in or lack of development of spoken language and gestures
 - Impairment in the ability to initiate or maintain conversation
 - Repetitive and idiosyncratic use of language
 - and/or lack of pretend play



Core Characteristics (cont.)

- 3. Restricted and Behavior
 - Restricted repertoire of activities and interests
 - Preoccupation with restricted patterns of interest
 - Inflexible adherence to routines, repetitive movements
 - and/or preoccupation with parts of objects

“Spectrum” of Autism Disorders

- Autism or Autistic Disorder: prototype
- Asperger Syndrome: Individuals with behavioral and social features associated with autism, no language/cognition impairment
- Rett Syndrome: X-linked degenerative condition
- Childhood Disintegrative Disorder (Heller syndrome): rapid deterioration of skills after typical course of development
- Atypical Autism or Pervasive Developmental Disorder-Not Otherwise Specified

Relationship among autism spectrum disorders.

Relationship among autism spectrum disorders. Overlapping circles represent that symptoms overlap although the disorders do not. The prototypical disorder, autism, appears in the center; other disorders extend from this prototype in decreasing severity and in decreasing number of domains affected.

(Wetherby & Prizant, 2000)

**“Umbrella Term”:
Autism Spectrum Disorders**

Autism
Asperger syndrome
Rett's syndrome
Childhood disintegrative disorder
PDD – not otherwise specified

Figure 1 Pervasive developmental disorders.

New DSM-V Criteria

Autism Spectrum Disorder (ASD)
must meet criteria 1, 2, & 3:

- 1. Clinically significant, persistent deficits in social communication and interactions, as manifest by all of the following:
 - a. Marked deficits in nonverbal and verbal communication used for social interaction
 - b. Lack of social reciprocity
 - c. Failure to develop and maintain peer relationships appropriate to developmental level

New DSM-V Criteria (cont.)

Autism Spectrum Disorder

- 2. Restricted, repetitive patterns of behavior, interests, and activities, as manifested by at least TWO of the following:
 - a. Stereotyped motor or verbal behaviors, or unusual sensory behaviors
 - b. Excessive adherence to routines and ritualized patterns of behavior
 - c. Restricted, fixated interests
- 3. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)

New DSM-V Criteria (cont.)

Autism Spectrum Disorder Severity Criteria

For criteria 1 & 2 severity is ranked as (based on amount of support needed)

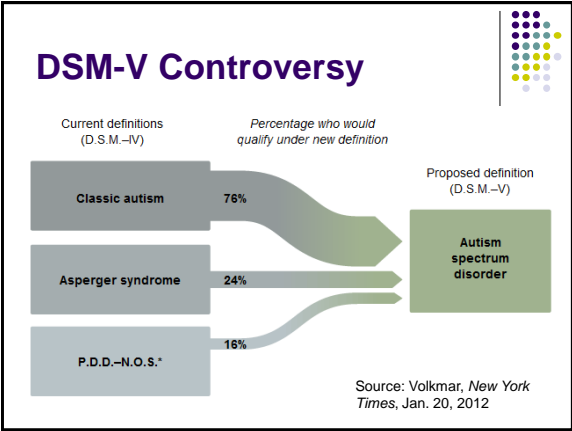
- Level 1 (mild autism): requires some support
- Level 2 (moderate autism): requires substantial support
- Level 3 (severe autism): very substantial support

- Support needs are not defined.

- Progressive scale in (1) social responsiveness, and (2) ability to be redirected from repetitive behaviors fixations or routines. In the most severe persons, autism impairs all areas of functioning, while autism impairs at least one area of functioning in the mildest autistic persons.

New DSM-V Criteria (cont.)

- Creation of a single diagnostic category for autism: "autism spectrum disorders"
- Incorporates the current diagnoses of autistic disorders, Asperger's Syndrome, and pervasive developmental disorder (not otherwise specified)
- Rett Syndrome and CDD no longer included



Is This The Typical Autism Case?



Characteristics: Autism Prototype

- **Cognition**
 - 30% mild to moderate intellectual impairment; 42% severe to profound intellectual impairment (Fombonne, 1999)
 - Rote memory (easily remember things without knowing what they really mean): well-developed but leads to misunderstanding that student has good higher-level comprehension skills; information also cannot be retrieved in every situation
 - Theory of mind: no understanding that other people have own thoughts, difficulty in understanding other's beliefs and emotions
 - Problem solving: access to only one problem-solving strategy. may not be able to recall when needed

Characteristics: Autism Prototype

- **Behavior**
 - Stimulus overselectivity
 - Child attends to only one item or object, no true understanding; responding pattern ≠ knowledge
 - Self-stimulatory behavior (e.g., rocking, hand flapping, etc.)
 - Repetitive Behavior
 - Obsession, Tics, Perseveration
 - Need for environmental predictability
 - Problem Behavior
 - Self-injurious (e.g., head banging, biting; relatively uncommon)
 - Aggression (directed towards others)

⇒ Can serve communicative function

Prominent Characteristics in ASD

Continuum of symptoms in autism spectrum disorders.


Atypical Communication Development

- Ages associated with early gestures in typically developing (TD) children:
 - Reaching 6-9 months
 - Giving 8-11 months
 - Showing 8-13 months
 - Pointing 9-14 months
 (Bates et al., 1975; Carpenter et al., 1983)
- Gestures are precursor to later speech and language development
 - Early symbolic form of communication

Atypical Communication Development (cont.)

- Children with ASD tend to rely on more primitive gestures
 - Leading
 - Pulling
 - Manipulating partner's hand

Atypical Communication Development (cont.)




Gestural use characterized by:

- Fewer gestures are combined with vocalizations than in TD children
- Less pointing (protodeclarative gesturing)
- Fewer conventional gestures
- Use of unconventional behavior to communicate (both verbal and non-verbal)


(Wetherby et al., 2000)

Language Difficulties



- **Language**
 - Development severely delayed and deviant in both expressive and receptive domains
 - When expressive language develops, first word often spoken between 2-3 yrs.
 - Language pragmatics are impaired, e.g.,
 - Parroting
 - Reversing pronouns
 - Verbal perseveration
 - Proxemics

Language Difficulties



- **Language (cont.)**
 - Repetitive or idiosyncratic language
 - Echolalia: form of communication in which people with autism echo other people's language by constantly repeating a portion of what they hear
 - Delay in development of intentional communication
 - Greater propensity to use challenging behavior to communicate
 - Limitations in joint attention, range of communicative functions, higher proportion of imperatives

Proportion of Nonverbal Children

- Autism includes a “delay in, or lack of the development of spoken language” (American Psychiatric Association, 2000)
- 14-25% of children diagnosed with an autism spectrum disorder (ASD) present with little or no functional speech (Lord & Bailey, 2002; Lord, Risi, & Pickles, 2004)
 - Autistic disorder only: 50% of children are functionally non-verbal
 - no sufficient natural speech or writing to meet their daily communication needs (Light, Roberts, DiMarco, & Greiner, 1998) ⇒ Candidates for intervention in augmentative and alternative communication

AAC and ASD

**GENERAL ISSUES
AUTISM ASSESSMENT
AND DIAGNOSIS**

Autism in Infants and Young Children

- Change in age at which autism is first diagnosed
 - Increased public and clinical awareness
 - Advances in early diagnosis
- 2 years of age or even younger
- Diagnosis of younger children more complex
 - Diagnostic stability
 - Developmental changes can be significant
 - Ex.: repetitive behaviors uncommon in young children, social deficits become more striking with age

Autism in Infants and Young Children (cont.)

- While some young children will meet autism criteria, others may not necessarily fulfill the required repetitive behavior criteria until around 3 yrs.
- Less common: meeting criteria initially and later making gains
- Strong efforts on improving screening and early diagnosis
 - Early identification and intervention ⇒ improved outcome/prognosis

New Test for Early Diagnosis


- Simple calling out a baby's name to see if he or she responds could be the first step in early diagnosis of autism
- "If a child fails the test at 12 months, they're highly likely to have some abnormal developmental outcome that could probably respond to therapy" (Ozonoff, 2007)
- Watch video clip:
http://www.cbsnews.com/sections/i_video/main500251.shtml?id=2640311n

New Test for Early Diagnosis (cont.)



Cultural Issues and Diagnosis


- Surprisingly very little discussion on this topic
- Cross-cultural comparisons can prove the robustness of diagnostic concepts
- Need for more rigorous and well-controlled studies on the issues of social-cultural factors in autism



Issues in Assessment of ASD


- Two levels of screening and evaluation:
 1. Level 1 Screening
 - Routine developmental surveillance by providers of general services for young children
 2. Level 2 Evaluation
 - Comprehensive diagnostic assessment by experienced clinicians for children who fail initial screening

(American Academy of Neurology, 2000; American Academy of Child and Adolescent Psychiatry, 1999)



Important Considerations

- Developmental perspective
 - Lifelong disorder, changes over time
 - Delays in one developmental area can impact acquisition of later developmental milestones
 - Autism symptoms often worst in preschool and substantially improve over time
 ⇒ form and quality of symptoms change with age
- Evaluation should include multiple sources and contexts
 - Symptoms may be dependent on characteristics of the environment



Important Considerations (cont.)

- Assessments of ASD should be multi-disciplinary whenever possible
 - Professionals from psychology, psychiatry, pediatrics, neurology, etc.
 - AND speech and language
 - One member to act as evaluation coordinator
- “Core” assessment battery
 - Specific approach will depend on assessment goal (e.g., diagnosis, treatment planning, annual or other regularly scheduled assessment, evaluation of treatment progress, etc.)

Table 1. Recommended Measures of a Core Assessment Battery for Autism Spectrum Disorders

Measure	Format	Age Range ^a	Administration/Completion Time	Training Needs ^b
Autism Diagnosis: Parent Report				
ADI-R	Interview	18 months to adult	1 to 2.5 hr	Intensive
SCQ	Questionnaire	4 years to adult	10 min	Minimal
PIA	Questionnaire	2 to 6 years	20 to 30 min	Minimal
PDDBI	Questionnaire	1 to 17 years	10 to 15 min	Minimal
Autism Diagnosis: Direct Observation				
ADOS	Direct Testing	2 years to adult	30 to 50 min	Intensive
CARS	Observation	2 years to adult	5 to 10 min	Moderate
Intelligence				
Mullen	Direct Testing	Birth to 68 months	15 to 60 min	Moderate
DAS	Direct Testing	2.5 to 17 years	25 to 65 min	Moderate
WISC-IV	Direct Testing	6 to 16 years	50 to 70 min	Moderate
Stanford-Binet 5	Direct Testing	2 to 85 years	45 to 75 min	Moderate
Leiter-Revised	Direct Testing	2 to 20 years	25 to 90 min	Moderate
Language				
CELF	Direct Testing	3 to 21 years	30 to 45 min	Moderate
PPVT	Direct Testing	2.5 to 90+ years	10 to 15 min	Moderate
EWPPVT	Direct Testing	2 to 18 years	10 to 15 min	Moderate
TLC	Direct Testing	5 to 18 years	<60 min	Moderate
CCC	Questionnaire	5 to 17 years	10 to 15 min	Minimal
Adaptive Behavior				
Vineland	Interview	Birth to 18 years	20 to 60 min	Moderate

Note: ADI-R = Autism Diagnostic Interview-Revised; ADOS = Autism Diagnostic Observation Schedule; CARS = Childhood Autism Rating Scale; CCC = Children's Communication Checklist; CELF = Clinical Evaluation of Language Fundamentals; DAS = Differential Abilities Scale; EWPPVT = Expressive One-Word Picture Vocabulary Test; PDDBI = Pervasive Developmental Disorders Behavior Inventory; PIA = Parent Interview for Autism; PPVT = Peabody Picture Vocabulary Test; SCQ = Social Communication Questionnaire; TLC = Test of Language Competence; WISC-IV = Wechsler Intelligence Scale for Children (4th ed.).

^aInclusive (e.g., 2 to 6 years = from 2 years 0 months through 6 years 11 months). ^bMinimal = little to no training required, but presumes familiarity with instrument. Moderate = presumes prior basic interviewing/cognitive assessment training. Intensive = additional specialized training, such as workshop attendance, suggested.

Core Autism Assessment

- First step: Review with parents the child's early developmental history and current concerns in areas of
 - Communication
 - Social and behavioral development
- Brief screening of potential medical and psychiatric issues (e.g., anxiety and depression)
- Review of available records
- Direct observation of and interaction with child

Autism Diagnostic Measurement

- In the past dominated by clinical impression, oral traditions, and subjective observations
 - Use of standard diagnostic criteria and recognition and interpretation of symptoms differed across settings
- Recently: Publication of standardized assessment tools (e.g., ADI-R, ADOS ⇨ gold standard of autism diagnosis)

Autism Diagnostic Measurement (cont.)

- Parent interviews and questionnaires:
 - Autism Diagnostic Interview – Revised (ADI-R)
 - Comprehensive parent interview that probes for symptoms of autism
 - Elicits information from parents on current behavior and developmental history
 - Social Communication Questionnaire
 - Parent-report questionnaire based on ADI-R
 - Same questions but briefer in yes/no-format, parents can complete on their own

Autism Diagnostic Measurement (cont.)

- Diagnostic observation instruments
 - Autism Diagnostic Observation Schedule (new version ADOS-2 coming summer 2012)
 - Wide range of patients: very young children with no language to verbal, high-functioning adults
 - New Toddler Module: for children 12-30 months of age who do not consistently use phrase speech
 - Modules 1 & 2 for younger children assess: social interest, joint attention, communicative behaviors, symbolic play and atypical behaviors
 - Modules 3 & 4 for older and more capable individuals: conversational reciprocity, empathy, insight into social relationships, and special interests

Autism Diagnostic Measurement (cont.)

- Diagnostic observation instruments
 - Childhood Autism Rating Scale (2nd Ed.)
 - 15-item structured observation instrument, completed by clinician, optional parent/caregiver questionnaire; in two versions:
 - Standard Version Rating Booklet (CARS 2-ST): children < 6 years and those with communication difficulties or below-average cognitive ability
 - High-Functioning Version Rating Booklet (CARS 2-HF): alternative for verbally fluent children and youth > 6 years, with average or above intellectual ability
⇒ demonstrates relatively strong relationship with ADOS

Autism Diagnostic Measurement (cont.)

- Summary
 - Several measures available, each with weaknesses and strengths
 - Little empirical data to guide clinicians choosing among them
 - Biggest limitation: reliance on current behavior
 - Critical for diagnosis to both directly observe the child and obtain information from parents

AAC and ASD

AAC ASSESSMENT IN AUTISM

General Issues

- No standardized instrument specifically for AAC assessment in ASD
- Particular areas that need attention
 - Cause and effect
 - Symbolic comprehension
 - Imitation
 - Intentional communication
 - Problem behaviors signaling intent
 - Any vocalizations/ prelinguistic utterances
- Can be done within current diagnostic tools

Childhood Autism Rating Scale (CARS)

- Development
 - Created to evaluate children referred to North Carolina's autism program
 - Designed to differentiate between autism and other developmental disabilities
- Description
 - 15 independently rated subscales (e.g., imitation, relating to people, sensory response, communication, activity level)
 - Behaviors are rated on a scale of 1 (normal) to 4 (severely abnormal)
 - Scores > 30 suggest a diagnosis of autism
 - Scores > 36 indicate probability of severe autism

CARS (cont.)

- Psychometrics
 - Internal consistency: high
 - Interrater reliability: high
 - Criterion-related validity: high
 - Predictive validity: 100% (when distinguishing between autism and MR)
- Advantages
 - Allows for repeated measurement across the lifespan
 - Well established psychometrics
- Limitations
 - Intended for use by clinicians, requires expertise
 - Does not follow diagnostic criteria of DSM-IV
 - Does not distinguish between autism and other PDDs

Autism Diagnostic Interview-Revised (ADI-R)

Rating Scales

Item	Response	Score	Weight	Item Total	Item Mean	Item SD
1. Recurrent stereotyped behaviors	0-3	1	1	1	1.00	1.00
2. Abnormalities of sensation	0-3	1	1	1	1.00	1.00
3. Abnormalities of motor behavior	0-3	1	1	1	1.00	1.00
4. Abnormalities of communication	0-3	1	1	1	1.00	1.00
5. Abnormalities of social interaction	0-3	1	1	1	1.00	1.00
6. Abnormalities of reciprocal social interaction	0-3	1	1	1	1.00	1.00
7. Abnormalities of reciprocal communication	0-3	1	1	1	1.00	1.00
8. Abnormalities of reciprocal social interaction and communication	0-3	1	1	1	1.00	1.00
9. Abnormalities of reciprocal social interaction, communication, and stereotyped behaviors	0-3	1	1	1	1.00	1.00
10. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation	0-3	1	1	1	1.00	1.00
11. Abnormalities of reciprocal social interaction, communication, and abnormalities of motor behavior	0-3	1	1	1	1.00	1.00
12. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation and motor behavior	0-3	1	1	1	1.00	1.00
13. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors	0-3	1	1	1	1.00	1.00
14. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction and communication	0-3	1	1	1	1.00	1.00
15. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation	0-3	1	1	1	1.00	1.00
16. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation and motor behavior	0-3	1	1	1	1.00	1.00
17. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors	0-3	1	1	1	1.00	1.00
18. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction and communication	0-3	1	1	1	1.00	1.00
19. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation and motor behavior	0-3	1	1	1	1.00	1.00
20. Abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation, motor behavior, and stereotyped behaviors, and abnormalities of reciprocal social interaction, communication, and abnormalities of sensation and motor behavior	0-3	1	1	1	1.00	1.00

Autism Diagnostic Observation Schedule (ADOS)

- Development
 - Developed to discriminate between autism, ID, and normal functioning using a standardized set of scenarios
 - Not intended to assess motor skills or sensory abilities or repetitive behaviors
- Description
 - 8 tasks: puzzle construction, symbolic and reciprocal play, joint drawing, simple task performance, description of pictures, narrative production, conversation, description of social and emotional situations
 - Examiner rates performance on a scale of 0 (within normal limits) to 2 (definite abnormality) to determine levels of social interaction, communication, and abnormal behaviors

ADOS (cont.)

- Psychometrics
 - Internal consistency: high
 - Interrater reliability: high
 - Test-retest reliability: adequate
 - Concurrent validity: adequate
 - Criterion-related validity: adequate
 - Predictive validity: adequate (could not distinguish between different PDDs)

ADOS (cont.)

- Advantages
 - Allows for observation of a wide variety of social and communicative behaviors
 - Well established psychometrics
 - Provides distinct versions based on language abilities
- Limitations
 - Observer must have substantial training
 - Possibility of cueing or prompting during interaction
 - Does not assess repetitive behaviors (a criterion of DSM-IV)

ADOS-2 Example

ADOS-2

Child ID: _____

Gender: Female Male

Date of Birth: _____

Date of Evaluation: _____

Chronological Age: _____

Examiner: _____

Other information: _____

Pre-Verbal/Single Words
Age Recommendation:
31 Months and Older

Observation/Coding

1. Free Play
2. Response to Name
3. Response to Joint Attention
4. Bubble Play
5. Anticipation of a Routine With Objects
6. Responsive Social Smile
7. Anticipation of a Social Routine
8. Functional and Symbolic Imitation
9. Birthday Party
10. Snack

ADOS-2 Video Clips



“Tablet-device Readiness”

iPad App: SPEAKone! (Purdue)


“Tablet-device Readiness”

iPad App: Sounding Board (AbleNet)

AAC and ASD

**SCIENCE VERSUS
PSEUDOSCIENCE**


The “Miracle” of Dolphin Therapy

Dolphin Assisted Therapy (DAT)


- “What do you think about the validity of this technique?”

⇒ *This is an example of Pseudoscience!*




DAT: Is There Evidence?

- Critical reviews show lack of carefully designed studies, lack of efficacy
 - Marino & Lilienfeld (1998; 2007)
 - Humphries (2003)
- Not able to locate studies specific to ASD
 - Hewitt (2008)
 - <http://div1.perspectives.asha.org/cgi/content/full/15/2/85?maxtoshow=&HITS=10&hits=10&RESULTFORMA T=&author1=Hewitt&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT>




Pseudoscience



“A pretended or spurious science; a collection of related beliefs about the world mistakenly regarded as being based on scientific method or as having the status that scientific truths now have” (Simpson & Weiner, 1989, paragraph 1).


- Pseudoscientific treatment claims
 - Appear to be, but are not, objective, empirically based, and rooted in the larger methods of science
 - Antithetical to the purposes of a true evidence-based clinical service discipline such as speech-language pathology
 - Deserve careful scrutiny

ASD and Pseudoscience



- Autism: ripe ground for unsubstantiated claims
 - No obvious physical differences
 - Developmental trajectory very individual
 - A child could make spontaneous large gains for no known reason

Characteristics of Science and Pseudoscience




<p><i>Objective</i></p> <ul style="list-style-type: none"> ● Based on systematic methods that involve hypothesis testing, systematic observations, and verification 	<p><i>Subjective</i></p> <ul style="list-style-type: none"> ● Often scientific (i.e., uses terms that make events appear scientific but there is in fact no evidence)
<p><i>Productive</i></p> <ul style="list-style-type: none"> ● Evolving process ● Progress depends on an accumulated growth of knowledge over time, during which useful features are retained and nonuseful features are discarded 	<p><i>Not Productive</i></p> <ul style="list-style-type: none"> ● Knowledge does not change ● Moribund state of knowledge based on age-old traditions

Characteristics of Science and Pseudoscience

- Based on a system of confirmation or rejection of hypotheses (Shermer, 1997)


<i>Verifiable</i>	<i>Not verifiable</i>
<ul style="list-style-type: none"> Knowledge based on empirical evidence 	<ul style="list-style-type: none"> Knowledge based on anecdotes



Why Can Pseudoscience Be Harmful?

Three major ways in which pseudoscientific treatments can be problematic:


- Treatment harmful per se, e.g., 10-year-old Colorado girl smothered to death by rebirthing therapy (Mercer, Sarner, & Rosa, 2003).
- Treatments that themselves are innocuous can indirectly produce harm by depriving individuals of scarce time, financial resources or both.
- Use of unsubstantiated treatments undermines scientific foundations of the profession. (Lilienfeld, Lynn, & Lohr, 2003)



Distinguishing between Science and Pseudoscience

- Clinicians must differentiate between scientific and pseudoscientific claims to treatment efficacy
- Look for warning signs
 - Untestable
 - Unchanged
 - Confirming evidence
 - Anecdotal evidence
 - Inadequate evidence
 - Avoiding peer review
 - Disconnected
 - New terms
 - Grandiose outcomes
 - Holistic

(Finn, Bothe, & Bramlett, 2005)



Is the treatment unable to be tested or disproved?

- Pseudoscientific approaches may be vague or circumspect, making it difficult to think of a method to test them
- If no tests can be made, a treatment's credibility relies on the developer's assertions
- Proponents may ignore findings that raise doubts about the treatment or ad hoc hypotheses may be derived to deflect concerns
 - "One size does not fit all" claim

Does Tx remain unchanged even in the face of contradiction?

- The goal of science is to determine what is true
 - Disconfirming evidence should be used to correct mistakes, reduce errors, and eliminate ineffective treatments
- Pseudoscientific approaches are rarely tested
 - Errors are not self-corrected
 - New findings are not incorporated
 - Approach remains founded on conviction and trust in theories, not facts

Is the rationale for the Tx based only on confirming evidence?

- Supporting evidence increases the credibility of a claim especially when replicated by different researchers
- However, truth is only demonstrated by eliminating the possibility that the claim is false
- Pseudoscience is usually based on confirming evidence alone because negative evidence is ignored, discredited, or difficult to find

Does supporting evidence rely on personal experience or anecdotes?

- Case studies can be a source of new hypotheses and provide a basis for developing therapy techniques, but that basis is weak
 - Highly selective
 - Susceptible to bias
 - Lack of experimental controls
- A scientific approach requires that change be documented with objective measures, experimental controls, and replication of findings
- Pseudoscience depends primarily on case studies, testimonials, and personal experience

Are claims incommensurate with the level of evidence needed?

- Scientists must provide evidence to support their claims
 - Scientific demonstrations should follow a phased model with each level addressing a different question
 - Credibility should be based on the findings from each level of evidence
- Pseudoscientists may not provide sufficient evidence for their claims, and insist that it is the role of their critics to prove them wrong
 - May require others to believe them on the basis of their personal authority

Is the Tx unsupported by evidence that has undergone scrutiny?

- Scientists submit their research to peer-reviewed journals
 - Peer review involves critical examination of pertinence, importance, clarity, and scientific credibility by experts in the field
 - This process helps to ensure the integrity of scientific literature
- Pseudoscientists disseminate information in other ways
 - Direct presentation to the public

Is the Tx approach disconnected from established scientific models?

- Scientific claims are usually consistent with current treatment paradigms for a given disorder
 - Differences typically involve improvements or changes to current models, not entirely new approaches
- Pseudoscientific claims are usually not consistent with established paradigms and have little evidence to support them
 - These new paradigms may appear exciting, revolutionary, and more compelling

Is the Tx described by terms that only appear scientific?

- Scientific terms are precisely defined, operationalized, and linked to observable, measurable events
 - These terms may be tested by anyone who can carry out the same procedures
 - Some scientific terms are similar to words used in everyday language, while others appear obtuse
- Pseudoscientific terms lack consistent operationalization and are not easily observable or measurable
 - They may appear obtuse to avoid careful scrutiny and to hide their lack of meaning


Is the Tx approach based on grand claims or unspecified outcomes?

- Scientists carefully specify the conditions under which a treatment can be studied
 - Predictions are based on groups, likelihoods, or probabilities with the remaining uncertainty always acknowledged
- Pseudoscientists are less likely to recognize limitations in their predictions
 - Claims are often designed to appeal to emotions and to raise false hopes

Is the Tx claimed to be holistic in nature?

- Scientists are precise and search for the reasons for a treatment’s effectiveness
 - This leads to a more thorough examination of characteristics of the disorder or components of the treatment, and it may appear that they have lost sight of the bigger picture
- Pseudoscience claims that a disorder can only be understood in a larger context
 - Such a claim may appease the general public, but results in a vague approach to the problem and unspecified interactions between biological, behavioral, and social systems

Exercise: Facilitated Communication



Watch video clip and apply the ten criteria of pseudoscience!

Which Criteria Are Fulfilled?

1. Untestable	YES
2. Unchanged	YES
3. Only Confirming Evidence	YES
4. Mostly Anecdotal Evidence	YES
5. Inadequate Evidence	YES
6. Avoiding Peer Review	<input checked="" type="checkbox"/> NO
7. Disconnected	YES
8. New Terms	<input checked="" type="checkbox"/> NO
9. Grandiose Outcome	YES
10. Holistic	YES

Pseudoscience Criteria Applied to Facilitated Communication

TABLE 3. Pseudoscience criteria at issue in existing controversy about facilitated communication, by consensus among three judges.

Criterion	At issue
1. Untestable	Yes
2. Unchanged	Yes
3. Confirming evidence	Yes
4. Anecdotal evidence	Yes
5. Inadequate evidence	Yes
6. Avoiding peer review	No
7. Disconnected	Yes
8. New terms	No
9. Grandiose outcomes	Yes
10. Holistic	Yes

Finn et al., 2005

And You Thought FC Was Gone ...?

Some (not all!) current FC movements:

- FC-loving Nancy Lurie Marks Foundation gave \$29 Mio. to FC-promoter Margaret Bauman's outfit at Massachusetts General Hospital.
- The Syracuse "Inclusion Institutes," which includes the FC Institute just received \$1 million.
- U.S. Department of Justice in its manual for interviewing victims with communication disabilities/ cognitive disorders endorses FC.
- Recently a Michigan man spent 80 days in jail, his whole family falsely accused of rape through FC (Todd, 2009)
- "There have been many more imprisonments due to false facilitated allegations of rape than there have been objective demonstrations of successful FC" (Todd, 2009, personal communication)

FC Continues to Grow ...

- Bill being proposed in Massachusetts mandating FC training
<http://www.metrowestdailynews.com/state/x42388429/Bill-would-make-it-easier-on-students-who-cannot-hear>
- State of CO sponsors FC training through its Developmental Disabilities Council, see <http://www.wowcolorado.org/>
- *Intellectual and Developmental Disabilities* published non-experimental Pro-FC article in 2009, without questioning (Tuzzi, 2009)
- New term "Saved by Typing"

⇒ Only a few of current ongoing activities!

Exercise: Rapid Prompting Method



Watch video clip and apply the ten criteria of pseudoscience!

Rapid Prompting Method

- Aka "Informative Pointing"
- Promoted through the media and workshops as a "revolutionary" new intervention for establishing pointing- and writing-based communication in people who are otherwise non-verbal.
- Putative communicator is taught to respond directly to subtle non-physical prompts and matching cues provided by the facilitator rather than being manually guided.
- Authorship validation, ongoing data collection, and other controls are vigorously avoided and discouraged. But, because the students' responses are typically made without physical contact with the facilitator, they appear to be more genuinely independent than the manually guided responses of FC.
- Methodological shortcomings
- Introductory textbook-level conceptual foundations
- Complete lack of empirical support

From Todd, J. "Rapid Prompting, Facilitated Communication, and the Dangers of the Reverse Eureka Error." Presentation to be held at ABAI 2010 conference in San Antonio, May 2010.

Which Criteria Are Fulfilled?

1. Untestable	YES
2. Unchanged	YES
3. Only Confirming Evidence	YES
4. Mostly Anecdotal Evidence	YES
5. Inadequate Evidence	YES
6. Avoiding Peer Review	YES
7. Disconnected	<input checked="" type="checkbox"/> NO
8. New Terms	<input checked="" type="checkbox"/> NO
9. Grandiose Outcome	YES
10. Holistic	<input checked="" type="checkbox"/> NO

Pseudoscience Criteria Applied to Rapid Prompting

Lesson learned:

- Distinguishing science from pseudoscience is not a dichotomous decision and involves a continuum, i.e., the difference is in degree rather than in kind (Herbert, Sharp, & Gaudio, 2002)

Current treatment evidence base in autism spectrum disorders

- Lots of anecdotes and speculations, little or no scientific data:* special diets, Vitamin A, cod liver oil, chelation, detoxification, gold salts, marijuana, Options, Whole Life Therapy (Higashi), touch therapy, deep pressure therapy, music therapy, art therapy, animal therapy, holding therapy, water therapy, visual integration therapy, metronome therapy, Irlen lenses, Rhythmic Entrainment Intervention, craniosacral manipulation, play therapy, "Floor Time" (DIR), Giant Steps, Gentle Teaching, Fast ForWord, "rapid prompting," Relationship Development Intervention, SCERTS, many OT techniques, antifungal medications, hyperbaric oxygen, hormones, many psychotropic medications, neurosurgery, fatty acids, etc.

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Current treatment evidence base in autism spectrum disorders

- Found ineffective in scientific studies:* Vitamin B, DMG, patterning (Doman-Delacato), sensory integration and other sensorimotor therapies, secretin, "eclectic" treatment, typical early intervention/special education
- Found harmful in scientific studies:* Facilitated Communication, auditory integration training, intravenous immune globulin, withholding vaccinations

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Current treatment evidence base in autism spectrum disorders

- *Limited scientific testing:* TEACCH, developmental approaches, "social stories," PECS, several comprehensive ABA models (e.g., CABAS, Pyramid, Applied Verbal Behavior, Competent Learner Model, incidental teaching and other "naturalistic" models, LEAP), fluency training, some psychoactive drugs (but most have negative side effects)
- *Substantial scientific evidence of effectiveness:* Many (but not all) applied behavior analysis techniques and "packages," early intensive applied behavior analysis

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Evolution of Evidence-based Practice

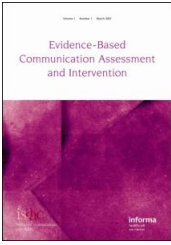
- Information about the nature and treatment of disorders should be developed through research and other empirically based activities
 - Not through other possible ways of knowing (e.g., faith, authority, or introspection)
 - Conclusions about communication processes should be derived from and supported by scientific evidence
 - Assessment and treatment methods should be evaluated by empirical methods
- ⇒ Emphasis on research or evidence-based practice (EBP)

Sources When Seeking for Treatment Evidence

- [Evidence-based practice journals](#)
- [Organizations and associations devoted to promoting EBP](#)
- www.winginstitute.org


Evidence-based Communication Assessment and Intervention

- Selects and appraises the latest and highest quality studies and reviews related to
 - Assessment, intervention, diagnosis, and prognosis published across 60+ professional journals in speech-language pathology and related fields
 - Full peer review
 - Published by Informa Healthcare



Evidence-based Practice Briefs


- Seeks to answer some of the biggest questions of clinical daily activities, supported with evidence and written practically and efficiently by leaders in speech-language pathology and related disciplines.
- Full peer review
- Electronic and paper format in addition to audio file ("Podcast")
- Published by Pearson



ASHA Compendium of EBP Guidelines and Systematic Reviews

- ASHA's National Center for Evidence-Based Practice in Communication Disorders (N-CEP):
 - Project to identify and obtain clinical practice guidelines from all over the world related to audiology and/or speech-language pathology
 - Whenever possible, clinical practice guidelines were tied directly to a systematic review of scientific evidence
 - Check out: <http://www.asha.org/members/ebp/compendium/>

The National Professional Development Center on ASD



- **Goals: Promote optimal development and learning of infants, children, and youth with ASD and provide support to their families through the use of evidence-based practices**
- Resources for families and professionals on evidence-based practices for individuals with ASD and on early identification
- Professional development activities for 12 states that focus on evidence-based practices for ASD
- Technical assistance to 12 state partners that focuses on evidence-based practices for ASD and on early identification and diagnosis of ASD
- **Check out:**
<http://autismpdc.fpg.unc.edu/>

National Autism Center



- Goal: to establish a set of standards for effective, research-validated educational and behavioral interventions for children with ASD.
- These standards identify treatments that effectively target the core ASD symptoms of ASD.
- Resulting National Standards Report is the most comprehensive analysis available to date about treatments for children and adolescents with ASD.
- Check out:
<http://www.nationalautismcenter.org/index.php>

The Wing Institute



- Created to promote evidence-based education policies and practices, offers services including:
 - The Evidence-based Education Knowledge Network*
 - Information Clearinghouse*
 - Professional Forums*
 - Publications*
 - Research*
 - Public Policy*
- *Grant support for graduate students*
- New feature on its web site: "What do the data tell us?"
- Check out: <http://www.winginstitute.org/>

Questions???




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