Introduction to Sign Language for Students with Autism

August 7, 2014
National Autism Conference
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Pennsylvania Training and Technical Assistance Network

PaTTAN's Mission

The mission of the Pennsylvania Training and Technical Assistance Network (PaTTAN) is to support the efforts and initiatives of the Bureau of Special Education, and to build the capacity of local educational agencies to serve students who receive special education services.

Presentation Outline

- Students with Autism
- Response Form
- Verbal Behavior
- About Sign Language
- Benefits of Sign
- Basics of Sign
- How to Teach sign (mands, tacts, intraverbals)

Goal of Presentation

- Review Core Deficits of Autism
  - Socialization
  - Communication
  - Flexibility
- How do we know what works with this population and how do we teach communication?

Difficulty of Speech

- An estimated half of all children with autism are non-vocal or have difficulty acquiring speech (Scott, Clark, Brady, 2000).

Evidence-Based Practices

- What does evidenced-based mean?
- How do we know what they are or where to find them?
- What are the evidence-based practices?
- Why does it really matter?

Language

- Language is complex
- Behavior interventions make **complex** aspects of human functioning **simple**
- Primary choice for communicating with others is vocal speech
- What if speech doesn't develop typically?
- What are the other options for communicating?

Alternatives to Spoken Language

- Gesturing
- Using pictures
- Signing
- Writing
- Typing
- Augmentative devices with various access modes/voice generation

The Form of Language

- People communicate with language behaviors
- This language can look different
- We call this the **form** of language
- The avenue in which a person communicates their wants and needs to another person is called their response form
- Response form is the general shape and physical characteristics of the behaviors through which one communicates

Response Form

Types of response forms include vocalization, sign language, picture exchange, writing, and various augmentative devices.

Vocal/Verbal Response Form

Form	Function
• Vocal-Verbal	• Verbal (Saying Water)
• Nonvocal-Verbal	• Verbal (Signing Water, handing over a picture of water, writing)
• Vocal-Nonverbal	• Non-Verbal (non-social vocal noises such as coughing)
• Non-Vocal-Nonverbal	• Non Verbal (crossing legs)

Response Form

- When selecting response form, a good rule of thumb is always consider vocal first.
- Why?
  - humans are evolved to speak
  - our vocal apparatus is always with us (portability)
  - our culture shapes up vocal verbal behavior

Response Form "Categories"

Jack Michael (1985) was the first person to make a clear distinction between two kinds of verbal behavior.

- Stimulus Selection-Based
- Topography-Based

Topography-Based with Requesting

Speaking

Signing

Writing

- The motor movements are different
- Each word "looks" and "feels" different

Selection-Based with Requesting

Picture Exchange Systems

Vocal Output Devices

- The motor movements are the same
- While this may seem simpler, there are added complexities (scanning, discriminating)

Analysis Tells Us…

- Signing and talking are quite similar
- Selection-based systems share few characteristics with speech

Choosing a Response Form

Where do we start?

Use a language assessment to help select a response form.

Decisions Based on Data

- What skills does the student have?
- How efficient are the responses?
- How easy are the skills to teach & acquire?
- How easily will the response form lead to independent responses?
- Implications for developing a full range of verbal responses and eventually complex behavior
- Portability

Response Form

- Consider vocal first!
- If vocalizations are unintelligible to the naive listener, vocal is not a functional response form.
- If weak echoic, consider sign language.
  - Portability
  - Hands are always with us
  - Topographical correlation an option for teaching vocals
  - Full range of verbal function
- If weak motor skills or attempts to teach sign fail, try picture exchange or augmentative devices.

Verbal Behavior

- B.F. Skinner in 1957
- The meaning of a word is found in it's **function**
- Teaching communication skills across the verbal operants
- VB is behavior mediated by other people
- Verbal behavior does not have to be spoken

Verbal Behavior vs. Nonverbal Behavior

"Verbal Behavior is behavior that has been reinforced through the mediation of other persons"

Verbal Behavior

Want juice------Say juice-----Person delivers

Sign Water

Point To Water

Exchange a Picture

Write Water

Non Verbal Behavior

Want juice-----Walk to refrigerator------Get juice

Verbal Operants Video

Verbal Operants

Verbal Operant	Antecedent	Behavior	Consequence
Mand	Motivative Operation (wants ball)	Verbal behavior (says "ball")	Direct reinforcement (gets ball)
Tact	Sensory Stimuli (sees or smells ball)	Verbal behavior (says "ball")	Non-specific reinforcement (gets praised, for instance)
Intraverbal	Verbal stimulus (someone says "What do you play with?")	Verbal behavior (says "ball")	Non-specific reinforcement (gets praised, for instance)
Echoic	Verbal Stimulus (someone says "ball")	Verbal behavior: repeats all or part of antecedent (says "ball")	Non-specific reinforcement (gets praised, for instance)

Other Relevant Operants

Operant	Antecedent	Behavior	Consequence
Receptive (Listener Responding)	Verbal stimulus (someone says "touch ball")* *in this case the cookie must also be present: all receptive discriminations involve 2 S^Ds	Non-verbal behavior (child touches ball)	Non-specific reinforcement (gets praised, for instance)
Imitation Point to point correspondence a.k.a. Mimetic	Non-verbal behavior (person performs an action, etc.)	Non-verbal behavior with point to point correspondence (person imitates same action)	Non-specific reinforcement (example: praise; 'you're right!', ''great job!' high five, pat on back, etc.)
Match to sample	Non-verbal behavior (presentation of stimuli)	Non-verbal behavior (in presence of one stimuli, a second stimuli is selected with shared properties)	Non-specific reinforcement (example: praise; 'you're right!', ''great job!' high five, pat on back, etc.)

Communication Modality	Motor Movements (Behavior Form)		Verbal Operant (Communication Function)				Positive Prerequisite Operants		
	Same for each meaningful word (selection-based)	Different for each meaningful word (topography-based)	Mand	Tact	Intraverbal	Echoic	Echoic Skills	Motor Imitation Skills	Match-to-Sample Skills
Speech		X	X	X	X	X	X		
Sign Language**		X	X	X	X			X	
Writing**		X	X	X	X			X	
PECS	X		X						X
Core Board	X		X						X
Picture-based Voice Output	X		X						X

Sign Language

- Different kinds
  - *Signed English*
  - *American Sign Language*
  - *Pidgen Sign*
- Deaf community
- Is an established and true language: can communicate a full range of functions and complexity
- **Martha's vineyard culture in the 19th century**

ASL

"A complete, complex language that employs signs made by moving the hands combined with facial expressions and postures of the body."

–National Institute on Deafness and Other Communication Disorders

Where does it fit?

- Back to communication as a core deficit of autism
- Making complex behavior simple
- Observable behavior
- How do we teach and prompt skills

Benefits

- Sign is one tool of many that allows teaching towards the core deficits for students who are not vocal
  1. Iconic repertoire built-in
  2. Scanning and discrimination steps not necessary
  3. Free from environmental support
  4. Can be prompted through various methods (imitation, physical and intraverbal: "sign 'ball'")
  5. Portable (our hands are always with us)
  6. Free
  7. More conversational

Sign Leading to Speaking?

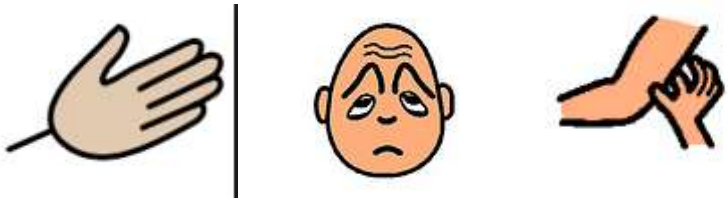
- "The available body of research on manual sign and gestures for children with autism reveals strong intervention effectiveness scores for symbol acquisition and production, as well as related outcomes such as speech comprehension and speech production. These results suggest that the use of signing gestures is a very effective communication option for children with autism." (Schlosser & Wendt, p. 370)

Only One Study by Anderson in 2002...

- Participants were found to prefer one response form over the other, but their choices were not attributed to any single factor.
- Participants using the PECS
  - Faster acquisition
  - Better generalization to novel items
- Participants using sign language
  - Higher levels of initiation
  - Higher levels of eye-contact
  - Higher levels of vocalizations

Concerns with Sign

- Need competent audience
- Staff need to know how to teach signs, prompt, and fade prompts



Sequence of Language Acquisition

- Mands and tacts emerge as single operants (kids with limited language repertoire are first taught single words-but later combine
- Initial use of multiple words includes using multiple known components (as opposed to full phrases)
- Intraverbal skills not present until later in child development

Initial Concerns

- Initially concern isn't teaching grammar or sign relations
- It IS IN teaching a broad mand and tact repertoire
- It is critical to teach a broad range of language that will be fairly easy and efficient for the child to use and **control their environment**

Initial Signs to Target

- Begin teaching sign in the mand frame
- Choose signs that don't resemble each other!
- AVOID generalized and broad signs like more, help, eat, drink, please

Tutorial on Signing

- Are they grounded or "air borne" (puzzle, airplane)
- Single handed or two handed (alone, follow)
- Dynamic or static (stand, walk)
- Single step or multiple movements (mom, ketchup)
- Repetetive movements (ball, popcorn, up)
- Location in space, within view (cheese/puzzle, eat/drink, think/forget)
- Variations of the same sign (room, kitchen, office)
- Fingerspelling
- "Classifiers"
- No articles, pronouns, verb tenses (at this point)

Classifier Examples

- Basic hand shapes that make up most signs
- Often used to show relation, tell stories
- CL:B something flat
- CL:4 lines
- CL:1 person
- CL:F small round things
- CL:3 vehicles

5 Signing Basics

Handshape
Orientation
Location – signing space
Movement
(Facial Expression)

Location Matters

THINK	
Handshape	
Orientation	
Location	
Movement	

DISAPPOINTED	
Handshape	
Orientation	
Location	
Movement	

How Perfect Should they be?

- Want the best production they can make
- At first, to develop a broad repertoire, we accept easier "baby signs"
- Work towards the adult form
- Just like vocalizations – don't expect perfection. We shape.
- When I present signs, I'll suggest ways they can be made in simpler form
- You'll want to shape to adult form

Teaching Sign

- Only have to be one sign ahead of student
- Teach others (family, friends) via "sign book"
- Show on back of cards
- Wall charts
- Why do we begin in the mand frame?

Just a Note…

- Most of our students with autism are NOT DEAF.
- TALK TO THEM! BE VOCAL!
- We want them to use sign as a speaker (not a listener)
- Model signs you want them to use, but don't require them to respond to signs

Fingerspelling

- Why important?
- Many words don't have signs
  - Proper names, cities, books, etc.
- Many signs are sharpened by use of abc cue
- Teach ABCS

Back to the Operants!

A common term for a MAND is a REQUEST

A common term for a TACT is a LABEL

Mand Training

Teaching students to make requests is a central focus of teaching effective communication skills

- Mands benefit the speaker
- Mand training relies on the use of the student's interest and motivation
- Mand training is clearly a functional skill: it's practical!
- Mand skills develop early in child development and should naturally be a part of early language training
- Motivation leads to increased likelihood of behavior!

Mand

- Saying something because you want it (antecedent is motivation)
- Result of behavior is getting what you ask for
- ABC Analysis- want it, say it, get it
- A common term for a mand is a request
- You can mand using different response forms
  - Possible concerns manding using different methods
- Types of mands: manding for items, actions, activities, missing items, removal of aversive stimuli, attention, information, etc.

Teaching a Signed Mand Video

Teaching a Signed Mand

- Check for motivation by holding out item.
- If student reaches for item:
  - Sign word as you say the word. If student models sign, reinforce as you say the word again, or:
  - Provide full physical prompt as you say the word again followed by delivery of reinforcement while saying word for the 3rd time
- Once student has practiced the correct mand several times begin to fade your prompt:
  - Say word, model sign and wait for student to repeat response and deliver reinforcer while saying word, or:
  - Say and sign word, prompt and say word, then immediately fade to a partial physical prompt wait for student to emit mand and deliver reinforcer on the more independent response while saying the word again.
- Fade out prompt until the only antecedents controlling the mand are the motivation and the presence of the item.
- Once mand is mastered with item present, move target to "spontaneous" mand program (item not present.)

Teaching Sign in the Mand Frame

- Procedures for teaching signed mands
  - Pair
  - Establish Motivating Operation
  - Model
    - If student imitates, deliver reinforcement! (& say)
    - If no sign, provide physical prompt on 3rd attempt and deliver reinforcement (& say)
  - 2 Types of Prompts
    - Physical versus imitation

Imitation Prompts

- Imitation programs
  - Teach the child to imitate – I do- you do
  - General larger motion signs
  - Towards fine motor movements
  - Teaching sign responses in imitation before they are used as functional operants (mands or tacts)

Physical prompting

- When student doesn't have imitation repertoire
- Shaping process
- Use of least intrusive physical prompts
- Dynamic responsiveness to students behavior
- Student gets the "feel"

Choosing a Prompt

- Why imitation is a superior prompt to physical
  - Intrusiveness
  - Model is more accurate presentation of adult form
  - Physical prompts don't allow the child to access feedback on accuracy or response emission
  - Child may learn that reinforcement is contingent on extending their hands: Zombie Hands!

Beware of Zombie Hands

- Person moves child's hands FOR them
- Failure to appropriately fade physical prompts
- Child learns
  1. Reach hands out
  2. Hands get manipulated
  3. I get reinforcement
- Results = child approaches adults and sticks out hands (zombie hands)
- The same thing gets shaped up if you allow pointing to serve as a generalized mand

Deliver and SAY IT!

- Signed mand training should always include a vocal model of adult form of the word
  - Why?
  - Parity!

Role of Parity in Vocal Training

- Sounds, words, phrases, melodic intonations, etc. become conditioned reinforcers because they are correlated with social reinforcement.
- Because the sounds, words, and other aspects become reinforcing in and of themselves, being able to match them results in reinforcement
- Parity=sounding like

Brandon Mand Session Video

Demo Basic Signs for Mands

- Candy, marshmallow, chip, popcorn, cereal, pretzel, chocolate, pbcup, soda, water, milk, juice, cookie, cheese
- Jump, push, swing, walk, spin
- Bubbles, music, radio, puzzle, phone, camera, book, keys, ball, light, playdoh, computer, blocks
- Off, open, movie, play, stop, watch!
- Who? What? Where? Why? How? Time?

Mand Shaping, Prompting, Prompt Fading Video

Sign Manding…Now What?

- Once mand repertoire is established programming may move in 2 directions
  - Expanding language repertoire across other operants – starting with tacts and intraverbals
  - Transferring response form from sign to vocal
    - One indication of readiness is rate of vocalizations in mand frame
    - Progress in any echoic program that may be in place

Tact

- Saying something because you see, smell, hear, taste or feel something
- Antecedent is sensory/non-verbal stimuli
- ABC Analysis – sensory, specific response, gen reinforcement
- Specific response as Skinner indicated would vary in its form
- Tacting then requires a topographical response form
- Signing allows tacting behavior b/c topographical

Why is Tact so Important?

- Developing other complex repertoires
  - Following multiple step directions
  - Selecting multiple named items
  - Talking about past events
  - Other conversational skills
  - Academic skills: reading comprehension, math and all other academic content areas

Heather ITT Video (2:40)

Basic Signs for Common Tacts

- Language builder cards
- Examples to generalize principles
  - Vehicles (car, truck, bike, train, plane)
  - Family (boy, mom, dad, grandma, aunt)
  - Fruits (apple, banana, grapes, melon, berry)
  - Animals (cos, horse, pig, frog, cat, dog, bug)

Shaping to Adult Form

- Getting to the adult form
- There are some cases when vocal behavior will emerge and its not necessary to shape to the exact adult form
- However, if one is considering the eventual use of sign language as a primary mode of communication it will be absolutely necessary to shape all signs to adult form in both word shape and appropriate grammatical sequence

Summary on Autism Interventions

- Sign language is one response form
- Sign language, because it is topographical has some clearly helpful characteristics:
  - Can be used to teach full range of verbal behavior (tacts and intraverbals)
  - Can be used in shaping vocal responses
- It is not the only augmentative system option but is one that should certainly be considered

Remember

- Teaching signs does not keep us from working on sound production and teaching echoics!
- On the contrary, the research supports emerging vocalizations from signers due to similarities of speech and sign!

Recommended Follow-up Sessions

- Session 58 Wednesday afternoon (Baker & Foor):

Speech Basics for Children with Autism: Strategies for the Classrooms and Home

- Session 68 Thursday morning (Finarelli and Forbes):

Using Evidence-Based Practice to Develop Speech and Language Skills

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