Speech Basics for Children with Autism

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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.

PDE's Commitment to Least Restrictive Environment (LRE)

Our goal for each child is to ensure Individualized Education Program (IEP) teams begin with the general education setting with the use of Supplementary Aids and Services before considering a more restrictive environment.

The presenter would like to thank the following for contributions to this presentation:

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What is Vocal Behavior?

"…the production of auditory stimuli resulting from the movements of the muscles of the vocal apparatus, e.g., the sounds one makes." (Carbone, 2012)

- Non-vocal learners may use of other forms of verbal behavior such as signing, writing, PECS, or use of speech generating augmentative devices.

Vocal/Verbal Response Form

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

The Value of Vocal Behavior

Why are we talking about this?

- Children with autism often fail to develop functional vocal behavior.
- Vocal verbal behavior is the most common mode of communication in the general population.
- For adept speakers it is a very effortless response and is always available (portable).

- In treating children with autism we may need to develop other forms of verbal behavior, such as sign language, if vocal behavior is not effective.
- As noted, all vocal responses do not constitute verbal behavior.
- Example: coughing and yawning do produce vocalizations but most of the time it is not considered verbal behavior

Developing Vocalizations (Speech)

- Vocal verbal behavior is the most desirable form of communication and therefore should be at least one of the goals to be achieved.
- A large number of children with autism fail to develop echoic responses (vocal imitation) to adult sounds and words (Esch, Carr & Michael, 2008).
- Many children with autism do not acquire vocal verbal behavior as their primary form of communication.

- To overcome this deficit the implementation of some behavior analytic procedures has shown promise in supporting the development of vocal verbal behavior.
- ABA – of the most evidence based conceptual frameworks for autism interventions (National Autism Center Standards Project, 2009)

Vocal Responding

- The basic principles of ABA are relevant to the process of training vocal skills.
- The same basic principles involved in an ABC analysis for teaching behaviors such a ADL skills, task completion, match to sample skills and so forth, apply to teaching vocal behavior.

Back to Basics: First Know Your ABCs

- Consider all teaching interactions in relation to behavioral events:
- **A = Antecedents (What happens before behavior)**
- **B = Behavior (What person does…must be able to observe it and measure it)**
- **C = Consequences (What happens after behavior)**

Skinner's Analysis of Verbal Behavior

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

Verbal Behavior

Want water---Say Water---Person Delivers Water

Sign Water

Point To Water

Exchange a Picture

Write the Word Water

Non Verbal Behavior

Want Water---Walk to refrigerator---Get Water

Why do we say what we say?

- To ask for what we want
- To label things
- To repeat things we hear
- To answer questions

Verbal Operants

Verbal Operant	Antecedent	Behavior	Consequence
Mand	Motivative Operation (wants cookie)	Verbal behavior (says "cookie")	Direct reinforcement (gets cookie)
Tact	Sensory Stimuli (sees or smells cookie)	Verbal behavior (says "cookie")	Non-specific reinforcement (gets praised, for instance)
Intraverbal	Verbal stimulus (someone says:"What do you eat?")	Verbal behavior (says "cookie")	Non-specific reinforcement (gets praised, for instance)
Echoic	Verbal Stimulus (someone says "cookie")	Verbal behavior: repeats all or part of antecedent (says "cookie")	Non-specific reinforcement (gets praised, for instance)
Listener responding (receptive) (actually not a verbal operant)	Verbal stimulus (someone says "touch cookie")*	Non-verbal behavior (child touches cookie)	Non-specific reinforcement (gets praised, for instance)
	*in this case the cookie must also be present: all receptive discriminations involve 2 Sds		

Developing Vocalizations (speech)

- Vocal verbal behavior is the most desirable form of communication
- The learner characteristics necessary for the development of vocal responding appear to be related to the development of at least some echoic skills.

- It appears that regardless of the method, learners with some echoic skills may develop vocalizations if the instruction focuses initially upon intensive mand (requesting) training, which takes advantage of the effects of strong reinforcement, along with the pairing of spoken words with delivery of the reinforcer.
- When vocal responses are also shaped as they develop, vocalizing is enhanced.

Teaching Procedures To Increase Speech Production

Manding

All Canidates

Automatic Reinforcement

Few speech sounds

Reinforce All Speech Sounds

Few Speech Sounds

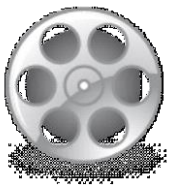
Echoic Procedure

Many Sounds/Poor Articulation

Kaufman Procedure Word Shells

Many Sounds/Poor Articulation

Introduction to The Mand (Requesting)



The Mand and Autism

- The mand requires:
  - Social approach and initiation
  - Interactions with other people as having value
  - Flexible and specific verbal responses (communication)
  - The required skills directly compete with the core deficits of Autism Spectrum Disorders

- Requesting (the mand) can take many forms:
  - Speaking
  - Gestures
  - Sign language
  - Picture Exchange systems
  - Various augmentative devices

Motivation and the Mand

- What does it mean to want something?
- In many cases, we can consider wanting something as being related to events experienced by the child (the result of events in the environment)

Mands – Improve Social Communication

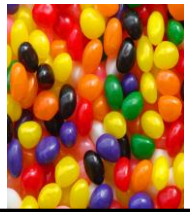
- Mands can help develop other types of social communication.
- Increases the value of speaking.
- Transfer of skills from requesting to labeling or from requesting to following directions.

Identify the Response Form

- Assess student skills
- Echoic and imitation are central
- No one form is best!
- Vocal first
- Other augmentative systems:
  - Sign language
  - Picture Exchange
  - Augmentative devices
  - Speech generating
  - Writing

Best Items:

- Can be delivered quickly
- Are consumable or allow only a brief period of contact
- Can be teacher controlled
- Are usually strongly motivating
- The sign or word used to mand for the item is not too hard to produce



Basic Mand Teaching Template

- Deliver wanted activities and items freely at first
- Model the response you want to teach (say it as you deliver!)
- Pause and see if the child asks (time delay)
- If necessary prompt the response
- Fade prompts

- Pair delivery of reinforcement with a model of the response form that the student will later be expected to emit. Say what you are delivering!
- Saying what is delivered while it is being delivered conditions the sound of the word as a reinforcer.

Keep In Mind…

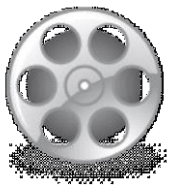
- Begin manding with one word mand (cookie)
- Requiring a child to produce multiple word responses may punish the behavior of requesting (manding) ("I want cookie").
- Response effort is too great and will decrease motivation to request.

- If you begin to teach the modifiers that increase length of utterance to match a typical child in a child with very few mands, tacts, and intraverbals, you may cause several problems:
  - Increase response effort and child stops talking
  - Articulation/clarity is affected
  - Unusual grammatical structure
  - Interferes with natural flow of communication

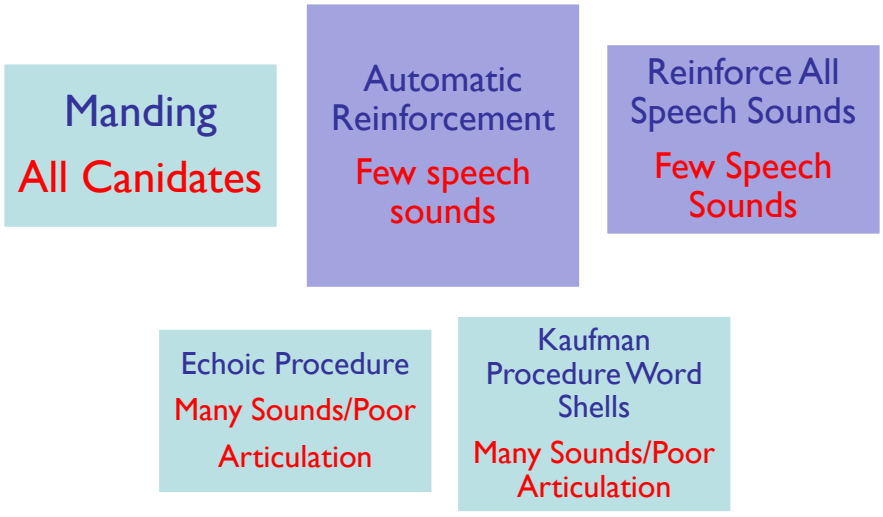
Shaping Mands

- In some cases we need to use systematic shaping of mands by differentially reinforcing closer approximations of the adult form of the mand (better responding = better reinforcement).

- Video Sign mand
- Video Vocal mand
- Video of Shaping During Mand Training



Teaching Procedures To Increase Speech Production



Automatic Reinforcement

- Parents frequently talk to their children and repeat high frequency words during early caregiving tasks (feeding, bathing, removing unpleasant stimuli, etc.) as well as during play.

- The parents' sounds and words that have been paired with the reinforcing activities noted above may become conditioned reinforcers.
- The same sounds when produced by the child during babbling may strengthen the muscle movements necessary to produce them.

- Consequently, infants may babble more frequently the sounds that have been paired with reinforcement.
- This process of automatic reinforcement seems to strengthen the vocals and increase the variety of sounds produced overall and prepare the young child to speak in words and sentences.

She said bubbles!!!!!!!

- All of this is to say that the foundation for speaking intelligibly in young children may be related to the outcome of automatic reinforcement upon the vocal attempts.
- Several researchers have extended this analysis to the application of a procedure called stimulus-stimulus pairing (SSP) and the concept of automatic reinforcement to the development of vocalizations in children who fail to develop them typically.

- Since phonemes and syllable units are the building blocks of vocal verbal behavior, any attempt to increase their frequency and variety in young children who do not develop them typically might lead to a greater likelihood of developing vocal behavior.

Stimulus-Stimulus Pairing

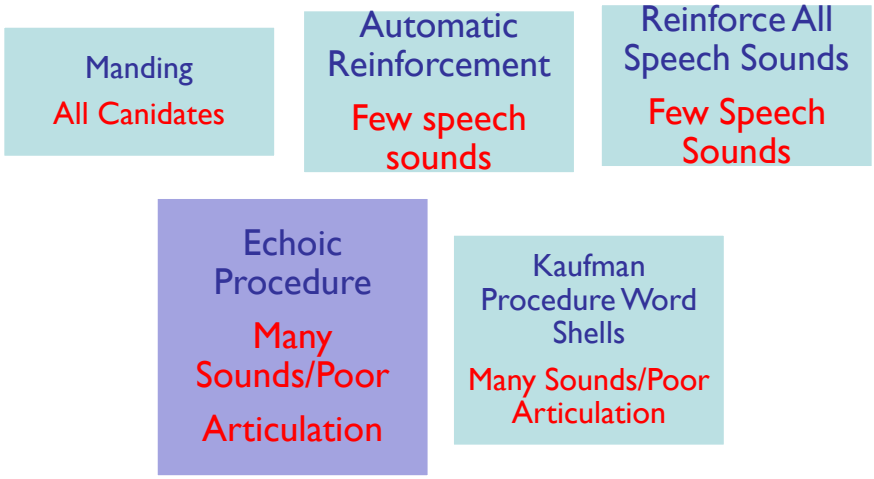
- The speech sounds and words heard by young children are frequently conditioned as reinforcers by correlation with parents' positive reinforcers (food, caresses, smiles, etc.)

- The closer the sound production is to matching the sounds that have been conditioned as reinforcers, the greater the reinforcement (Schlinger, 1995; Sundberg, Michael, Partington, & Sundberg, 1996).

Stimulus-Stimulus Pairing

- Take an inventory of all sounds that that are currently in the child's vocal repertoire.
- From this inventory, a sound that is currently in the child's repertoire and most often heard will be chosen as the "target sound."
- During reinforcing activities, present the target sound frequently and allow the child the opportunity to imitate.
- If child echoes the target sound, reinforce abundantly.

Teaching Procedures To Increase Speech Production



Echoic Training (repeating what is said)

- Vocal imitation is an important skill in the development of vocal verbal behavior
- Echoic training methods are designed to increase the number and intelligibility of vocal responses.

Selecting targets for echoic training:

1. Developmentally easy sounds
2. High frequency sounds you hear during play with child (peek-a-boo, songs, play with toys, etc.)
3. Sounds and words associated with reinforcers and for reinforcers for which the child asks/requests (mands)

Echoic Teaching Procedure

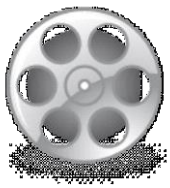
1. Begin the teaching procedure by having items the child likes available and visible to the learner to establish motivation for correct responding.
2. Present the echoic.
3. If the learner reaches parity, reinforce immediately.
4. If the learner does not reach parity, re-present the word 2-3 more times (based upon the learner).

5. If at any point the learner reaches parity or a better response occurs, reinforce.

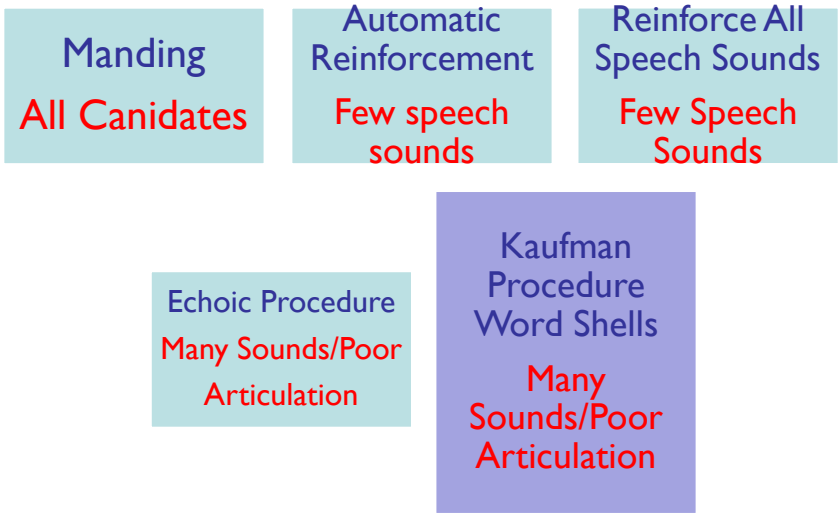
6. If the learner does not reach parity or give a better response following 2-3 echoic trials,

drop to an easier echoic or motor imitation response and differentially reinforce.

Echoic Video



Teaching Procedures To Increase Speech Production



Kaufman Procedure – Word Shells

- Simplifying words with word shells
- Systemic method for shaping word approximations
- Successive approximations to the target word
- Utilizes sound simplification changes demonstrated by typically developing children.

Kaufman Procedure – Word Shells

Assumptions:

1. Children who speak with limited consonant production and with motor coordination difficulties will have intelligibility problems.

2. Even though some of these sounds may appear in isolation, they are not produced in combination with other sounds.

3. Many of these children simplify their production of words to compensate for these coordination difficulties (final consonant deletion, weak syllable deletion, etc.)

4. As teachers we may be able to provide simplified forms of the word or word shells that are close to what the learner can produce.

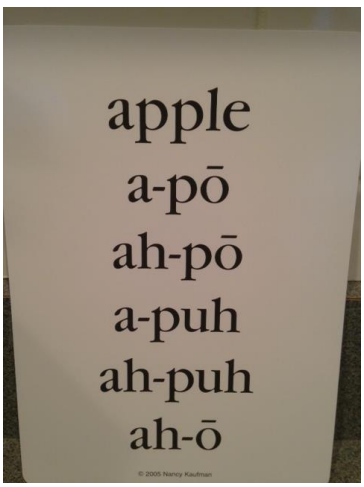
5. By presenting these forms of the word during vocal imitation as successive approximations to the "adult form" of the word, we may be able to shape the word production with limited learner frustration.

6. By requiring movement up the hierarchy of word shells to receive reinforcement, the learner may produce intelligible words within and across many syllable forms (CV, CVC, CVCV, VC) (pa, pat, papa, at).

- Learners who are good candidates for these vocal teaching procedures have these behavioral characteristics (Kasper, Godwin, & Hulshof, 2002):
  - They have a limited ability to echo words clearly and therefore much of their talking is unintelligible.
  - They do produce simple vowel and consonant sounds in isolation.

- Limited phoneme repertoire.
- Difficulty producing and sequencing sounds.
- Limited response to echoic training as evidenced by limited vocalizations even after acquiring 15-25 signed mands.
- Poor approximations that are resistant to change.

Kaufman Kit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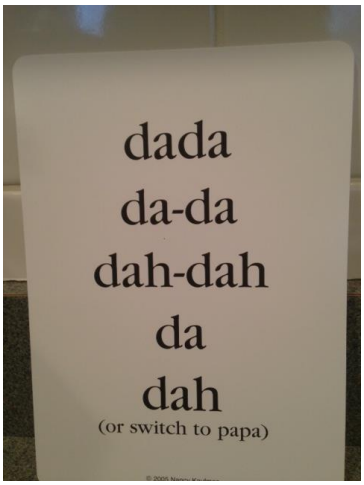
© 2005 Nancy Kaufman

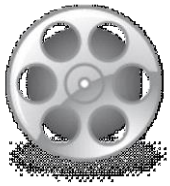


Kaufman Words – Basic Kit

Examples

- CVCV mama, papa, neigh neigh, moo moo
- VC on, up, out, in, eat, oat, arm, ant, eye
- CV day, two, me, tea, pea, dough, bay, bow
- VCV apple, obo, oh no, oh boy, okay
- CV1CV2 mommy, puppy, daddy, baby, bubble, potato, people, banana ("nana"), turtle

Word Shells Video



Kaufman Teaching Procedures

- Begin the teaching procedure by having strong reinforcement available and visible to the learner to establish motivation for correct responding.
- Present the word approximation at the level of the word that has achieved parity to insure success immediately.

- Present the next higher word form immediately. If the learner quickly achieves parity (within one trial), then present the next form of the word without reinforcement to promote momentum.

- If the learner does not meet parity, continue to present this word approximation for 3-5 trials. The purpose of re-presenting the word is to give the learner several attempts to slip into parity and thereby receive reinforcement for doing so.
- If the learner does not meet parity during this process, present a sound, word, or motor movement that the learner can successfully imitate. Reinforce the imitative response.

- Provide greater magnitude of reinforcement for parity responses that occur with fewer trials.
- Consider using other antecedent variables for which the learner is likely to be successful.
  - Present a few easy motor imitation tasks or easy words with similar syllable shape to build behavioral momentum before presenting the target.
  - Use a promise reinforcer when presenting the target (this means you will bring up a visible reinforcer as you present your S^D)

Word Shells - Examples

- Steinly
- Stein-ly
- Sss-tein-ly
- Tein-ly *current level
- Tie-ly
- I-ly
- I-ee

Word Shells - Examples

- Candy
- Can-dy
- Cah-dy *current level
- Cah-ee
- Ah-ee

Remember…

- Reinforce speech sounds you hear from your child.
- When you are engaged with your child in a motivating activity, be sure to use the name of the item when you give it to your child.
- Do not require a complete sentence from your child at first. This is a higher demand which may punish the vocalizations.

- Functional communication is the top priority… and the speech/vocals are the icing on the cake!!!
- Thank you for your attention!

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