

# HOW TO TEACH VOCAL BEHAVIOR TO NON-VOCAL LEARNERS

There are 4 methods that may be used simultaneously to teach a non-vocal child to talk. The four methods are:

1. **Pair signs and words during mand teaching:** Teach the learner to mand (request) using sign language while pairing the word with the delivery of a reinforcer.
2. **Pairing of sounds and words with reinforcement:** Pair sounds and then words with reinforcers to increase vocalizations.
3. **Differential reinforcement of words or word approximations:** Teach the learner to mand using sign language. Once the sign is strong don't reinforce immediately after the sign but instead present the word again and pause to prompt a vocal attempt.
4. **Vocal Imitation (Echoic) teaching:** Teach vocal imitation using a word and sound simplification system based upon the work of Nancy Kaufman, SLP.

## 1. **PAIRING SIGNS WITH WORDS DURING MAND TRAINING:**

Teach the learner to mand using sign language while pairing the word with the delivery of a reinforcer. This is sometimes referred to as simultaneous or total communication instruction.

There are 3 ways that this method helps to develop vocalizations in non vocal children:

1. To increase the likelihood that the learner will begin to say the names of the items or activities they are signing it is important that the teacher initially teach requesting. When you start with mands the child is more likely to participate in language teaching and by teaching the child an acceptable method of asking for things you may reduce problem behavior. In addition, it may be easier to teach other forms of communication such as labelling or answering questions after manding has been taught first (Carroll and Hesse, 1987). Moreover, requesting benefits the learner directly by receiving the reinforcer of greatest value at the moment it provides the strongest reinforcement for the sign and also pairs the sound of the word said by the teacher with strong reinforcement.

Through this process the sound of the word becomes reinforcing (fun) to hear by the child and therefore the sound of the word becomes a reinforcer. If a child has a babbling repertoire then they are likely to make many sounds and consequently they will eventually make the sounds that have been paired with reinforcement. When that occurs those sounds will be selected by automatic reinforcement and will be said more often. (Sundberg, et al. 1996) Through this process the child will begin to say the words or make approximations to the words that were said by the teacher when a reinforcer was delivered. This process supports the child's use of words in addition to sign to get reinforcers during language teaching sessions.

2. Once the child begins to say the words or approximations to the words they can be differentially reinforced by the teacher directly. In other words, when the learner wants something during mand teaching and says the word or an approximation to the word while

- signing the teacher can deliver the reinforcer and strengthen the vocal response and the sign. This will lead to even greater strengthening of the vocal responses for the items desired during manding.
3. The 3<sup>rd</sup> way that simultaneous communication methods may foster vocalizations is through the pairing of the motor movements with the sound of the words. In this way the signs may begin to act as prompts for the vocal responses and may actually become self-prompts for the learner. The use of the sign will actually increase the talking of the child in these situations.

## **2. PAIRING SOUNDS AND WORDS WITH REINFORCEMENT:**

It should be noted that not all learners will acquire vocalizations as quickly as Ian especially without the use of some of the other procedures also described in this module. The fact that Ian already had a strong babbling repertoire of many speech sounds and also had some capacity to imitate some sounds supported the development of vocalizations through the use of simultaneous mand/sign language training. Learners who do not babble a variety of sounds will usually not progress towards vocal responding as quickly as those who do.

Some may not make any progress at all.

In the case of children who make very few sounds it is recommended that you begin sign mand teaching as you saw in the videos you have seen thus far. It will be important to add some additional procedures with these learners to help support vocalizations.

First of all, you should attempt to deliver a reinforcer to these learners every time you hear a sound and provide abundant reinforcers for speech sounds or phonemes. This will help to increase the amount of sounds they make and therefore make it easier to shape vocal responses.

Sometimes rough play will elicit sounds more easily from some children and because the play is fun the sounds might be reinforcing to hear and therefore increase the frequency of these sounds in a very low rate sound maker.

A procedure related to this is called stimulus-stimulus pairing. This procedure takes advantage of the effects of automatic reinforcement that is generated by the learner babbling the sounds that have been paired with reinforcement. (Sundberg, 1996). When using this procedure you choose sounds you have heard the child say or easy sounds and purposely pair reinforcers with the sound. This can be done throughout the day when it is convenient or during sessions in a more structured way. We recommend the structured approach since it may be easier to insure that you conduct many learning opportunities per day. It may be necessary to conduct hundreds of trials before you hear any attempt by the child to imitate the sound you have just presented so be prepared for intensive sessions. The learner however is usually very cooperative since he/she is receiving his/her favorite reinforcer for little effort initially.

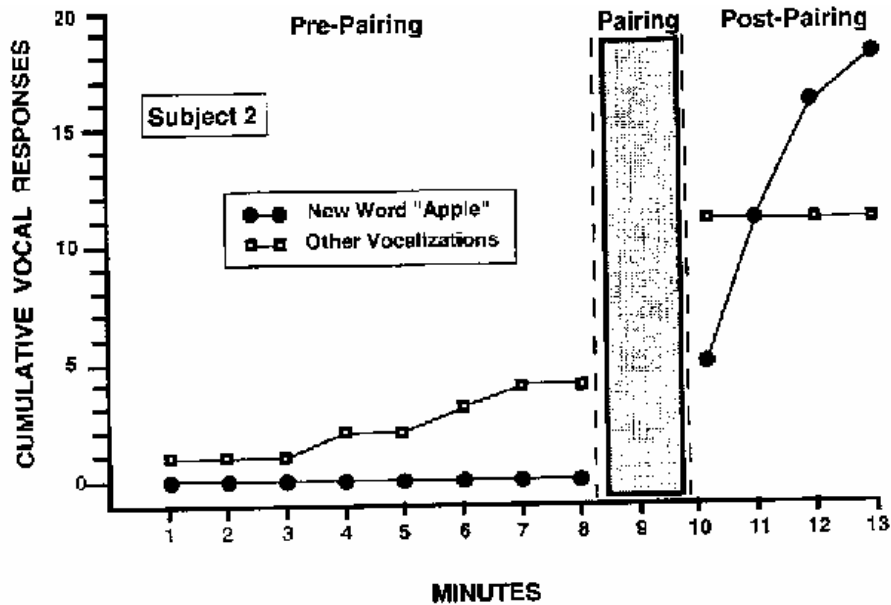


Fig. 2. Cumulative number of all vocal responses for Subject 2 on pre- and post-pairing measures. The shaded area represents the time during which one new target word was paired with tickles.

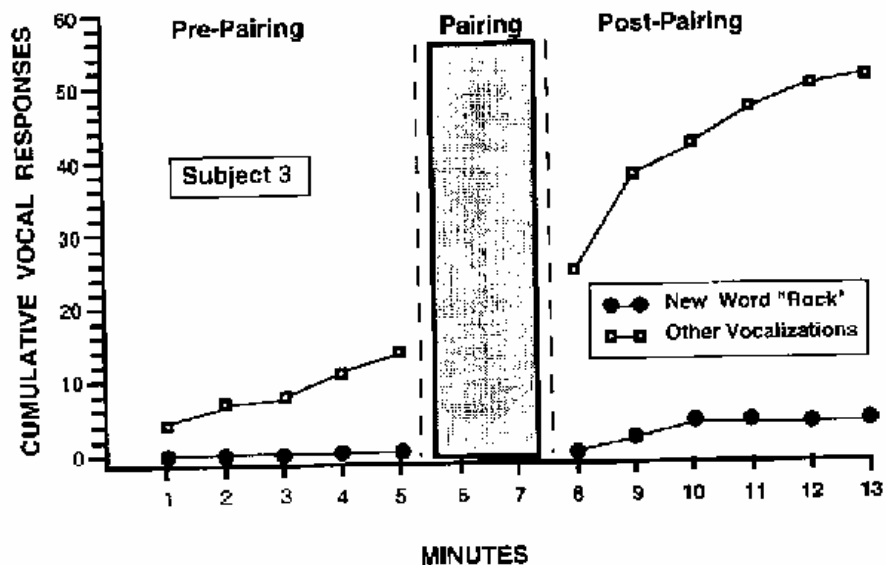


Fig. 3. Cumulative number of all vocal responses for Subject 3 on pre- and post-pairing measures. The shaded area represents the time during which one new target word was paired with rocking and cuddling.

The procedure requires that you present a sound three times with about a 1 second delay between presentations. If you hear any approximation or even any sound after any of the presentations, deliver the reinforcer immediately. If there is no sound or approximation then deliver the reinforcer after

the third presentation. Here is a diagram of this procedure with the sound “buh”

“BUH” 1 sec “BUH” 1 sec “BUH “ 1 sec ----  
REINFORCER

### **3. DIFFERENTIAL REINFORCEMENT OF WORDS OR WORD APPROXIMATIONS:**

As you saw earlier, Ian developed improved vocalizations through the use of simultaneous communication methods where sign and words were paired during mand training. Some learners although they babble frequently and a variety of sounds may be slow to acquire the vocal responses for the items and activities they learn to mand with sign. In some cases the frequent babblers learn to say the words for only some of the reinforcers they mand with sign. In either case it may be necessary to utilize another procedure to help increase vocalizations within the context of manding with sign.

This procedure is conducted as follows;

1. for all signs that are strong mands, in other words, the sign occurs without physical or demonstration prompting when motivation is strong, the teacher should momentarily withhold reinforcement for signs that are not accompanied by vocalizations or approximations to the word being signed.
2. Immediately after the sign the teacher should say the word of the reinforcer the learner is manding with only sign. Pause about a second allowing the learner to say the word or an approximation to the word.

3. If he/she says the word or a close approximation, deliver the reinforcer and you would have differentially reinforced talking and signing.
4. If the learner does not say the word or an approximation then re-present the word 2 more times. If any one of them is an approximation or the word reinforce immediately.
5. However, if by the 3<sup>rd</sup> presentation the child is still silent and makes no approximation deliver the reinforcer anyway to avoid extinguishing the sign, causing problem behavior or the learner losing interest in cooperating with you.

#### **4. Vocal Imitation Teaching (ECHOIC TRAINING):**

In addition to the procedures above it may be necessary to also conduct vocal imitation training sessions to increase the number and intelligibility of vocal responses. Learners who are good candidates for the vocal teaching procedures have these behavioral characteristics (Kasper, Godwin and Hulshof, 2002)

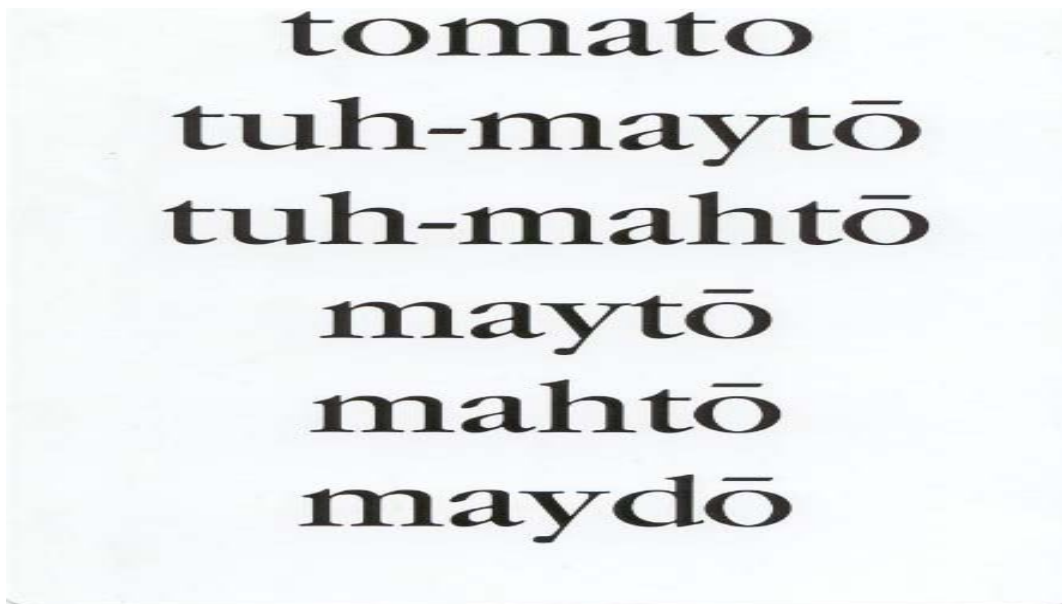
- They have a limited ability to echo words and sounds and therefore much of their talking is unintelligible. However, they do produce simple vowel and consonant sounds in isolation. If they can not perform even these most basic skills then investigation of medical issues and structural or muscle weakness problems should be investigated by appropriate professionals. However this problem would not preclude the use of any of the other 3 procedures listed above.
- 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.

Once you have identified the appropriate candidate then the question becomes which sounds and words should you present to the learner for him/her to imitate during these sessions. That decision should be based upon an evaluation of the learner's current imitative repertoire that will help you determine the appropriate starting point. It will be best to start with the sounds and words which are the easiest to produce and move through a curriculum from simple to complex and thereby shape the muscle movements of the vocal musculature to produce even the most difficult sounds within developmental limits. We have found that the The Kaufman Speech Praxis Kit ( I and II) materials by Nancy Kaufman, Speech Language Pathologist, provides the assessment and materials necessary to begin a very effective vocal imitation program for many children with autism. When you purchase the assessment along with the Kit of pictures you have all the materials you need to get started on an effective vocal imitation training program. (ordering information is below) We have developed and modified the Kaufman procedures for children with autism based upon a behavioral analysis of language development.

When you purchase the evaluation you will receive a list of words on the assessment form all divided into syllable forms, e.g. consonant vowel, consonant vowel consonant, etc. During your assessment you will record exactly what the child says when you present each word or sound. After conducting the assessment you will then determine where the imitative repertoire begins to breakdown and use that as the starting point for teaching the vocal imitative skills. At that point you will turn to the kit you have also purchased. In the kit you will find picture cards with pictures

on one side and the breakdown of the name of the picture on the back side in the same syllable shapes as presented on the assessment, e.g. Consonant vowel, consonant vowel consonant, etc. For example, on the back of the picture of a tomato which is a consonant- vowel-consonant-vowel word you would find the following syllable breakdown:



**tomato**  
**tuh-maytō**  
**tuh-mahtō**  
**maytō**  
**mahtō**  
**maydō**

You will note that the word is broken down into its word shells, e.g. successive approximations to the correct form of the word. The word shells move from simple at the bottom (maydo) of the card to more complex at the top to eventually the correct form of the word (tomato). These steps or successive approximations towards the word allow you to present vocal imitation trials from simple to complex and only move to the next difficult level after the lower level has been mastered. Through this process you can shape word formation and production without frustrating the learner by starting at a level too difficult and therefore reducing the rate of reinforcement.

The following are the procedures that are recommended for assessment and then teaching:

## ASSESSMENT

1. The assessment materials that are provided by Nancy Kaufman should be used by a speech-language clinician with the appropriate training. If you are not a speech language pathologist it is not recommended that you use the formal evaluation method developed by Kaufman.
2. An alternative method is to develop an informal vocal imitation (echoic) assessment form by listing all the words and the approximations or word shells found on the back of the cards on a data sheet. List the words by category, e.g. VC, VCV, etc.
3. Present the correct form of the word as an imitative stimulus to the learner and record what he/she actually says. If the correct form is not the same as what you said, or in other words parity is not achieved, then move to the lowest level of the card and present that form of the word. Record what the learner says and mark the data sheet to indicate where parity was achieved. If parity is not achieved on any form of the word that indicate such.
4. After completing the assessment review the data sheet and find the word categories where parity is not achieved and where articulation breaks down.
5. Determine the lowest level at which parity is not achieved and begin the presentation of word approximations one step lower on the card to assure immediate success and then move up the card according to the teaching procedures described below.

## TEACHING PROCEDURES

1. Be sure to have strong reinforcement available and visible to the learner to establish motivation for correct responding
3. Present the word approximation at the level of the word that has achieved parity to insure success immediately.
4. Present the next higher word form immediately.  
Continue to present if incorrect for as long as learner can tolerate the re-presentation. The purpose of re-presenting the word is to give the learner several attempts to slip into parity with the word you presented and thereby received reinforcement for doing so. If the learner reaches parity after several presentations then reinforced the imitative response
5. If learner does not reach parity and can no longer tolerate additional presentations, then drop to the next lower form to achieve parity and reinforce.
6. 5. If the learner quickly achieves parity then present the next form of the word without reinforcement to promote momentum. If he she does not reach parity then repeat the presentation process until parity is achieved or the learner can not tolerate the presentation any longer. Present the next lower level if parity is not achieved and reinforce. If parity is achieved present the next higher level and continue the process.

### **Data Recording Procedures:**

1. Set up probe data sheets with the form of all the word where parity breaks down.
2. Probe once per day using cold probe method.

3. The Criterion for success may be adjusted but start with 1 daily successful probe to meet mastery at the word approximation level.
4. Once the correct form of the word is the form being probed set the mastery criterion at 3 consecutive days of probes for mastery to be met.