

PICTURE SELECTION & SIGN LANGUAGE

CRITERIA FOR CHOOSING AN AUGMENTATIVE SYSTEM

1. **EASE OF ACQUISITION FOR THE LEARNER:** Choose the system that is easiest for the child to learn, requires the least response effort for the child and is acquired the fastest to insure the immediate replacement of maladaptive behavior with functional communication.
2. **DEVELOPMENT OF VOCALIZATIONS:** Choose the system that is most likely to facilitate the development of vocal behavior (talking).
3. **FULL LINGUISTIC SYSTEM:** Choose the system that allows for verbal behavior across all the meanings of words, e.g. mands, tacts, intraverbals, just in case the child does not develop vocal behavior as his/her sole form of communication.

Important Distinctions

Selection Based verbal behavior consists of scanning an array of pictures and selecting the desired picture by pointing to it or exchanging it.

Topography Based verbal behavior (signing) consists of producing a distinct response form for each meaning or controlling variable.

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Shading Indicates Advantage of Sign

No Shading Indicates Advantage of Picture Selection

CONCEPTUAL ISSUES

1. Picture Selection requires an additional level of discrimination not required by talking or signing. This can be difficult for some learners to acquire beyond the first few requests which are simply match to sample activities. (Ease of acquisition)
2. Picture selection fails to establish correspondence between the muscle movements (response) and its product which is responded to by the listener. For example when talking different muscle movements correspond to different auditory response products. Moreover, when signing different muscle movements correspond to each different visual response product (the sign). (Development of Vocalizations)
3. Picture selection requires an effective scanning repertoire in order to find and select the picture related to the appropriate motivational, verbal or non-verbal stimulus. This skill is not required with sign language. (Ease of Acquisition)
4. Pictures become increasingly abstract and require fine discriminations as the complexity of the words increase. Consequently the time and effort necessary to teach may preclude instruction, e.g. beautiful. (Ease of Acquisition)
5. When teaching picture selection the teacher does not usually communicate with pictures also and therefore there the learner does not have a conversational model in the communication “language” being taught. The child must learn to respond to 2 languages, vocal and pictures. When you teach sign language you must sign as when you teach vocal language you must speak to give the learner the model. (Ease of Acquisition)
6. Sign language research indicates a greater likelihood of developing vocal verbal behavior as compared to picture selection due to automatic reinforcement and correspondence between response form and response product. (Development of Vocalizations)
7. Sign language instruction facilitates receptive language and receptive understanding to a greater extent than picture selection. (Full Linguistic System)

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8. Picture selection systems do not lead to a full linguistic system of tacts and intraverbals. It will be necessary to teach literacy (reading and writing) to develop a full linguistic system. This may be very difficult in many children with autism who do not acquire vocal verbal behavior. (Full Linguistic System)
9. From the perspective of the listener exchanging a picture and signing are the same. From the perspective of the speaker they are very different conceptually in terms of the skills required, how they are learned and equipment needed to communicate. (Ease of Acquisition)

PRACTICAL ISSUES

1. Picture selection requires the environmental support of having just the right pictures with you when you are motivated to communicate. As the number of pictures used becomes large, issues of portability become a consideration. With sign you always have your hands with you and therefore is similar to talking. (Ease of Acquisition)
2. The picture selection response is slow compared to signing and therefore may hold the attention of only a very motivated listener, e.g. teacher, parent. Signing has a response speed similar to talking. (Ease of Acquisition)
3. With picture selection the listener does not need any special training to understand the speaker. With sign language the listener must be able to understand the signs and a signing verbal community must be established. (Ease of Acquisition)
4. With picture selection the teacher does not need to have the training necessary to shape signs in a child who may have limited motor imitation skills. (Ease of Acquisition)
5. With picture selection the first few responses may involve simple match to sample and therefore makes early acquisition quite easy. For example, when the learner wants a cookie he/she sees the cookie and points to or exchanges the picture of a cookie. (Ease of Acquisition)
6. Picture selection requires a multi-step response form, e.g. locate pictures, turn pages or scroll screens, scan array of pictures, point to or remove picture and place on strip, hand to listener. Sign language response form is much less effortful and similar to talking. Also, a less effortful response may lead to easier replacement of problem behavior. (Ease of Acquisition).

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7. Picture selection requires the “listener” to be in very close proximity to the communicator. Sign language and talking are the same in that they can be effective across a room. (Ease of Acquisition)
8. Signs are frequently iconic (look like controlling stimulus) and therefore provide a built in prompt for the learner and the listener. (Ease of Acquisition)

WHAT WE KNOW ABOUT SIGN LANGUAGE WITH CHILDREN WITH AUTISM

1. There is convincing evidence that sign language acquisition with spoken words accompanying sign (total communication) may lead to vocalizations with some children. Children who already possess some vocal imitation skill are more likely to develop vocal verbal behavior as a result of sign language acquisition.
2. Almost all children with autism can learn to sign despite motor imitation difficulties .
3. Sign language teaching may lead to improved vocal verbal behavior in children who are vocal but engage in frequent delayed echolalia or video-type scripting or for whom the development of more abstract verbal behavior, e.g. adjectives, prepositions, etc. are difficult to acquire.
4. Sign is acquired more easily (faster and accurately) than picture symbol systems and with greater facilitation of mand stimulus selection (receptive language)
5. Sign language as a form of verbal behavior appears to mediate receptive understanding.

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Why Sign Language Training May Fail

- First signs taught are not mands
- First signs taught are too complex (e.g., please, yes/no, help, toilet, more, thank you)
- First signs may resemble each other too closely (e.g., eat and drink)
- First signs may involve a complex response form
- Not enough training trials are provided
- Training is conducted under multiple sources of control (e.g., motivation, picture/object prompts, verbal prompts, English prompts, imitative prompts), and prompts are not faded so spontaneous responses can occur
- Individual verbal operants are never established (i.e., mands, tacts, intraverbals), responses remain multiply controlled
- Stuck at one level too long, not a progressive curriculum in place
- Single verbal operant focused on almost exclusively (e.g., tacts, but limited intraverbal or mand training)
- Failure to establish a signing verbal community
- Failure to require signs outside of the training sessions
- Failure to generalize to novel stimuli, staff, settings, times, etc.

For a complete review of the differences between sign and PECS and other picture symbol systems see:

Potter, B. and Brown, D. (1997) A review of studies examining the nature of selection-based and topography-based verbal behavior. *The Analysis of Verbal Behavior*, 14, 85-104.

Shafer, E. (1993) Teaching topography-based and selection-based verbal behavior to developmentally disabled individuals: Some considerations. *The Analysis of Verbal Behavior*, 11, 117-133.

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SUMMARY SELECTING A RESPONSE FORM

1. If an echoic behavior is moderate or at least weak then vocal behavior should be the response form of choice.
2. If skilled attempts to develop the echoic repertoire and mands and tacts are unsuccessful then an augmentative response should be considered.
3. If a person has physical or neurological disabilities which makes the differential muscle control necessary for signing impossible a pointing or selection based system should be immediately considered.
4. If a student is young without physical conditions which preclude sign then begin an intensive signing program that includes speaking while signing. The teacher however should be skilled in prompting and differentially reinforcing vocalizations that may occur. **THE MAIN REASON FOR USING SIGN IMMEDIATELY IS THAT SIGNS MAY LEAD TO VOCALIZATIONS MORE EFFECTIVELY THAN A PICTURE SELECTION SYSTEM.**
5. With older students who may be involved in frequent community activities and who do not have a strong echoic repertoire or frequent verbalizations, a combination of signing and pointing systems may be best.
6. With older students the signs should be taught because they will probably be acquired more quickly, will occur more easily across most environments and therefore will facilitate the replacement of maladaptive behavior more quickly and efficiently.
7. This older person may have a need to immediately verbally interact with persons in the community who do not have specialized sign training and therefore would benefit from the use of a picture selection repertoire. Picture selection will be easier to acquire once sign language has been taught.

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USING SIGN LANGUAGE TO SUPPORT VOCALIZATIONS

1. Present words at the same time the child signs to take advantage of the effects of automatic reinforcement with someone who has some babbling.
2. Echoic responding is also being taught concurrently according to one or several of the procedures that are listed below.
3. When mand-signs are strong and will not be weakened if reinforcers are delayed slightly AND some vocal approximation to manded reinforcer is either present when the child mands or in separate echoic trials, require a vocal approximation to the word before reinforcement is delivered. Identify across all instructors the target vocal approximation required for reinforcement to occur. Then follow this procedure:
 - When the EO is strong for the reinforcer and the sign for it occurs at any prompt level say the word, not just a vocal approximation. You want the full word paired with the reinforcer not just a sound or partial word.
 - If no vocal response occurs within 2-3 seconds, withhold the reinforcer and repeat this process 3 more times if needed.
 - During any of the presentations of the echoic prompt if the vocal approximation occurs differentially reinforce immediately by delivering the reinforcer manded.
 - If the vocal approximation does not occur THEN REINFORCE ANYWAY AFTER 3 PRESENTATIONS OR THE SIGN AND ALL ATTEMPTS TO COMMUNICATE COULD BE WEAKENED.
 - Even when you do not get an approximation and can not directly reinforce, you may still have strengthened the likelihood that an approximation or the word may be selected in the future by the automatic reinforcing effect generated by the pairing of the word with the reinforcer.
 - When the targeted approximation is occurring regularly then begin to require a closer approximation to the exact word and only differentially reinforce when that occurs using the same procedure as described above.
 - Continue this until the word occurs each time instead of the sign.
 - Continue to mix echoic teaching opportunities with all the other skills in your intensive and natural environment teaching situations.

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HOW DOES SIGN SOMETIMES LEAD TO VOCAL VERBAL BEHAVIOR?

1. First of all, sign may immediately eliminate the problem of not being able to interact with others in a child who has very limited vocalizations or even no echoic repertoire. Listeners immediately know what the person is “saying” and can thereby provide reinforcement which reduces the tendency to engage in maladaptive behavior. Any vocalizations that occur at the time reinforcement is delivered are strengthened. In situations in which persons are not acquiring vocal behavior but are being “pushed” to do so, any requirement to interact verbally may be punished and further diminish the opportunity to teach verbal behavior of any type.
2. If teachers speak as they sign and require and reinforce approximations to spoken words then words are paired with specific signs and highly reinforcing vocal interactions.
3. For example in mand training if the spoken word “eat” is consistently paired with the sign eat and the delivery of food, then the word may acquire the power to evoke the vocal response or be a reinforcer when it is said.
4. Consequently, as you begin to shape the vocal repertoire the production of the words not only gets direct reinforcement but what you hear and feel by saying “eat” will help to strengthen the vocalization.
5. As you teach sign you also teach a generalized motor imitative repertoire. This repertoire involves a matching response that then produces reinforcement. This process may facilitate the development of a vocal imitative repertoire (echoic).
6. It appears that students who have some echoic responding will develop vocalizations more reliably from being taught sign language.
7. When signs begin to evoke vocalizations then the signs may be used by the person or others to prompt vocalizations.

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Comparison of Natural Language Paradigm and Sign Language

Natural Language Paradigm	Sign Language
Early in the training every EO does not have a specific topography (vocalization) that can be reliably prompted to insure the delivery of frequent reinforcement. In some cases, even when an EO is strong and no specific topography is being required, just a vocalization, there is no reliable method to prompt vocalizations. This reduces opportunities to reinforce verbal behavior and may lead to disruptive behavior.	Every EO has a sign that can be prompted when the motivation is strong and therefore every verbal response can be reinforced and the word can be paired with the reinforcer to strengthen evocative effect of words through automatic and conditioned reinforcement.
Early in the training reinforcement can not be delivered when an EO is strong but the reinforcer is not present. Since there is no specific and differentiated topography related to specific EO's reinforcement specific to the EO can not be delivered. Even when reinforcement is delivered for any vocalization the reinforcer may not be specific to the EO and therefore slightly reduces the reinforcing effects.	Early in the training reinforcement can be delivered specific to an EO even when the item is not present. If the sign topography has been successfully transferred to the control exerted by the EO verbal behavior can be reinforced even when the item is not present. This leads to greater opportunities for verbal behavior to be reinforced and leads to spontaneous responding or verbal behavior free from multiple controls.
Can not immediately transfer vocal responses across functional language categories, tact, intraverbal, because the initial response form is not sufficient to control the behavior of a listener when an EO and reinforcer are not present.	Can begin to transfer signed topographies across functional categories and therefore increase opportunities for verbal behavior and speech to be paired with reinforcement.
The topographies of vocalizations can be shaped (articulation) through differential reinforcement and therefore lead to more articulate speech.	Vocalizations and specific topographies can be differentially reinforced while signing as well and therefore more articulate speech can be shaped. Moreover, specific speech sounds have been paired with specific signs and therefore the signs may act as

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	<p>evocative stimuli for the vocalization and automatic reinforcing stimuli. In addition, the motor imitative movements when signing may facilitate vocal imitative behavior as well. Finally, the sign may act as a prompt for the vocalization once signs evoke vocalizations and therefore lead to greater opportunities for vocalizations to be reinforced.</p>
<p>If the NLP shaping procedures do not produce a useful vocal repertoire an augmentative system of communication must be eventually chosen. This may mean several months or even years of attempting to teach vocal behavior may constitute lost time in developing a verbal behavior repertoire.</p>	<p>If sign language and vocal verbal behavior shaping does not produce a useful vocal repertoire the time spent teaching it has not been lost since the child may well have a very sophisticated signing repertoire including a conversational repertoire with sign-competent listeners.</p>

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WHAT I WILL DO WHEN I GET HOME
Teaching Sign Language

- 1. I will obtain a sign manual or CD and or take a signing course in American Sign Language.**
- 2. I will insure that everyone who works and or interacts regularly with my child will learn sign language.**
- 3. I will begin teaching the first signs as mands for his/her reinforcers. I will say the word each time he/she mands**
- 4. I will use the teaching procedures that include fading of physical and gestural prompts to teach mands with signs.**
- 5. I will insure my child gets many opportunities a day to mand with signs. We should contrive and capture many opportunities per day**
- 6. I will count and graph the number of mands per day. Variety of mands will be as important as number.**
- 7. I will use the echoic teaching procedure to improve vocalizations once signs are strong**
- 8. I will teach across all the verbal categories using sign language, e.g. mand, tacts, etc.**

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