

# Sound-Object Associations

## (The Learning to Listen Sounds)

A free module courtesy of  
Listen Up!  
and  
Ellen A. Rhoades Ed.S., Cert. AVT

This module was prepared in response to the many requests we have received asking for something for the beginning listener. It is a free module that can be downloaded from our web site and passed on to anyone that can use it. Images may not be incorporated in any documents outside of this module due to copyright restrictions.

On the pages that follow you will find an excellent article written by Ellen Rhoades. You will also find the Sound-Object Association cards. These cards should be cut out along the broken blue lines. If you are going to laminate them, do this before cutting them. We have even included a chart to help you keep track of when a sound is introduced and the listener's progression towards mastery.

Like all our products, we've designed this module to be extremely flexible in its use. We've tried to develop this module to meet the needs of beginning listeners of all age ranges. Use of these cards should be tailored to the specific needs, abilities, and age of the beginning listener. Be sure to start out with only one or two sounds and add more as sounds are mastered. Here are just a few ideas on using these cards to get you started. Remember that these are not "rules" for use, but only some suggestions. Modify any of these activities, or make up your own.

- ◆ Very young child - We do not recommend that these cards be used directly with very young children. Instead, we suggest that you use plastic toys. Use the cards to remind yourself and others which Learning to Listen sounds are being working on.
- ◆ Preschool child
  1. Produce the sound and have the child match a plastic toy object to the card.
  2. One activity kids seem to really enjoy is to have them swat at the card with a clean fly-swatter when they hear its sound.
  3. Place objects around the room. When you make the sound, the child tries to find the object.
  4. Show the child the card and make the sound. Then go around the house trying to find as many of those sound objects as you can.
  5. Stick the cards to a wall and have the child throw a foam ball at the card when he hears its sound.

- ◆ School age child
  1. Let them put a sticker on the back of the card, stamp the card, or put it in a “discard pile” when they hear the sound.
  2. Spread the cards out on the floor and have the child step on the card he hears the sound for.
  3. Draw a picture of an object on a balloon. When the child hears the sound, he finds its balloon and pops it.
  4. Use the cards to play a modified game of “Go Fish”.

The cards will last much longer if you print them on card stock (pages 8-10 of this document). We hope that you enjoy this free module. Please feel free to contact us if you have any questions or comments.

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## **SOUND-OBJECT ASSOCIATIONS**

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Long before babies speak words or know their meaning, they first hear sounds frequently, and then memorize them (Jusczyk, 1997). For children using hearing prostheses, among the many activities that can facilitate listening to sounds are Sound-Object Association activities. This type of activity involves associating a sound with a referent, an item such as a transportation vehicle or animal or with a routine meaningful action. Activities that attribute consistently similar sounds to items or actions have been implemented for years by parents of normally hearing babies and been researched by linguists and other child development professionals (e.g., Harding, 1983; Norris & Hoffman, 1994). As frequently noted among researchers, young babies seem to first become familiar with frequently heard sounds before they understand words and certainly before they speak words.

This type of activity is not unique to professionals practicing auditory-based learning with children who happen to be hearing impaired, yet some professionals may attach a different label to this activity, namely 'Learning to Listen' sounds. Regardless of what this activity is called, linking a sound to a referent is considered an important activity for auditory-based intervention. In fact, imitating a sound that is associated with an object is called onomatopoeia and the sound itself is considered an onomatopoetic word.

There are many reasons as to why adults should facilitate the development of sound-object associations. Some of these objectives are as follows:

- To encourage the child to attend to sounds.
- To facilitate the recognition that sounds are different.
- To help the child understand that different sounds have different meaning.
- To develop auditory imprints, also known as auditory schema or stored perceptual representations, for specific sounds or language-based phonemes.
- To highlight critical parameters used in spoken language
- To engage the child in turn-taking and joint attention behavioral interactions.
- To stimulate fluent movement of the child's articulators needed for speech.
- To help the child experiment with producing different sounds.
- To integrate and synchronize physical and social behaviors into vocal interactions.
- To develop 'communicative intention.'
- To develop auditory familiarity with the spoken language.
- To enable the child to become a communicator before the concept of communicating is truly understood.

Young children need to actively participate in the learning and listening process. Therefore, implementation of sound-object association activities with very young children should incorporate toys or personal action, i.e., pictures are not recommended. Sound-object activities are meant to be meaningful as well as actively enjoyable for both adult and child – not passive rote drill work (e.g., Stark, Ansel, & Bond, 1988). Moreover, we should vary how we use these sounds, i.e., we should use their associated toys in different ways, since we restructure our auditory schema of a particular sound each time we hear it in a different context (Norris & Hoffman, 1994).

It is a good idea to start out with just one, two, or three sound-object associations when first implementing these activities. As the young child comes to associate meaning with a few items or actions, more sound-object associations can be introduced. For ease in planning and learning, it is suggested that sound-object associations be presented categorically. We know that young infants are already categorizing their newly learned concepts (e.g., Eimas & Quinn, 1994; Hasegawa & Miyashita, 2002), so it seems that facilitating categorical development would be the prudent thing to do. Therefore, I avoid mixing my transportation vehicle sounds with my animal sounds. These are planned as separate activities, e.g., one day I might have a vehicle sound-object association activity in my therapy session, and the next day I might have an animal sound-object association activity.

Toys used for sound-object association activities should be simple representational items that are easily recognizable to young children. Ideally, the animals should be in standing rather than sitting positions, and the vehicles should at least include typical representations, e.g., a sedan rather than a convertible or police car if just one car is used. When selecting toys, avoid those that produce a sound while being moved, since these sounds typically take precedence over speech. If the toy is battery-operated, remove the battery during the session. Transportation vehicles include ambulances, fire engines, trucks, cars, motorcycles, buses, airplanes, boats, and trains. Other vehicles that are of particular interest to the child can also be used for creating sound-object associations. For example, a child may encounter helicopters more than any other type of plane, in which case helicopters can be included.

Another consideration as which vehicles will be used by adults in this activity has to do with availability of toys, e.g., a child's parent may have access to a toy fire engine but not to a toy ambulance or police car. When selecting items for these activities, consider relative sizes; start with typical objects that look like the real thing regardless of whether they are small or large in size. With children 18+ months, it will be fine to include an occasional non-representational animal or vehicle from which toddlers can then generalize.

A variety of table-top props lend themselves to more interesting activities, and many of these props can be handmade rather easily. Examples of table-top props are a plastic fence, a gas station or airport hangar, a train track, a barn, an oval piece of blue paper representing a small water pond, some small pebbles and twigs retrieved from outdoors. The more props one can use, the more opportunities there will be for repeated vocalization of sounds, and the more varied will be the connected language that accompanies the sounds being made. Even young infants seem to attend more to visual objects when they have an auditory stimulus associated with it (Schafer, Plunkett, & Harris, 1999). This relates to early word comprehension.

An effective auditory-verbal strategy that should be used with these sound-object association activities is that 'hearing comes first.' The adult should vocalize the sound before showing the child the item. Special attention should be given to voiceless sounds also known as fricatives. These are phonemes that are not voiced, instead being whispered, e.g., /t/, /p/, /k/, /s/, /f/, /ch/, and /sh/. These high frequency sounds are often difficult for young children to hear when couched within whole words, since vowels seem to supersede the whispered phonemes because they may seem louder to the child using hearing prostheses. Therefore, it is important that these voiceless sounds be used without any vowels during sound-object association activities.

The following examples of sound-object associations are based on my experiences as someone with a hearing loss and as an Auditory-Verbal Master Clinician for 30+ years:

## TRANSPORTATION VEHICLES

**Aaaaaah (airplane)** – There is generally no ambiguity on this choice of sound from therapist to therapist. This is a good basic vowel that even the typical child with profound deafness using a hearing aid tends to comprehend and use it rather quickly. I have a tendency to exaggerate its suprasegmental features (inflection and duration) when I initially produce it because this is among the first sound-object association activities that I use. The child is typically new at learning how to listen, and I want this child to clearly hear the highs and lows in my vowel production as he's watching me fly the plane up and down. I'll also make the plane stop and go along with changing the duration in how I say the sound. I'll make the plane move rhythmically along with my voice as well, e.g., the plane jerks along if I say "ah ah ah" as opposed to "aaaaaah". Sometimes the child will begin to produce this sound on his own within a week or so. Sometimes it will take a month or so. I do not 'urge' the child to do talk. However, when the child does produce it, I want to hear some variation of suprasegmental features in his "aaaaah." The use of a monotone vowel is undesirable; if that's what I'm hearing from either parent or child, then I'll engage in even more singsonging with my voice (exaggerating even more so, perhaps along with rhythmic whole body movements in order to make my point).

**Buhbuhbuh (bus)** – Besides being a developmentally appropriate sound (it's one of the first consonants that babies produce), this is an easy sound for babies to imitate and independently produce. When I produce this sound, I like to sing it using a variety of rhythms to synchronize with my movements of the bus on the table or floor. This sound is one that I use during my early auditory-verbal therapy sessions because it stimulates the use of the child's lip articulators. Sometimes the way the young child produces that sound is an indicator of hearing status, e.g., if the child says "muhmuhmuh", then I wonder about the child's amplification, noting this as a potential concern for implant candidacy. Be especially careful that the child is not watching the speaker's lips while the sound is being produced, since /m/ and /b/ look alike). Like the airplane, we should not vocalize the sound when we are not moving the bus. I use a small and large bus, so that I have a reason to make loud and soft 'buhbuhbuh' sounds, thereby encouraging the comprehension and expression of still another suprasegmental feature known as intensity.

**Oooooooo (fire truck siren)** – This is another excellent means for stimulation of pitch variations also known as inflection or intonation. I vocalize this vowel sound continuously from high to low to high to low to high to low. Parents may have difficulty sustaining these uninterrupted pitch variations on a single vowel, so I have them practice this at home, initially for a short time but gradually expanding it in duration. Sometimes, parents say they can only do this if they use the 'eeeeeee' sound, and I accept that. Either vowel is fine. Note that this vowel requires a different lip movement than the "aaaaah" one, so we're again stimulating the lip articulators. Again, the absence and presence of the adult voice for the fire truck is synchronized with the movement of the toy. The most important reason for using this particular sound-object association activity is to develop good comprehension and production of vocal intonation. This is one of the favorite activities for young children that I've worked with, because they love the novelty

of sirens and flashing lights. If a parent does not have access to a toy fire truck at home, an ambulance or a police car can be used as a substitute, but my preference is always for the fire truck because it looks quite different than other transportation vehicles. The use of a Cheerio or other rounded item for encouraging the child to vocalize this sound is not suggested. The prosodic exaggeration of this phoneme is for the express purpose of improving the child's auditory discrimination or speech perception; it is an auditory strategy and not a visual one.

**Brrrrrrrrr (car)** – Some therapists choose the “vrrrooom-vrrooom beep beep” sound instead of the blowing raspberries that I prefer. I like the lip trilling ‘brrrrrrr’ because it better focuses on stimulating the lip articulator. I would prefer not to initially complicate it with the addition of a vowel. Many children with significant hearing loss that first come to me for therapy have no history of babbling experience, and their articulators are flaccid. Movement of lips and tongue are critical for good speech. Even parents may have difficulty with producing this oral-motor skill, so they should practice this at home. The adult should be sure that the lip trilling is synchronized with movements of the car – for absence or presence of movement (off/on lip trilling), length of movement (long/short lip trilling), large or small movements (loud/soft lip trilling), and rhythmic movements (sequenced lip trilling). If the child spontaneously engages in blowing raspberries rather than tongue trilling, than I accept that as a worthy outcome of my efforts. Regardless, it should be kept in mind that just because a child can engage in lip trilling or blowing raspberries does not mean he hears.

**Ptptptptpt (boat)** – Some therapists don't use this sound at all, preferring the "putt-putt" sound instead. In fact, some therapists use the sound "bu-bu-bu-bu-bu" for a boat and I make every effort to avoid this. I use “ptptptptpt” or “**p-p-p-p-p-p-p**” (known as labial stops, another pre-speech skill) because this is when I'm developing the child's familiarity with a high-frequency sound. The sound must be whispered so that no vowels accompany it. I make sure that parents demonstrate how they will say this sound before they leave my therapy room; invariably their produced version of it is "putt-putt" so I make sure that we practice saying it until there is complete absence of a vowel. Of course, I explain the logic behind our practice to the parent, i.e., the vowel will 'drown out' the consonant to the young child who is just developing listening skills. I'm going for clarity in hearing so that I can 'imprint' this new sound into that little child's brain. Should the child spontaneously produce a vowel when I bring out my toy boats, then I know someone has erred and I also let the child know that the sound does not go with the boat. Once again, we strive for voice-action synchrony, in that our movements of boats are reflective of how we say the associated sound, and vice-versa, e.g., presence and absence of sound associates with presence and absence of movement, and rhythm of boat associates with movement of boat.

**chchchchch (train)** – Some therapists instead say “choochoochoochoo” but I studiously avoid this. Again, I make a special point to tell the parent *not* to include the vowel and insist that she correctly demonstrate how she will do this before she leaves my therapy room. Whispering the “**chchchchch**” sound is important to me for the same reason that the boat sounds should be whispered: hearing the vowel will take precedence over the high-frequency consonant for the inexperienced listener. With the train, I'm developing the child's auditory schema for a high-frequency sound that involves rounding the mouth and pushing the tongue against the roof of the mouth (another important pre-speech skill) and shortened whispered sounds (as opposed to prolonged vowels) that involve ‘stops’ which are not in the “shhhhhhh” sound. When the child eventually produces this sound

on his own, he may spontaneously vocalize "shshshsh" and I will accept that at this early stage if for no other reason that the child has indicated to me that he heard those stops. As usual, remember the need for voice-action synchrony to encourage development of those suprasegmental aspects of speech. Sometimes trains that do not produce sounds are hard to find, yet I feel it's important to have a silent train. Otherwise, the child typically wants to 'turn it on' and hear that noise, and that noise unfavorably competes with live human speech. With young inexperienced listeners, noise supersedes speech. If the parent only has the kind of train that produces sounds, I suggest that the batteries are removed so that the child cannot turn it on. Of course, there is a time and place for the noise-producing train, but not when the child is developing sound-object associations.

## ANIMALS

**Mooooo (cow)** – I think all therapists use the same sound for this animal. In addition to being a good vowel, it's combined with the initial low-frequency consonant /m/. When I produce this sound, I use a low voice, dropping it to a bass. This change in my voice tends to be interesting to the child. For this sound, I hardly vary my suprasegmental features other than for duration. As always, I synchronize my voice with the action.

**Repeated tongue clicking (horse)** – Some therapists say "neigh" for the horse, but I avoid this. I prefer the tongue clicking because it involves another important pre-speech skill. I want the child to try manipulating his tongue to do something that it hasn't previously done. When I repeatedly click my tongue, the typical child is initially fascinated, so he looks at my mouth. I let him look because my mouth is usually closed, with my lips barely parted, as I'm clicking my tongue. The child sees my upper neck (under my mouth) moving, he hears this intriguing sound, and he tries to imitate this. Some of the children cannot imitate it and that's fine. What's important is that they tried. At the very least, the child will produce a different kind of sound. Another nice thing about this tongue clicking is that I can synchronize the speed and rhythm of my clicks with the speed and rhythm of the trotting or galloping horse.

**Meeow (cat)** – This is one of my favorite sounds because it has a nice vowel transition and it permits me to produce interesting inflectional variations within a two-syllable combination. When I vocalize this sound, I make an effort to sound like a cat and the "ow" part requires a nicely rounded mouth.

**Woofwoof or arfarf or ruffruff (dog)** – Some therapists use the sound "bow wow" for the dog but I tend to avoid this. I prefer either "arf arf" or "woof woof" or "ruffruff" because the "ow" sound is in the cat sound and I am looking to expand the child's auditory experiences for different phonemes (I've already used the /b/ phoneme in my bus activity and the 'ow' sound in 'meow.' Sometimes I use the woof, ruff, and arf sounds interchangeably. What I like about these dog sounds is that they end in /f/ that I ensure is as audible as possible by exaggerating it within earshot of the child. I produce the sound so that the vowel rises from my chest just like I am barking. For me, varying my targets is a key element to those sounds I choose for my sound-object association activities.

**Ssssss (snake)** – I particularly enjoy highlighting this sound with young children, because it clearly lets me know whether high frequency hearing is present and/or

whether the hearing prosthesis is sufficient. If the child is not hearing optimally, i.e. at a level worse than 35 dB, then I will be very consistent about vocalizing this sound within earshot of the child. It is also important to me that I learn about the children's fears, if they have any. If the child's fears preclude use of a toy snake, then I will associate this sound with running liquid, e.g., while pretending to hose down a car, while pretending to put gas in a car, and after I've pretending to turn on a water faucet or flush the toilet. Although production of this phoneme /s/ does not usually occur until the preschool years, I am sometimes surprised by young toddlers who say it so clearly. I think this is because toddlers tend to enjoy activities incorporating this sound just as babies love to hear adults whisper in their ears. Like the /p/ phoneme in boat, the /s/ sound is always whispered; I remind each parent not to use voice with this voiceless or whispered sound.

**Quack quack (duck)** – To make this interesting to the child, I use a really low voice for this sound. The neat part of this sound is that it starts and ends with the /k/ phoneme, making it more likely to be heard even though there's a vowel stuck in the middle of it. With this one, I can vocalize differentially for duration, i.e., some long quacks and some short quickies are good, depending on how I manipulate the duck. If the child does not seem to be hearing optimally with his hearing prosthesis, this sound can be vocalized softly or whispered within earshot of the child; this will help the child better hear the /k/ phoneme.

**Hop hop hop (rabbit)** – While this is not an animal sound as such, it is a handy action-oriented verb to know and children love learning functional words. It starts and ends with two different high-frequency sounds /h/ and /p/, so I will sometimes whisper this verb when I make the rabbit hop in the dark (lights off) and I will normally vocalize the verb when I make the rabbit hop in a well-lit room. The parent is again reminded that whispering better enables the child to clearly hear high-frequency consonant sounds.

With the above animals and transportation vehicles, I tend to incorporate all of the associated sounds in my early auditory-verbal therapy activities. Given that I introduce a variety of other activities that greatly benefit the young rapid language learner, I tend not to present any more sounds than are presented here, as I feel the above are sufficient. It is important that we enable children to move as quickly as possible to word-object associations and then on to more advanced auditory-verbal intervention that involves connected language at a more complex level. However, I use the following sounds when I read books or whenever these animals happen to be included in my first-year therapy activities:

**Oink oink (pig)** – The use of another vowel is fine and, in this case, it is combined with a diphthong sound /nk/

**Ba-a-a-a (sheep)** – This is similar to the airplane sound except that here the vowel is repeatedly broken so that one syllable becomes many.

**Squeak (mouse)** – Making this sound involves using a really high-pitched voice.

**Whistle like a bird** – This sounds interesting to the child. Most young children will not be able to whistle yet, so some of them will spontaneously vocalize a falsetto "ooo" and that's cute as well as acceptable.

## OTHER ITEMS AND ACTIONS

**Mmmmm** – This is taught like it's a word, as in "Mmm, it's good!" I use this when tasting foods or pretending to eat during a therapy activity. I acoustically highlight this if the child does not have an isolated /m/ in his vocalization repertoire. Be careful that the child does not say "mba" (inserting a /b/ is a poor habit based on insufficient hearing and the child is confusing hearing with vibration). Unfortunately, this sound seems highly subject to 'overkill' as adults may get into the habit of vocalizing this instead of moving quickly toward expanding the child's language knowledge.

**Shhhhh** – This is a wonderful sound because it's so easy to hear and children love to turn out the lights so they can walk around the room on their tip-toes, hold their finger over their little rounded mouth, and whisper "shhhh.". Sometimes this is done just because the doll or adult in the room is pretending to sleep. I always use this as part of my activities to develop a good foundation for listening and speaking. If a hearing aid user does not hear this sound at a distance of three feet from the speaker, then this often indicates the need for referral to a cochlear implant team for candidacy. This is an easy sound for cochlear implant users to hear.

**Smacking lips (kiss)** – This is another important pre-speech skill that facilitates articulator movement. Besides hearing the sound, children typically imitate it with ease. I use this when I feed a bottle to the baby doll and the doll is drinking from the bottle, or when I move cows and horses over to water trough on the toy farm and they're busy lapping up the make-believe water.

**T-t-t-t (clock)** – This phoneme essentially represents movement of the second hand on a clock and should be easily heard when within earshot by every child, regardless of hearing prosthesis used. Again, be sure the parent does not insert a vowel into this sound associated with the ticking of a clock.

**K-k-k-k (coughing)** – The adult says this when pretending the baby doll is coughing or /g-g-g-g-g/ when pretending the baby doll is gargling after brushing her teeth. It is a good idea to sometimes contrast these two sounds so that the child better hears the differences, since one phoneme is voiceless and the other is voiced even though mouth articulators are used similarly for both sounds.

## SOME FINAL THOUGHTS:

Before starting therapy with sound-object association activities, it is a good idea to determine if the child has yet developed a history of associating a particular sound with a particular referent, since changing the association and possibly confusing the child is not advised. For example, a child may already associate 'toot toot' with a train moving. Therefore, we might engage in a train playing activity whereby the 'chchchch' sound is made only when the train is starting up and the 'toot toot' sound is made when the train moves.

From time to time, attempt to check on the young child's comprehension. For example, while playing with animals, the child can nonchalantly be asked to give the cow a drink of water, assuming there is a trough or imaginary pond on the table. While it is unrealistic to ask babies to choose correct items, toddlers one year and older are capable of

choosing the requested target object (e.g., Woodward & Hoyne, 1999). Keep a record of those sounds that the child understands without the use of visual cues. As another example, there might be a garage and some cars, a fire truck, airplanes, and a train on the floor. As the adult is completing the activity and the child's had enough time to play with the items, the adult can ask the child for a vehicle by sound while holding out a hand or receptacle. Without visual cues from the adult, does the child put the correct vehicle in the hand or receptacle? Typically, when the child understands most of the sounds, it's time to move on to using the words and dropping the sounds. Comprehension checks for sound-object associations should be done naturally, meaningfully, and in a playful manner.

While the child should be exposed to as many animal sounds as possible, he does not need to demonstrate that he can comprehend each and every one "80% of the time" as is often specified in school learning objectives. This is unrealistic for infants and toddlers since young children do not consistently perform on command. As long as the child demonstrates incidentally on at least one occasion that he clearly understands a particular sound is associated with the referent, comprehension for a handful of animal sounds and another handful of vehicle sounds is all that's needed. At this point, the young child has demonstrated understanding that sounds are meaningful and differentiated, and that exposure to varied auditory schema has occurred.

Daily activities should be creatively presented. Creativity can also involve the incorporation of an appropriate seasonal theme into the activity. For example, ghosts say "Oooooo" during Halloween; we click our tongues while trotting our toy horses during Thanksgiving or when playing with cowboy toys; Santa Claus says "Ho ho ho!" during Christmas; "Mmmmm" is what we say when eating Halloween or Valentine's Day candy; "Hop hop hop" is what the Easter bunny does; "Sssss" is what we say as we are filling up the inflatable wading pool with water.

With animals and transportation vehicles, it's important to vary both toys and presentation of them each day. Using just one boat can get boring for a child. In addition to having an appropriately sized toy for each of the above (large sizes for babies, and hand-sized for older toddlers), I urge parents to purchase a bag of inexpensive plastic planes, boats, etc. from their local party store. Sometimes the day's activity at home may involve just one plane. Other days it can involve a lot of varied plane activities, such as landing some of them on a paper strip on the floor while flying others in the sky. Still other days, the activity may involve just boats sloshing around in a large plastic bowl along with planes flying over makeshift houses on the table. And on other days, we can use one of each vehicle type. The hardest part of the adults' job is to be creative, because children often become bored with repeating the same activity with the same item everyday. Parents should keep therapy toys (those that must involve adult participation) separate from the child's room toys, so that children look forward to playing with parents.

Make a special effort to caution parents that these activities should be enjoyable without applying uncomfortable pressure on the child to talk. After all, the child is just learning to listen and, with normally hearing children, we do not expect them to talk prior to one year of hearing. If we expose the child to these sounds over a sufficient period of time in a variety of contexts, with everyone taking turns at having fun, the child typically will begin to vocalize spontaneously. As Meltzoff (1999) states, exposure to sounds is sufficient to alter the nature and quality of young children's vocal productions.

When the child does begin to indicate that he can identify the correct vehicle based on the sound made by the adult, and when the child does use at least some of these sounds, the transition should immediately be made to word-object association, i.e., the adult should begin naming these vehicles (airplane, boat, ambulance, bus, car) and stop using the sound. A danger with many adults is that they stay too long on this sound-object association level because it's comfortable; in reality this is known as 'overkill.' 'Overkill' can create a problem by delaying the child's transition from sounds to words. Time is of the essence and we want to move the child forward as quickly as possible to word-object associations. In my opinion, when the child demonstrates comprehension or appropriate production of a handful of animal sounds and a handful of vehicle sounds, it is time to move on to acoustically highlighting words (referent labeling) within simple but complete sentences, using the sounds only as incidental aspects of the activities.

**Caveat:** Some children seem to have difficulty transitioning from the sound to the symbol level, i.e., word-object association. This could be an indication that 'overkill' occurred, or it could be indicative of a learning disorder such as ASD or APD. When in doubt, consult with professional diagnosticians and developmental neurologists.

In general, there are developmental steps to which typical children adhere when engaging in sound-object association activities for at least half of the referents:

Step 1: Child will identify the object by the sound

Step 2: Child *may* vocalize the sound, either by imitation or spontaneously

Step 3: Child will identify the object by its name and sound

Step 4: Child will identify the object by its name

Step 5: Child *may* vocalize the name, either by imitation or spontaneously

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