Articulation Development

Children develop the ability to produce speech sounds at different rates. For example, research shows that, overall, boys develop articulation skills at a slower rate than girls do. As children grow older, they learn to use more and more speech sounds that may have been difficult to pronounce in the past. The following list includes approximate ages at which children develop the ability to produce specific speech sounds correctly:

Sounds	Ages
p,m,h,w	12 months to 3 years
b	18 months to 4 years
k,g,d,t,n,ng	2 to 4 years
f,y	2 1/2 to 4 1/2 years
r,l	3 to 7 years
s	3 to 8 years
ch, sh	3 1/2 to 7 years
z	3 1/2 to 8 years
j	4 to 7 years
v	4 to 8 years
unvoiced th (as in "thumb")	4 1/2 to 8 years
voiced th (as in "that")	5 to 8 years
Note: Ages apply for English as a first language	*Second language learners may develop sounds at later ages.*

Common Articulation Delays and Disorders

When a child does not develop articulation skills at expected ages, he/she may have an articulation delay or disorder. A delay occurs when the child does develop speech skills, but is "behind," time-wise. A disorder means that the child is developing speech differently than one would expect. Here are descriptions of some common articulation delays and disorders:

Lisp: A lisp is a mispronunciation or distortion of the /s/ and /z/ phonemes (speech sounds). There are generally two kinds of lisps: **frontal** and **lateral**. The tongue protrudes forward with a frontal lisp. With a lateral lisp, the tongue moves to the side for speech sound production. This movement may also include side movement of the jaw. Generally, a frontal lisp is easier to correct in therapy, if therapy is needed at all. The child's frontal lisp often self-corrects with maturity (see the notes on *Dental Development*). A lateral lisp may be harder to correct, and therapeutic intervention for a lateral lisp may be recommended at an earlier age than for a frontal lisp. Thumb sucking may contribute to development and maintenance of a lateral lisp.

W for R: Many young children substitute a "w" for a /r/ sound. Children may also omit the final /r/ in words, leaving the vowel "open," sounding like someone with a New York accent. I'm not concerned about this substitution unless it doesn't start to get better by the middle to end of 1st grade.

Developmental Apraxia of Speech (DAS, a.k.a. **apraxia, or dyspraxia):** a motor-coordination disorder that significantly affects a child's ability to produce speech sounds. Children with apraxia present with very low intelligibility (ability to be understood) as compared to other children their age. A child with apraxia may be able to produce sounds correctly in words, but produce it inconsistently in phrases or sentences. The child may produce sounds correctly in some words, but incorrectly in others, depending on the letters surrounding the target sounds. For example, a child may be able to say "k" very clearly in the word "Coke," but be unable to say "coat." In this case, the child may say "Coke" or "tote," showing difficulty coordinating his/her tongue muscles to change position. Young children with apraxia may leave out sounds in the middle or ends of words, or speak just in vowels when other children are using consonants.

Children with apraxia may need to do oral-motor exercises that help improve muscle functioning and coordination for speech. Some of these exercises may be designed to promote effective chewing and swallowing, everyday activities that may improve muscle movement for speech. Others may include practice with whistles, horns, straws and bubbles. **It is crucial that children with apraxia practice their oral-motor and speech articulation exercises daily at home with their parent(s).** Daily concentration on the speech movements will help children to progress faster in therapy. (See *Homework*).

Children with apraxia tend to be "at-risk" for reading difficulties because they are not able to say many, many sounds, thus being unable to *hear* the sounds correctly when they speak. This can be explained by an idea called the Motor Speech Hypothesis, which suggests that children learn to process sounds in their heads by saying them and hearing them "internally." Children need practice hearing and processing these sounds

in order to make the quick correspondences with letters that is necessary for reading. (See Literacy).

Dysarthria: is a weakness of the oral muscles. Often, children with overall low body tone may experience low tone in the oral muscles as well. Children with a history of consistent respiratory congestion may also present with weak oral muscles. (This can often be linked to the habit of mouth breathing, which may result in a habitual "open-mouthed" posture and flaccid tongue that may hang down.) Children with mild dysarthria can often say speech sounds correctly if they slow down and concentrate on using strong muscle movements. Children with dysarthria may also "surprise" us when they are angry or upset, and speak very clearly under those circumstances because they are contracting all of their muscles more strongly.

Ankyloglossia (a.k.a. **"tongue tie"):** Some children have a very short *lingual frenulum* (also referred to by some as *frenum*). This is the piece of tissue that connects the tongue to the bottom of the mouth. The frenulum may range from reddish in color to white and fibrous. When the frenulum is too short, it may prevent a child from being able to move his/her tongue high enough to make speech sounds that require movement or contact with the palate (roof of the mouth). Some of these sounds may include g,k, r, sh, ch, and j. Other children may be able to say these sounds, but have difficulty coordinating their articulation well. Others may seem to slur their words. Still, many children have "tight" lingual frenula and have no difficulty with speech at all! Sometimes exercises may help stretch the frenulum--Speech-Language Pathologist Char Boshart suggested that the whiter, more fibrous lingual frenula may be more amenable to these types of exercises.

Ankyloglossia may prevent a child from making progress in articulation therapy. At this point, the articulation problem is considered to be a physical/medical problem rather than a speech disorder. Minor surgery can be performed by a doctor or oral surgeon to cut the lingual frenulum to allow more movement, and thus, improve articulation. Past research has shown this surgery might help, but that the tissue would often grow back. Now, many doctors make a stitch under the tongue after the cut is made to prevent any regrowth and help assure more continued tongue mobility. For children whose speech is affected by ankyloglossia, this surgery alone may result in radically improved articulation. However, surgery should be followed-up with "tongue stretching" exercises.

More notes on articulation:

Dental development and Articulation: It's been my experience through the years that for many children, articulation development is *highly* tied to their development of adult teeth. Children whose dental development is a bit "late" may exhibit persistent developmental frontal lisps on /s/ sounds or substitute w for /r/ sounds.

The mouth seems to develop with a predictable pattern of growth: The tongue is the *first* part of the mouth to stop growing, while the tongue is the *last.* (The jaw completes development for most people by about age 20). I've found that the jaw grows just enough to accommodate the tongue for a good "s" sound when the child has grown all of his/her adult incisors: the 4 front teeth on both the upper and lower jaws. At this point, most children will naturally outgrow their lisps without therapeutic intervention. For most kids, this happens at around third grade, but for some children, this may not happen until fifth or sixth grade. For children with later-developing dentition, learning to keep too large a tongue inside too small a jaw to produce /s/ may be too difficult---the child's mouth has just not grown enough for him/her to comfortably make the speech sounds correctly, even *with* articulation therapy. This should be kept in mind when children exhibit developmental articulation differences. Once the front teeth have grown in and the jaw has grown sufficiently, children who continue to demonstrate frontal lisps and who need therapeutic intervention tend to make very good progress in articulation therapy. I have also observed children who have worked hard at producing the /r/ sound make significant improvement when these teeth have grown in and the jaw has grown.

Additionally, children whose teeth come in crooked, or with big gaps between their teeth, may also feel they are fighting a losing battle to produce their s's correctly. Very often, orthodontia in its proper time will correct the speech problem. (It should be noted that orthodontic appliances, such as retainers, may cause a child's speech to sound distorted. Children will often accommodate their speech production to the appliance. For some, articulation may still sound "fuzzy." When the appliances are removed, the child's speech usually returns to normal).

Nasal Congestion: Many children with a history of consistent respiratory congestion may also present with articulation difficulties. In addition to promoting mouth breathing, resulting in mild oral muscle weakness, congestion can reduce muscle coordination in the mouth. Additionally, many children who experience nasal congestion may also experience ear infections, preventing them from hearing sounds clearly. Congestion can occur in the nose, sinuses, and ears, and may be prolonged over a long period of time. Congestion may also fluctuate, resulting in inconsistent improvement.

Congestion may be caused or set off by viruses, or it may be due to airborne or food allergies. While continued congestion may affect articulation, it is primarily a medical problem. Speech therapy may result in some progress, but appropriate medical

intervention is often the most effective treatment for congestion-based articulation disorders.

A few words about Ear Infections: Ear infections may occur either with, or following nasal congestion. Because young children have very small and horizontal Eustachian tubes, fluid often enters the ear and may not drain. (Older children and adults have more vertical Eustachian tubes). Fluid can be clear, or infected. Fluid in the ear may fluctuate---be present one day, and drain out another. Or it may be more noticeable (or bothersome) after a night's sleep or a nap, when a child lays horizontally (and the fluid pushes against the eardrum). The child may complain of an earache, but he/she may also be so used to the congestion that it does not bother him/her enough to mention it. (Often, very young children are not able to communicate these ideas, and by the time they can, they have gotten used to feeling this way--it is "normal" for them.). A child with ear fluid may present with fluctuating hearing loss that is often hard to detect with a hearing screening. Fluctuating loss may be confusing for a child---he/she may not be aware that things sound perfectly one hour, and then fuzzy the next. Children with a history of ear infections may be at risk for development of articulation disorders, as well as auditory processing problems. (See Language and Literacy).

Homework: My articulation therapy program includes short, daily practice exercises to be completed by children with their parent(s) at home. The rationale for this is that speech articulation is a *habit*, a behavior we engage in automatically. We teach our muscles these habits by engaging in regular practice until the muscle movements are automatic. This is true for eating, speaking, writing, driving a car...the list goes on and on. When we begin to learn a behavior, we do it slowly and deliberately. The more we practice, the more our brain and muscles learn to move more automatically, until we don't even think about the movement. (How many times have you gotten into your car and reached a destination, and you realized you didn't even notice yourself starting the car, putting on a turn signal, or making a turn?) The same is true for developing articulation habits. In this case, practice *does* make perfect. Students who practice their daily home exercises tend to make much swifter progress in articulation therapy.

Here are some websites with exercises and/or information on Articulation Development and Disorders:

Articulation Activities for 3 -5 year olds

Articulation Activities for K-2

Articulation Exercises and Games

More Articulation Activities

Developmental Apraxia of Speech

Tongue-Tie/Ankyloglossia

Tongue Twisters

Char Boshart's website (Oral-motor)

Innovative Therapists (Oral-motor)

Back to the Mrs. Rosenberg's Speech-Language Homepage