

TALK, READ, SING, GROW YOU CHILD'S BRAIN

- [Karen] Welcome everyone, to Living LSL, a Family Learning Series. Today's webinar is talk, read, sing, grow your child's brain. I'd like to hand it over to Teresa Caraway to introduce our facilitator and our session. Please begin when you're ready.

- [Teresa] Well thank you Karen and welcome everyone. Thank you so much for joining us for talk, read, grow your child's brain. This webinar is part of a Living LSL, Hearing First Family Learning Series, and you can access previous Living LSL webinar recordings on our website at hearingfirst.org/livinglsl. I am so pleased to introduce my esteemed colleague and dear friend, Dr. Carol Flexer. Dr. Flexer is a renowned audiologist, certified listening and spoken language specialist and Professor Emeritus at the University of Akron, Ohio. An international lecturer and educational audiologist, Dr. Flexer has authored over 155 publications, including 17 books, which are widely read today by professionals and parents of children who are deaf or hard of hearing. Many of you are most likely familiar with her work. She has served as past president for the Educational Audiology Association, the American Academy of Audiology and the AG Bell Academy for Listening and Spoken Language. Dr. Flexer has been supporting families and professionals for over 40 years and her work has been instrumental in the amazing listening and spoken language outcomes we see every day in children diagnosed with hearing loss. Let's welcome Dr. Carol Flexer.

- So thank you Teresa. Thank you so much for that introduction. And thank you Hearing First for inviting me to deliver these webinars. I've enjoyed it so much and thank you for joining us. I'm coming to you from my home in Hudson, Ohio, which is near Cleveland and it happens to be a beautiful sunny day. And I'm thinking of you in your homes, and hopefully you're in sunshine as well. The purpose of this webinar is to emphasize how and why to talk, read aloud and sing with your child for language enrichment and social development. After this webinar, you'll be able to demonstrate to your friends and children strategies for talking, reading aloud and singing with your child for knowledge acquisition and social development. You know, the information that I'm going to be presenting in this webinar really apply to all children, because we're looking from a developmental model. So, ever wonder what's the best way to grow your child's brain, to get them ready for friends, for life? It's you, you. As a parent, your interactions with your child, builds their brain. Going to talk about a lot today. It's gonna be a very busy hour focusing on listening as the foundation for future literacy skills. Literacy is tied to knowledge, knowledge of words and sounds and knowledge of how the world works. To begin the literacy journey, read to your child daily beginning in infancy. Our goal is to be able to read chapter books aloud to our children by age four. And also gonna talk about developing and creating experience books. Everything is an experience. Singing with your child, whole brain workout. Going to discuss brain information related to music, the relationship between singing and literacy and physical movement and synchronicity and emotional connectivity. Well, you know me, right? We have to begin with the brain. Hearing occurs

in the brain. We tend to think we hear with our ears, but actually hearing occurs in the brain. We have five amazing senses that capture and deliver different types of environmental information to the brain. The information from the environment has to be changed to neural impulses because that's all the brain can read. So for example, the eye receives optic wavelengths and those wavelengths in the eye are changed neural impulses sent to the brain, and then through exposure, practice and language, the child learns the meaning of those visual images. And for sound, the ear picks up vibrations that are changed to neural impulses sent to the brain, and through exposure and practice and language, the child learns the meaning of those auditory of events. And if there's a hearing loss, what we mean is, there's something stopping in the doorway. You know, the eyes are the doorway for visual impulse. The nose is the doorway for olfactory sensations, and the ear is the doorway for vibrations. And if that ear doorway is closed a little bit, we might call that a mild hearing loss, and if the doorway is closed more, we might call severe, profound or deaf. But the problem is that the doorway is not open sufficiently to deliver auditory information to the brain because we hear with the brain. The ears are the way in. So what do we do if there's a doorway problem? Well, we have a continuum of technologies, hearing aids, cochlear implants, bone anchored devices, remote microphone systems. And this continuum of technologies allows us to breach the doorway to deliver auditory information to your child's brain. The only purpose of wearing technologies is to deliver information to your child's brain, for knowledge, there's no other purpose. And this is a graphic that shows how this whole system works. Vibrations in the environment are sent through the outer ear, middle ear, inner ear, where they're changed to neural impulses, read by the brain through exposure, practice and learning, the child understands the meaning of the sound. And what goes in is what comes out. English in, English out. Spanish in, Spanish out. You don't get Spanish in and French out, right? So it's clear speech in, clear speech out. Muddy in, muddy out, garbled out. So it really matters what's going on in the doorway and what doorway device we use to access the brain. The brain access tools. And please refer to the first webinar that talks about the child's brain and how this mechanism works. How do children learn to listen and talk? You teach them. They learn by listening and hearing the speech and spoken language of their parents and caregivers. Well, a child with hearing loss learns spoken language, the exact same way, by listening to you. How can they do that? Through their technology. The technology breaches this doorway problem, and sends information to the, say it with me, brain, exactly. And what about reading? A child who has a hearing loss, a doorway problem, can learn to read just like their hearing peers. And we'll talk about what that process is, because that process begins with listening. And our children with doorway problems can learn through listening, like their hearing peers, provided when we do what it takes, they're identified early, they consistently wear their appropriate hearing devices, all waking moments. Eyes open, technology on. And they're working with specialists in listening and spoken language development. Now the reason that we need specialists in addition to technology is, as great as the technology is, it's not the same as the organic doorway. So the brain needs more practice in order to develop neural connections. How do you start? You start by sharing your brain. As parents and caregivers, you have a lifetime of knowledge and information to share with your child. Your home language, your family traditions, your culture, a lifetime of stories. And talking about daily events and activities and these early interactions during the first 3 1/2 years of life will establish the neural foundations for your child's

future literacy, academic and career success. We begin with serve and return conversations in earliest infancy. Well, what does that mean? That means a back and forth exchange of interactions. These are everyday conversations that you have with your child. You may start a conversation by saying something like, hi baby, hello darling girl. And then you pause and wait and see how the baby responds. Could be eye opening, eye gaze, could be a sound. Yes, I hear you you say, yes, that's right, you are my darling girl. So, these serve and return conversations are the architecture of neural integration, including pivotal auditory pathways. Have many of these serve and return conversations throughout the day during routines of daily living and social routines and your listening and spoken language specialist can provide special techniques to enrich these exchanges, and these techniques are good for all children. What's good for a child is good for a child, right? Partner with your pediatric audiologist because the difference with our child with the doorway problem is we have to be very aware of the technology. We need to make sure it's working, we need to make sure it's worn and we need to work with our educational pediatric audiologist to make sure the doorway is measured appropriately, and the devices are programmed appropriately. We wanna make sure your child's brain has access to clearest most complete auditory information, and you have to wear it every waking moment. 10 to 12 hours a day at a minimum. We have a brain to grow here. See, the brain is the only organ at birth that is completely unformed. There are billions of neurons, they're ready to go, but the connections between the neurons are created by environmental experience and exposure to the world. So our auditory environmental experience, our back and forth, our serve and return conversations, our read-alouds, our singing, that's the basis of our children developing those particular neural pathways. Make sure that technology is operational, it's up to date, it's charged and it's worn. And please refer to our webinars about technologies to provide more information about how critical your pediatric audiologist is to your child's auditory brain development and use of technology. Reading, I could just sit here and look at these pictures for a while. I love them. What I want to play is a short reading clip from the BWH Hospital in Boston. This clip shows families reading to their newborns in the neonatal intensive care unit. They're reading the book, "Goodnight Moon". And the reason I'm showing it to you is the idea that the focus of these readings that are promoted by the hospital is to develop the brain. You see there's brain conversations everywhere. Everyone is recognizing that in order for a child or anyone to grow, develop, and learn, we have to access, stimulate and integrate neural connections in the brain. Let's take a look.

- In the great green room, there was a telephone and red balloon and a picture of the cow jumping over the moon.

- And there were three little bears sitting on chairs. I love this book. And two little kittens and a pair of mittens.

- And a quiet old lady who was whispering hush.

- So I love that video. Did you get a few tears? I always do. So as the families are reading to the babies, clearly these babies don't know what the words mean, right? But it doesn't matter because it's your voice that matters. And the words are going in and the brain is being stimulated and the babies are being cuddled and they're associating reading and words with love and protection. And that's what we want to have happen. So what does... Oh, and also I wanted to point out that we want to use and encourage the families to use their home language. So one of the mommies was reading the book in Spanish because that's her home language, and that's the language where she has the most to say, knows the most words and has the most to contribute to her newborn, to her children. So we are beginning that literacy journey in the brain development and knowledge arena, right at birth. Literacy is the ability to communicate through written words. But there's a lot more than just reading and writing. Because we have literacy we can be good at math, having technological skills and solve problems. Think of reading as the building block to learning. Literacy starts in the cradle as you saw in that video, not in the classroom. Begin sharing books with your newborn as soon as possible. It seems early, but it's not. From preschool through second grade, children are learning to read. And it's important for your child to learn to read, because beginning in third grade, children make the shift and they start reading to learn. So we have a block of time to learn to read, and then the rest of our lives is advancing our skills in reading to learn. It's important that your child with hearing loss, with a doorway problem is able to read at grade level by third grade. And we have a lot to do with their ability by reading aloud to them. So what's this big picture about literacy development? How does this develop in the grand scheme of things? We need to connect the dots between hearing, brain plasticity, listening, talking and literacy development. I talked about the logic chain in the first webinar. And again, I encourage you to go to the page in the Family Learning Series and review the webinars or encourage your friends to watch them because these webinars are on a continuum where every piece is connected. And the logic chain talks about this system that's necessary, that leads to our literacy outcome. It starts with developing the brain. Now by developing the brain, I'm looking at actually two broad categories. One is the actual development of neural pathways of the integration between neurons of those synaptic connections. That's the actual neural architecture that we need to develop and is ongoing because our brain has neural plasticity, the ability to change and integrate. The second part are the figurative data files of knowledge. So we need the neural pathways and the child needs to know stuff, information, knowledge, that auditory information gets in through the doorway and then through our doorway brain access technological devices, which is the second part of this system that must be in place for our children with doorway problems, right? Early and consistent use of hearing technologies. All children, we have to be aware and grow their brain. For all children, we need general infant child language development in the family's home language. All children benefit from enrichment. We need special attention to enrichment for our children with doorway problems, and a listening and spoken language specialist can help. All children benefit from enrichment in pre-literacy and literacy skills. Our children with doorway problems need extra enrichment in these skills. Hearing is a first order event for spoken language, reading and learning. As human beings, we are neurologically programmed to extract patterns, it's patterns, from the speech sounds we hear for processing spoken language, reading, academic competencies. The auditory centers of the

brain are critical for this process. Think of hearing as a type of Velcro, to which other skills like attention, spoken language, reading, writing, academic competencies are attached. Children must repeat it. Practice, practice, practice, right? Children must repeatedly hear the details of phonemes that are speech sounds, in order to understand very subtle aspects of the language. And these very subtle linguistic aspects are first learned in infancy and they extend and expand all the way through high school. So when does literacy development actually start? You know, I just love these pictures. Notice how there's a joined focus of attention of mommy and daddy and baby on the book. Notice how the baby's eye gaze is looking at the book and the babies are hearing their parents' voices through their technology. Notice how we're really recommending real book books, especially in these early years. I mean, certainly electronic books will be valuable later on. Why do we need book books? 'Cause we're looking at sensory integration of the five senses. I mean, look what's going on with this reading. The babies are hearing their parents' voice. They're seeing the book, they're touching the book. They're being enveloped in a loving embrace by their families. They can maybe even take a little nibble out of the book and they can maybe have a little scratch and sniff on the book so they can smell it. See how this book reading is a full sensory experience with full engagement, including emotional connectivity. And if the parents are singing the words, using a lot of intonation, we're also getting singing involved in these read-alouds. Well, what is this early literacy development? Janet Werker, at the University of British Columbia, she's one of many who's done a lot of research on infant language development. And she summarizes that infants acquire native languages by listening, and they start life being prepared to speak. Because at birth infants prefer their mother's speech and songs and stories heard before birth. How are they hearing before birth? Well, at about the 20th week of gestation of development inside the mother, the inner ear is mostly formed. So for the last 20 weeks of pregnancy, babies are receiving auditory stimulation through their mothers bodies that directly vibrate their skull, stimulate their inner ear and send information to their brain. So even though there's not serve and return in utero, obviously, there still is auditory stimulation. Those auditory pathways are being fired up, they're fired up. And with repetition of hearing, there's mother's voice right at birth, babies recognize and prefer their mother's voice. And because that happens in utero and if our babies with doorway problems, don't have that in utero inside experience, we wanna make sure that they get that experience, auditory stimulation, firing of their auditory pathways as soon after birth as possible. Which thank goodness, is why we have newborn hearing screening. If your baby did not pass the screening, you go right to the audiologist. We need immediate fitting of technology, once the hearing loss is confirmed by your pediatric audiologist, because we know we need to get right to that brain very, very early, as soon as possible. Now in the first six months of life, the baby's brain is open to and receptive to every possible speech sound humans can make and can discriminate, distinguish all these speech sounds. But after listening for 12 months, and by the end of the first year, the brain has now become much more efficient and has organized itself around the languages and speech sounds that it hears all the time and the brain is no longer distinguishing speech sounds that have not been received to these neural pathways. Because after listening for a year, this reorganization of the brain improves and tunes the phonetic categories required for their language and reduces those not required. So you're probably thinking, well, my child needs to learn two spoken languages and that's true for many children around the world. They need to know two or three spoken languages.

The earlier you get those spoken languages to the brain, the sooner that brain can tune itself to those languages. And read Janet Werker's work about how to develop multiple spoken languages, beginning in infancy. Reading, neurocircuitry about reading, probably the most complex task humans perform using the most parts of the brain. Speech is biologically programmed. Speech is natural. What that means is, even though the brain doesn't have any neural connections until stimulated by environmental experiences, the brain is hardwired to, as soon as auditory spoken language gets to the brain, that brain is gonna fire up and get those connections going rapidly, because they're hardwired in. However, that hardwiring ready to go wiring for spoken language, it's not there for reading. Reading, doesn't have a hardwired component. To learn to read that requires explicit instruction in the code because we have to create the wiring. The brain does not have specialized built in regions for reading like we do for spoken language. So we need to create, through exposure and practice, neural pathways for reading. We need to create connections between the prefrontal cortex, temporal lobe, parietal lobe, occipital lobe, those have to be created through active teaching and through exposure, which is why we start reading very, very early. Listening is the foundation of reading. It takes about 20,000 hours of listening to speech before a child's brain has clear mental referents for the speech sound. Listening ability is critical. So reading starts with listening. And what are we listening to? Knowledge, vocabulary, words, narrative stories, serve and return, phonological awareness, the knowledge that words are made up of sounds. And then that goes to print awareness. We can write symbols that indicate a particular sound. And then we need to get skilled at reading, but ultimately we need to understand the meaning of what we read. Hearing First has an amazing array of resources for families. And you will be receiving a goodie bag with links to all of these resources. Here's one, that really elaborates on building literacy block by block. There's general agreement that grade-level competence and literacy is desired for all children. And the start to that is reading aloud. With preschoolers, read-aloud materials typically consists of picture books, board books, big books, newspapers, magazines, et cetera. Read aloud, read aloud, a listening task. Again, notice the posture, notice the joint focus, oh, and notice these really cool ear molds, you know, celebrating these brain access devices. This is like an amazing opportunity this technology offers. In a previous webinar, *Knowing What Your Child Can Hear*, I described an audiogram, which is the way pediatric audiologists measure what's going on in the doorway. What is getting through the doorway? This is an audiogram of a familiar sounds audiogram, a graph of a child's hearing sensitivity, where at the top we have pitches, low to high pitch sounds. This vertical is loudness, very soft, to very, very loud sounds. And this figure in the middle we call the speech banana 'cause that's the shape. And these, this shape designates the frequencies, pitches and loudness of the various speech sounds that comprise our language. Notice that in these low frequencies, you have vowels that provide 90% of the energy of speech, but only 10% of the clarity. And then we get to the high frequencies, and that's where the consonants are. Consonants provide 90% of the clarity, but only 10% of the power, only 10% of the power. The vowel sound "aaa" is the loudest sound in English, and the voiceless "th, th, th", is the softest sound in English. Notice that speech, we know speech is more than vowels and consonants. Speech has melody, has force, speech has loudness and pitch and durational cues. And when we read aloud, we wanna make sure our child's brain is receiving everything that's available, vowels, consonants, melody, the melody of speech. All of this develops your child's brain. Speech is high-

frequency dominant for clarity, music is low frequency dominant. Even though all of these sounds have a spread of energy, we're showing where they're most dominant. 250 Hertz is about middle C on the piano. So, even if the child, before a cochlear implant, their brain can receive only low frequency sounds, look at all that's there. There's a lot of information we can get to the brain. And what's one of the most important things we can do is sing, sing, sing. We need melody and clarity. Read aloud at least 15 minutes every day. More is better, truly. Exposure to storybooks is the biggest factor in a preschooler's vocabulary. More parent-child conversations occur during read-alouds than during anything else you do with the child. And children who were read aloud to, know more than twice as many new words. Because where do we use new words or words that we don't speak every day? Well, we find them in books, right? Because characters in books speak differently than we do and have experiences that we can't have in real life. Reading aloud to children before age six affects language, literacy, reading development. And you read a loud at breakfast, before bedtime, in a doctor's waiting room, in the high chair, just have your books everywhere. Think about reading aloud as a conversation, not a task. The website, growingbookbybook.com, growingbookbybook.com is a wonderful resource. Vocabulary is one of the biggest predictors of kindergarten success. So early intervention, think about learning words. Now, by words we don't mean parrot words, we mean meaning, words carry meaning. And this is just an overview of the average number of English words understood by typically developing children. Some children understand a whole lot more and some a lot less. This is an average. These are words understood, not necessarily spoken. Although the older a child gets the more they need to say the words as well as understand the meaning. So you can see what happens, by age two, we expect the child to know at least 300 words and many children know over 1000. It looks like kind of a gradual progression, but look what happens between age five and six, the child jumps from knowing about 2,500 words to 13,000 and then to 20,000. Where do a lot of these words come from? Books, they come from reading. Here's a tip, name the characters in the books. For infants, finding books that name different characters tends to lead to a higher quality shared book reading experience and seems to result in more learning and brain development benefits. It's possible that books that include named characters result in more talking by the parent. Because it's all about talking. Babies just like to hear you talk. You don't need to read every single word to infants, show enthusiasm, choose a story, poem or new story that grabs your child's interest. You know, find something you're interested in too. Cut the session short if interest lags, but it's your idea to stop the session. If the child starts getting fidgety, you might say something like, okay, one more page. Isn't this fun? One more page and then we're done. Here we go, one more page, ba, ba, ba. All done, bye bye book, bye bye. You parents, you choose when you stop reading. Link the story to life and other books and ask your child to predict the outcome. Start with picture books and build to storybooks and novels. I usually recommend reading about 10 to 20 little picture books a day. I made up the number. I don't know how many. You've 15 to 20 minutes a day. The point is a lot, because we are creating these pathways for reading. Those pathways aren't there, we're building them. Vary the length of subject matter. Go on a book walk, talk about the book, front, the back, the pictures. Reading aloud to your children, never too early and never too late to start. Here's sometimes parents stop reading to their child once the child can read themselves. Don't do that, keep reading. Because reading is this wonderful listening task that extends auditory memory, auditory vocabulary, auditory attention.

And you're gonna read to your child one or two grade levels above what they can read. You're always expanding their knowledge of the world, their vocabulary. It's generally agreed that there are these five areas that are necessary to develop an enhanced literacy. We have phonemic or phonologic awareness, more about that in a moment. Phonics, which is decoding. Reading fluency, automaticity, and recognizing words, vocabulary and of course, understanding comprehension, which requires background knowledge, prediction, imagery, et cetera. To kind of encapsulate we need decoding skills such as phonologic and phonemic awareness and print knowledge. And then on the other end, we have to have language comprehension, vocabulary, grammar, narrative skills. Both are critical and must be taught. Teach sounds. Phonologic awareness is the insight that words are made up of individual sounds. Phonologic awareness is strictly a listening task. Phonological awareness refers to the ability to segment, break apart and manipulate the sounds of spoken language. Phonological awareness isn't the same as phonics. Phonics involves knowing how the written letters relate to spoken sounds. Activities that develop phonological awareness in children are rhyme, practice with rhyme and beginning sounds and syllables. Critically, research has shown that a child's awareness of the sounds of spoken words is a strong predictor of their later access in learning to read. We need to help children recognize listen and hear that words are made up of individual sounds. The best way to teach phonological awareness to young children is having fun, books, games and songs in addition to a wide variety of hands-on activities. Nursery rhymes, songs, poems, read-alouds that manipulate sounds, are all effective methods that develop phonemic awareness. Hearing First also here has wonderful, has just a wealth of materials that you will receive in your goody bag, as I mentioned and that you can access and on the Hearing First website. Here are a sample of books that are very commonly used to facilitate phonological awareness, where we emphasize the sounds in the words in these books, because the words are written just so. ♪ Jessie Bear, Jessie Bear what will you wear ♪ ♪ Silly Sally, silly Sally, chicka chicka boom boom ♪ And of course, "Goodnight Moon". How about chapter books? You know, we should have a goal of reading chapter books aloud to preschoolers, whether or not they have a doorway problem. Why do we want to start reading chapter books so early? To expand auditory memory, auditory attention, improving comprehension and auditory world knowledge, vocabulary, theory of mind, that is learning that other people have a perspective different than you might have. People know stuff you don't know and you know stuff other people don't know. That's all part of theory of mind. And of course, cultivating an enjoyment of books. So how do you determine what books to read aloud? Chapter books. Well, oh and I did this project about chapter books with Sarah Carpenter, who is a LSL Cert AVEd, she's at Sunshine Cottage School in San Antonio, Texas. And we worked with this with her preschool classroom and determined that, how we select chapter books, our topics and characters that are interesting to your child, books with larger print or less print per page. Now keep in mind, you initially are reading it, not the child, but they're gonna be looking at this book. A book with not too many or too few chapters, pictures on each page or every other page, because we're still using picture knowledge. And so, how do you do this? Well, have your child select from maybe two or three books you have. So let them make the choice. You may read anywhere from one to all chapters in a sitting. When starting a book, picture walk the first chapter before you read it, talk about pictures and vocabulary that will be in the book, then read the chapter. Ask your child, so, were you right about the pictures? After reading the first chapter, take a

picture walk of the second chapter and discuss what those pictures might suggest. During the next reading of the book, picture walk the previous chapter. We want to really work on auditory memory, recall what happened. Then picture walk the next chapter again and then read it and then picture walk the next chapter. So there is a process of teaching your child, how to learn through a chapter book. And this process is good for all children, not only children with doorway problems. And continue the pattern until you have finished the book. And if your child seems uninterested, don't give up. Consider reading at a different time or picking a different title. We have a brain to grow here. We have a brain to grow in terms of vocabulary, knowledge, auditory capacity. Here's a list of some appropriate chapter books for preschool, for all preschoolers. And these can also be very helpful or fun for preschoolers who have doorway problems like the "Unicorn Diaries", "Owl Diaries", "Pirate Pug", et cetera. Listening is the foundation for reading. Include chapter books for preschoolers. Don't give up if at first the child isn't interested. Experience books. Oh, love experience books. They help your child move beyond talking about here and now. They're homemade books. You put them together, paper or apps. Once made, these books help your child share events from their point of view. They can practice telling what happened, where they went, what they did. For example, an experience book might be created after a trip to the zoo or the grocery store, they can be made about daily routines. Everything is an experience. Once again, amazing handouts on the Hearing First website. You will receive links to these. These are actual pages out of an experience book from a family that I've worked with for years. This is Stacey Lim's experience book, and this is what it might look like. This is what you do at home families? One page every single day, even in infancy, as the child gets older, the writing can become more complex and then experience books can meld into journaling as the child gets older. But here's an example. I use a yarn to tie daddy. I called daddy mommy. It's a slip of the tongue. Daddy helped mommy open a can of carrots. Look at all of the conversations you can have. These are experiences that were had each day with the child and family. So what about music? As we discussed in literacy, please sing the books to your child because the brain loves it. By music in these early years, early months and years, what we mean is adult directed, singing out loud with your child throughout the day. It's an active and interactive social conversation, right? So I'm not talking about don't turn on your iPad, don't turn on the computer, this music is a personal experience and the brain loves music. And we encourage families to include music activities daily. The words stimulate the left hemisphere of the brain and the rhythm stimulates the right hemisphere and the corpus callosum, the middle, is stimulated and exercised by crossover. You see, we want crossover between the hemispheres for optimum brain function. And this crossover, right and left hemispheres is called interhemispheric transfer. Music is a whole brain workout. Music enhances paralinguistics. That is the emotional content that underlies the conveyance of words. Are we happy? Are we a little angry? Are we being silly? What's the paralinguistics? You know, words may... Oh, how about sarcasm? That nasty, nice voice where words say one thing, but the paralinguistics say another. For example, that's a nice blouse. That's a nice blouse. Same words, different paralinguistics, different meaning. Rhythm is foundational for literacy development. What's the basis of literacy? ♪ Rhythm, rhyme and repetition ♪ ♪ Rhythm, rhyme, repetition ♪ Foundational to literacy. Many children who have literacy problems have rhythm problems. Singing with your child, you're there, it's your voice, builds a strong foundation for literacy. And your voice is the one that your child loves to hear the best.

Little cartoon of corpus callosum Begin early through movement and music. Your baby's perception of rhythm is linked to their body movements. Movement helps your baby develop a basic beat foundation for both music and communication. Move while you sing to your baby. Basic beat, basic beat. We need to make the connection between rhythm, basic beat, movement. Make music interactive by adding actions, fun routines and sing throughout the day. ♪ Now's the time to pick up toys, pick up toys ♪ You can make everything a song. Beat synchronization. Children who can synchronize to a beat, tend to be better at reading, phonologic awareness, short-term auditory working memory, rapid naming and encoding of speech sound. You know, I find, when talking to families about music, I present all of this science because sometimes we might think oh, we're just wasting time. We're just being silly singing songs without recognizing the valuable contribution our singing is making to our baby's brain development, that leads to their spoken language development that leads to their literacy development. Who knew that singing to your baby is the beginning of their literacy development? It is. Singing can improve your child's pitch perception and production. When children sing they produce a wider range of sounds, which helps their brain discriminate them. Singing improves how your child's brain processes the spoken word, helps distinguish between rapidly changing sounds, rhyming sounds songs, build your child's phonemic awareness. Singing provides opportunities for your child to learn vocabulary. When you sing and rhyme, your baby knows it's learning time. Now, the reason singing helps with vocabulary besides including words in songs that you might not speak day to day, is that when we sing, we tend to sing more slowly and produce sounds clearly. So for example, we might go ♪ Row, row, row your boat ♪ We don't go ♪ Row, row, row your boat going down the stream ♪ ♪ Merrily, merrily ♪ No, it's, ♪ ♪ Row, row, row your boat ♪ So we have nice rhythm, a nice beat and we have the words being easier to hear. So this is a young child who has bilateral cochlear implants, who, through a lot of experience and practice, and with parents who are musicians and love to sing, has developed her own singing. Now, a lot of many parents have asked, who have children with doorway problems, if they can enjoy music. The answer is yes. If they can learn to sing, the answer is yes. With exposure and with practice. Will every child develop a high level of singing? Not every child with typical hearing develops high level skills, but an enjoyment and appreciation? Absolutely. Listen to this. Notice how, when you sing you move, you can't help it. The basic beat, the singing and the moving. I mean not many children with typical hearing can sing like that. So clearly she has... And she has a capacity, but without exposure and practice, a capacity to learn is of no value, right? We have to enrich and stimulate a child's potential. Consistent use of musical activities at home can sharpen early listening skills, improve auditory discrimination and attention, develop these integrated neural pathways in your child's brain, support social interactions because music of all things is, can be very social, very emotional, very connecting. More handouts available on Hearing First about singing. You'll have links to all of these amazing resources. And there are additional ones. I also recommend BabyBeats, which is a free app that shows parents and caregivers through videos, how to teach basic beat, how to teach and expand and enjoy music. And Chris Roka in England has written a lot of this information. And is also an amazing resource for music. "Songs for Listening, Songs for Life", a "Musical Journey", "Singing Phonics", there are so many resources. Please look at the website, sing up, www.singup.org, another excellent resource. So, active participation is always better than passive, right? Get that child involved. Get them involved with that book, get them

involved with singing and moving and basic beat. By the end of the first year after birth, infants are becoming specialized for the rhythmic and tonal structures of the music they hear. Listening to auditory stimuli affects movement. Across cultures, infants experience concurrent movement and singing in everyday life. For all babies, we need to enrich and have more practice opportunities. Synchronizing rhythmically with others is very important for social development and theory of mind. So you can have a baby, your baby sitting on your lap facing out, and you're gonna have another family member sitting across from you facing you and as you sing together, you move synchronous, you move in synchrony. So your moving with the beat, you're moving with the beat, you're moving, moving. And the person across from you is also moving with the beat. Synchronizing rhythmically. That's like one of the very first ways that we connect emotionally with others. Where we say... Don't we, isn't there expression, hey, I just am in sync with you, right? That's what we mean. Putting it all together. What do we have here? Well, hearing is the building block for learning. Now what's hearing? Hearing is auditory access through the doorway to the brain. If there's a doorway problem, we have to use the appropriate doorway device on our continuum of technologies. Your pediatric audiologist is the one who manages the hearing, who measures your doorway, who programs your doorway device, who changes that brain access doorway device, if the doorway changes. Your pediatric audiologist is critical to making sure information gets to your child's brain. And then your child needs to wear that device every waking moment, right? People have eyelids that close visual stimuli, we don't have ear lids. So a typical organic doorway is available for auditory information, 24/7. A child who has doorway problem, their brain is available for auditory information only as long as they're wearing their device, their auditory brain access device, their hearing aid, cochlear implant. Well, if they only wear their device four hours a day, it will take that child's brain six years to receive the auditory exposure that a child with a typical doorway receives in one year. Will that child be behind in what they know? Yes. Because remember connections between the brain are built, crafted by environmental experience and exposure. If auditory information isn't experienced, then those brain connections won't occur. Now none of our current technologies are engineered for 24 hour wear, so I'm not saying keep them on 24 hours. Until we get fully implantables, we can't do that. But we can every waking moment. We have a brain to build. So we get auditory information to the brain, then we focus the child on listening. Listen, I heard you. You heard that, listen. What this listening means is pay attention to auditory information, activation of that prefrontal cortex, which leads to talking spoken language. Reading is a secondary linguistic function. It's based on hearing, listening, talking, leading to reading. Writing is based on reading and a child is learning to read and write through grade three, and from grade three on, they are writing and reading to learn, to do well in school. Which creates the foundations for going to college or vocational school, which will lead to having the job of their dreams. We have a whole system here and this system applies to all children. We just need to be even more aware of what this hearing section means to our child who has a hearing loss, who has a doorway problem. Hearing is the building block for learning. So thank you for listening. Ha, I just love it. It's so cute. And of course, we go right to that temporal lobe, right? Which isn't actually right there, it's over here somewhere. So what is your plan for reading and singing at home? Please jot down who you will share this information with. So what are you gonna do with this information? Is there something that you really wanna carry forward and that you want to share with others in your life? Thank you

for participating in this whole Living LSL series. I refer you to the Living LSL, a Family Learning Series webpage, where you can view, you can review, you can send people your caregivers, your friends, to watch these five webinars that are all about hearing and your child's brain, knowing what your child can hear, remote microphones, what's possible with today's technologies and finally, how are we gonna build this brain? Talking, reading, singing, growing that very, very precious brain. So thank you so much for joining us for this webinar and for this whole Family Learning Series. And thank you Hearing First for putting this together. Please all of you go to the Hearing First website, to the Family-to-Family Support Community, and we have professional communities too. Please join us at Hearing First. Thank you and have a wonderful day. Goodbye.