

Supporting Children's Early Brain Development

Baby Talks Series

Sarah Lidl: Good afternoon, everyone, and welcome to Baby Talks. We're so pleased to have you join us today. Baby Talks is a series of webinars for teachers, providers, and home visitors working with infants and toddlers serving Early Head Start, Head Start, and childcare programs. These webinars will introduce you to some of the research behind the Head Start Early Learning Outcomes Framework, the ELOF. I'm Sarah Lidl from the National Center for Early Childhood Development, Teaching and Learning.

My colleagues and I are from ILABS, or the Institute for Learning and Brain Sciences at the University of Washington, and we will be presenting these webinars. ILABS is a partner organization in the NCECDTL consortium and is one of the leading infant research centers in the country. Before we begin, I'd like to go over some information regarding the webinar. We'll be using some of the Adobe Connect features to help us interact. At times, we will ask you to type in the chat box located to the right of the PowerPoint slides in response to specific questions. We would also like to point out that the Q&A box is located in the lower right corner. If at any time you have questions related to the presentation or other related topics, please type your question there. We'll be monitoring that box throughout our time together today. I know the presenter is also going to ask you to be jotting down some ideas, so if you have pens and papers handy, that would be wonderful. It would help you in the presentation today.

Supporting documents for this webinar, including a PDF of this presentation, can be found in the Supporting Documents box in the bottom right of your screen. If, for any reason, you get disconnected from the webinar, you can use the same link that you used previously to rejoin the webinar. We want to let you know that the session will be recorded, and it will eventually be posted on ECLKC. Finally, following the webinar, you will see a link to an evaluation form. We request that you complete the evaluation as we use this information for improving our webinar presentations and for planning future webinars. Upon completion of the evaluation, you can download a certificate of completion for your participation in today's webinar. If you are viewing the webinar with colleagues on one computer and only one person is registered for the webinar, please forward the link to your colleagues who also viewed the webinar so that they can also complete the evaluation and receive a certificate of completion. So without further ado, I'd like to turn it over to today's presenter, Amelia Bachleda, also from ILABS and part of the NCECDTL consortium of partners. So, Amelia, take it away.

Amelia Bachleda: Thanks so much, Sarah, and welcome, everybody. I'm so glad that you've joined us today. So today, we're going to be talking about the developing brain and some ways we can support children during this early period of really rapid brain growth. Our brains are incredible, learning and adapting throughout our lives. And really, no one has more to learn than an infant.

All babies are born into a strange world full of new smells, touches, sights, tastes, sounds and very quickly, infants have to learn how to interact and be a part of this world. Infants display an amazing eagerness to learn. They're born detectives. Their job is to figure out the world and their place in it. Today we're going to spend some time talking about this amazing process that we all go through and what we can do to support the developing brains of our youngest learners. After this webinar, we hope you'll be able to identify the growing brain as a work in progress. There's an incredible amount of brain development that occurs in just the first five years of life. Describe how a child's early experiences shape the physical development of the brain, and explain at least three ways to support children's learning and brain development. In this webinar, we're going to cover how the brain develops and the latest research on how to support children's brain development. We'll talk about brain development and how a child's earliest experiences build the brain. We'll discuss research-based strategies for supporting children's early brain development, and learn and share strategies with your colleagues that you'll use in your work to support children's brain development. One of the reasons that we're talking about brain development

today and ways to support a child's developing brain is that brain development underlies all of the domains of the Head Start Early Learning Outcomes Framework. Throughout the ELOF, the goals and indicators are based on developmental milestones that all have some fundamental basis in brain development. Throughout the webinar today, we invite you to think about how your knowledge of child development and the ELOF's intersects with and supports what's happening in a child's developing brain. We know that children are learning at an unbelievable pace in the first few years of life. Every moment of every day, there is something new to take in, to explore, to learn. I'm sure that you see this every day in your work. So it makes sense that in this period when children are learning so much so quickly that their brains are also growing at an incredible rate, but what might be surprising is just how quickly a child's brain grows. At birth, a baby's brain is already about 1/4 the volume of an adult brain. The rest of a newborn's tiny body is not even close to 1/4 of their adult size. If it were, the average newborn in North America would weigh about 40 pounds. But we know that children's brains continue to grow and to grow quickly. Okay. So if a child's brain is 25 percent of its adult size at birth, what percentage of its adult size do you think it is at one year, just a year later? And I'd love for you to take a moment to enter your guesses into the chat box. So the question is, if a child's brain is about 25 percent of its adult size at birth, what percentage of its adult size do you think it is just 1 year later at 1 year? Right. Lots of guesses.

Sarah: I see lots of — Oh. Lots of guesses.

Amelia: So many guesses.

Sarah: I see a lot of them agree that it's in the 50 percent area or so.

Amelia: Yeah, yeah. I'm seeing that, too. All right. So we're going to keep on moving. Thank you so much for your guesses. So by the end of the first year of life, a child's brain is already 75 percent of its adult size. I saw some people guessing 75 percent, but it's a little bigger than most people had guessed. So to put that into perspective, if a child was already 75 percent of their adult height at 1 year of age, they would be about four feet tall. Let's all imagine working with a room full of 4-foot-tall 1-year-olds. Okay, and then let's move on. By five years of age, our brains have grown to about 90 percent of their adult size, but it's important to note that while a child's -- While a 5-year-old's brain may be 90 percent of adult size, this does not mean that a child's brain is 90 percent finished developing by age five. A 5-year-old has much, much more to learn. Children's brains are uniquely primed to learn from the experiences that they have every day. At this stage, the brain is kind of like a rough draft. It's ready for the experiences of life to continue shaping it into the specialized brain of an adult. So to help us understand what's going on as the child's brain grows and as they learn, I'd like to spend just a few minutes talking about how the brain -- what the brain is and how it works. For those of you who've joined us on Baby Talks before, some of this might be a little familiar. We won't spend too much time on this content, but because we know that our viewership is made up of at least 25 percent of you who have less than a year's experience in early childhood education, we think it's important to revisit this basic groundwork about the brain's functioning. Okay. So let's start with the nervous system. You can think of your nervous system like your body's communications team. Our nervous system is this network of connections in our brain and the neural pathways that send signals throughout our bodies. Networks of neural connections form an information super highway. Rapid communication between our body and our brain divide, drive every single motion, intention and thought. It is this network that allows us to learn and adapt to our ever-changing surroundings. The cells that generate and transmit these signals in our brains are called neurons. Neurons are the building blocks of the nervous system. Throughout gestation, neurons are born in the developing brain and a lot of them. The adult brain has about 86 billion brain cells, and children are born with almost all of the brain cells that they will ever have. We have neurons outside of our brains, too. These neurons carry messages from our brain to the rest of our body. For example, telling our limbs when we want to move them or sending messages back to our brain, such as, "Careful! That cookie sheet is really hot!"

Together, the neurons inside our brain and throughout our bodies make up this complex communications network. It's important to know that neurons never work alone. All neurons work as part of a network receiving and sending information to many, many other neurons. Connections between neurons are called synapses. At the beginning of this webinar, we asked you to guess how many connections an average neuron makes to other neurons. Do you remember your guesses? The options were 25, 150, 500, 3,500 or 7,000. All right. Try and call up your guesses. Remember your guesses. The answer is that the average neuron makes about 7,000 connections, or synapses, to other neurons, and many of you guessed this at the beginning of the webinar. Every time we learn something new, we either make new connections between neurons in our brains or strengthen the connections that we already have. When children are born, they already have the majority of the neurons, or brain cells, they'll ever have -- about 86 billion. But children don't yet have all the connections between the brain cells. They haven't formed all those synapses yet. It's our experiences that help determine which connections form between neurons and how strong those connections are. When we learn something new, we're shaping how the neurons in our brains connect and communicate. We're shaping the architecture of our brain. The more often we have a particular experience or set of experiences, the stronger the connections between neurons become. And this is true of both positive and negative experiences in our lives. Children's brain are particularly sensitive to experiences, in part because during the first few years of life, connections between neurons are forming really quickly. When a child is born, they already have the majority of their neurons, but because the connections between neurons in our brains depends on the experiences we have in our lives, newborns yet don't yet have all the connections in place. And this is a really good thing because each of us has to become an expert at living our own lives. This flexibility in how our brain is wired allows us to do just that. The drawing on the right side of the screen is a little bit of a more accurate represent -- representation of what just a few neurons in the brain look like. The sort of darker, triangular-blob spots are the neural cell bodies, and the center lines are the connecting axons and dendrites that carry the messages between neurons, those connecting fibers. Within the first 5 years of life, the density of connections between neurons increases rapidly. To take a closer look at how this happens, I'd like you to do an activity with me. So if everybody has a piece of paper and a pen, grab it now. That would be wonderful. What you see on the right side of your screen are pictures of what the brain looks like at different ages and development. The ages that are pictured are listed on the left. So what I'd like you to do is to take a piece of paper and write the ages that are listed on your own piece of paper, so one month, three months, six months, four years and six years. Then what I want you to do is match the pictures with the age you think each picture represents by listing the letter next to the month or year. Okay. So for example, do you think the brain at one month looks like picture "A," picture "B," picture "C," picture "D" or picture "E"? Okay? So go through and ask that question for all of these different ages. I'll give you a few minutes to work on this, and if you're watching this webinar with colleagues, I encourage you to work together. Then we'll go over the answers together. And I'm seeing a few people sharing your answers in the chat box. Feel free to share your answers in the chat box.

Sarah: I love that everybody is sharing them in the chat box. This is sort of fun to see. It looks like most people think that the 1 month is "D." I know you'll process this, Amelia, but there seems to be some consistency here in answers.

Amelia: Yes, absolutely. We'll go through them together in just another few seconds. Thank you so much for participating, everybody. It is really fun to see all -- everybody's answers coming in. All right. We're going to go through them together. I'll reveal them one by one. So I think a majority of the people thought that "D" was what the brain looks like at 1 month, and indeed, you're right. Let's look at the second one. "A" is three months. "C" is six months. "E" is four years, and "B" is six years. All right. How did you do? Did any of the answers surprise you? If they did surprise you, go ahead and chime in to the chat box if you'd like. So take a minute to compare the density of the connections in the brain of a 4-year-old, pictured here

in gray, and the brain of a 6-year-old, pictured here in blue. I think a lot of people thought that "E" was six years and "B" was four years, and that's a very common answer. But a 6-year-old's brain actually has fewer connections than a 4-year-old's brain. So I'll say that again. A 6-year-old's brain actually has fewer connections than a 4-year-old's brain. In fact, our brains overproduce connections. In the first five years of life, a child's brain makes more connections than it will ever need. A young child's brain has about twice as many connections as an adult brain has, in fact. The process of refining the number of connections between neurons is called pruning, and this is an incredibly important process for healthy brain development. You can think about the process, this process, a little bit like the process of caring for a berry bush, like a raspberry bush or a blackberry bush. At first, there's this period of rapid growth. The brain is blooming. During this time, the brain makes many extra connections. The extra connections actually make the brain less efficient, and just like after a period of rapid growth in the spring, a berry bush can become gangly and unwieldy with too many branches going in all different direction. After the period of blooming in the brain, connections are refined, or pruned, based on the experiences we have in our lives, so they're refined based on those experiences that we have. Connections that we need and use are kept. Connections that we don't need, ones that are actually making it more difficult for the brain to function, are removed. The result of this process is a brain or a berry bush that is healthy and thriving. The branches or connections that are left are stronger, and the brain is more efficient. Throughout brain development, there are multiple periods of blooming and pruning. These bursts occur at different times in different regions of the brain. Scientists think that these bursts of blooming and pruning align with sensitive periods in the brain. Sensitive periods are time when our brains are particularly open to learning new experiences, learning from new experiences. And what this means is that there are times in development when our brains are particularly primed to learn certain skills. You can think of it like bursts of blooming and pruning. Blooming and pruning happens first for our sensory development, followed by language and motor development and then higher cognitive abilities, and this is a period that stretches well into our teens and even our early 20s. The experiences that we have during these periods, these sensitive periods, are particularly influential. So over the course of childhood, we're really building our brains. It's a massive construction project that is a result of both our biology and our experiences. Our biology is providing the neurons, the mechanisms to connect them and defines the structure of the brain. Our brains look very similar to the naked eye, yet at a microscopic level, at the level of neurons, our experiences influence how our brains are wired. Our experiences guide which neural connections form, which become more efficient, and which will be removed. The more frequent an experience, again, whether that experience is a positive experience or a negative experience, the stronger those connections will grow, the stronger those patterns of functionality in the brain will become. This combination of biology and experience contributes to all aspects of a child's development, and children are excited to learn from the experiences that they have in their lives and share them with you. The Early Learning Outcomes Framework indicates that, for example, preschoolers are eager to learn about the world around them and discuss their experiences. You can learn more about how children engage with the world and their experiences in the initiative and curiosity subdomain of approaches to learning. In the second half of today's webinar, we're going to talk about some of the things that we can do to support children as they learn, building the neural architecture that will serve as the foundation for learning for the rest of their lives. Before we share some strategies with you, we'd love to hear from you. How do you support early brain development in the children that you work with? If you're a home visitor, how do you help families to support their children's developing brains? So or I'll give you a moment to reflect on this question, and I'd love for you to share some of your strategies that you use in the chat box.

Sarah: It looks like lots of people are typing and lots of responses thinking about, you know, reading to children, singing to them, asking them open-ended questions, building their relationships. Lots of play,

supporting early literacy. Oh, my gosh. They're flying by so quickly. It's hard to read them. It's a good problem to have.

Amelia: Yes, and I love this because this is really getting at what we're going to talk about a little bit more is that, you know, supporting a child's development is supporting brain development. You can't support brain development without supporting a child, right? They're interlinked. They're one and the same, and so all of these strategies that you're providing here are really fantastic.

Sarah: I also like -- So Tammy said something about building children's trust, so that's obviously an important thing that's not necessarily a concrete activity but very important to building brain development.

Amelia: Absolutely. Yes, so important to make sure that children feel like they have a safe environment, adults that they trust, absolutely. Really important.

Sarah: I also like that Bridget mentioned setting goals with families that have to do with development, so again, thinking about that parent-engagement piece.

Amelia: Right, right. And I saw another answer here of thinking about what's developmentally appropriate, which is also really fabulous, and we'll talk a little bit about that, too. Well, fantastic. Thank you so much for all of your strategies that you're offering here. Please continue to offer strategies, and I really do appreciate how active you've been in the chat. So we'll continue on. So all of your strategies were fantastic ways to support brain development, but before we dive in and begin talking about some more about the strategies that we can all use to support children's brain development, I wanted to take a few moments to talk about self-care, and this is a really important topic. Although working with children and families is important and rewarding, it is hard work and can often be stressful, and you do not need me to tell you that. It's important to recognize signs of stress in yourself and to ask for and receive needed support. And it's also important to take the time to care for yourself and attend to your own needs. As caregivers with so many children and families to care for, it can be tempting to just give and give and give and give and give, but not only is that hard on ourselves. It can actually translate into being hard on the children and families we serve. Not taking time for ourselves and learning about strategies to reduce our stress can influence the quality of care we provide. A recent study found that if professional caregivers had higher levels of cortisol, a hormone that's involved in our stress response, it predicted lower-quality caregiver behavior. So high cortisol was a stronger predictor of lower-quality care than physical workload or caring for more children under the age of two in a care group. This means that if we're stressed, it influences our ability to care for others more than actually having a higher workload does. This work is both about caring for children and also caring for yourself. On the screen and in the handouts, you'll find a link to an excellent webisode resource on self-care and professionalism that's available on the ECLKC. I encourage you to explore this resource with your team, and carve out time to focus on this essential aspect of our professional lives. As we continue to think more about how we can support children's brain development, I invite you to use the chat box to share with your colleagues how you support yourself and your team as you do this important, difficult and rewarding work. All right. So, thank you again for all those strategies that you shared earlier about supporting children's early brain development. As we saw, there are many ways to support a child's developing brain, and as you may have noticed, to support a child's developing brain is really to support the developing child. When we support a child as they learn, grow and develop, we are supporting their brain development. They aren't two separate things. And while there are many ways to support children's brain development and mind, I wanted to take some time to focus on five key, research-based practices. They are engaging and tailored or contingent back-and-forth interactions, creating an environment where the child is actively engaged and, when appropriate, the child guides the learning, sharing your thinking about what you're doing and why you're doing it, modeling persistence in the face of a challenging task or problem, providing extra regulatory support for children

and creating an environment that has predictable routines. These research-based strategies help support all children, regardless of a child's unique abilities, strengths and challenges, and they can be tailored to the individual child, supporting and affirming the knowledge and skills each child has, their cultural background and their personal identities. And I also want to note, thank you, everybody, for sharing your strategies for self-care in the chat. This is a really, really important piece of our conversation, and I really appreciate you chiming in. Those are all fantastic strategies. Okay. So as we're going through each of these practices, I invite you to think about how an example -- an example of how you might use or have already used these strategies to support the children you work with either in the classroom or the home or in the context of a home visit. And to help you do so, as we go through, jot down each of these categories on a piece of paper, and write down your ideas. If you feel like it, share them in the chat box as we go along. You don't have to worry about writing them all down now. They're going to be listed on each slide, but just sort of a reminder to think about each of these categories, and think about how you use them in your own work. All right. We know from our work with children and from years of research that children learn best during back-and-forth interactions. Even though we know this, I wanted to share a study that does an amazing job of highlighting just how powerful these types of interactions are for children's development. Researchers Michael Goldstein and Jennifer Schwade instructed caregivers to respond immediately to their infants babbling. Caregivers based their responses off of specific sounds of their baby's babbling, and they responded using full vowels and full words. The researchers found that when the caregivers responded to the baby's babbles, the infants dramatically changed the way they were babbling over the course of just 20 minutes. These babies began making new word sounds based on the caregivers' response, again, just in the course of 20 minutes. These new sounds contained the same patterns that they had heard their caregivers make when they responded to their babbling. Okay. So for example, an infant might look to her caregiver while holding a small doll and say, "Ba." The caregiver, in response, might say, "Oh, yes, Mai, a doll. Look at that doll you have. What a nice doll." In response, Mai might change her babbling pattern from "Ba," to "A da. A da." Children's ability to learn and engage with us in back-and-forth interactions is described nicely by one of the Early Learning Outcomes Framework goals for language and communication, which is attending, understanding and responding to language from others. From zero to eight months, children should participate in back-and-forth interactions, exchanging facial expressions and language sounds with familiar adults. By nine to 18 months, children should begin to understand the meaning of familiar caregiver's verbal and nonverbal communication, and respond with facial expressions, gestures, words or actions. The study that I just shared with you demonstrates the power of responding and interacting with infants when they are babbling. Learning happened even during the short 20-minute period. Even though babies aren't speaking yet, replying to a baby's babble lets you know that you heard them, and you understand that they're trying to say something. You're engaging them in a conversation that they are so eager to be a part of. This strategy of responding to what a child is interested in and engaging that child in conversation is particularly beneficial for children who are dual-language learners. By building on their interests and knowledge, you can support a child as they learn by being a good language model. Let's look at an example together from a resource called, "Supporting English Language Development When Children Have Little Experience with English." You can find it in the strategies sections of the Planned-Language Approach. It's linked on this slide and also in your handout. In this vignette, Maya, who's three years old and does not use English words yet, brings a crayon to Thomas. Thomas names the crayon and shares in her delight. "A crayon," he says. Maya says, "Cron" for crayon. And Thomas acknowledges her attempt by saying, "Yes," and repeating the whole word. "Yes, this is a crayon, Maya. Let's color together," and then they explore this new tool together. Thomas asks an open-ended question. "What would you like to draw?" He knows that she might not respond with English words but takes her scribbles and gestures as her response. To see more of Maya and Thomas, check out the resource that's linked at the bottom of the page. Okay. So it's almost impossible to miss the fact that children are very interested in learning how and why we do the

things we do. We've likely all had the experience of seeing a child imitate our action. Letting young infants actively engage with their learning by playing with new objects is one excellent way to support their learning. Another way to help babies learn about what we are doing and why is to talk about our own actions, in other words, to share our thinking out loud. This helps babies connect our actions in the world to our thoughts, feelings and reasons for doing them. Very often, we talk about what the baby is doing or looking at, which is wonderful, but it can also be very helpful to young children to explain what you are doing and why. For example, if you're too hot, you might say, "Oh, I'm feeling too warm right now. I'm going to take off my vest so I feel cooler. I wonder if you're feeling too hot in your sweater, too." This is also a great technique to use when you're frustrated. It's okay to be frustrated, and modeling how you're managing your emotions is another way to help very young children start to learn about how they will begin to manage their own emotions. For example, if you spill a pitcher of milk, you might say, "Ugh, I'm frustrated right now because I just spilled this milk. I really didn't want to do that, but now I'm going to get a towel and clean it up. Do you want to help me clean it up? Let's mop up this milk together." Of course, we can't do this all the time, but the more we can talk about what we are doing and why, the more babies learn about a world that, to them, can sometimes seem so -- seem so random and chaotic. Okay. I'd like to try one together. Imagine what you might say to a child in this situation when you're washing your hands. What might you share about what you're doing and why you're doing it? Take a moment to share some of your ideas in the chat box, so let's imagine that we're washing our hands. There's a child with us. What might we say about our actions as we're doing this?

Sarah: All right. People are describing talking to children about the process of washing hands, some people talking about the purpose, "So I'm washing to get them clean or to get the germs off," again, thinking about the process or perhaps framing it in terms of why it's important, so, "It's important to wash your hands to make them clean." Other people -- So Jackie is talking here about the water, so, "The warm water feels good." It looks like maybe she was going to turn it into a song, too, which is fun.

Amelia: Yeah, that is fun.

Sarah: Oh, and George actually suggested singing a song.

Amelia: Fabulous, yeah, other people talking about that their hands are dirty, and that's why, so giving a little bit of the process. You know, not only do they want to make them clean, but why -- how did they -- what was the first stage that their hands were in? Fabulous. All right. So we've been talking about how active engagement helps babies learn, and we know that learning environments where children are able to not only engage in the learning but also participate in the direction of that learning are particularly beneficial. In a recent study, researchers found that babies learned more about the toys they were interested in. In the study, 16-month-olds saw two completely new toys, so at 16 months, children have learned that pointing is a way to get information about the world or share what they're interested in, so the researchers gave these babies -- put these two new objects in front of the babies, and they waited until the baby pointed at one of the two objects. Then they showed the babies how both of the toys worked. 10 minutes later, the babies got a chance to play with the toys. What do you think happened? Do you think the babies were able to figure out how both toys worked or just one toy worked? So I'd like you to think about this experiment and share your guess, so I'll rephrase it again. Okay. So 16-month-old baby had two toys in front of them. The researchers waited until the baby pointed at one of the toys. Then they showed the babies how both toys worked. Then they waited 10 minutes and gave the toys back to the babies. What do you think happened? Which one do you think they remembered how it worked, both of them, one of them? All right. Getting a variety of answers, both toys, the toy they pointed at, the one the baby was interested in. All right. So as many of you guessed, the babies did better at remembering how the toy they pointed at worked. Even young children have strong preference and interest just like we do as adults. The initiative and curiosity subdomain of the ELOF explains that young children between 0 and

9 months show excitement when they are engaged in learning by smiling at an adult, laughing after batting a mobile or knocking over a toy, for example. And even very young children learn better when they have a chance to learn about things that interest them. This is probably true for you as well. So I'd like you to — I'm going to ask a series of questions, and feel free to answer as many as you like. Okay. So take a moment to share with your colleagues something that you really enjoy learning about and that you find easy to learn, something that might be harder for you to learn about and takes more work for you to concentrate on. There's two, so what's something that you love to learn about and you find really easy to find about? What's something that's harder for you to learn about and maybe takes more work to concentrate on? And then take a moment to think about how you might allow a 12-month-old baby to direct some of her own learning. What classroom or instructional supports and practices do you have in place that might help? So how can we support even really young babies to direct some of their own learning?

Sarah: Some really great responses from folks and thinking about what kind of learning is easy for them and what is harder for them or takes some more time and effort. In terms of supporting children, I see -- So Sandy suggests providing toys that they're interested in, having materials at their eye level and within reach, placing the items on the floor and allowing them to make a choice.

Amelia: Absolutely. Yeah. Those are all great things. Infants have really strong preferences from the beginning, and they enjoy just like us. We're all humans, right? We all like to learn about things that we're interested in and tend to be more engaged in them.

Sarah: Mm-hmm. A lot of people also mentioning making sure the items are developmentally appropriate, so a good thing to keep in mind.

Amelia: Yes, absolutely. Freedom to move, I see as well, fabulous. A variety of different options.

Sarah: Yes, exactly. That's what I was going to say, too. I think, you know, even keeping in mind that there are simply lots of things that kids could choose from.

Amelia: Yeah, fabulous. Wonderful. Thank you, all, for sharing so much, and please continue to do so. So one great way to follow a child's lead is to use the C.A.R., or CAR, method. Have you heard of this before? We'll take a minute to go through it together. So the first step is to comment on what a child is doing or appears interested in and then wait for the child to respond. Then, based on their response, ask a question and then wait again for the child to respond, and respond by adding more to the conversation and then, once more, wait for the child to respond, so comment and wait, ask a question and wait, respond by adding a little more and wait. And one of the key pieces of this method is the waiting. I think it's so easy to ask a child a lot of questions or make a lot of comments about what a child is doing, but we sometimes forget to wait, to be quiet, to give the child a chance to share their thoughts and observations with us, and I think this can be particularly true of really young infants who might not be responding completely verbally yet. They can answer with their actions, with their choice. This method works even for very young children. Like I said, a child doesn't have to be talking to engage in a back and forth about something that they're interested in. For a baby, their response might be a coo or a point, which you can build on in your response back to them. To learn more about the CAR method and other tips for engaging children in conversation, check out the resource that's linked at the bottom of the screen and in your handout. Every day, we run into a situation where something doesn't work or work out the way we expected. Think back to the last time something did not work as you expected the first time or the first time you tried it, so think back when something didn't work as you expected the first time you did it. What did you do? You probably tried it again, or you tried something else, but how did you learn to try it again? Babies are constantly faced with challenges. Every day, they try new things, often not succeeding right away, and just like us, sometimes they get frustrated when it doesn't work out. Often when we work with and care

for babies, we demonstrate how things work but not our process in figuring out how that thing works, and when something does go wrong, we try not to show our frustration, but what if babies saw us try and fail a few times before we succeeded at a task? Would that help them learn persistence? Researchers at MIT wanted to know if babies could learn persistence just by watching an adult try and fail at a task before they ultimately succeeded. And so these researchers set out to test just that. They created an experiment where one group of babies watched an adult either quickly succeed at a task three times in a row, appearing to display no effort, so same task succeeded three times right in a row, no problem. Another group of babies watched an adult work at the task for 30 seconds before ultimately succeeding. This adult displayed effort and persistence. Here's the key piece. What would happen when babies had a chance to play with a new tricky toy of their own, a toy that didn't work the way they expected to right away? What do you think happened? Do you think babies who saw the adult try longer before they succeeded acted differently than the babies who saw the adult succeed three times in a row? Take a minute to share your guesses in the chat box, so what do you think happened? Do you think the babies who saw the adult try longer before they succeeded acted differently than the babies who saw the adult succeed three times in a row? Take a moment if you'd like to share your responses in the chat box. All right. So some people are guessing that the ones that persisted try longer. Babies persisted when viewing persistence. All right. Let's go over the results together. So as many of you guessed, babies who watched the adult struggle more spent more time trying to figure out how to make their own toy worked. They didn't have the expectation that the toy would work right away, and they persisted longer. As adults, we know how important it is to be able to persist in the face of challenges in our lives. Helping babies to understand that things don't always work the first time, even for adults, and that it takes effort sometimes helps them learn from a very young age to persist in tasks and that sometimes it takes different strategies to get things to work. Learning to persist in tasks is one of the goals in the cognitive self-regulation subdomain of the ELOF. By 36 months, we want to see children persisting in learning new skills or solving problems and continuing in their efforts to finish a challenging activity or task with the support of an adult. Think about how you could incorporate modeling persistence into your work with children and share your ideas in the chat box. Again, that question was, think about how you could incorporate modeling persistence into your work with children and share your ideas in the chat box.

Sarah: I see some people suggesting that we purposely fail sometimes to give us an opportunity to model persistence.

Amelia: Mm-hmm.

Sarah: Other people suggest modeling and positive encouragement, talking about what you're doing while you're doing it.

Amelia: Yeah. Repeating --

Sarah: Yep. Letting children see the process, not just the end product. I love that.

Amelia: Yeah, absolutely. I mean, we as adults do things all the time that, you know, require us to persist a little bit, and I think it's such a fabulous learning and modeling opportunity. Okay. So sometimes babies, and even as adults, we just get upset when things don't work out or aren't going the way we planned. As adults, we're able to regulate our feelings. We draw on our life experience to know that, even though we're frustrated that we spilled the milk or that our shirt got wet, things are going to be okay. We can clean up the milk. We can change our clothes. But babies don't have that experience to draw on. They also are still developing connections in the parts of their brain that help regulate emotions and control their impulses. They have to build those connections through experience, and they rely on the adults in their lives to provide that extra regulation and support so they can begin to learn how to process their emotions. One of the best ways to provide that extra regulation and support is through responsive

caregiving. Responding to a child's needs often means providing that extra regulatory support that they need, for example, holding them to help them calm down. Children not only learn skills that will help them self-soothe later on but also that there are adults in the world that they can depend on when they are feeling upset. These early relationships are fundamental to healthy brain development, and this is reflected in the ELOF. In the emotional functioning subdomain, one of the goals is that a child manages their emotions with support of an adult. By 36 months, children may use different ways to calm or self-comfort when they're upset and respond positively to emotional supports from adults and other children. Responsive caregiving is key not only for building successful emotional and social skills but also the foundation for cognition, problem-solving, resilience and learning throughout life. Strong relationships early on also build resilience to stress later on. In fact, research shows that the quality of the interactions between an infant and a parent are predictive of a child's executive functioning skills. Executive functioning skills are the skills that are fundamental for success in life and school. They include the ability to think flexibly to solve problems, to be able to pay attention and focus on a task, to remember rules and procedures and the ability to control impulses. A region of the brain, the prefrontal cortex, plays a critical role in our executive functioning ability, but the connections and networks that are forming in this part of the brain are developed over the course of our entire childhood. It takes years of experience to build these connections and response networks, and that also means years of practice. Young children can't yet control their emotions or impulses because they simply do not yet have the neural networks in place to do so. They quite literally cannot, and we should not expect a child under 5 to be able to control any of their impulses on their own yet, but through supportive and responsive caregiving, adults can help children to learn these skills and begin to develop these neural networks. By providing external regulation, we help children learn to provide their own self-regulation later on. Take a moment now to think about how you work to support children's developing executive functioning skills through responsive caregiving, either by work that you do directly with children or how you help support families on home visits. I'll give you a few more moments to just think about how you work to support children's developing executive functioning skills through responsive caregiving, either by the work you do directly with children or how you help support families on home visits.

Sarah: I see some responses of talking about labeling or talking about feelings, labeling emotions --

Amelia: Mm-hmm.

Sarah: helping children understand some -- or generate some ideas for how to self-regulate and modeling self-regulation. That's a big piece of things.

Amelia: Yeah, absolutely.

Sarah: I like that Linda shared that she shares with families what is age appropriate so families can start to understand a little more about what that means.

Amelia: Yeah. It's really important. I think it's a common misconception that, for example, children should be able to control their impulses under the age of 5 when that's just not the case. The brain isn't ready to do that yet, and they need a lot of this external support and responsive care in order to be able to begin to work to do that on their own at a later age.

Sarah: Yeah. I also like that Sheryl noted that it's important to allow children to express their emotions so not trying to cycle that but allowing children the space and opportunity to do that.

Amelia: Yeah, yeah, and that safe place to be able to, you know, feel those big feelings that we all have. Absolutely. Fantastic. Thank you so much for your continued participation. All right. So responsive caregiving provides children and their developing brains with the support they need to grow and thrive. Another key way to provide support is through flexible, individualized schedules and routines. They

provide predictability, allowing children to focus on learning rather than spending a lot of energy thinking about what's going to happen next. Consistent routines and schedules help create a predictable structure in a world that children are already working so hard to figure out. This can be especially helpful for children with suspected or identified disabilities or delays. Children typically feel more comfortable and secure when they know what's going to happen next, and this is true of all children. We also know that the more often a child has an experience, the stronger the connection will be forming in their brain. Creating predictable routines gives children the opportunity to repeat an experience many times and to learn from it. Children enjoy this type of consistency and the opportunity to repeat something as they are learning. Children very often want us to read a book over and over as I'm sure you've experienced or try a new task again and again and again and again as they learn and build those neural connections in their brains. The consistency of the pattern of activities within a particular routine is the key for creating flexible yet reliable approaches, so, for example, you might establish a routine of singing a song as you get bundled up for your walk outside rather than worrying about taking the walk at exactly the same time or in the same order every day. Home visitors can look for opportunities to help caregivers build and improve their family routines to support consistency, so, for example, if a child often struggles with nap time, you might suggest starting nap time with predictable quiet, cozy, quiet time that includes reading from a selection of favorite books. It's likely that you know and have experienced the power and importance of predictable routines in your work. Based on what we've learned today about the brain, why do you think that predictable routines help support a child's developing brain? Please share your thoughts in the chat box. So again, that question was, based on what we've learned today, why do you think predictable routines help support a child's developing brain?

Sarah: I see responses like consistency, making children feel secure, trust, security, secure space, a lot of these safe-environment kinds of answers here.

Amelia: Yeah, as well as --

Sarah: Consistency.

Amelia: -- strengthening neural connections, too. Repeating something over and over gives a chance to build those connections in the brain. Fabulous. Yeah. Wonderful. Okay. So today we've talked about the amazing brain development that occurs in the first few years of life. We've talked about how children's brains are built based in part on their biology and in part through the experiences that they have in their daily lives, and we talked about what we can do to support learning and brain development. Because the brain is making so many connections in the first few years of life, early childhood experiences have particular influence on the developing brain. The experiences children have often, again, whether they are positive or negative, set the foundation for future learning, and while the experiences that children have when they are young have a special influence on the brain, our brains are flexible. We can learn new things throughout our lives or change our pattern of responses to situations or people, but it'll likely take more time and effort simply because, as adults, our brains are not as flexible or open to new experiences as the brain of a child. Finally, children learn best in the context of relationships. We don't need fancy toys or flash cards to support brain development. Instead, children learn from those back-and-forth contingent interactions they have with familiar adults. They learn when they feel safe and supported in environments that have predictable routines where their needs are met through responsive caregiving. These types of environments allow children to actively engage with their environment and express their interest, wonder and curiosity at the world around them. Today, we've talked about how the brain develops and strategies that anyone can use to support a child's developing brain. We'd like to wrap up our conversation today with a question. How are you going to take what you've learned today and apply it to your work with children and families? What additional tools or information might you need to support your work? So I invite you to take a moment to share your strategies in the chat box. So how are you going to take what

you've learned today and apply it to your work with children, families? What additional tools or information might you need to support your work?

Sarah: I see immediately Bethany says that she's going to use the CAR strategy, which I think is fantastic.

Amelia: Fabulous. Yeah, that's a good one.

Sarah: Mm-hmm. Other people talk about sharing this information with families, with teaching staff, somebody mentioning that they're going to start modeling persistence or, you know, really work on that. A lot of people mentioning the CAR method, so I think that's a great, great takeaway from this.

Amelia: Yeah, and I do encourage everybody to check that out, the resources linked in the handout and the PowerPoint presentation.

Sarah: Wonderful, so let's keep those answers coming in the chat window, and in the meantime, I'd like to thank everybody so much for listening. We really hope this information will be valuable to you as you help programs consider ways to enrich the experiences for the children and families they serve. If you have any thoughts you'd like to share about how this relates to your work or questions about any of the content we covered today, we'll open it up for your comments and questions in the four or so minutes that we have remaining here. I very much appreciate how active everybody has been in the chat window. I know that that's been a fantastic way for us to get feedback throughout this webinar. So here, you can see on this last slide here is a link to the evaluation form for today's webinar. We request that you kindly complete the evaluation as we use this information for improving our webinar presentations and planning for future webinars. Upon completion of the evaluation, you can download a certificate of completion for your participation in the webinar. If you're viewing the webinar with colleagues on one computer and only person is registered for the webinar, please forward this link to your colleagues who also viewed the webinar so that they can also complete the evaluation and receive a certificate of completion. So with that said, please let us know if you have any questions in addition to those final responses from that final question that Amelia posed. So Mary asks, "Are the studies listed in the resources?"

Amelia: They -- I'm not actually sure if they made it into the PDF of the PowerPoint. I don't think they're listed on the screen, but that is something that we should do in future presentations, and we could certainly make those available.

Sarah: Mm-hmm. Jackie asks, "Any more resources for dual-language learners and families who require interpreters?"

Amelia: Yes. There are a wealth of information on ECLKC. What I would do is I would encourage you to find that resource that linked to Maya and Thomas, and that'll take you to a whole section of resources on the Planned Language Approach on ECLKC that has just a wealth of information about different resources and activities that you can do to support children who are dual-language learners.

Sarah: Wonderful. A question about whether the transcript will be available, which we might actually have our DTL support team answer here. I believe it is, but I will let them confirm that.

Lauren Artzi: Yes. This is Lauren. Underneath the PowerPoint, you'll see a caption -- a caption area where the transcription has been scrolling the whole time, and if you click save right there, then you should have the transcript for the webinar. It'll download.

Sarah: Wonderful. Thank you, Lauren. And Victoria asks whether there are certificates for attending, so if you complete the survey that is linked here on this final slide, you will be able to print the survey of participation or print a certificate of participation after you complete the survey. All right. So we are at time, so thank you, everyone, so much. We appreciate you attending, and we appreciate especially how

active you've been in the chat box today. So thank you very much, and we hope to see you at our next Baby Talk webinar. Bye-bye.

Amelia: Thank you, everyone.

[End video]