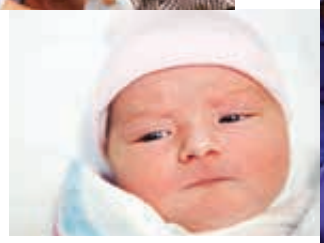
Zero to Three journal

JANUARY 2016
VOL 36 NO 3

Connecting Science, Policy, and Practice:

ZERO TO THREE's National Training Institute, 2015

FEATURED IN THIS ISSUE:



This Issue and Why It Matters

This issue of *Zero to Three* offers highlights from the ZERO TO THREE National Training Institute (NTI), held in Seattle, WA, December 2–4, 2015. More than 2,500 participants attended this year to celebrate our 30th NTI. The articles in this issue include:

- Highlights from the Science Plenary featuring Andrew Meltzoff, PhD, and Patricia Kuhl, PhD, of the University of Washington Institute for Learning & Brain Sciences, Seattle, WA. They share the latest research about brain functioning during the first 3 years of life and the important role of early social interactions for later school readiness and lifelong learning.
- The innovative approach of Nadine Burke Harris, MD, founder and chief executive officer of the Center for Youth Wellness, who gave the Keynote Plenary detailing how toxic stress caused by adverse childhood experiences (ACEs) is having an impact on the health and development of children. The article by Dr. Burke Harris and her colleagues describes the theoretical framework and their approach to ACE screening in a primary care pediatric setting.
- A summary of what has been learned about early development during the past 15 years by Ross Thompson, PhD, Distinguished Professor of Psychology at the University of California, Davis, one of the participants in the Policy Plenary. He explores how the science has advanced during the time period in between the publication of two reports from the National Research Council and the Institute of Medicine: The 2015 report *Transforming the Workforce for Children From Birth Through Age 8: A Unifying Foundation*, and the 2000 report *From Neurons to Neighborhoods: The Science of Early Childhood Development.*
- Issues covered in the conference Tribal Track, a collection of presentations designed to ensure that those who work with Tribal communities have access to relevant, high-quality, and culturally competent professional development opportunities. Kelli Bohanon, an assistant director at ZERO TO THREE, explores the efforts of tribal communities who are taking advantage of federal funding opportunities and partnerships to build more coordinated, effective early childhood systems.

In the **Practical Tips and Tools** section of this issue we include information about the new resources: *ZERO TO THREE Critical Competencies for Infant-Toddler Educators™* and the *Infants and Toddlers in the Policy Picture: A Self-Assessment Toolkit For States* to help evaluate progress toward building an effective early childhood system and set priorities for improvement.

We are already planning for next year's conference, when the name of the event will be changing from "NTI" to the ZERO TO THREE Annual Conference. It will be held in New Orleans, LA, on Dec. 7–9, 2016. The Call for Proposals will be released in late January and due mid-March.

Also new in 2016, the organization will launch the ZERO TO THREE Membership program. Membership includes the Journal, online Journal Author Spotlight seminars, discounted conference registration, exclusive member pricing on resources, and members-only access to newsletters and networking opportunities. Special rates will be available for groups, retired professionals, and students. To learn more about Membership and sign up for email alerts, visit **www.zerotothree.org/Membership**.

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ZERO TO THREE

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Zero to Three journal

JANUARY 2016
VOL 36 NO 3

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Zero to Three is a bimonthly publication from ZERO TO THREE: National Center For Infants, Toddlers, and Families. ISSN 0736-8038

Exploring the Infant Social Brain: What's Going on in There?

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ABSTRACT

Advances in neuroscience allow researchers to uncover new information about the social brain in infancy and early childhood. In this article we present state-of-the-art findings about brain functioning during the first 3 years of life that underscore how important social interactions are to early learning. We explore learning opportunities that occur during everyday interchanges between adults and infants and how these influence the brain. We also examine longitudinal data to understand how children's earliest social interactions set the stage for school readiness and lifelong learning.

A symphony of neural activity erupts in an infant's brain in response to the sound of her native language or a touch on the hand. New, powerful brain imaging techniques now allow researchers to visualize this neural activity, using safe, non-invasive technology. For the first time, scientists are able to witness what happens inside the brain as the baby looks at a person, hears a voice, or experiences a touch to the skin. Researchers are uncovering previously invisible brain mechanisms that underlie and support the visible behavior of babies. These discoveries linking brain and behavior are deepening the understanding of cognitive and social-emotional development, revising long-standing scientific theories, and addressing useful practical applications.

In this article we review the importance of social interactions to early learning. From the moment of birth, humans are primed to seek and respond to social partners around them. Research continues to demonstrate that rapid infant learning happens in the context of these rich social interactions. Scientists seek to isolate segments of this interaction so as to understand the fundamental brain and psychological mechanisms involved. In fact, the latest science of child development allows researchers to peel away the layers of social interactions to look at component parts. In this article, we analyze some of the newest discoveries and explore the potential for learning within the coos, glances, and gestures that occur before spoken conversations take place. Finally, we examine longitudinal data to understand how these early experiences prepare children for school, connecting the dots from early learning to school readiness.

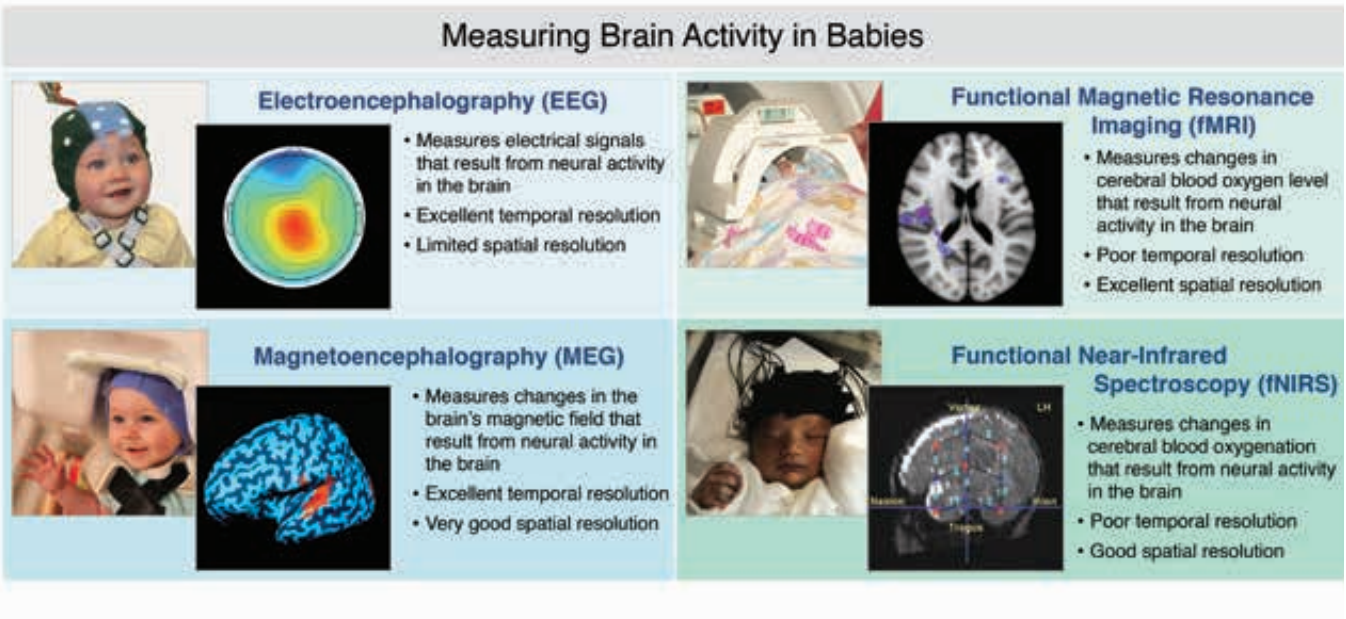
Visualizing the Developing Brain: Infant Brain Science Techniques

How do researchers uncover what's happening inside the baby's brain? Neuroscientists use four main tools to explore the infant brain: electroencephalography (EEG), magnetoencephalography (MEG), functional magnetic resonance imaging (fMRI), and functional near-infrared spectroscopy (fNIRS; see Figure 1).

EEG measures the electrical activity that results from neurons firing in sync. To measure this activity, a snug cap fitted with sensors is placed on an infant's head while they listen, look, or touch. The sensors record the brain's electrical activity during these tasks. EEG is an excellent tool to monitor infant brain activity millisecond by millisecond, but it is not as accurate in showing where the activity occurred. If one thinks in terms of "time and space," one would say: EEG has excellent *temporal* resolution but not very accurate *spatial* localization of the source of the neural activity.

Magnetic resonance imaging (MRI) is used to take detailed pictures of the brain's structure. This technique can be used to compare how the brain's structure develops over time. A closely related technique is called fMRI, which shows the brain's structure, but also provides detailed information about brain activity. Unlike EEG, fMRI does not directly measure electrical activity; it measures changes in the blood's oxygen level, which alters when the brain is active. Although fMRI provides very good spatial information about where brain activity is occurring,

FIGURE 1. **Four brain science technologies used with infants and toddlers.**



it does not provide precise timing information about when the brain activity occurs (changes in neural activity happen in milliseconds, but the blood-oxygenation changes that they induce are spread out over seconds). fMRI is challenging to use with infants because it is noisy, and infants must remain perfectly still to collect a clear picture of the brain. Some researchers use fMRI while children are sleeping, but that restricts the type of research questions that can be addressed.

fNIRS is related to fMRI but is far less expensive, is portable, and allows some movement in the infants. This technique measures hemoglobin concentration in the blood flowing to different areas of the brain, which provides very good spatial information about which areas in the brain are active. Because blood changes are slower than the actual underlying neural activity, fNIRS, like fMRI, does not pinpoint exactly when in time things are happening in the brain. This technique can be combined, however, with EEG to provide even more detailed temporal information.

MEG is another brain-imaging technique that can be used with young babies, and it promises to change the field. By detecting changes in the magnetic field caused by minute neural electrical activity, MEG reveals, to the millisecond, which areas of the brain are at work, and it can do so with great spatial precision. The MEG brain-imaging device provides both timing and spatial information, is perfectly safe, and allows the infants to move. This technology can be used to reveal the dynamic brain mechanisms that underlie the cognitive, linguistic, and social-emotional development during the earliest years of life.

Combining MEG with other tools that reveal the brain's structure, including diffusion tensor imaging (which illuminates the developing bundles of connections forming in the brain), researchers now can obtain a better picture than ever before about infants' brains and how they respond. A child is born with 86 billion neurons, most of the neurons they will ever have. But those 86 billion neurons haven't yet formed all of the trillions of connections that make up the human brain. During the first few years of life, these billions of neurons reach out to other neurons, each with multiple connection points that will be systematically shaped and reshaped by the experiences of a child's life as well as maturational growth. During infancy and early childhood, the brain shows an extraordinary ability to change with experience, and this is called *neuroplasticity*, indicating that the young brain is highly malleable and open to revision. Neuroplasticity presents an important opportunity. The experiences children have literally shape their brains. Their brains are built in part through the experiences they have, including the social experiences they receive from interacting with adults.

Learning Your Native Language: The Power of Social Partners

Infants are born *citizens of the world*, able to make out the difference between all the fundamental sounds, or phonemes, in all the languages around the world. As they grow and become immersed in their native language (or languages), they become *native language specialists*: by 12 months old, there are measurable differences in an infant's ability to distinguish sounds (Kuhl et al., 2006). While they improve at differentiating sounds in their native language, infants lose the ability to distinguish sounds from foreign languages. However, children raised in bilingual households can discriminate between sounds in both of their languages (Garcia-Sierra et al., 2011), which shows the learning that occurs when exposed to two languages.

In a recent study in our lab, we used MEG to peer inside infants' brains as they learn the fundamentals of language. We found that baby brains actually lay the groundwork for forming words long before they speak (Kuhl, Ramírez, Bosseler, Lin & Imada, 2014).

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From the moment of birth, humans are primed to seek out social partners around them, and to thrive from social interaction.

Seven- and 11- to 12-month-old infants listened to a series of native and foreign language syllables such as *da* and *ta* while in the MEG machine. The younger infants showed brain activity in several regions including an auditory area of the brain called the superior temporal gyrus, as expected—but also in Broca's area and in the cerebellum, regions responsible for planning the motor movements required for speaking. This brain activation pattern occurred for sounds in both the child's native language (English) as well as in a non-native language (Spanish), demonstrating that the brains of very young infants respond similarly to all speech sounds, regardless of whether they've heard the sounds before. But brain activation in older infants was different. By 11–12 months old, the motor areas of the brain were more active while listening to non-native speech than when listening to native speech sounds. We think this is because these areas of the infant brain are rehearsing motor plans while listening to speech, and trying to do this for foreign sounds is more difficult.

These activity patterns reflect how early experiences affect the developing brain. As infants listen to language, brain areas that coordinate and plan motor movements become activated by speech sounds, even before infants talk. These findings suggest that infant brains rehearse the mechanics of speech in preparation for their first words. These results highlight the value of engaging children in social interactions, even if they do not yet talk back.

To investigate the role that social interactions plays in language learning, we also invited monolingual, English-learning 9-month-old infants into the lab and exposed them to Mandarin Chinese over twelve 25-minute sessions. Some infants spent these sessions with a native Mandarin speaker as she sang songs, read books, and played. Another group watched a recording on TV of the same sessions but didn't experience the live interaction. A third group simply listened to audio recordings from the sessions. A fourth group served as a control and heard only English during otherwise identical sessions. Remarkably, infants who played with the live Mandarin speakers were just as good at discriminating sounds in Mandarin Chinese as were infants raised in Taiwan, where Mandarin is the native language. However, infants exposed to video or audio recordings alone showed no learning—they were identical to the control infants who heard no Mandarin (Kuhl, Tsao & Liu, 2003). These findings suggest that social interaction "gates" language learning, allowing the infant's brain to process sounds and words, learn their subtleties, and remember them for later use (Kuhl, 2007, 2011).

THE BENEFITS OF "PARENTESE"

As adults interact with babies, many naturally adopt a sing-song style, cooing "Ohhhh myyyy! Whaaaat a biiiiiiig smmmiile you haave!' This exaggerated speech, called *infant-directed speech*, or *parentese*, is a valuable piece of the social interaction puzzle. In general, very young babies prefer to listen to speech sounds over other non-speech sounds (Vouloumanos & Werker, 2004) and prefer infant-directed speech to typical, or adult-directed speech (Fernald, 1985; Fernald & Kuhl, 1987).

Our research suggests not only that infants have definite auditory preferences, but that this style of speech may actually help them learn. Infant-directed speech elongates vowels, extending them over a longer period of time. This stretching makes the acoustic differences between the sounds more distinct, while keeping the fundamental linguistic elements intact (Liu, Tsao, & Kuhl, 2007). Infants (6–8 and 10–12 months old) whose mothers use more parentese are better at discriminating speech sounds (Liu, Kuhl, & Tsao, 2003). Moreover, the more parents use parentese to their 11- and 14-month-old infants, the more the infants babble. One year later, at 2 years old, those same infants had larger vocabularies (Ramírez-Esparza, García-Sierra, & Kuhl, 2014). Parentese appears to be most effective when parents interact with children one-on-one. The more back-and-forth exchanges that occur, the more opportunities for infants to learn language. How adults talk to infants, not just how many words they say, is a fundamental component of their language learning.

BACK AND FORTH: CONTINGENCY IS IMPORTANT

Contingency, or the back-and-forth style of interactions that draw in both partners, is another component of high-quality social interactions. Infants are drawn to contingent responses very early in life. As early as 4 months old, infants prefer an adult who responds contingently to an adult who does not (Hains & Muir, 1996). Children's preference for contingent interactions extends into toddlerhood (Goldstein, King, & West, 2003), and it aids in the development of prosocial behaviors (Thompson & Newton, 2013) as well as word learning (Tamis-LeMonda, Bornstein, Baumwell, & Melstein Damast, 1996).

Contingent social interactions may even help children learn language from screen media. Typically, children younger than 3 years have difficulty learning language from video (Krcmar, Grela, & Lin, 2007). Evidence suggests that lack of contingency in videos contributes to this difficulty. One study investigated whether 24- to 30-month-olds can learn language from a video chat (Roseberry, Hirsh-Pasek, & Golinkoff, 2014). Although video chats, like videos, present speakers in only two dimensions, it mimics live social interactions: A child and speaker can

participate in a two-way exchange. In the study, children learned new verbs through video chats just as well as from live social interactions, but they showed no evidence of learning when they passively watched a video.

It may be possible to design improved or different screen devices that respond contingently to children and can participate in some form of "interaction." In fact, research with robots is beginning to be used in laboratories to investigate the important role of contingent social behavior in children's learning (Meltzoff, Brooks, Shon, & Rao, 2010). For example, when robots orient their heads toward 18- to 24-month-old children and name a toy in Finnish, English-speaking children follow the robot's eye gaze and learn the Finnish names for common objects (Kuhl, 2011; Meltzoff, Kuhl, Movellan, & Sejnowski, 2009). Researchers are continuing to explore what features attract babies' attention and engage their learning mechanisms, especially for language.

Looking Toward the Future: The Importance of Eye Gaze

Imagine that you are an infant, immersed in a sea of sounds, trying with all your might to figure out what in the world is going on. What cues could you use to stay with the conversation? Eyes provide a great deal of information; where people are looking can reveal other people's attention, desires, emotions, goals, and likely future behavior. Infants rely heavily on nonverbal social cues like eye gaze as they learn about the social and physical world.

Infants aren't born understanding that following someone's gaze can provide useful information. When do infants understand that eye gaze connects a looker with their environment? When do infants follow others' gaze as they look at interesting objects and events? Our laboratory developed a game to answer this question. Toddlers sit across from a researcher and watch as she turns her head toward one of two identical objects placed on either side of a table. The researcher first looks at the child, then turns to look at one of the toys. For some infants, the adult turns to face the object with her eyes open. For other infants, the adult turns with her eyes closed. If a child understands that people can only see things with their eyes open, they should follow only the adult who turns to the toy with open eyes. This is exactly what happens for infants at about 12 months old: They look at the toy more consistently when the experimenter's eyes are open compared to when her eyes are closed (Brooks & Meltzoff, 2002; see Figure 2).

But how sophisticated is this understanding of eye gaze? What if the researcher's view of the world is blocked by an inanimate device and not their own eye closure? What if it is blocked by a barrier, wall, or blindfold? While 12-month-olds understand that closed eyes can't see, they fail to recognize that a blindfolded researcher can't see, and mistakenly follow the researcher's head turn (Brooks & Meltzoff, 2002). Why do infants understand closed eyes block the researcher's view, but not blindfolds? We hypothesized that this is because infants have more experience opening and closing their own eyes than with blindfolds and could better understand what eye-closure meant when other people did it.

This hypothesis led to a new experiment. We gave another group of 12-month-olds experience with cloths that could act like blindfolds: we raised and lowered the cloth several times in front of the child, blocking their view of the toy. Sure enough, the 12-month olds who had this self-experience no longer followed the blindfolded adult's head turn. Infants used their own experience that the cloth blocked their own view to understand their partner's experience that the blindfold blocked the other person's view (Meltzoff & Brooks, 2008). This experiment shows that what children learn about themselves can be used to understand others—an insight that will later help children develop a *theory of mind* (the understanding that other people have individual thoughts, feelings, and desires just like the children do themselves).

Infant gaze following is also a major factor in language development. Results from our research show that the better an infant is at following an adult's gaze and pointing to objects at 10 to 11 months, the bigger their vocabulary at 2 years old (Brooks & Meltzoff, 2008). Gaze following and pointing are examples of joint attention. Shared attention can help a child hone in on what an adult is talking about, providing key pieces as they assemble the language puzzle.

FIGURE 2. **Gaze following in babies**

The adult first looks at the child, then turns to look at one of the two identical toys. The 1-year-old watches as a researcher turns and then looks to the same object. (From Meltzoff, Kuhl, Movellan, & Sejnowksi, 2009, *Science, 325*, 284–288.)

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The more back-and-forth vocal exchanges that occur, the more opportunities for infants to learn language.

"I Can Do That, Too!"—Infant Imitation

Within an hour of birth, infants pay attention to human faces and imitate simple facial expressions (Meltzoff & Moore, 1977, 1983). The discovery of this ability changed the way researchers think about early learning and how infants register the similarity between self and other. Young children are constantly observing adults' behavior and use imitation to learn from adults even before adults can use language to teach them. Learning by watching is one of the most powerful learning tools infants use before they can talk. Imitation helps children understand, at a fundamental level, that they are similar to others, which Meltzoff (2007) has described as the "Like-Me" theory of social-cognitive development. The central idea of this theory is that young children, and even infants, are striving to build maps that connect self and other—they can recognize that others are "like-me" and they want to be "like you."

Deferred imitation, or imitation after a delay, is also a key to infant learning and a useful way to measure babies' memory. Nine-month-olds show deferred imitation of a simple action, such as pushing a button, even after a 24-hour delay (Meltzoff, 1988). They can watch an adult perform an action on an object, store it in their memory, then recall and perform the same action 1 day later. Twelve-month-olds imitate a simple action after a 4-week delay (Klein & Meltzoff, 1999). Amazingly, 16-month-olds can remember an action for 4 months (Meltzoff, 1995). Deferred imitation supports the teaching and learning of non-verbal behaviors and traditions.

Not only do children imitate across time, but they are also adept at imitation across different settings and contexts (Barnat, Klein, & Meltzoff, 1996) as well as across social situations, imitating familiar people, strangers (Hayne, Boniface, & Barr, 2000), and even other infant peers (Hanna & Meltzoff, 1993). By imitating social partners of all ages, children have more opportunities to learn about the world and to see how others are "like me."

Recent advances in neuroscience allow researchers to explore the neural underpinnings of imitation. While wearing an EEG cap to measure brain activity (see Figure 1), infants watched a researcher demonstrate an action, such as pushing a button on a box. It is interesting that a specific change occurs in infants' brain activity not only when infants push the button with their own hands, but also when they simply watch the researcher push the button (Marshall & Meltzoff, 2014; see Figure 3). These are exciting new discoveries combining infant behavior and infant neuroscience: it's as though the infant brain is saying "Hey, you're like me! I can do that, too."

How the Baby's Body Is Represented in the Baby's Brain: The Power of Touch

A gentle touch is one of the earliest forms of communication between babies and their caregivers. That touch says "I love you" long before infants understand language. Touch may be one of the first ways that infants recognize the social presence of others, and research with adults suggests that the perception and sensation of a person's own body, and those of others, are deeply intertwined with that person's social and emotional interactions with the world (Damasio, 1994).

In a recent study, we explored how infants' brains process touch. Babies sat on their parent's lap while wearing an EEG cap to sense electrical activity in the brain. Infants then received a series of light touches, alternating randomly between the right and left feet and hands. Infants' brains responded with different patterns of neural activity that corresponded to the specific part on the body that was touched—hands versus feet (Saby, Meltzoff, & Marshall, 2015). At this early stage of the neuroscience work, scientists are describing these results as revealing "body maps in the infant brain" (Marshall & Meltzoff, 2015). Understanding how infants process touch, and what parts of their brains become active when different parts of their body are touched, provides a scientific foundation for understanding the origins of a self-concept.

FIGURE 3. **Scientists are uncovering the neural bases of infant imitation**

Similar brain regions seem to be involved when the infant performs a simple action, such as pushing a button, and when they observe someone else doing so. This result shows the infant social brain in action. (From Marshall & Meltzoff, 2011, *Developmental Cognitive Neuroscience, 1*, 110–123.)

Touch and a sense of one's own body are essential in infant development and mental health. In order to imitate their social partners, infants need to map the behaviors they observe onto their own bodies. Understanding how neural body maps develop, and how an infant relates her body to the bodies of her social partners, will help explain how infants learn so rapidly from watching others in their culture. Future research may allow us to illuminate how the body map originates (perhaps even prenatally) and how it is changed with experience—for example, how the hand body map is changed when infants begin to reach out and grab objects or the foot body map is changed when they begin to walk. Researchers have hypothesized that babies' body maps are crucial for connecting self and other and may form the foundation for empathy and social-emotional connectedness (Marshall & Meltzoff, 2015; Meltzoff, 2013).

The Puzzle of Other Minds, Cracking the Emotional Code

A child's first introduction to another person's mind is through the back-and-forth interactions they have with their caregivers. When an infant smiles or lets out a little cry, and their caregiver responds accordingly, the infant learns how people relate to each other. As their relationships becomes more nuanced, children look to adults for emotional guidance in uncertain situations. A child can look to a trusted caregiver to learn whether it's okay to approach a new person or venture into freshly fallen snow (Feinman, Roberts, Hsieh, Sawyer, & Swanson, 1992; Sorce, Emde, Campos, & Klinnert, 1985). Fourteen-month-old infants who watch an adult smile as he peeks inside one box, and then wrinkle his nose in disgust as he peeks in another, are more likely to look inside the box that appeared to make the adult happy (Repacholi, 1998). They use other people's social cues to make decisions about how to explore objects in their world. This is called *social referencing*.

Looking to others for clues extends beyond objects. Young children also watch and listen intently to emotional reactions exchanged between adults and then shape their own behavior accordingly. Scientists call this *emotional eavesdropping* (Repacholi & Meltzoff, 2007). In one study, toddlers watched an adult play with a toy that made a sound. A second adult then came in and either expressed anger (as if it were a "forbidden toy") or had a neutral response to the first adult playing with the toy. Infants who watched the adult express anger were hesitant to play with the toy (Repacholi, Meltzoff, Rowe, & Toub, 2014). These experiments are among the first to demonstrate that infants modify their own behavior in response to emotional exchanges that they are not directly a part of. They learn by "eavesdropping" on the emotional interchanges that they see and hear between two other people. By observing the emotional responses of other people in their lives, infants learn important lessons about how people respond to actions, what are "forbidden actions" in this family or culture, and even about the personalities of the people around them. This ability is crucial for success in school and in the personal relationships people maintain throughout their lives.

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A gentle touch is a form of nonverbal communication between babies and their caregivers.

Building the School-Ready Brain

Years of research have shown that the secret to building a school-ready brain is really no secret at all. Children are born learning, and the rich social interactions they have in their early years are important. Engaging with children from an early age and encouraging back-and-forth volleys of communication have measurable benefits for later development. We found that the ability of 6-month-old infants to tell the difference between the basic components of speech sounds predicts their later language abilities (Tsao, Liu & Kuhl, 2004). Using parentese also helps infants process language because it stretches vowel sounds. The more infant-directed speech an infant hears, the larger their vocabulary is likely to be at 2 years old (Ramírez-Esparza et al., 2014). Other components of social interactions, such as eye-gaze,

Learn More

Scientist in the Crib
A. Gopnik, A. N. Meltzoff, & P. K. Kuhl (2000)
New York, NY: Harper Collins

The latest science shows that babies and young children know and learn more about the world than adults could have imagined. They think, draw conclusions, make predictions, look for explanations, and even do experiments. Adults can learn as much by looking in the crib and the nursery as by looking in the scientist's petri dish or the telescope. In some ways, we learn more—we learn what it means to be human.

I-LABS Online Modules
www.ilabs.uw.edu/outreach-modules

I-LABS is building an online library of resources for early learning professionals, parents, caregivers, policymakers, and interested community members. The online training modules are designed to share the latest science of child development with the broader community. Each module explores a particular topic, such as early brain development, children's imitation, or language acquisition, and nests it within the larger landscape of child development. All modules are free and are designed to be useful for both everyday interactions with children and for informing systems-level programs and policies.

are also correlated with increased language learning outcomes (Conboy, Brooks, Meltzoff, & Kuhl, 2015; Brooks & Meltzoff, 2008). Further, infants who are better at gaze-following before their first birthday have been found to use more words to describe mental states at 2½ years old, and in turn, children with higher mental-state vocabulary at 2½ years have better theory of mind scores at 4½ years old (Brooks & Meltzoff, 2015). This link between skills in the first year to abilities in preschool helps to connect the dots between infancy and school readiness.

Preparing a child for school means preparing them socially, emotionally, mentally, and linguistically—it means getting them ready for non-academic as well as academic challenges. A school-ready child is one who has been exposed to rich social interactions and has been welcomed into conversations from the earliest phases of life. The playful back and forth between an infant and her father provides exquisite opportunities for early learning. Embracing these everyday moments, filling them with language, social imitation, and gentle touches transforms these interactions into learning moments. There is a growing appreciation of how the infant social brain is biologically prepared for interaction, and how interpersonal exchanges in turn influence brain development (Meltzoff et al., 2009). Babies are born learning, and the people in their social environment feed their hunger to learn.

Acknowledgments

We thank Sarah Lytle and Amelia Bachleda for their help. Support for writing the article was provided in part by the Hearst Foundation.

Andrew N. Meltzoff, PhD, holds the Job and Gertrud Tamaki Endowed Chair and is the co-director of the University of Washington Institute for Learning & Brain Sciences. A graduate of Harvard University, with a doctorate from Oxford University, he is an internationally renowned expert on infant and child development. His discoveries about infant imitation have contributed to the understanding of early cognition, personality, and brain development. His research on social-emotional development and children's understanding of other people has helped shape policy and practice.

Patricia K. Kuhl, PhD, is the Bezos Family Foundation Endowed Chair for Early Childhood Learning and co-director of the University of Washington Institute for Learning & Brain Sciences. She pioneered research on EEG and MEG methods for early language development and has published influential studies showing how young children do (and don't) learn from TV. Dr. Kuhl's work has played a major role in demonstrating how early exposure to language alters the brain. This has implications for critical periods in development, for bilingual education, reading readiness, developmental disabilities, and for computer speech recognition.

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Screening for Adverse Childhood Experiences (ACEs) in an Integrated Pediatric Care Model

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ABSTRACT

Adverse childhood experiences (ACEs) are stressful or traumatic events that place children at risk of negative health, mental health, and behavioral outcomes. The Center for Youth Wellness (CYW), working in partnership with the Bayview Child Health Center (BCHC), pioneered ACE screening for children and adolescents. This article describes the theoretical framework and rationale for ACE screening in a primary care pediatric setting, introduces the CYW Adverse Childhood Experiences Questionnaire (CYW ACE-Q), and describes the BCHC-CYW Integrated Pediatric Care Model aimed at addressing the effects of ACEs and toxic stress. Considerations for the implementation of ACE screening are also reviewed.

The Center for Youth Wellness (CYW), a clinic and research center located in the Bayview Hunters Point neighborhood of San Francisco, was created to respond to the new medical understanding of how early life adversity harms the developing brains and bodies of children. The mission of CYW is to improve the health of children and adolescents exposed to adverse childhood experiences (ACEs). By developing tools and methodologies for early detection and science-based interventions, the effects of ACEs and toxic stress are addressed through concerted clinical, research, and field-building efforts. CYW works in partnership with the co-located Bayview Child Health Center (BCHC), a pediatric primary care medical home. Together, CYW and BCHC form an integrated pediatric care model aimed at addressing the medical and behavioral health needs of children exposed to ACEs, supplemented by CYW's research and field-building efforts.

Theoretical Framework

The BCHC-CYW Integrated Pediatric Care Model is rooted in substantial evidence demonstrating the association between ACEs and detrimental health outcomes, and the role of toxic stress in this relationship.

ACEs

ACEs are stressful or traumatic events that take place before a child is 18 years old. The 10 categories of ACE domains consist of physical, emotional, and sexual abuse; physical and emotional neglect; mental illness of caregiver; incarceration of a relative; violence toward the mother; substance abuse in the home; and parental divorce or separation. The term *ACE* or *ACEs* was coined in 1998 following the publication of the groundbreaking Adverse Childhood Experiences Study (ACE Study) by Vincent J. Felitti and colleagues (1998).

The ACE study asked more than 17,000 California adult patients at Kaiser Permanente in San Diego to self-report about their medical history and exposure to ACEs. Almost two thirds (63.5%) of participants reported having at least one ACE, and 12% reported having four or more ACEs (Anda et al., 2009). Furthermore, not only were ACEs common within this sample, researchers found a statistically significant association between

ACEs and numerous health conditions such as ischemic heart disease, cancer, chronic bronchitis or emphysema, stroke, and diabetes (Felitti et al., 1998). The study also demonstrated a dose-response relationship between the number of ACEs experienced and the risk for negative health outcomes. As the number of reported ACEs increased, the odds of reporting an illness or risk behavior also increased (Felitti et al., 1998). The ACE Study was the first to assess physical health outcomes related to ACEs in a large population-based sample.

Subsequent research with diverse populations of adults and children continues to confirm the high prevalence of ACEs and a strong association between ACEs and poor health outcomes. A nationally representative study found that approximately two thirds of adults reported at least one ACE (Gilbert et al., 2015). In children, the prevalence of at least one ACE has ranged from one third to nearly one half of the population in nationally representative samples (Bethell, Newacheck, Hawes, & Halfon, 2014; Bright, Alford, Hinojosa, Knapp, & Fernandez-Baca, 2015; Wing, Gjelsvik, Nocera, & McQuaid, 2015).

Research on ACEs and health outcomes outside of the original ACE studies further suggest a strong, dose-response association between ACEs and negative health outcomes, including cardiovascular disease, chronic lung disease, headaches, autoimmune disease, sleep disturbances, early death, obesity, smoking, general poor health, depression, post-traumatic stress disorder, anxiety, substance abuse, and binge drinking in adults (Kalmakis & Chandler, 2015). In children, ACEs have been correlated with fair or poor general health, illness requiring a doctor, fair or poor dental health, lifetime asthma, attention deficit hyperactive disorder, autism, being overweight or obese, and learning difficulties (Bethell et al., 2014; Bright et al., 2015; Burke, Hellman, Scott, Weems, & Carrion, 2011; Flaherty et al., 2013; Wing, et al., 2015). Studies on ACEs during childhood have also found an association between ACEs and violent behavior (delinquent behavior, bullying, physical fighting, dating violence, carrying a weapon; Duke, Pettingell, McMorris, & Borowsky, 2010).

TOXIC STRESS

While the mechanisms linking childhood adversity to poor health outcomes are still being explored, growing literature indicates that early adversity can profoundly alter child and adolescent development and long-term health outcomes. Scientists now understand that maladaptation of the physiological stress response plays an important role in negative long-term health outcomes.

The *stress response* refers to the physiological and behavioral response to selective pressures from the physical and social environment. These selective pressures challenge and disrupt homeostasis, or the self-regulating property to maintain internal stability (McEwen, 2000, 2005). The stress response is influenced by many factors, such as the intensity and severity of the stressor; the individual's perception of the stressor; and the physical, mental health, and genetic makeup of the individual. The American Academy of Pediatrics (AAP) described three general categories

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When children are exposed to a stressor as part of their development, such as the first day of school or a school test, the stress response system is activated.

of the stress response: positive stress response, tolerable stress response, and toxic stress response (Shonkoff et al., 2012).

The *positive stress response* is a normal and essential part of healthy development. It is characterized by brief increases in heart rate and blood pressure, as well as mild elevations in hormonal levels through the activation of the hypothalamic-pituitary-adrenal (HPA) axis as part of the neuro-endocrine-immune (NEI) network. The positive stress response involves a cascade of events preparing the body for a "fight or flight" response. When children are exposed to a stressor as part of their development, such as the first day of school or a school test, the stress response system is activated. However, the physiological stress response self-regulates through negative feedback once the child is no longer exposed to the stressor (Shonkoff, Boyce, & McEwen, 2009). In comparison, during the *tolerable stress response*, the body's alert processes are elevated to a greater degree and for longer periods of time. This is due to stressors that are greater in severity or duration than those activating a positive stress response. However, a caring relationship with an adult can serve as a buffer, allowing the brain and organs to recover when the stress response self-regulates and the body returns to homeostasis (Shonkoff et al., 2009).

Conversely, the *toxic stress response* is an intense, frequent, and/or sustained activation of the body's stress response and autonomic nervous system, without the buffer of a caring adult. This response is the result of a dysregulation of the NEI network via the HPA axis and the innervation of endocrine and immunological systems (McEwen, 2000). The cumulative effects of a chronic dysregulation of the NEI network do not allow the body to return to homeostasis. If these effects occur in early life due to ACEs in the absence of nurturing caregiving relationships, or in the presence of additional vulnerabilities of the child or family (e.g., biological and genetic susceptibility), it can activate a stress response that becomes "toxic" for the body (Taylor, 2010)

The effects of a toxic stress response during sensitive periods of development can become permanently incorporated into

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Universal and routine screening for adverse childhood experiences in the pediatric medical home allow for prevention and early intervention, potentially leading to improved health outcomes for millions of children nationally.

a child's physiology and increase his vulnerability to developmental, biological, psychiatric, psychological, and behavioral outcomes in adulthood (Johnson, Riley, Granger, & Riis, 2013). These outcomes are due to damaging alterations to multiple body systems, including the nervous, endocrine, cardiovascular, reproductive, and immune systems. In the long run, these multisystemic alterations are responsible for the changes of the body's metabolism and may result in epigenetic alterations (changes in the way DNA is read and transcribed). Examples of stress-related alterations associated with a dysregulation of the NEI network may include attention deficits, learning disabilities, development or worsening of asthma in children, high blood pressure leading to cardiovascular disease, and insulin resistance resulting in early onset diabetes during adulthood (Johnson et al., 2013; McEwen, 1998, 2004, 2007; National Scientific Council on the Developing Child, 2014; O'Connor, O'Halloran, & Shanahan, 2000; Pacák & Palkovits, 2001; Schneiderman, Ironson, & Siegel, 2005; Segerstrom, & Miller, 2004; Shonkoff & Levitt, 2010; Steptoe, Hamer, & Chida, 2007; Wellen & Hotamisligil, 2005; Whirledge & Cidlowski, 2010).

RATIONALE FOR SCREENING

Given the health implications of ACEs and toxic stress, screening children for ACEs promotes healthy development and is a critical investment in preventing poor health outcomes over the life course. The AAP recognized the importance of identifying child maltreatment in order to better support positive child development (Flaherty & Stirling, 2010). In its policy statement, *Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science Into Lifelong Health*, the AAP explicitly called on pediatricians to "actively screen for precipitants of toxic stress that are common in their particular practices" (Garner et al., 2011, p. e229). The primary care medical home is uniquely positioned to be the site for routine universal screening of ACEs for children and adolescents. Pediatricians and family practice physicians are trained to prevent disease and to understand the important role of caregivers and communities in determining a child's well-being (Garner et al., 2011). Interacting with children and their families at regular intervals (e.g., annual well-child visits) allows primary care providers the opportunity to develop trusting relationships with their patients. These relationships can promote disclosure and collaboration when treatment for the effects of toxic stress is indicated.

By screening youth for ACEs early and regularly, pediatric care providers and their behavioral health partners can implement primary prevention strategies to educate caregivers about the impact of adversity on their child's developing brain and body and can tailor integrated interventions based on an understanding of the child's odds of illness or disease. In addition, because plasticity of the brain during early childhood and adolescence makes children particularly vulnerable to the effects of ACEs, it is an ideal time for early intervention and treatment. Increased neuroplasticity also offers the opportunity for healing when there is early detection and effective intervention (Knudsen, 2004).

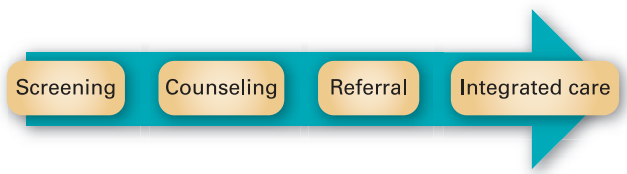
The BCHC-CYW Integrated Pediatric Care Model

The BCHC-CYW Integrated Pediatric Care Model was created to recognize the impact of ACEs on health, and to treat toxic stress in children. These goals are accomplished through routine screening, which allows for early detection and intervention, paired with a multidisciplinary approach focused on addressing the NEI dysregulation of toxic stress. Children and adolescents are screened for exposure to ACEs during routine visits to BCHC. Based on the CYW Adverse Childhood Experiences Questionnaire (CYW ACE-Q) and information collected during the visit, pediatricians determine whether a referral to CYW for integrated care is indicated (see Figure 1).

THE CYW ACE-Q

The CYW ACE-Q, currently in the process of clinical validation studies, was developed through the BCHC-CYW partnership with input from the CYW community advisory boards, local youth stakeholders, health educators, and clinical and research staff. The tool is based on the instrument created by Vincent Felitti and Robert Anda for use with adults and has been modified to be de-identified (meaning that participants identify the number of experiences and not the specific experiences they have been exposed to) based on experiential evidence. The CYW ACE-Q includes all 10 ACE domains as well as additional

FIGURE 1. **Center for Youth Wellness-Bayview Child Health Center Integrated Pediatric Care Model**



experiences postulated to also disrupt the HPA axis and NEI network. These experiences are community specific and/or have been documented in literature but not accounted for in the original instrument (Felitti & Anda, 1998). The CYW ACE-Q is intended for use in pediatric and family practice settings to identify patients at increased risk for chronic health problems, learning difficulties, mental and behavioral health problems, and developmental issues due to changes in brain architecture and developing organ systems brought on by exposure to extreme and prolonged stress. The de-identified nature of the CYW ACE-Q is preferred by primary care providers, clinical staff, and families at BCHC because it allows doctors to assess exposure to ACEs with a focus on primary care outcomes given the contextual and time constraints of a pediatric visit. Deeper conversations of exposure to adversity are then addressed through integrated care at CYW upon referral.

The CYW ACE-Q tool is available in English and Spanish in three versions: (1) CYW ACE-Q Child, (2) CYW ACE-Q Teen, and (3) CYW ACE-Q Teen Self-Report (SR). The instrument is comprised of two sections. Section 1 of the CYW ACE-Q (items #1–10) consists of the traditional 10 ACEs, and Section 2 includes seven (CYW ACE-Q Child) or nine (CYW ACE-Q Teen and CYW ACE-Q Teen SR) items assessing for exposure to additional early life stressors identified by experts and community stakeholders that are relevant to the youth served in community clinics. (See Table 1).

The CYW ACE-Q is either an informant (CYW ACE-Q Child and CYW ACE-Q Teen) or self-report (CYW ACE-Q Teen SR) instrument. It is presented to the parent/caregiver and/or youth upon check-in for standard medical appointments. It is administered to all new patients who are 9 months and older prior to their first appointment, at the 9- and 24-month well-child visits, and then yearly thereafter.

SCORING

The CYW ACE-Q calculates cumulative exposure to ACE categories in patients from birth to 19 years old. It asks respondents to report how many categories of adversity apply, rather than which categories they have been exposed to. Each completed CYW ACE-Q generates a two-number score. For example, a patient could be given a score of 3+2 (three categories endorsed in Section 1 and two endorsed in Section 2) or 4+4 (four categories endorsed in each section). The traditional ACEs (Section 1) and additional items (Section 2) are kept separate in the CYW ACE-Q for purposes of research and evaluation, given that Section 1 has population-based reference data about risk of disease. In addition to using the CYW ACE-Q as a screening tool, the data is used to help evaluate the effectiveness of the BCHC-CYW Integrated Pediatric Care Model in decreasing risk of adverse health outcomes.

SCREENING

Upon check-in for well-child exams, a BCHC medical assistant provides the patient or patient caregiver (depending on the age of the patient) with the appropriate CYW ACE-Q instrument. The CYW ACE-Q is provided as part of a packet of routine assessments. The medical assistant describes all of the paperwork in the packet, including the purpose of the CYW ACE-Q and instructions for its completion. The medical assistant normalizes the screening process for all patients, explaining that the primary care provider will review the results with them during the

TABLE 1. **The Center for Youth Wellness Adverse Childhood Experiences Questionnaire (CYW ACE-Q)**

Screening tool	Description	Section One	Section Two	Age range	Completed by
CYW ACE-Q Child	17-item instrument, 2 sections, 2–5 minutes to complete	Original ACEs (1–10)	7 additional ACEs (foster care, bullying, parent/guardian death, separation due to deportation/ immigration, serious medical procedure/illness, violence in neighborhood, discrimination)	Children birth to 12 years old	Parent/ caregiver on behalf of child
CYW ACE-Q Teen	19-item instrument, 2 sections, 2–5 minutes to complete	Original ACEs (1–10)	9 additional ACEs (foster care, bullying, parent/guardian death, separation due to deportation/ immigration, serious medical procedure/illness, violence in neighborhood, discrimination, youth intimate partner violence, youth arrest/incarceration)	Youth 13 to 19 years old	Parent/ caregiver on behalf of teen
CYW ACE-Q Teen Self-Report	19–item instrument, 2 sections, 2–5 minutes to complete	Original 10 ACEs (1–10)	9 additional ACEs (foster care, bullying, parent/guardian death, separation due to deportation/ immigration, serious medical procedure/illness, violence in neighborhood, discrimination, youth intimate partner violence, youth arrest/incarceration)	Youth 13 to 19 years old	Youth (self-report)

appointment, and that only the number of categories experienced is desired, rather than the specifics of any one experience. All of the patient's paperwork is completed by the caregiver and/or child in the waiting room or the exam room.

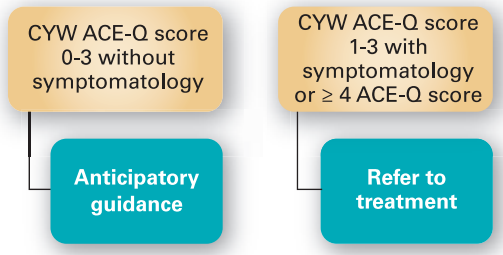
During the screening, the primary care provider follows a standard procedure for reviewing the CYW ACE-Q results with patients and their caregivers. First, the provider shares relevant information on stress and its effects on health and development. The provider normalizes screening and reminds the child and/or caregiver that all patients are asked to complete the tool because it provides essential information for understanding the patient's health needs. Second, the provider asks about symptoms associated with toxic stress (see Table 2). These symptoms have been identified through direct clinical experience and also through an extensive review of the research literature documenting symptomatology that is associated with the disruption of the NEI network. Third, on the basis of the patient's CYW ACE-Q score and relevant symptomatology, the primary care provider will provide anticipatory guidance or recommend integrated care through the BCHC-CYW partnership.

Specifically, if the CYW ACE-Q score (from Sections 1 and 2 combined) is 0, or 1 to 3 without symptomatology, the primary care provider provides anticipatory guidance. This may include specific information on ACEs, toxic stress, strategies for decreasing exposure to ACEs, and the importance of stress management and consistent, supportive relationships. If the CYW ACE-Q score (from Sections 1 and 2 combined) is between 1 and 3 with symptomatology, or if the CYW ACE-Q score is 4 or more (regardless of symptomatology), the provider will recommend integrated care (see Figure 2). This clinical protocol was developed to target resources to those patients already demonstrating symptomatology of NEI disruption or with ACE exposure so high as to be considered high risk for adverse health outcomes. In addition, many parents and/or caregivers may be reluctant to dedicate time to a treatment regimen when the child is not exhibiting obvious symptomatology.

TABLE 2. **Symptomatology Accompanying Adverse Childhood Experiences (ACE) Screening**

Symptomatology check-list
❑ Sleep disturbance
❑ Weight gain or loss
❑ Failure to thrive
❑ Enuresis, encopresis
❑ Constipation
❑ Hair loss
❑ Poor control of chronic disease (e.g. asthma, diabetes)
❑ Developmental regression
❑ School failure or absenteeism
❑ Aggression
❑ Poor impulse control
❑ Frequent crying
❑ Restricted affect or numbing
❑ Unexplained somatic complaints (e.g., headache or abdominal pain)
❑ Depression
❑ Anxiety
❑ Interpersonal conflict

FIGURE 2. **Center for Youth Wellness Adverse Childhood Experiences-Questionnaire Scoring and Referral**



Before a referral, the pediatrician describes CYW services and offers a direct introduction (i.e., a warm hand-off) to a CYW provider. The pediatrician may also emphasize the importance of good nutrition, quality sleep, regularly physical activity and exercise, mental health treatment, mindfulness-based practices (e.g., meditation), and healthy relationships–especially with a consistent and supportive caregiver—to help reduce the risk of long-term health problems (Khoury, Sharma, Rush, & Fournier, 2015; Lopresti & Drummond, 2013; Macdonald et al., 2012; Miller, Brod, Yu, & Chen, 2014; Simkin & Black, 2014; Slopen, McLaughlin, & Shonkoff, 2014).

INTEGRATED CARE

Once a child has been referred to CYW by a BCHC pediatrician, a multidisciplinary clinical team provides support to the patient and the family using a care coordination approach. Care coordinators, who are at the heart of the Integrated Pediatric Care Model, are trained to interact and respond to patients using an ACEs-informed lens. Care coordinators educate families and other providers about the impacts of ACEs and a toxic stress response on health, engage families at home and school, collaborate with the family and multidisciplinary team members to develop and implement a comprehensive treatment plan, provide consistent guidance, model self-care, and make referrals to additional services as needed.

CYW and BCHC partner to provide thoughtfully coordinated medical, mental health, and wellness interventions to address the impact of ACEs and toxic stress. Based on the science of NEI disruption, CYW's clinical model integrates a multidisciplinary, family-focused approach that includes: care coordination, comprehensive bio-psycho-social assessment, home visits, health education, psychotherapy, wellness nursing, psychiatry,

biofeedback, acupuncture, and referrals to internal and external services (see Table 3 for more information). This suite of services has been carefully selected and designed through research of evidence-based practices and promising interventions, community input, and clinical expertise from CYW and partner institutions. These services are aimed at reducing exposure to ACEs and assessing and treating NEI disruption with the long-term goal of reducing health risk.

TABLE 3. **Center for Youth Wellness Clinical Program Services**

Intervention	Description
Clinical evaluation	Care coordinators administer a set of comprehensive intake forms and clinical tools to evaluate behavioral and mental health status, needs, and strengths of patients and families
Home visits	Care coordinators and nurses engage with families at home and at school, recognizing barriers such as lack of access to child care and transportation
Education	Clinical team members offer targeted education that helps families better understand the causes and symptoms of chronic stress and provide strategies to mitigate the kind of stress that can hurt children's health and well-being
Psychotherapy	Therapists provide a variety of evidence-supported treatments and promising practices that share core principles of culturally competent, trauma-informed therapy that are appropriate for children and families from diverse cultural backgrounds, including Child-Parent Psychotherapy and Cue-Centered Therapy
Wellness nursing	Nurses provide education to families about the impacts of adverse childhood experiences (ACEs) and toxic stress on health and wellness. They coordinate specialty care appointments, often accompanying patients/families to see specialists, and provide consultation on strategies for attaining, maintaining, or recovering optimal health
Psychiatry	Psychiatrists provide medication evaluations of children and caregivers and offer consultation to Bayview Child Health Center physicians and Center for Youth Wellness (CYW) staff as needed
Biofeedback	A biofeedback specialist works directly with children and teens to build awareness and control over body processes such as muscle tension, blood pressure, and heart rate. Identification and monitoring of these body processes helps patients recognize and better regulate their "fight or flight" stress response
Referrals	Care coordinators make appropriate referrals for CYW clinical services and also coordinate referrals to high-quality institutional partners who also use an ACEs-informed service lens

Considerations for Introducing ACE Screening

ACEs threaten the developing brains and bodies of children. Universal and routine screening for ACEs in the pediatric medical home allow for prevention and early intervention, potentially leading to improved health outcomes for millions of children nationally. Before introducing ACE screening into clinical practice, health professionals are encouraged to explore models for screening and referral and to consider a number of factors to assess for organizational readiness.

Health professionals interested in implementing an ACE screening program should first familiarize themselves with the literature on ACEs and toxic stress. Although causal mechanisms are currently being explored, research documenting robust associations between exposure to ACEs and negative health outcomes is well established. Providers should then clearly articulate the purpose and value of screening at their particular clinic. Operationalization will require planning that begins with setting short-, medium-, and long-term goals. Evaluation and data collection plans should be prioritized to measure the success of the implementation efforts. In addition, institutions should evaluate and explore existing systems and processes to ensure compliance with state and other regulatory bodies.

Developing and implementing an integrated care model that encompasses screening, referral, and possibly treatment may require new community partnerships, staff training, professional development, and the hiring of additional or expertise-specific providers and support staff to monitor and track data and conduct evaluations. Because one organization may not be able to develop or reproduce a wide array of specialty services, working with community partners or experts that may already be well-situated to do so is highly advisable. Health professionals should also incorporate training for staff on topics such as

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Watch CYW CEO and BCHC pediatrician Dr. Nadine Burke Harris talk about how childhood trauma affects health across a lifetime on TEDMED: **https://www.ted.com/speakers/nadine_burke_harris_1**

The CYW ACE-Q and User Guide have been made available to primary care providers for the purpose of information sharing*. Visit the "Health Care Professionals" tab on our main website to access this material or visit **http://sgiz.mobi/s3/ab0291ef106d**

*The CYW ACE-Q is free and is intended to be used solely for informational or educational purposes. The CYW ACE-Q is not a validated diagnostic tool, and is not intended to be used in the diagnosis or cure of any disease.

trauma-informed care, vicarious trauma, conflict resolution, and mandated reporting, along with consistent supervision, specialty areas that staff may not be familiar with. Finally, because screening for ACEs and certain interventions are not yet reimbursable by health insurance companies, institutions must be creative, resourceful, and strategic about securing sustainable sources of funding.

Conclusion

The BCHC-CYW Integrated Pediatric Care Model was developed from an understanding of ACEs and their childhood and adult health implications. BCHC pediatricians routinely screen children for ACEs at their primary care visits using the CYW ACE-Q to identify children exposed to adversity who may be at risk of poor health outcomes. Upon identification of children and families who are in need of support from exposure to high doses of adversity, CYW responds by providing comprehensive integrated care using evidence-based strategies.

Successfully applying an understanding of the impacts of early life stress on health within pediatric medical settings requires extensive and iterative program development. We hope that the information provided here and in the CYW ACE-Q User Guide (available online) provides a starting point for health professionals to begin discussing how screening and healing may occur in their own clinics. Ultimately, validating a prospective, age-appropriate ACE screening tool for children will lead to an evaluation of the feasibility of a universal integration of screening in a pediatric health care setting. Widespread and routine screening for exposure to ACEs and risk of developing adverse health outcomes can help assure that children and families exposed to ACEs receive the care they need and prevent long-term negative health outcomes.

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What More Has Been Learned? The Science of Early Childhood Development 15 Years After *Neurons to Neighborhoods*

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ABSTRACT

The new Institute of Medicine/National Research Council report, *Transforming the Workforce for Children From Birth Through Age 8: A Unifying Foundation* (2015), begins with a summary of the science of early development and learning, with particular attention to discoveries during the past 15 years since the publication of *From Neurons to Neighborhoods* (National Research Council & Institute of Medicine, 2000). This article summarizes what has been learned during this period and its implications for practitioners who work with young children. New advances include better understanding of the scientific foundations for learning that develop during the first 3 years, the realization that early learning is more than just acquiring cognitive skills, knowledge of the influence of chronic stress and the significance of early relationships, and new understanding of the interaction of biology and environment in early learning.

In 2000, the National Research Council (NRC) and the Institute of Medicine (IOM) released the landmark report, *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Commissioned because of Congressional and public interest in the implications of early brain research for understanding early childhood development, and with the realization that the social and economic circumstances of young children had changed in recent decades, the committee writing the report focused attention on several basic conclusions that have since become foundational to public awareness of the importance of the early years. These conclusions include:

- Human development is shaped by a dynamic and continuous interaction between biology and experience.
- The growth of self-regulation is a foundation of early childhood development that influences all domains of development.
- Nurturing human relationships are the "active ingredients" of healthy development.
- Early brain development is important, although the narrow focus on birth to 3 years old begins too late and ends too early.
- Children's social competence and emotional well-being are as important to school readiness as are language and math skills.
- Social and economic disadvantage creates "striking disparities" in development that are apparent early and are predictive of later academic success.
- Early childhood programs are fragmented and require better coordination to address young children's needs.
- There is an unacceptable gap between current knowledge of early childhood development and the implementation of that knowledge in programs and policies that support young children and their families.

Although most of the policy recommendations of the report have received little attention, *Neurons to Neighborhoods* contributed to a broader public awareness of the importance of early childhood development and articulated an agenda for further research that has been influential.

Early in 2015, the NRC and the IOM released a new report, *Transforming the Workforce for Children Birth Through Age 8: A*

Unifying Foundation. As with *Neurons to Neighborhoods*, the committee writing this report was charged to summarize the science of early development and learning and examine its implications for policy and practice. The focus, however, was on the professionals who provide care and education for children from birth to 8 years old. What are the implications of the science of early development for the preparation of a workforce to seamlessly support children's development from birth through school entry? What do they need to know? How should they be trained and supported? What public policies would contribute to the development of an integrated system of services that best prepares young children for successful learning in the years that follow?

As a member of each committee, I was excited to see how much the science of early childhood development had advanced in the 15 years between the publication of each report. In this article, I highlight some of the significant advances in what researchers have learned, with particular focus on early childhood development. I also describe some of the implications of these discoveries for policy and practice.

Learning Begins Early, From Birth, and Is Rapid and Cumulative

From Neurons to Neighborhoods acquainted the public and policymakers with the importance of early childhood learning as a foundation for school readiness and later academic success. Summarizing what has been learned since then, the authors of *Transforming the Workforce* devoted considerable attention to the first 3 years, describing children's thinking as "astonishingly competent, active, and insightful from a very early age" (IOM & NRC, 2015, p. 88).

To illustrate this, they summarized research showing that infants and toddlers create implicit theories that help them understand the actions of objects and the behavior of people, and these theories become progressively refined as young children learn more. Their early-emerging *theory of mind*, for example, helps 1-year-olds understand that people's actions are goal-oriented, that others' facial expressions reveal the emotions they are feeling, and that people are paying attention to what they are looking at and thus it is "on their minds" (Wellman, 2014). Infants intuitively analyze the statistical patterns in the speech sounds they hear to enable them to distinguish words in order to learn language (Saffran, 2003). Infants have an approximate number awareness that enables them to distinguish different small quantities, and toddlers are beginning to comprehend number principles such as one-to-one correspondence (Mix, Huttenlocher, & Levine, 2002). Infants and toddlers are also keenly responsive to what they can learn from the actions of people and the words they hear. They pay attention, for example, to cues indicating that an adult is communicating with them—such as eye contact, infant-directed speech, and using their names—and then tune in to what the adult is saying and referring to (Csibra, 2010). The committee concluded that, to an extent not earlier recognized, learning begins from birth and provides the foundation for learning that follows.

Such a conclusion may seem surprising to practitioners who work with infants and toddlers because these achievements are not transparent in their behavior. Instead, very young children often seem distractable, driven by emotion, and impulsive, and consequently adults easily underestimate their cognitive abilities. Yet the astonishing growth of language, infants' use of pointing and gestures to get an adult to look at an interesting object, and babies' use of an adult's emotional expressions to determine whether unfamiliar objects are safe or dangerous are among the hallmarks of a rapidly developing mind at work.

How, then, should practitioners who work with very young children use this knowledge? One recommendation of the committee is to recognize that the thinking of infants and toddlers is far more inquisitive and conceptual, and less egocentric, than traditionally believed. Using an abundance of child-directed language when interacting with them by labeling, putting into words what people are feeling or objects are doing, and narrating the child's ongoing experience of discovery and problem-solving are among the ways that adults provoke early cognitive growth (see box From *Transforming the Workforce*). In addition, engaging in imitative play, categorization (sorting) and counting games, creating "what would happen if" informal experiments of physical causality, and responding to the child's curiosity about unexpected events enlists social interaction into new learning. With research showing that the amount of child-directed speech by adults to infants was associated with their vocabulary size at 2 years old (Weisleder & Fernald, 2013), and that parents' spontaneous "number talk" (e.g., counting objects, references to time) from 14 to 30 months was associated with children's number knowledge at 46 months (Levine, Suriyakham, Rose, Huttenlocher, & Gunderson, 2010), such experiences with caregivers provide the foundation

From *Transforming the Workforce*

Consider, for example, a parent or other caregiver interacting with a 1-year-old over a shape-sorting toy. As they together are choosing shapes of different colors and the child is placing them in the appropriate (or inappropriate) cutout in the bin, the adult can accompany this task with language that describes what they are doing and why, and narrates the child's experiences of puzzlement, experimentation, and accomplishment. The adult may also be using number words to count the blocks as they are deposited. The baby's attention is focused on the constellation of adult behavior—infant-directed language, eye contact, and responsiveness—that signals the adult's teaching, and this "pedagogical orientation" helps focus the young child's attention and involvement. The back-and-forth interaction of child and adult activity provides stimulus for the baby's developing awareness of the adult's thinking (e.g., she looks at each block before commenting on it or acting intentionally on it) and use of language (e.g., colors are identified for each block, and generic language is used to describe blocks in general). In this interaction, moreover, the baby is developing both expectations for what this adult is like—safe, positive, responsive—and skills for social interaction (such as turn taking). (Institute of Medicine and National Research Council, 2015, p. 103)

for the development of cognitive skills that children will use throughout life. These experiences also provide a foundation that subsequent educators can build upon.

Because early learning is rapid and cumulative, young children benefit from continuity in their learning experiences over time. This continuity occurs when adults in various roles and settings communicate with each other about the child's progress and characteristics and treat them with sensitivity to their developing capabilities and according to best practices in early education.

Learning Is More Than Just Cognitive Skills

The committee writing *Transforming the Workforce* devoted considerable attention to the science of early learning. In addition to the studies of early cognitive development described above, the report discussed extensive research on the concept knowledge that children acquire for learning specific subjects, such as mathematics and language, as they enter school.

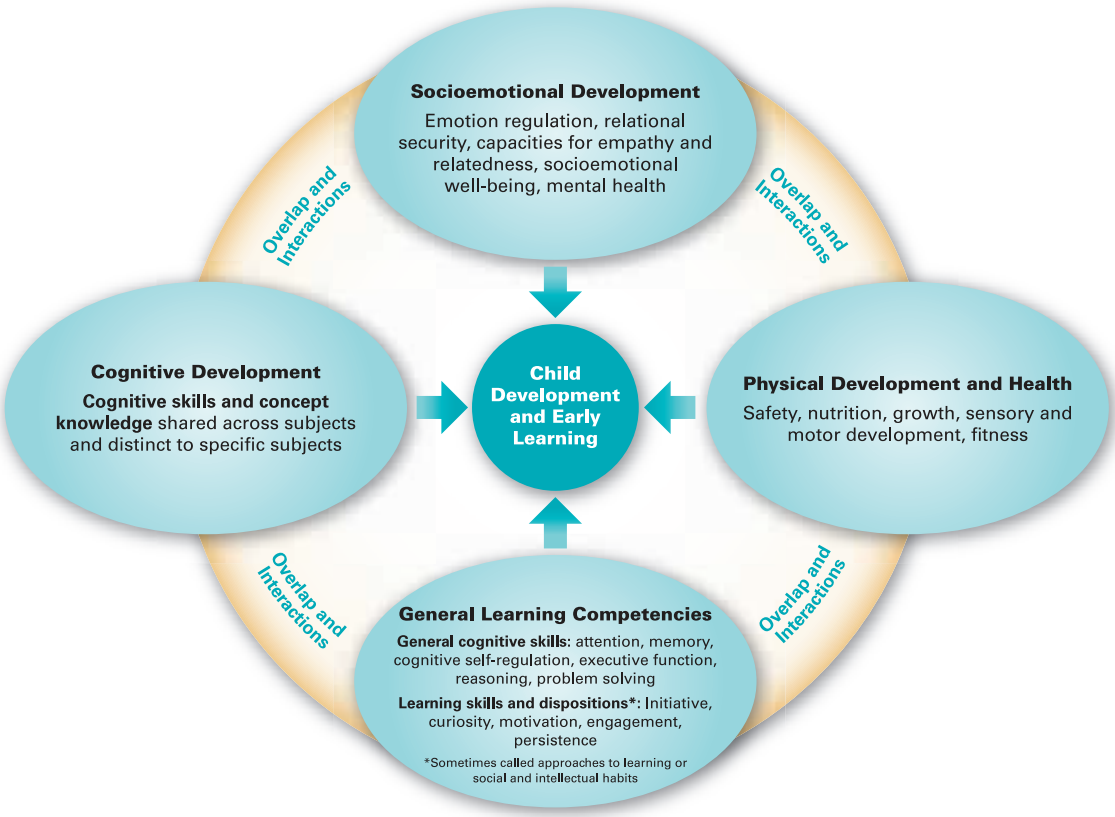
From the outset, however, the committee noted that learning is more than just acquiring cognitive skills (see Figure 1). In addition, learning includes (a) learning skills and competencies that help children acquire further understanding in formal and informal settings, (b) socioemotional development that supports emotional well-being and the social skills for learning with other people, and (c) physical development and health that provide essential resources to early learning.

LEARNING SKILLS AND COMPETENCIES

Early learning is fueled by curiosity, engagement in learning challenges, persistence in problem-solving, the initiative to pose and explore alternative approaches, strategies of reasoning and problem-solving, self-confidence, and self-regulatory capacities that enable children to manage their attention, thinking, and emotions in learning activities. These characteristics have been labeled "noncognitive skills" by Heckman (2007, p. 13250) and others to distinguish them from strictly cognitive skills, but the committee instead chose the term "learning skills and competencies" to describe what they are and their importance to early learning. Beginning in infancy, when the baby's "mastery motivation" denotes the persistence, focus, and curiosity accompanying exploration and problem-solving (Wang & Barrett, 2013), educators and researchers have long recognized that these competencies are significant contributors to early learning and to differences in academic success.

Many of these learning competencies involve self-regulation, which has been studied under the concept of "executive

FIGURE 1. **The Organization of Early Learning**



Reprinted with permission from *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* (2015; Fig. 4-1, p. 86) by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, DC.

functions" (Best & Miller, 2010). Executive functions are a collection of competencies that include developing working memory, growing cognitive flexibility, and developing capacities for inhibiting an initial response to consider alternative responses that might be better. These skills support learning and academic achievement in many ways throughout childhood and adolescence, such as by helping children to make reasoned rather than impulsive judgments and to consider alternative perspectives. Executive functions are based in brain regions that have a long maturational course—beginning in infancy and extending to early adulthood—but they develop most rapidly between the ages of 3 and 5 years. This means that most children at school entry are beginning to think more flexibly, use memory strategies, and focus their attention and thinking better than at younger ages (although they still have a long way to go). By contrast, infants and toddlers have very limited capacities for self-regulation, and thus require the support of caregivers to manage their attention, feelings, and behavior (Thompson, 2009).

Self-regulatory skills, together with other learning competencies, also develop in the context of children's relationships with adults who support their learning. As described below, their enthusiasm for the child's problem-solving, confidence in the child's success, and cognitive probes help to strengthen the child's approaches to learning. Viewed in this manner, educators are important not just for the cognitive skills they promote but also the learning skills they help to inspire and support.

SOCIOEMOTIONAL DEVELOPMENT

Early learning also depends on growth in a variety of socioemotional skills that support emotional well-being and social competence in learning settings. As described in the report, these skills include social awareness (i.e., social and emotional understanding), self-awareness (including self-confidence and knowledge of one's strengths and limitations), relationship skills, self-management, and responsible decision-making. Learning competencies and socioemotional skills thus overlap, as one would expect them to. Self-regulatory skills, for example, are as important to children's successful interactions with others in classroom activities as they are to children's capacities to focus their attention and thinking.

The importance of socioemotional skills is underscored by how much early learning is social and relational in nature. Early in life, infants and toddlers require the relational support that keeps them focused and persistent in learning activities because their self-regulatory skills are so limited. With increasing age, socioemotional skills are essential to the ability to function successfully in classrooms and other group learning activities because most early learning is social in nature. The importance of these skills is also reflected in considerable research reviewed in the report showing that early behavioral and emotional problems impede early learning and pose further risks to school adjustment, academic achievement, and long-term educational and vocational success in adolescence and adulthood.

PHYSICAL DEVELOPMENT AND HEALTH

Early learning also depends on physical development and physical well-being, which includes the safety of the physical and built environments in which children live, the nutritional adequacy of the child's diet, child health and fitness, and adequate health care if problems arise.

Unfortunately, some of the strongest evidence for the importance of physical health to early learning derives from studies of children living in difficult circumstances. As described in the report, considerable research documents the poorer learning and academic performance associated with compromised health, food insecurity, nutritional inadequacy, and limited physical activity in childhood. The committee described how early care and education settings can be important avenues for ensuring that children receive regular immunizations as well as health, vision, dental, and behavioral screening to identify children with special needs. Early education settings can also be forums for health education (for families as well as children) and sources of referrals to community health agencies.

Relationships Are Central to Early Learning

The skills and competencies essential to early learning develop in a relational context. The committee writing *Transforming the Workforce* agreed with the *Neurons to Neighborhoods* committee that nurturing relationships are the "active ingredients" of learning and healthy development. What was new in the 2015 report was the recognition that high-quality, positive learning environments are also important to enable adults to develop secure, responsive relationships with children, and to provide support to the adults who work in these settings.

The importance of relational support to early learning is illustrated by research on parent-child attachment, which shows how relational security promotes the child's confidence and competence at exploration, supports self-regulation, buffers stress, and enables children to learn from the sensitive guidance provided by their caregivers (Thompson, 2013). Other research summarized in the report profiled how young children develop an awareness of their strengths and limitations and acquire self-esteem through the evaluations of those who care for them and how those evaluations are conveyed. Social interaction is also a forum for the growth of cognitive skills, such as the storybook reading and counting games that provide initial foundations for understanding language and number. As children mature, of course, the activities they share with parents that promote learning also evolve: conversations become longer and more complex, items are measured and sorted into groups of specific quantities, and shared problem-solving becomes more dogged and creative. In these ways, cognitive skills and learning competencies are shaped by social interaction.

Young children also develop emotional connections to caregivers and educators outside of the home, and these relationships also support early learning. Considerable research shows that children achieve more in learning environments in which they

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Infants and toddlers have very limited capacities for self-regulation, and thus require the support of caregivers for support to manage their attention, feelings, and behavior.

have positive relationships with the adults in those settings. In addition to creating a positive climate for learning, these teachers encourage the child's effort, persistence, and mastery through verbal comments and by working alongside the child, especially as they engage in open-ended conversations about the child's interests and experiences. Children who develop positive relationships like these are more excited about learning, more enthusiastic, and more self-confident.

As the report notes, however, many early learning environments are not well designed nor well resourced for promoting these kinds of positive child-teacher interactions, especially in settings for young children. Early learning environments can be deficient because of the high number of children (and their age range) in relation to the number of adults, the limited size and quality of the environment, and the poor availability of developmentally appropriate materials to stimulate children's thinking. In addition, the committee noted that early childhood educators are frequently under stress, with high rates of depression, emotional exhaustion, burnout, and physical illness as the result. The educator's stress can directly impact the quality of interactions with a child. In one study, for example, researchers measured the depressive symptomatology of 761 home- and center-based care providers, and they found that depression was linked to higher levels of behavior problems in the 3-year-olds in their care owing, in part, to the poorer quality of care in those settings (Jeon, Buettner, & Snyder, 2014). Understanding the significance of children's relationships with the adults who educate them, therefore, requires appreciating how other factors within the learning environment, as well as demands on the adult, can make those supportive relationships easier or more difficult to develop. Stress for teachers, as well as for children, can be an important problem.

Chronic Stress Impedes Early Learning and Healthy Development

One of the significant discoveries about early learning during the past 15 years reflects a sad reality in the lives of young children. Chronic stress undermines early learning and healthy development, the committee reported, because of its biological consequences for developing children. Concerted research on this issue in recent years coincides with the experience of early educators that increasing numbers of young children are appearing in their classrooms showing behavioral signs of stress, trauma, and living in adversity (Thompson, 2014).

What kinds of experiences constitute chronic stress for children? Poverty is the most prevalent and best studied, in part because it incorporates multiple stresses associated with food insecurity, housing instability (and sometimes homelessness), parental depression and anxiety, poor child care and schools, and environmental toxins and other dangers that may endure and cumulate. In 2013, nearly half the children under 3 years old in the United States lived in families in poverty or near-poverty conditions (Jiang, Ekono, & Skinner, 2015). Other sources of chronic stress include child abuse and foster care. These experiences constitute readily recognized experiences of "toxic stress." But the committee noted that other forms of chronic stress for young children might not be so easily recognized as severe, such as parental depression or continuing marital conflict in the home. That young children respond to these conditions with heightened stress underscores that they experience certain circumstances as stressful that an adult would not regard as severe, but which are significant to children because they involve the withdrawal or denial of nurturing support.

Chronic stressful conditions have biological consequences that help to account for their immediate and long-term behavioral effects. Prolonged activation of physiological stress systems, especially in the absence of supportive relationships, alters the neurocircuitry of those systems and thus becomes "biologically embedded" in their development. Sometimes this causes these systems to become hyperreactive to perceived threats; in other cases, stress reactivity becomes blunted or underresponsive; in either case, stress responding becomes poorly regulated. Chronic stress also creates dysregulation of the immune system, which increases the child's vulnerability to infections and chronic diseases. Furthermore, the chronic output of stress hormones has downstream effects on other brain systems that regulate stress reactivity. These include the prefrontal cortex (the seat of executive functions that manage self-regulation and cognitive flexibility), amygdala (emotion activation and regulation) and hypothalamus (multiple motivational systems). One study reported, for example, that preschool children growing up in poverty had lower volumes of gray matter, which is tissue that is important to information processing, especially in brain areas relevant to cognitive reasoning and self-regulation (Hanson et al., 2013). More generally, the continuing "wear and tear" on biological systems resulting from chronic stress contributes to

the well-known association between early chronic stress and higher rates of health and mental health problems.

These biological effects have important consequences for early learning and development, according to the committee. Young children who are hyperreactive to threat may show greater reactivity and poorer self-control when social or emotional challenges ensue in the learning environment. Because of the brain areas affected by stress hormones, moreover, children experiencing chronic stress may have difficulty with self-regulation, language, and with maintaining attention and cognitively focusing on learning activities. Thus persistent stress is likely to undermine many of the cognitive skills and learning competencies on which cognitive growth depends and reduce the emotional well-being that children need to devote themselves to learning activities (Blair & Raver, 2012). It is thus not surprising that children in these conditions frequently fall behind their peers.

Young children's vulnerability to chronic stress and its biological and behavioral consequences underscores, therefore, the committee's attention to the associations between stress, learning, and early mental health. For many children, the influence of chronic stress undermines success in learning activities and contributes to the development of behavior problems that further erode classroom achievement. Consistent with this view, the committee summarized studies indicating that socioemotional and self-regulatory problems are frequently cited by early educators as common impediments to children's learning and school readiness. In addition, there have been significant advances during the past 15 years in documenting that even very young children show evidence of anxious and depressive symptomatology, behavioral and conduct problems, traumatization and posttraumatic stress, and other serious psychological problems (Egger & Emde, 2011). Taken together, understanding early learning requires appreciating how chronic stress constitutes a fundamental impediment to academic success and also poses significant risks to early mental health that also undermines children's learning and well-being. This is one reason that many early educators receive training in understanding the effects of early adversity on children's behavior and are establishing consultations with early childhood mental health specialists who can assist them when needed.

Fortunately, the support of close relationships can buffer stress for young children (and, indeed, for people of all ages). There has been longstanding research interest in the benefits of social support for coping with stress, and the committee noted that this work has recently been complemented by human and animal studies of the biological effects of social support on stress reactivity. These studies show that social support helps to reduce the reactivity of physiological stress systems and may activate biological systems that promote more effective coping and social bonding (Hostinar, Sullivan, & Gunnar, 2014). Taken together, these findings show that the experience of having someone "on your side" when facing difficulty can have emotional and biological benefits that aid effective coping, and this appears to be true for young children as it is for adults.

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Young children develop emotional connections to caregivers and educators outside of the home, and these relationships also support early learning.

Biology Continuously Interacts With Environment to Guide Learning and Development

The committee's summary of the effects of stress and social support on children's learning provides further evidence for the influence of early experience on brain development. The brain incorporates experience into its developing architecture whether those experiences are stressful or supportive, and new experiences can further alter the developing brain.

The continuous and adaptive interaction between biology and environment is a theme in *Neurons to Neighborhoods* that is also present in *Transforming the Workforce*. This theme led the earlier report to conclude that the debate over the relative importance of nature or nurture is "overly simplistic and scientifically obsolete" (NRC & IOM, 2000, p. 6) because biology and environment are each important and indissociable. The 2015 report identified, however, several scientific advances in understanding the interaction of biology and environment during the past 15 years that are noteworthy.

First, advances in understanding "gene-environment interplay" help underscore how inseparable are the influences of genetics and environment. Contrary to traditional views that the effects of heredity are immutable and direct, contemporary studies of gene-environment interaction and epigenetics show that how heredity is expressed in behavior depends significantly on environmental influences. The most groundbreaking perspective comes from the emergent field of behavioral *epigenetics*, which shows that environmental conditions can alter gene expression—that is, whether genes become activated (and thus influential) or deactivated (and this uninfluential) in behavior and development. Thus even though DNA never changes, its expression can change. There is still much to be learned about epigenetic processes, but current research reviewed by the committee indicated that stress

is one of the most potent environmental conditions provoking epigenetic changes in gene expression in childhood.

Second, there are individual differences in how susceptible people are to environmental influences. Some children are dramatically affected by environmental adversity or support: they flourish when conditions are positive, but are significantly undermined when conditions are bad. By contrast, other children appear to be less affected by environmental adversity or support—they carry on fairly consistently in different circumstances. In the popular media and in some professional contexts, these children are distinguished as "orchids" (thriving under positive conditions but wilting under adversity) or "dandelions" (neither benefitting nor hindered significantly by different conditions). The reasons that children differ in this way are complex and may arise because of early experiences, temperamental variability, genetic predispositions, or a combination of these. Taken together, however, research suggests that not all children are affected in the same way by the same environmental circumstances.

What does this mean for early learning? It is too soon to derive strong conclusions, but these discoveries suggest that the impact of genes and environment in the classroom are variable. Learning activities will have different impact on children who differ in their genetic characteristics, but these activities also constitute the environment in which these genes are expressed. And a child who wilts in adversity may not simply be dispositionally vulnerable but instead the one who is prone to thrive if conditions become more supportive.

Conclusion

Transforming the Workforce and *From Neurons to Neighborhoods* were written 15 years apart but with complementary agendas: each committee was asked to summarize current scientific understanding of early learning and development and explain its implications for policy and practice. The results are descriptions of the significant influences on early development that build on each other and show the remarkable growth in developmental science in the interim. Most important, the conclusions provided by each committee have significant implications for equipping the early childhood workforce with the knowledge and skills needed to seamlessly support learning from birth through childhood. Each committees' recommendations for changes in public policy and professional practice offer hope that, in the future, society's support for healthy early development may reflect the best knowledge of the influences that guide children's growth in a positive direction.

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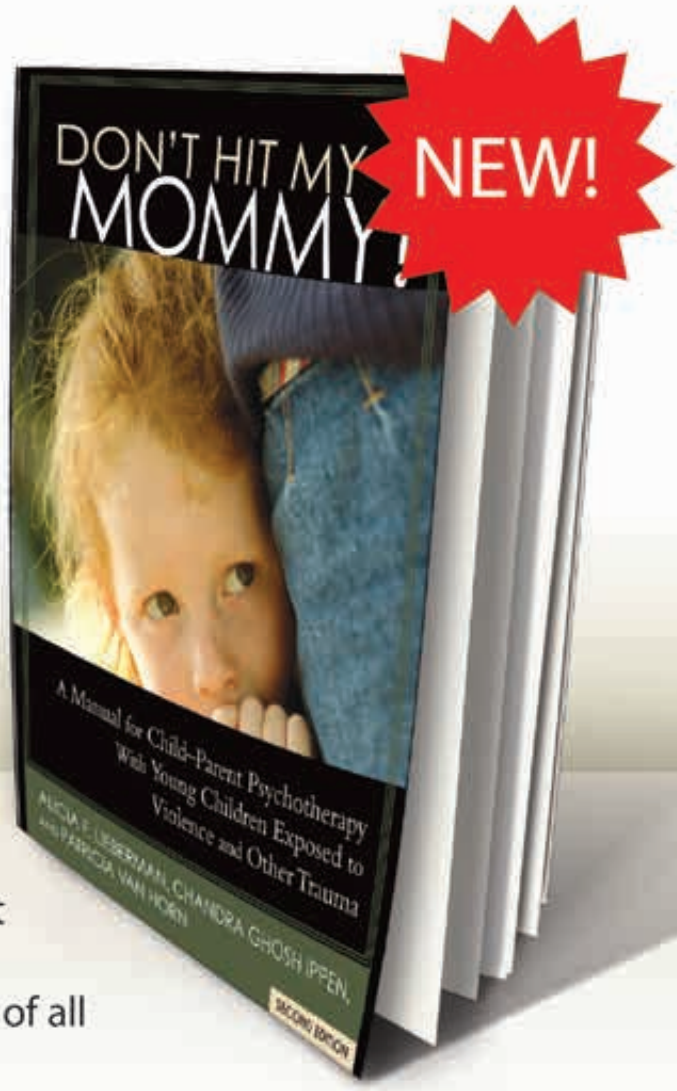

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New Directions in Tribal Early Childhood Programs

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ABSTRACT

This article explores the efforts of tribal communities building more coordinated and effective early childhood systems by taking advantage of federal funding opportunities and partnerships. Given a new level of understanding and response from federal agencies regarding the unique nature of tribal communities, efforts are being made to acknowledge the need for adaptability and the importance of cultural and geographical context impacting the development of strong early childhood systems in tribal communities. This article highlights these partnerships and the programs and initiatives involved in them, including specific examples of tribes taking advantage of the opportunity to build more responsive, coordinated, and sustainable systems of care for the young children and families they serve.

Tribal communities have a long history of providing high quality early childhood programs and services, such as tribally operated Head Start programs, to ensure children in their communities are getting off to a strong start. Head Start programs were some of the first tribally operated programs in the United States, commencing with 34 American Indian/Alaska Native (AIAN) Head Start programs in 1965 (Early Childhood Learning and Knowledge Center, 2015). Tribal Head Start programs created movement for increased tribal control of programs. Prior to the Indian Self Determination and Education Assistance Act of 1975 (PL 93-638), schools, programs, and services in tribal communities were administered by federal agencies such as the Bureau of Indian Affairs and Indian Health Service (U.S. Bureau of Indian Affairs, 2015). The provision of early childhood services by tribal nations continues to this day and has evolved to focus on the development of tribal early childhood systems.

As targeted federal and state investments in the early childhood field have expanded across the country, tribal nations and urban-based programs serving Native Americans have taken advantage of the opportunities to expand early childhood services in their communities—from Head Start and Early Head Start, to Tribal Maternal, Infant, and Early Childhood Home Visiting (MIECHV), Project LAUNCH, and more. With the expansion of early childhood services over time, an unintended consequence has been the development of a patchwork of isolated programs that have limited knowledge about what the others are doing with regard to service provision. Simply stated, as programs are growing rapidly and serving more children, a strong desire exists to improve coordination among programs to maximize services to children and families.

Understanding the journey to building responsive, coordinated systems of care for young children and families in tribal communities must begin with a recognition of the long history of societal, cultural, geographical, and other barriers that have persisted for decades. These barriers have decreased the ability to create effective systems that address the unique needs, assets, and landscapes of tribal communities. Despite the long-standing government-to-government relationship and efforts to address disparities in tribal nations, persistent gaps and inadequate responses when aiding tribal nations in addressing the varying and unique needs of their land and people are well documented. A 2003 report, *A Quiet Crisis: Federal Funding and Unmet Needs in Indian Country* from the U.S. Commission on Civil Rights, painted an astonishing picture of the disparities in federal funding for tribal nations; a lack of understanding of the varying and precise needs of tribal nations; a shortage of flexibility in how various government funding can be deployed to respond to the array of unique circumstances across tribal nations; and an absence of a recognition that in order for tribal nations to build sustainable systems of programs and services, resources for infrastructure are essential. The report concluded that until a new level of understanding, collaboration, and flexibility is reached when supporting tribal nations in the federal government structure (and federal spending is adequately increased to meet the needs), tribes will continue to struggle with their ability to use federal resources effectively and efficiently.

The impact of this perennial crisis in the development of modern day early childhood systems of care in tribal communities can be witnessed across a wide variety of areas. These include a lack of access to (and resources to build) technology and data systems,

geographical and cultural isolation, gaps in securing a qualified and culturally responsive workforce, inadequate health care access, a lack of understanding for ways that federal funding can be used for systems building, and many more. These challenges have limited the capacity of tribal nations to engage at a level of coordination and collaboration needed to build responsive systems of care for children and their families, even as new funding opportunities have been made available to tribal nations (C. Sharp, personal communication, October 14, 2015).

Despite these ever-present barriers, tribal communities have endeavored to take advantage of funding opportunities to serve children and families. They have leaned on the strength of their cultural belief systems related to family, community, and love of their children, and they used these values as the foundation for early childhood programs they have created in their communities along the way. In addition, not only have tribal communities made the most of their resources to support children and families over time in the midst of disparity, but a new day has arrived in the way that federal agencies are coming together to think differently about partnering with and supporting tribal communities in building systems of care for young children and their families. Federal agencies are acknowledging the need for adaptability and recognizing the importance of cultural and geographical factors impacting the development of strong early childhood systems in communities. More important, recent federal efforts also reveal an understanding that program creativity and flexibility can exist in a culture of accountability. This article highlights the efforts behind these partnerships, the programs and initiatives involved in them, and a few specific examples of tribal communities that are taking full advantage of the opportunity to build more responsive, coordinated, and sustainable systems of care for the young children and families they serve.

A New Level of Engagement to Build Tribal Early Childhood Systems

As researchers continue to learn about what it takes to build coordinated and effective early childhood systems that not only result in important outcomes for children and families but are also responsive to community need and sustainable, it has become increasingly evident that it takes flexibility, innovation, intentional capacity building (and planning), and ongoing investments to actually make it happen. In response to this discovery, there have been an increasing number of federal funding opportunities targeted specifically at supporting development strategies for tribal early childhood systems, demonstrating a new level of engagement between the government and tribal communities.

TRIBAL HOME VISITING

Beginning in 2010, the federal Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services (HHS) funded Tribal Home Visiting projects through a 3% set-aside from the MIECHV program. To-date, a total of 25 tribal grantees have been awarded funding for this purpose, totaling $44 million. The Tribal Home Visiting Program is designed to develop and strengthen tribal capacity to support and promote the health and well-being of AIAN families, to expand the evidence base around home visiting in tribal communities, and to support and strengthen cooperation and linkages between programs that service AIAN children and their families. This funding stream permits tribal grantees to use grant resources to support an array of system building-related strategies, including, but not limited to, planning and capacity building, Memorandum of Understanding development, partner engagement, infrastructure development, and more (ACF, 2015a).

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Tribal communities have endeavored to take advantage of funding opportunities to serve children and families.

TRIBAL EARLY LEARNING INITIATIVE

Launched in 2012 by the ACF, the Tribal Early Learning Initiative (TELI) was created to support tribal communities advancing system building strategies and innovative practices aimed at improving outcomes for children and families. TELI has four goals:

- Support tribes to fully and effectively coordinate and leverage Child Care and Development Fund, Head Start/Early Head Start, and Tribal MIECHV programs to meet the needs of communities, children, and families.
- Create and support seamless quality early childhood systems across programs serving young children and families.

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Children's healthy development is realized in the context of a healthy community.

- Raise the quality of services to children and families across the prenatal to age 5 continuum.
- Identify and break down barriers to collaboration and systems improvement. (ACF, 2015b)

In August 2015, ACF announced a new round of TELI grants to six tribes across the US, and concurrently announced the release of a report detailing the accomplishments of the first TELI grantee cohort. The report highlighted examples of several accomplishments of the four grantees, including, but not limited to: the creation of a single tribal early learning program enrollment form to facilitate the enrollment process for families, the selection of common assessment tools to more easily compare data across programs, holding joint professional development trainings for early childhood teachers, and investing in data systems to allow for better coordination and sharing of relevant child and family data across programs (ACF, 2015c).

PROJECT LAUNCH

Project LAUNCH (Linking Actions for Unmet Needs in Children's Health) is a federal grant program administered by the Substance Abuse and Mental Health Services Administration (SAMHSA). The program's primary objective is to promote the social, emotional, behavioral, physical health, and cognitive development of young children from birth to 8 years old (Gwaltney, Goodson & Klein-Walker, 2013). Started in 2008, Project LAUNCH aims to create a shared vision for the well-being of young children through locally based networks that include federal, state, territorial, and tribal entities in an effort to coordinate child-centered services and integrate behavioral and physical health services. Project LAUNCH services include efforts to increase developmental screening in a wide range of early childhood settings, promote mental health consultation in early care and education settings, and to strengthen family and parent support, among other strategies (Enomoto, 2014).

CIRCLES OF CARE

The SAMHSA Center for Mental Health Services administers the Circles of Care program, a 3-year discretionary infrastructure grant. The Center for Mental Health Services awards the grants to AIAN tribes, tribal organizations, urban Indian programs, and tribal colleges. Supported by SAMHSA leadership, the program began in 1998 as a result of planning with tribal leaders, AIAN mental health professionals, and advocates. Until the creation of the Native Connections program in 2014, the Circles of Care grant program was the only SAMHSA grant program focused specifically on AIAN communities with no competition from states, counties, or cities (SAMHSA, 2015).

EARLY CHILDHOOD COMPREHENSIVE SYSTEMS

The federal Health Services and Resources Administration (HRSA) first announced the Early Childhood Comprehensive Systems (ECCS) initiative in 2003 as an opportunity to support states in their early childhood systems development efforts. In 2013, the initiative evolved to focus more specifically on three aspects of systems development in states, with a particular focus on integrating health in early childhood systems. When applying for this grant opportunity, states were asked to select a specific area of focus with a plan for improving integration of health into the state's early childhood system. The areas of focus states had to choose from include: mitigate toxic stress and trauma in infancy and early childhood, coordinate the expansion of developmental screening activities in early care and education settings, and improve state infant and toddler child care quality improvement efforts (HRSA, 2015a).

Although there is currently only one tribal-specific ECCS grantee in the country (Great Plains Tribal Chairman's Health Board in South Dakota), tribal communities are active participants in various ECCS efforts and plans across some states. Tribal communities participate by serving on planning committees and councils and engaging with state partners in developing tribal summits, among other strategies (B. Hamilton, personal communication, October 21, 2015).

HEALTHY START

For 22 years, HRSA has implemented the Healthy Start program for mothers and children who live in communities with high rates of infant mortality. Healthy Start focuses on reducing racial/ethnic disparities and improving the overall health outcomes of the participants. Healthy Start accomplishes this by funding a variety of grantees around the country, including health departments, community-based organizations, and universities. While most of these local Healthy Start projects are in urban areas, more than a quarter serve rural communities, including communities on the US-Mexico border and regions with a predominantly Native American population (Healthy Start EPIC Center, 2015)

SYSTEMS OF CARE FOR EARLY CHILDHOOD PLANNING AND EXPANSION

Since 2002, SAMSHA has provided a series of Systems of Care planning grants to tribal communities across the country. The

purpose of these grants is to aid communities in developing comprehensive strategic plans for strengthening approaches to building systems of care for young children's mental health (News Medical, 2015).

RURAL INTEGRATION MODELS FOR PARENTS AND CHILDREN TO THRIVE

Rural Integration Models for Parents and Children to Thrive (Rural IMPACT) is an initiative launched in 2015 by the White House Rural Council to provide technical assistance in rural and tribal communities with a primary aim of reducing child poverty. By taking a two-generation approach, communities will attempt to decrease child poverty by increasing opportunities for parental employment and education while improving overall child well-being. The program is administered by HHS in collaboration with other federal agencies including the Departments of Agriculture, Education and Labor, and the Corporation for National and Community Service. In agreement with HHS, the American Academy of Pediatrics and the Community Action Partnership will oversee the demonstration project and provide technical assistance to the 10 participating communities (HRSA, 2015b)

Bridging Systems of Care for Young Children in Tribal Communities

Given the increasing number of federal initiatives and partnerships specifically intended to develop more seamless and coordinated systems of care for young children in tribal communities, progress is being made in bridging systems to better serve children and their families. Tribal communities are implementing a range of innovative strategies in this arena, and the following section will feature two communities making great strides to bring partners, programs, and services together in ways that create new avenues for coordination, and ultimately, long-term sustainability for the systems of care they aim to build.

PORT GAMBLE/S'KLALLAM TRIBE: KITSAP PENINSULA, WASHINGTON STATE

The Port Gamble/S'Klallam tribe has a long history of caring for and serving their youngest children through the Tribal Early Childhood Education Center (a combination of Head Start and child care). Most recently, the tribe has focused on implementing their newest grant opportunity, the Tribal Home Visiting program. A community with a strong commitment to the overall well-being of its children and their families, Port Gamble/S'Klallam is serving as an example for other communities across the country to implement an integrated approach among young children's mental health services and partners. Since 2003, they have been designated as a Brazelton Touchpoints site, with the goal of creating a system of care and promoting a paradigm shift in how the community as a whole is approaching their work with families of infants and toddlers (T. Ives, personal communication, October 9, 2015)

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Like many communities across the country, the Cherokee Nation's behavioral health system had historically been structured in a way that focused on serving adults, with very little to offer children.

Touchpoints is an evidenced-based theory of child development shaped through the research of Dr. T. Berry Brazelton and his colleagues at Children's Hospital in Boston. The theory offers a practical method for strengthening parent-child relationships, beginning before a child is born and continuing through the child's earliest years (J. Grant, personal communication, October 16, 2015). Touchpoints helps parents understand the disorganization and regressions that may accompany the child's developmental shifts, and it also enhances the capacity of providers and professionals working with families to connect with families when their involvement is most likely to be appreciated and their messages most likely to be helpful (J. Grant, personal communication, October 16, 2015). Touchpoints provides a common language that enables families and providers to work together and professionals to collaborate. It is an adaptable, culturally sensitive way of working that engages a community's heritage, assets, and self-strengthening capacities on behalf of its young children (T. Ives, personal communication, October 9, 2015). Touchpoints implementation in the Port Gamble/S'Klallam tribal community aims to create cohesive and consistent understanding and knowledge of the Touchpoints approach across the range of partners (e.g., Head Start, Early Head Start, MIECHV, health and mental health providers, social services, child welfare) working to support families in navigating children's social and emotional development.

Shared professional development—accompanied by collaborative consultation, peer support, and reflective coaching from an

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The genuine engagement and ownership by the people of the community is making all the difference as they are building their system of care.

assigned mentor with the Touchpoints Brazelton Center—serves as the core strategy and foundation for embedding the Touchpoints approach into the "way of life" of service providers and families in the Port Gamble/S'Klallam community. The following core objectives guide the training experience of partners involved:

- understand theories and concepts of the Touchpoints approach with emphasis on developmental and relational elements of parent-child-provider relationship and their practical applications;
- enhance delivery of care to Tribal families by using relationship-building strategies and communication tools based on the Touchpoints approach; and
- observe and participate in encounters with parent and child that demonstrate the Touchpoints approach of collaborative anticipatory guidance (T. Ives, personal communication, October 9, 2015).

During the training experience, partners developed a common language for how they communicate with and support families. The system of care they are building is grounded in a common understanding of engaging in anticipatory guidance, recognizing developmental stages, and enhancing relationships with each other and the families they serve. It is helping them think about current and future possibilities for bridging programs and services, such as strengthening their capacity to respond to resource and referral needs of families, building a shared data system, and creating a centralized intake for families (T. Ives, personal communication, October 9, 2015).

Being a part of the Touchpoints community has also presented opportunities for Port Gamble/S'Klallam staff to participate in leadership development activities through the Touchpoints American Indian/Alaska Native Community Leadership Program. The program encourages emerging leaders in the tribal early childhood field to continue developing their skills by participating in webinars and in-person institutes, designing a community-action project, and having an opportunity to work with a mentor on a regular basis throughout the process. For many leaders participating in the program, it has not only developed their overall capacity for leadership, but it has also helped them recognize themselves as leaders in a way that they didn't before the experience. In fact, many of the leaders reported feeling empowered through the experience to become cultural brokers in their communities, and to serve as a bridge connector and liaison to community partners. These leaders are a critical element in creating shared understanding of cultural values across those serving families (J. Grant, personal communication, October 16, 2015).

Port Gamble/S'Klallam has established a solid foundation for creating a seamless, coordinated, and sustainable system of care for the youngest children their community. Touchpoints has served as a mechanism to form bridges in their community by putting their strongest values and cultural beliefs at the center (T. Ives, personal communication, October 9, 2015). Having centered their work on ensuring their interactions with children and their families are strengths-based and ingrained in the culture of the community, families have developed a deeper trust in all providers. Families know that they can expect the various providers they work with to be consistent in their guidance and support. Now, families are not only gaining a greater understanding of what to look for in their child's development, but they are getting the tools and support they need to support their child's growth. It has long been known that children's healthy development is realized in the context of a healthy community. All things considered, Touchpoints in the Port Gamble S'Klallam community has served as an important catalyst in creating a shared philosophy embraced by all partners that parents truly are their child's most important teacher and advocate.

GREAT PLAINS TRIBAL CHAIRMAN'S HEALTH BOARD: SOUTH DAKOTA

HRSA's ECCS grants provide states an opportunity to develop plans for advancing the integration of health strategies into the larger early learning system. As mentioned above, while some states have embedded tribal participation in the work they are focusing on, only one state, South Dakota, has an ECCS grantee that is a tribal organization. This provides a greater opportunity for much-needed systems integration and community capacity building in the area (B. Hamilton, personal communication, October 21, 2015).

The Great Plains Tribal Chairmen's Health Board is the grantee for South Dakota and their current grant focus, based on needs identified across the 18 tribal communities in their geographical area, is mitigating toxic stress and trauma for the children and families. For now, the work is beginning with one of the 17 tribes in the Great Plains area—the Sisseton-Wahpeton Oyate of the Lake Traverse Reservation. A steering committee, made of three key partners, guides the implementation of the projects goals and shared the common objectives for advancing the work.

The three partners are the Great Plains Tribal Chairmen's Health Board (where ECCS and HRSA Healthy Start are housed), South Dakota Department of Health (MIECHV and South Dakota State University- MIECHV data partners), and the Sisseton-Wahpeton Oyate (a sovereign Tribal Government that operates numerous community outreach, prevention, and intervention programs). The project goals are:

- *Goal 1: Enhance the state and local early childhood systems that are currently focused on creating a trauma informed system, screening for domestic violence, and strengthening infant mental health;*
- *Goal 2: Provide education to MCH Service Providers on effects of toxic stress on children and families*;
- *Goal 3: Provide community education on the effects of Adverse Childhood Experiences (ACEs) and toxic stress on children and families; and*
- *Goal 4: Collaborate with MCH providers to define and develop a process for trauma informed care that includes the identification, referral, screening, and health education of new mothers during well baby, Healthy Start, MIECHV, and WIC visits* (Great Plains Tribal Chairmen's Health Board, 2015).

Ultimately, system leaders have a goal of convening community partners (across Tribal health, Indian Health Service, social services, MIECHV, ECCS, Healthy Start, Head Start and others) to learn together about how to develop a trauma-informed system of care to address the needs of their people. In an effort to prepare partners for the work ahead, MIECHV partners were able to offer a webinar on Collective Impact provided by Liz Weaver from the Tamarack Institute. Following this initial exposure to the Collective Impact model as a way of establishing a foundation for future conversations, the ECCS grant funded a Collective Impact gathering in early 2014 with a focus on bringing community partners to the table to participate in a Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis on adverse childhood experiences and mitigating toxic stress. Although there was high participation among community partners for the 2-day event, it became evident that system leaders needed to take a step back and re-think strategies for moving forward. When partners came together (in-person) for the Collective Impact gathering and SWOT analysis, it was the first time for many of the partners to meet one another. They knew very little about one another and the programs and services they each represented. Although they were able to generate some important information in the SWOT analysis, relationships and trust—the foundation of any community or system partnership—were nonexistent. The partners needed time to build relationships with one another in order to effectively engage in systems conversations. (S. DeCouteau & C. Hacker, personal communication, October 22, 2015).

The partners agreed that the next steps in maintaining momentum around the initiative were to develop a coalition, a mechanism for bringing partners together to develop relationships, to learn about one another, and then gradually find ways to move forward. As a result, the community created the First 1,000 Days Initiative Interagency Forum. The first meeting of the Forum took place a month following the Collective Impact gathering and has met regularly ever since. ECCS resources have supported costs for teleconferencing, travel, technical assistance, and meeting rooms. Over the last year, the Forum has made great strides in building their capacity to collaborate. At each monthly meeting they've spent time sharing key information about the various programs and services they each bring to the community. They also have been working on resource mapping to achieve a better sense for what service provision looks like across the different partners. In June 2015, ECCS funding supported a regional First 1,000 Days Initiative Maternal and Child Health Resiliency Conference in an effort to bring partners together to learn about the very issues they were focused on solving—including toxic stress, the impacts of drugs and alcohol in pregnancy and on families in general, the importance of fostering resiliency, and other key topics related to adverse childhood experiences. Most recently, they developed a draft mission and vision statement for a charter that will formalize commitments for working together. (S. DeCouteau & C. Hacker, personal communication, October 22, 2015).

Federal agencies are acknowledging the need for adaptability, and recognizing the importance of cultural and geographical factors impacting the development of strong early childhood systems in communities.

The South Dakota ECCS initiative and the First 1,000 Days Initiative Interagency Forum are making significant strides in creating a trauma-informed system of care for the children and families they serve—just as it was envisioned in the ECCS strategic plan. How they actually arrived at where they exist today, however, didn't happen as they initially planned it. The ability of system leaders and partners to pause and shift their original plans in order to allow time for relationship building has undoubtedly set a strong foundation for their success to-date. Most important, this foundation is only the beginning of critical system-bridging that is sure to continue. Eventually, this progress will result in a coordinated and seamless trauma-informed system of care for their community.

Creating a HERO in the Cherokee Nation

It's long been known that tribal communities place a particular emphasis on making certain that the services they offer are not only tailored to meet the very specific needs of the tribal populations they serve, but that they are designed and delivered in a manner that is reflective of their deeply embedded cultural values and traditions. This is also true for the Cherokee Nation,

Children are of utmost priority in Cherokee nation and are highly admired and loved by the adults and elders who care for them.

although it is important to note that their approach to early childhood and child mental health is very unique, and their approach plays a significant role in the progress the community is making to create a system of care for the children and families that reside there. In fact, the community is convinced that the work they are doing is so impactful that it will create sustainable changes in the health and well-being of their people for years to come (J. Skinner, personal communication, October 15, 2015).

The Cherokee Nation, the largest tribal nation in the United States, is situated in Northeastern Oklahoma and is home to more than 317,000 people (Cherokee Nation, 2015a). Unlike many tribes in the country, Cherokee Nation is not located on reservation land. Their land area covers 7,000 square miles of jurisdictional area across fourteen distinct counties in Oklahoma. The mission statement of the Cherokee people represents the strongly rooted culture and values that guide the way of life they live today: "The Cherokee Nation is committed to protecting our inherent sovereignty, preserving and promoting Cherokee culture, language and values, and improving the quality of life for the next seven generations of Cherokee citizens." (Cherokee Nation, 2015a) When it comes to supporting the continued growth and development of their youngest children, it is something clearly embedded deep into the mission and is of highest priority. In fact, children of the Cherokee Nation are viewed as "heroes" to the adults and elders in their community, which is defined differently in their culture from how it is recognized in Western culture. In Cherokee culture, the word for hero (*a-tsi-lv-quo-di*) is translated as "someone who is loved or admired." Children are of utmost priority in Cherokee nation and are highly admired and loved by the adults and elders who care for them (Cherokee Nation, 2015b).

Despite the strength of deeply ingrained cultural foundations and love for their people and children, the Cherokee community is a place where high rates of trauma, toxic stress, and chronic health and mental health conditions persist and adversely impact the overall health and well-being of the community. In an effort to address these unfavorable conditions for their people, the Cherokee Nation has taken a comprehensive and highly strategic approach to create sustainable changes in the lives of families and their children and the systems that serve them (Cherokee Nation: *HERO Strategic Plan*, 2012). They are focusing their efforts in a major way on the impact they have through strong and coordinated early childhood programs and services, and specifically, they are looking to change the way that the community approaches the social and emotional outcomes of their children.

The community's journey to enacting significant change for their children by improving partnerships, coordination, and creating systems of care was an uphill climb in the beginning. Like many communities across the country, the Cherokee Nation's behavioral health system had historically been structured in a way that focused on serving adults, with very little to offer children. In addition, the community had long-served children in Head Start, Early Head Start, and other forms of early childhood services that addressed the well-being of children. However, these programs and services operated with each one focused on serving the children and families enrolled in their programs in an effort to meet the specific outcomes designed for any given program or service. While the spirit of collaboration and partnerships had always existed in the community along with a desire to improve their approach to systems building, it wasn't until 2007 when they were awarded funding from SAMSHA for the Systems of Care for Early Childhood Planning and Expansion grant that a true "system" would be envisioned (J. Skinner, personal communication, October 15, 2015). The funding for 1 year was the first opportunity that the tribe had to develop a strategic plan for children's services and to really begin thinking about what building a system of care to address children's mental health might look like. Although a plan and a focused strategy grew out of the initial 2007 grant, the limited funding wasn't enough to keep the process moving into implementation. Fortunately for Cherokee Nation, three leaders who had been engaged in the work from various vantage points in the community—Dr. Misty Boyd, Dallas Pettigrew, and Juli Skinner—came together, leveraged funding, and created what became the HERO (Helping Everyone Reach Out) Project (J. Skinner, personal communication, October 15, 2015).

Building on the initial strategic plan for children's services developed in 2007, the HERO Project is a strategy to join service providers and various programs into a seamless continuum of services and interventions aimed at improving overall outcomes for children—with mental health as the central focus. According to leaders in the community, one of the most significant elements of the implementation and development process for the HERO Project (and a key strategy for building sustainability of the work overtime) was deep, authentic community engagement at the onset (J. Skinner, personal communication, October 15, 2015). The community had long-held beliefs about the importance of drawing on the strengths and assets of the people in creating a movement for children, and the project would stay true to these values throughout the planning process. Led by Cherokee Nation Behavioral Health, the project began by convening 20 local community coalitions across the 14-county jurisdiction, representing voices from a diverse array of ethnic and socioeconomic backgrounds and an array of community agencies and partners in health, mental health, early education, schools, social services, and beyond (it is important to note that Cherokee Nation is not on a reservation so it is fully integrated with the larger community). Through

this comprehensive feedback gathering process, it was identified that a substantial barrier existed for families in knowing what services are available and how to access them (J. Skinner, personal communication, October 15, 2015). In addition, through a needs assessment, the community learned that time gaps existed in parents' understanding of the need for mental health services for their children and where they would even access them. The community also offered feedback about the impact of the stigma that often comes with talking about mental health and recognized that this was a significant barrier to addressing concerns that arise with children. Through these conversations, it became evident that opportunities are needed to enhance parenting skills and create awareness with families (and the community at-large) in the area of children's mental health, including an emphasis on the importance of mental health in their overall development. The information and insights gathered from families and community partners through these processes served as the foundation in setting goals for the HERO Project. Implementation of the project moved forward with a solid focus on stronger coordination and shared learning among community partners, and improved access and active participation of families (J. Skinner, personal communication, October 15, 2015)

Building on the strengths of the community, including the focused goals of the HERO Project and the assets of existing programs and resources underway, the efforts to build a coordinated and sustainable system of care took shape in 2012. During this same time period, the tribe applied for and was awarded a Project LAUNCH grant and also secured funding through the MIECHV program to further augment their efforts to integrate and provide broader access to services. These initiatives brought additional focus to not only improving family supports for caring for young children, but also aided the community in continuing to enhance their overall approach to building a system of care for improving children's mental health in the earliest stages of life. For the first time, partners across Project LAUNCH, MIECHV, Head Start, Early Head Start, school districts, and child care would come together across a variety of activities with a central focus on children's mental and behavioral health (J. Skinner, personal communication, October 15, 2015).

Implementation of the HERO Project happened through the work of the many partners and families within the community, as well as in a centralized clinical setting where children and their families can receive coordinated and timely mental health and behavioral services when issues are identified. HERO Project staff housed in the clinical setting hold education and experience in social work, counseling, and other related fields. Although having a centralized clinical setting for families to access services is a significant part of the Project's success to-date, the efforts to build increased coordination and partnership among the partners and families in the community is propelling the project goals forward in ways that community leaders believe will create sustainability for the future. The genuine engagement and ownership by the people of the community is making all the difference as they are building their system of care. Not only are they creating partnerships and shared understanding and knowledge around children's mental health that rarely existed before, but the involvement and participation of families in helping to lead the work of the project in communities is profound. The following are few examples of specific strategies that are currently being implemented to build and strengthen the system of care in Cherokee Nation through the guidance of the HOPE Project:

- **Shared professional development across providers.** Opportunities for providers to come together to engage in professional development activities aimed at improving child outcomes is a core component of the Cherokee Nation's HERO Project. Program initiatives from Head Start/Early Head Start to Project LAUNCH to MIECHV to schools are all engaged in partnerships to deliver evidence-based interventions such as Triple P, the PAX Good Behavior Game, and Center on the Social and Emotional Foundations for Early Learning—a national center that offers a pyramid approach and tools for supporting young children's mental health. The Project works with 42 schools in four counties around social and emotional skill development by providing education and activities to teachers around this important development.
- **Parent education and involvement.** Parents are considered central to the success of children and the system of care in Cherokee Nation. They are regarded as the experts on their children and the community invests in them to ensure they remain a central focus of the process. Through the HERO Project, 6- and 10-week parenting group classes are offered to families, including Triple P training. Family care management exists in the clinic setting to help with parenting support and any other needs. Family care managers are available to assess families

Learn More

Websites

National Indian Child Welfare Association (NICWA)
www.nicwa.org

Cherokee Nation HOPE Project
www.cherokee.org/News/Stories/20150727_CherokeeNationHEROProjectopensnewofficeinTahlequah.aspx

Port Gamble S'Klallam Tribe Early Childhood Education
https://www.pgst.nsn.us/tribal-programs/tribal-services/early-childhood-education

Brazelton Touchpoints Center
www.brazeltontouchpoints.org

PBS *Indian Country Diaries*

This resource has videos and information on American Indian history and experiences. Boarding school and removal of AI/AN children from their homes has had a lasting effect in tribal communities.
www.pbs.org/indiancountry/index.html

and help them to develop strategies and increase knowledge in areas of need such as education, housing, and child care. Collaborative problem solving and motivational interviewing are common strategies used in the Project for surrounding families with support in the community.

- **Community mobilization to improve coordination and create awareness.** Perhaps one of the most impactful strategies of the HERO Project is using community organizing and mobilization. Through the HERO Project, they have developed action teams made up of parents and caregivers that seek to improve, coordinate, and collaborate with child serving systems, such as schools, clinics and other organizations. The action teams develop their own identity and provide guidance on the development and implementation of evidence-based interventions. They drive everything the Project does. (J. Skinner, personal communication, October 15, 2015)

There is no doubt the HERO Project and the genuine focus and interest in young children of the Cherokee Nation are making a positive impact—not just on outcomes for children themselves, but in setting a solid foundation for the tribal nation's future. The Project now serves as an invaluable example for other communities across the nation looking to break down silos and to create seamless systems of care for young children and their families. Project leaders have experienced highs, lows, challenges and successes, but they are convinced that this approach has greatly enhanced access, experiences, and support for families in a very positive way. As Juli Skinner, administrative officer with the HERO Project offered in an interview recently,

> *Have patience. Get to know your communities. We completed windshield surveys (the needs assessment) before we began anything. That is key. Listen to your people. Keep in mind that families are the experts in their own families. Focus on strengths and go from there (2015).*

In May 2015, Cherokee Nation Principal Chief Bill John Baker signed a proclamation declaring the month of May as "National Children's Mental Health Awareness Month." Not only did this proclamation bring focus to the significant contributions of the HERO Project in the community, but it did just what Cherokee Nation does best—it brought the entire community together to celebrate and protect their most precious resource, its children.

Conclusion

Building coordinated, seamless and sustainable systems of care in early childhood is no simple task. For a leader or a partner in a tribal community, systems building comes with an additional set of unique opportunities and challenges. Tribal communities across the country are paving the way for their tribal counterparts to continue to grow their capacity to leverage resources, to develop new and innovative partnerships, and to continue doing what tribal communities have always done exceptionally well—building on the strengths of the unique values and cultures of their people as the foundation for their systems building work. Tribal communities are proving that building relationships, cultivating shared understanding and common language, and facilitating authentic family and community engagement are key catalysts in bridging programs and services. Over time, the creation of these coordinated and sustainable systems for young children and their families will set the stage for long-term health and vitality in the communities they serve for many years to come.

Acknowledgment

This article was supported by the unique contributions of Maria Gehl, Paul G. Spicer, Cindy Oser, and Christopher Sharp. I want to extend sincere gratitude to them for their vision, knowledge, and experience which brought such important wisdom and inspiration to the making of this article.

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ZERO TO THREE Critical Competencies for Infant-Toddler Educators™ ... in Brief

This brief provides an overview of the *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™ in five sections:

1. Critical Competencies' Focus
2. Critical Competencies' Foundation
3. Relationship to Other Relevant Criteria
4. Organization and Content Examples
5. Using the Critical Competencies

www.zerotothree.org/CriticalCompetencies

Early experiences matter. The quality of the early care and education provided to young children not only impacts their experiences now, but directly contributes to their future success in school and in life. High-quality early learning experiences require effective educators but attainment and application of these critical knowledge and skills is difficult. Attainment and application of critical knowledge and skills can improve educator effectiveness. *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™ (Dean, LeMoine, & Mayoral, 2015) details essential skills educators need to create exceptional early learning experiences.

The *Critical Competencies:*

- Support educators who work in group settings (center-based and family child care homes) with infants, toddlers, or both
- Focus on pedagogy—the method and practice of teaching
- Detail essential and observable skill sets that effective early educators use to optimize babies' and toddlers' (1) social-emotional, (2) cognitive, and (3) language and literacy development
- Feature considerations for working with high-needs populations
- Offer considerations for supporting dual-/multi-language learners

Critical Competencies' Focus

The *Critical Competencies* focus on a subset of teacher-child interaction skills because:

- Strong teacher-child interactions within these areas of learning and development are most closely associated with children's success in school and life, particularly for children at risk (Campbell & Ramey, 1994; Curby et al., 2009; Hamre & Pianta, 2007; LoCasale-Crouch et al., 2007; Mashburn et al., 2008).
- Early educators need to acquire culturally and linguistically competent knowledge and skills to intentionally support infants and toddlers raised in multilingual and multicultural environments.
- Infant and toddler educators need access to information on how to apply foundational knowledge in a group setting, what infant-toddler teaching and learning looks like in practice, and what specific skills educators need to optimize children's learning opportunities.

The *Critical Competencies* advance the call from the Institute of Medicine (IOM) and National Research Council's (NRC) committee report *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* (2015) to increase supports for the infant-toddler workforce, to develop specialized competencies for this population building on core competencies for the early care and education workforce, and to ensure that these competencies address the cross-cultural skills needed to work with diverse populations.

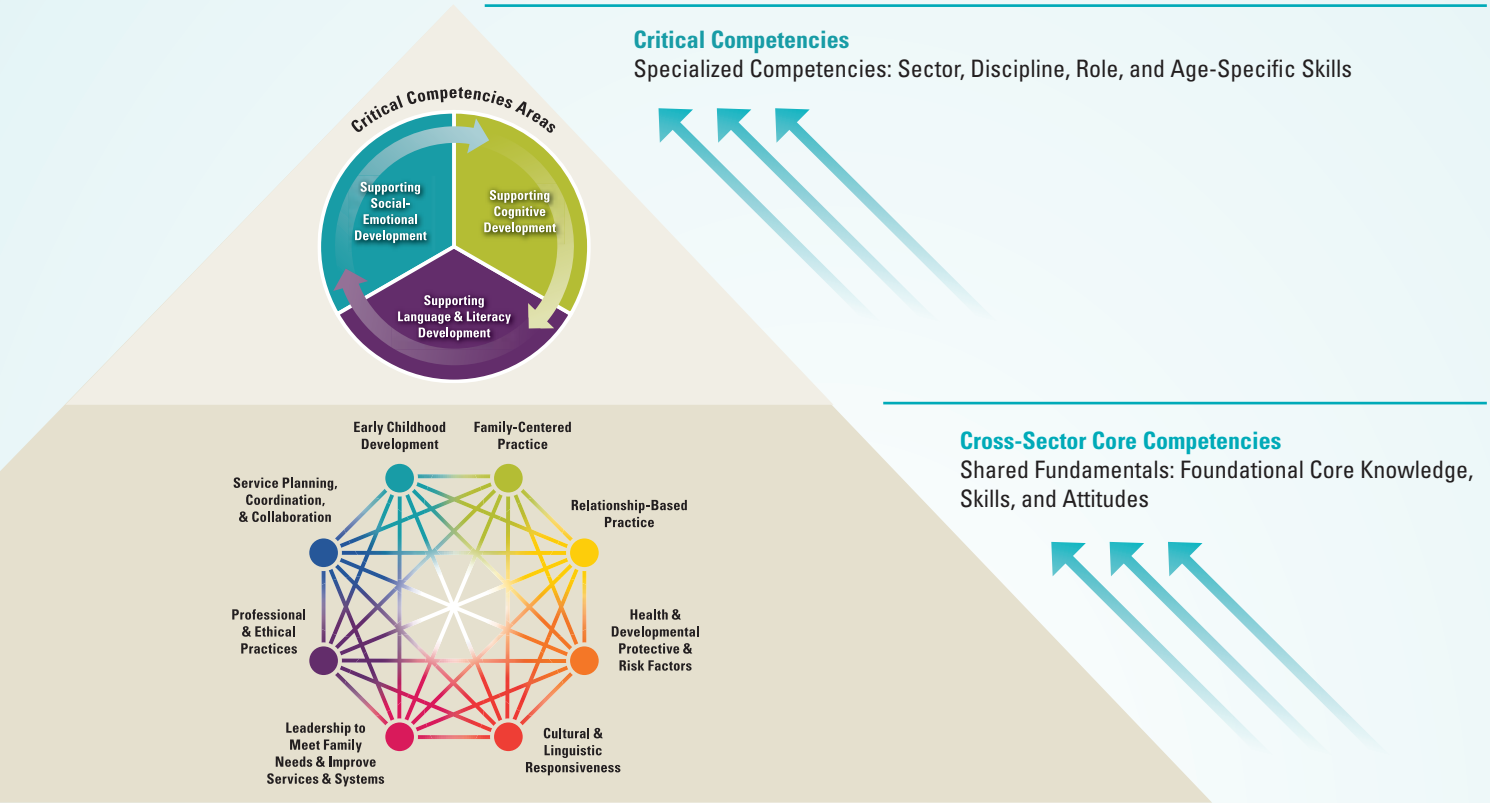
Critical Competencies' Foundation

The *Critical Competencies* build on the foundation provided by ZERO TO THREE's *Cross-Sector Core Competencies for the Prenatal to Age 5 Field* (ZERO TO THREE, 2015) which were generously funded by First 5 Los Angeles and present a universal set of core competencies necessary for all prenatal-5 service providers. The Cross-Sector Core Competencies describe essential knowledge, skills, and attitudes that any professional working with young children needs, in eight domains as illustrated in Figure 1.

Relationship to Other Relevant Criteria

The *Critical Competencies* also build on professional criteria for the early childhood field, giving consolidated and easily understood guidance. In partnership with the organizations below, the *Critical Competencies* are crosswalked with:

FIGURE 1. **Critical Competencies Build on the Foundation of the Cross-Sector Core Competencies**



- National Association for the Education of Young Children's (NAEYC) *Standards for Early Childhood Professional Preparation* (NAEYC, 2009)
- Council for Professional Recognition's *Child Development Associate (CDA) Credential™ Competency Standards* (n.d.)
- Michigan Association for Infant Mental Health's (MI-AIMH) *Competency Guidelines®* (2014)
- Division for Early Childhood's (DEC) *Recommended Practices in Early Intervention/Early Childhood Special Education* (2014)
- WestEd's Program for Infant/Toddler Care's (PITC) topics and objectives (n.d.)
- Irving Harris Foundation's *Diversity-Informed Infant Mental Health Tenets* (n.d.)
- Collaborative for Understanding the Pedagogy of Infant/Toddler Development's (CUPID) *Draft Competencies for the Infant/Toddler Workforce* (2015)
- Center for the Study of Social Policy's *Strengthening Families™ Protective Factors* (n.d.)

It is important to note that the *Critical Competencies* also include links to the child development outcomes described in the new Head Start Early Learning Outcomes Framework (U.S. Department of Health and Human Services, 2015), and suggested alignment with infant and toddler teacher observation tools including:

- *Quality of Caregiver-Child Interaction for Infants and Toddlers* (Q-CCIIT) draft indicators (Atkins-Burnett et al., 2015)
- Classroom Assessment Scoring System (CLASS®) tool for infants (Hamre, La Paro, Pianta, & LoCasale-Crouch, 2014)
- Classroom Assessment Scoring System (CLASS®) tool for toddlers (La Paro, Hamre, & Pianta, 2012)
- Infant/Toddler Environmental Rating Scale–Revised Edition (ITERS-R; Harms, Cryer, & Clifford, 2006)

Organization and Content Excerpts

The *Critical Competencies* are organized in three learning and development areas and 13 sub-areas as illustrated in Figure 2.

Each of the three learning and development areas include:

- an overview of the developmental area for infants and toddlers and
- a summary of infant-toddler educators' role in supporting development in the area.

FIGURE 2. **Critical Competencies Areas and Sub-Areas**

Critical Competencies Sub-Areas

Supporting Social-Emotional Development

1. Building Warm, Positive, and Nurturing Relationships
2. Providing Consistent and Responsive Caregiving
3. Supporting Emotional Expression and Regulation
4. Promoting Socialization
5. Guiding Behavior
6. Promoting Children's Sense of Identity and Belonging

Supporting Cognitive Development

7. Facilitating Exploration and Concept Development
8. Building Meaningful Curriculum
9. Promoting Imitation, Symbolic Representation, and Play
10. Supporting Reasoning and Problem Solving

Supporting Language & Literacy Development

11. Promoting Communication Exchange
12. Expanding Expressive and Receptive Language and Vocabulary
13. Promoting Early Literacy

Sample Excerpts

Area 2: Supporting Cognitive Development

Supporting infant and toddler cognitive development requires educators to have a solid understanding of the infant-toddler developmental continuum, individual children's interests and temperament, and the way in which cognitive learning is scaffolded—coached or supported by a more experienced peer or a caregiver—through responsive facilitation of play and exploration. "When adults understand how the mind develops, what progress children make in their cognitive abilities, and how active inquiry and learning are children's natural inclination, they can foster cognitive growth by supporting children's active engagement with new experiences" (IOM & NRC, 2015, p. 101). When this knowledge is coupled with responsive and nurturing facilitation by a trusted teacher, infant-toddler

Specifics for Infant-Toddler Educators

Infant-toddler educators are central to young children's cognitive development because they provide the consistent and supportive relationships in which exploration and understanding of concepts are nurtured. Within consistent relationships infants and toddlers seek out experiences and interactions that spark their curiosity and wonder about the world. Supportive educators build on the natural inquisitiveness of infants and toddlers to purposefully plan for and support extended engagement with and increased understanding of basic foundational concepts. Cognitive growth is stimulated by infant-toddler educators' ability to observe and follow children's natural inclinations to learn about their world and to build on such teachable moments. The following competencies can help infant-toddler

Each of these 13 sub-areas include:

- specific and detailed, pedagogy-focused skill statements that help educators understand what the competency looks like in their day-to-day interactions;
- content that directly supports those who work with high-needs populations;
- suggestions for working with dual-/multi-language learners; and
- examples in practice with young infants, mobile infants, and toddlers.

Sample Excerpts

Infant-toddler educators who *facilitate children's exploration and concept development* demonstrate the following observable skills:

C-1a Ensure that different types of culturally appropriate objects and toys are present and accessible in the group care setting so that infants and toddlers can explore objects and their functionality

C-1b Position infants to promote independent exploration of objects, their own hands and feet, or a caregiver's face

C-1c Promote infants' exploration using their senses—hearing, touching and feeling different textures, seeing, smelling, or tasting

C-1d Extend infants' exploration of objects by repositioning infants, imitating actions, and modeling varied ways to use objects

C-1h Facilitate children's exploration of concepts like means-end and cause and effect by prompting through processes and offering specific verbal and nonverbal information or guidance when children need additional cues to understand concepts, for example:

- Helping toddlers investigate how mud is formed when it rains or which things sink or float by asking, "I wonder whether the feather (or rock, or container) will sink or float?"
- Exploring cause and effect with infants by commenting, "When you move your hand this way, the toy makes a chica, chica sound"
- Exploring object permanence with an older

*Considerations for Supporting **Vulnerable Populations***

Facilitating exploration and concept development is important for all children but especially critical for children who may not have opportunities to safely explore small manipulatives, cause and effect toys, or other learning materials in their homes. Sometimes key things that promote children's learning are missing from the environment. For instance, an environment may not have play materials, the space may not be safe for child exploration, or family members may not be available or know how to facilitate children's play and exploration. When children have limited access to key experiences in the home environment, it is critical that they have access to and support for play with various toys and materials within the group care setting. Making the most of learning opportunities by sitting close by

*Considerations for Supporting **Dual-/Multi-Language Learners***

Infant-toddler educators support concept development by setting up environments to encourage young children's exploration, while using conversations during that play to build on children's understanding. The use of language to reinforce concepts is important for all children, and requires a thoughtful and linguistically responsive approach when working with children learning multiple languages. Some concepts introduced and learned may be unique to the school or home setting. However, more often infants and toddlers have similar experiences across both settings that early educators can help link and extend. It is important for teachers to engage and build trust with parents and families to create supportive home-school connections that foster concept and additional development. Connecting

What does *facilitating children's exploration and concept development* look like in practice?

Young Infants	*Mobile Infants*	*Toddlers*
Maribel, a 5-month-old in Emma's child care program, is enjoying tummy time and has begun to reach for various toys on the floor. Emma notices her attempts to reach a squeaking toy that is just out of her arm's range. Emma moves closer to Maribel and says, "I see you reaching for that rubber duck, let me help you. I am going to move that toy a little closer so you can pick it up." After moving the toy, Maribel wiggles her body to grab the toy, Emma says, "Wow, Maribel, you got the duck!" As Maribel	One-year-old Jamie has been working on placing shapes into their correct cut-outs on the shape sorter off and on for the last week. Manuela has noticed that sometimes he gets upset and frustrated when the shapes don't slide in. When that happens, Jamie has been dropping the toy and moving on to another activity. Today Manuela has made sure that she can be on the floor while Jamie explores the toy. When Jamie starts to struggle and drops the toy, Manuela says, "That star is a hard	Tommy, a 30-month-old, is sitting on Laura's lap reading a book about fruits and vegetables. When they turn to a page containing cherries, Tommy points to the cherry and says, "Apple!" Laura smiles and looks at the book saying, "It does look like an apple, Tommy, doesn't it? It is red like an apple, and it is round like an apple, but this is actually a fruit called a cherry." Laura points to the stem of the cherry and says, "See how the cherry has a long stem on the top? Cherries have long stems, and

Using the *Critical Competencies*

The evidence-based critical skills defined by *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™ can be used by all stakeholders to build a shared understanding of what effective and specific teaching skills that support infants' and toddlers' social-emotional, cognitive, and language and literacy development look like. The *Critical Competencies* provide concrete skill statements and practice examples to help these professionals and those that support them successfully bridge the knowledge to practice process. Table 1 summarizes additional potential uses of the *Critical Competencies* by stakeholder roles.

A central tenet of the early care and education field is the individual context at the heart of each child's development. Similarly, the individual context of early childhood educators, programs, communities, and systems influence the potential uses of *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™. To be meaningful, these competencies (and truly any standards) must be used appropriately in the unique context of the individual educator, program, agency, organization, institution, community, or system. ZERO TO THREE's Workforce Innovations team can help your organization use this competency framework to analyze your existing workforce supports and target professional development priorities that are strategic and aligned

TABLE 1. **Potential Uses of *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™**

Stakeholders	Additional Potential Uses
Individual educators	Reflect on practice, assess current competencies, identify areas for growth, and plan for professional development
Program administrators	Specify competencies for roles and job descriptions; reflect on and evaluate staff performance; frame and record professional development needs, plans, goals, and achievements
Professional preparation and development (training, technical assistance, and higher education) providers	Inform and frame professional development goals, objectives, expected outcomes, and other elements of content and design; categorize and publicize opportunities
Organizations/institutions/ agencies that design or deliver professional development	Set or align professional development content; ensure aligned requirements; coordinate, categorize, and align offerings; facilitate modularized, stackable, transferable offerings and articulation agreements
Professional development systems	Assess current offerings and identify overlaps and gaps; plan for priority needs; categorize, promote, and track opportunities; frame expectations of competency and career progression

with your workforce goals. Our team of Workforce Innovations experts use their diverse and extensive experience to take an innovative approach that:

- centers on who your workforce members are and their professional needs;
- is grounded in research, including implementation science to support system efficiency, accountability, and fidelity; and
- offers a global perspective while honoring your unique context.

For more information about *ZERO TO THREE Critical Competencies for Infant-Toddler Educators*™, related Workforce Innovations services, and professional development opportunities, visit www.zerotothree.org/CriticalCompetencies or email workforce@zerotothree.org.

ZERO TO THREE's mission is to ensure that all babies and toddlers have a strong start in life. ZERO TO THREE provides parents, professionals, and policymakers the knowledge and know-how to nurture early development.

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Infants and Toddlers in the Policy Picture: A Self-Assessment Toolkit for States

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All infants and toddlers need good health, strong families, and positive early learning experiences. Furthermore, young children benefit most from an early childhood system that is built through collaboration. These goals form the framework for a policy agenda that creates a comprehensive range of services and supports that honor the needs and choices of families for their children. This self-assessment toolkit (available online at www.zerotothree.org/satool2015) draws on research on effective policies and best practices to help states evaluate progress toward building an effective early childhood system and set priorities for improvement.

The toolkit will guide you through a series of questions that will prompt you to collect data on how infants and toddlers are doing in your state and to analyze existing state policies and funding choices. In each section, ZERO TO THREE has provided national comparison data as well as suggested sources where you can find information for your state. Each topical section also includes optional stakeholder surveys that you may use to gather input on how existing services are meeting families' needs. We recommend that you read Suggested Process for Using the Self-Assessment Toolkit (see below) before you begin using the toolkit.

If you are interested in consulting with someone at ZERO TO THREE about how to use this resource in your state, or if you would like to provide feedback on your experience with the toolkit, please contact stateassessment@zerotothree.org.

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This toolkit was developed to help state policy leaders assess the current status of services for infants, toddlers, and their families and set priorities for improvement.

Suggested Process for Using the Self-Assessment Toolkit

This toolkit was developed to help state policy leaders assess the current status of services for infants, toddlers, and their families and set priorities for improvement. The toolkit is divided into sections focused on four goals of a state early childhood system: good health, strong families, positive early learning experiences, and collaboration and system building. ZERO TO THREE recommends that a state agency, statewide organization, or planning group take leadership in providing the data for your state, with input from a wider group of stakeholders. The following is a recommended process for completing the full toolkit, but state leaders may also choose to use only those sections that meet your specific needs at a given time.

(1) COLLECT STATE DATA AND POLICY AND PROGRAM INFORMATION

For each section of the self-assessment toolkit, you will be prompted to provide data on current child outcomes as well as the programs and policies that the state has in place. Much of this information is readily available in existing resources, such as ZERO TO THREE's State Baby Facts. It may be necessary to reach out to staff across state agencies to answer some questions. The tool provides information to help you compare your state's status to national averages, as well as prompts to include comments and

more in-depth data, when available. Once you have entered data for each section, you will have an opportunity to print a results page that you can share with others in your state.

(2) SEEK STAKEHOLDER INPUT

This toolkit will be most useful if completed with the involvement of a diverse group of individuals concerned with the needs of infants, toddlers, and their families. The agency or organization leading the process should develop a plan for seeking input from state and local agency staff administering various programs as well as from direct service providers. Thinking through who might have knowledge about each of the topics covered is a good way to make sure no key stakeholders have been left out. (A list of potential stakeholders compiled by ZERO TO THREE is available here: www.zerotothree.org/suggstakeholders.)

Stakeholder Survey

The final set of questions in each section of the tool is intended to be used as a stakeholder survey. You can convene focus groups and use these questions as a discussion guide or enter these questions in a Web-based survey tool, such as SurveyMonkey. The full list of survey questions is also available in Excel™ format here (www.zerotothree.org/satool2015) and can be exported to a Web-based survey tool. It may also be helpful to share the data that you have already collected with stakeholders and seek additional input for the Comments sections. For example, individuals working at the local level may bring different perspectives in identifying gaps in program access or challenges in effectively implementing state policies.

Family Survey

Another important group of stakeholders are families in the state who are current or potential users of state services. ZERO TO THREE has developed a separate survey (www.zerotothree.org/satool2015) written specifically for this purpose, which state leaders can use to inform planning efforts.

(3) USE THE RESULTS

After completing the self-assessment tool, ZERO TO THREE recommends convening a group of state leaders to select a short list of priorities for state action in each of the four goal areas: good health, strong families, positive early learning experiences, and collaboration and system building. Participants can analyze areas in which your state is lagging, compared to other states, as well as trends in stakeholder input. Participants may consider criteria for prioritizing select policy areas, including which changes would have the greatest impact for young children, as well as what is feasible in the current political and fiscal climates. Additional information on how to prioritize state policy strategies is available at www.zerotothree.org/egprioritycriteria.

Once priorities are established, it is critical to develop an action plan with assigned responsibilities, a timeline, and measurable outcomes. These priorities will also need to be incorporated into relevant state plans that will be reviewed by an oversight group on a regular basis. The process could be completed over the course of several meetings or calls or through a more intensive day-long retreat. To learn about some of the strategies states can consider to improve and better coordinate services for infants, toddlers, and their families, view ZERO TO THREE's recent publication, *A Place to Get Started: Innovation in State Infant and Toddler Policies* (www.zerotothree.org/public-policy/policy-toolkit/a_place_to_get_startedsinglesmar5.pdf) and online database of state initiatives, *Baby Matters: A Gateway to State Policies and Initiatives* (http://policy.db.zerotothree.org/policyp/home.aspx).

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Young children benefit most from an early childhood system that is built through collaboration.

Acknowledgments

ZERO TO THREE thanks the Alliance for Early Success for their generous support of this toolkit. In addition, we would like the following individuals that provided guidance throughout the development and writing process: Leanne Barrett, Rhode Island KIDS COUNT; Marijata Daniel-Echols, Michigan Early Childhood Investment Corporation; Diane Dellanno, Advocates for Children of New Jersey; Carey McCann, BUILD Initiative; Debra Reuvenny, Pennsylvania Office of Child Development and Early Learning; Stephanie Schmidt, Center for Law and Social Policy; Jennifer Stedron, Early Milestones Colorado; and Megan Waltz, Minnesota Department of Health. Finally, the following organizations provided valuable resources and advice on the toolkit development: Child Care Aware of America, Child and Family Policy Center, National Center for Children in Poverty, and the National Women's Law Center.

Social and Emotional Development

The Devereux Early Childhood Assessment for Infants and Toddlers (DECA-I/T) is a premier tool for assessing protective factors and screening for potential risks in the social and emotional development of very young children. This assessment is standardized, norm-referenced, reliable and valid, making it appropriate for child and program outcomes.

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Jargon Buster

Given the multidisciplinary nature of our work with infants, toddlers, and families, we often come across words or acronyms that are new or unfamiliar to us. To enhance your reading experience of this issue of *Zero to Three*, we offer a glossary of selected technical words or terms used by the contributing authors in this issue. Please note that these definitions specifically address how these terms are used by the authors in their articles and are not intended to be formal or authoritative definitions.

Adverse Childhood Experiences	Adverse Childhood Experiences (ACEs) are stressful or traumatic events that take place before age 18. The 10 categories of ACE domains consist of physical, emotional and sexual abuse, physical and emotional neglect, mental illness of caregiver, incarceration of a relative, violence toward the mother, substance abuse in the home, and parental divorce or separation. [Find it in Purewal et al., page 10]
Contingency	Contingency, or the back-and-forth style of interactions that draw in both partners, is a component of high-quality social interactions. Infants are drawn to contingent responses very early in life. Children's preference for contingent interactions extends into toddlerhood, and it aids in the development of prosocial behaviors as well as word learning. [Find it in Meltzoff & Kuhl, page 2]
Executive Functions	Executive functions are a collection of competencies that include developing working memory, growing cognitive flexibility, and developing capacities for inhibiting an initial response to consider alternative responses that might be better. These skills support learning and academic achievement in many ways throughout childhood and adolescence, such as by helping children make reasoned rather than impulsive judgments, and to consider alternative perspectives. [Find it in Thompson, page 18]
Neuroplasticity	During infancy and early childhood, the brain shows an extraordinary ability to change with experience, and this is called *neuroplasticity*, because the young brain is highly malleable and open to revision. Neuroplasticity presents an important opportunity. The experiences children have literally shape the structure of their adult brains. [Find it in Meltzoff & Kuhl, page 2]
Parentese	A type of exaggerated speech consisting of a sing-song style cooing, called infant-directed speech, or *parentese*, is a valuable piece of the social interaction puzzle. In general, newborns prefer to listen to speech sounds over other non-speech sounds and prefer infant-directed speech to typical, or adult-directed speech. [Find it in Meltzoff & Kuhl, page 2]
Toxic Stress Response	*Toxic stress response* is an intense, frequent, and/or sustained activation of the body's stress response and autonomic nervous system, in the absence of buffering by a caring adult. If these effects occur in early life as a result of the exposure to childhood adverse experiences such as abuse, neglect, and household dysfunction, in the absence of nurturing caregiving relationships, or in the presence of additional vulnerabilities of the child or of the family, it can activate a stress response that becomes "toxic" for the body. [Find it in Purewal et al., page 10]

UPCOMING ISSUES

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May: **Understanding Complex Trauma**
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