



ZERO TO THREE
Early connections last a lifetime

The Growing Brain

From Birth to 5 Years Old

A TRAINING CURRICULUM FOR
EARLY CHILDHOOD PROFESSIONALS

Aidan Bohlander, Claire Lerner, and Ross Thompson, Editors

– *Participant Manual* –

Unit 5: Social-Emotional Development



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Preface

“The brain is a social organ of adaptation built through interactions with others.” (Cozolino, 2014, p. xvi)

The development of the growing brain is one of the most important topics in early childhood development, with significant implications for early childhood professionals. Research on infant brain development is exploding. With the advent of the magnetoencephalography (MEG) for infants, researchers can now see more clearly into a young child’s brain activity and learn what impact interactions have on certain aspects of development.

The greatest rate of brain growth and development is during the first few years of life. This rapid development occurs at the same time a child is making critical connections with his or her outside world. Because of such rapid brain growth during the first few years, early experiences have a disproportionately greater impact on the newly growing brain’s development.

Often, an early childhood professional provides one of the earliest human interactions an infant or young child will experience. The professional will play a significant role in determining the experiences and environment that shape and influence the construction of the early brain. When an early childhood professional and an infant interact together, each is inducing the other’s internal states of being. It’s the basic day-to-day experiences, be they nurturing or non-nurturing, that set the young child on his or her course of brain development.

It is for these reasons that ZERO TO THREE, in partnership with the University of Arkansas Early Care and Education Projects, developed The Growing Brain (TGB) curriculum for early childhood professionals. Since 1977, ZERO TO THREE has been translating research that helps us understand how the youngest children think, learn, and interact with the important adults in their lives. We turn that scientific knowledge into helpful tools and practical resources for parents, policymakers, and professionals, like yourself, to help make the lives of babies, toddlers, and their families better.

This Participant Manual, along with the other curriculum materials you’ve received, is intended to support your learning experience. In the Manual you will find key points from each presentation as well as discussion questions. Please use this Manual as a workbook during the course to record presentation and discussion highlights. Together with the other TGB materials, we hope it will serve as a valuable record of your learning and resource on early brain development that you will return to again and again as you work with young children.

Thank you for what you do each and every day to support the youngest and most vulnerable members of our society. Each interaction that you have with each young child is helping to shape the very structure of his or her brain. That is an incredible responsibility and privilege! Thank you for your participation in this course and your commitment to be a positive influence on the children and families you serve.

Reference

Cozolino, L. (2014). *The neuroscience of human relationships: Attachment and the developing social brain* (2nd ed.). New York, NY: WW Norton & Company.

Introduction

How wonderful to have this new resource on the brain and child development! I remember when we wrote our curriculum, *Early Development and the Brain: Teaching Resources for Educators* (Gilkerson & Klein, 2008), a colleague asked: “Is the brain a fad? What will be next?” The brain has hardly been a fad; as one of the central regulators of the body and of our experience with the world, its critical importance in understanding young children’s development and how best to nurture their growth will always be supremely important for anyone who cares about young children and is invested in nurturing their healthiest development.

We wrote the former curriculum for early childhood faculty and trainers so they could confidently teach about the brain and its role in early development to their students. While early educators had long focused on the whole child, brain imaging brought a seismic shift in our understanding about biopsychosocial development. Now students in early childhood development, as well as faculty, fully appreciate the power of brain health and functioning and are eager to learn how they can best build the brainpower of the children they serve.

This new curriculum, *The Growing Brain (TGB)*, addresses the same vital areas that we covered: the structure and function of the brain; factors and experiences that can harm the growing brain, especially stress, and how to protect the brain from harm; and the connections between the brain, language development, and sensory functioning.

In the 9 years since we wrote our curriculum, much more has been discovered about the brain, especially regarding emotional regulation, the role of caregiving relationships, and the impact of trauma. Evidence that young children’s early experiences shape the actual architecture of the brain and how it functions has grown dramatically, and it has put a spotlight on the importance of the interface between the brain and the environment and on the centrality of human interaction and relationships in brain development. Accordingly, *TGB* focuses heavily on the growing field of “affective neuroscience”—the science of emotions and the brain—and how the earliest interactions shape lasting patterns of relatedness. The link between brain, body, and behavior is ever clearer. Unmediated adverse childhood experiences (ACEs) are linked with problems in adult physical and mental health in ways we might not have imagined. Synchrony in mother-infant behavioral interactions also has a significant influence on the growing brain, as this synchrony is mirrored physiologically in the child’s heart rate synchrony—heart to heart and brain to brain. This early synchrony relates to self-regulation in infancy and toddlerhood and even shapes the adolescent’s capacity for empathy. In this *TGB* curriculum, you will learn about the impact of disrupted synchrony and how factors such as maternal depression affect the child’s ability to read emotions. *TGB* also includes very important content on the impact of stress on the developing brain, which is heavily influenced by the availability of a caring adult to help mediate the stress—to provide protection and help make the experience manageable. One of the most powerful features of this curriculum is that it translates very complex concepts in a way that is digestible, is meaningful and relevant, and provides a range of interactive exercises that enable trainees to integrate and apply these concepts in their daily work supporting young children. In short, it engages trainees’ brainpower in active learning!

Further, while professionals must be critical consumers of neuroscience, how do we help parents absorb this new information from science and build their confidence in what *they know* about their child? How can we help protect and grow parents’ intuitive competence—a concept well-documented decades ago in studies of parenting? While brain and behavior research will continue to bring new discoveries, we are reminded of one of the most fundamental ideas of early care and education: the essential value of observation as a way of knowing. A child’s behavior is one of the best windows into brain functioning. Our role is to encourage parents, teachers, and other caregivers to pause, watch, and truly notice the child’s responses to his world—to see what this child can take in at this moment on this day. What experiences does he approach? What experiences does she pull away from—even a bit? What is too much input for him? What is too little for her? Where is the sweet spot—the space for moderate novelty in which the brain thrives?

The science of early development is an integrated science, and you are an integrated professional. Enjoy deepening your understanding of child development and the brain and sharing that knowledge with others!

Linda Gilkerson, PhD
Professor, Erikson Institute

Note for Participant Manual: Unit 5

This section of the participant manual is comprised of important content and reflections related to Unit 5, Social-Emotional Development of *The Growing Brain*. All 7 Units are available separately from ZERO TO THREE, as well as available as a complete publication package. Please see the participant manual table of contents on page 3 for a list of all 7 Units.

We are proud of the participant manual as a way of enhancing participants' understanding of *The Growing Brain* as an interactive curriculum: it is a fully designed and functional workbook for learners to explore and exchange ideas. They can be purchased individually, or as a group purchase. Your learners can make the purchases or you can on their behalf.

Unit 5 covers:

- how the developing brain is affected by children's interactions with the important people in their lives;
- how adults play a critical role in supporting young children's social-emotional development; and
- how brain connections are experience dependent, reflecting how early experiences last a lifetime.

The participant manual is available from the ZERO TO THREE bookstore as a digital download. This download is a single-use license for either you or your learners to print—in order to make best use of the workbook features.

Teaching *The Growing Brain: Birth to 5 Years Old*

The Growing Brain: From Birth to 5 Years Old is a 21-hour course. The following is a suggested time schedule for teaching each unit based on the field test. Times may vary from trainer to trainer and based on the needs of participants.

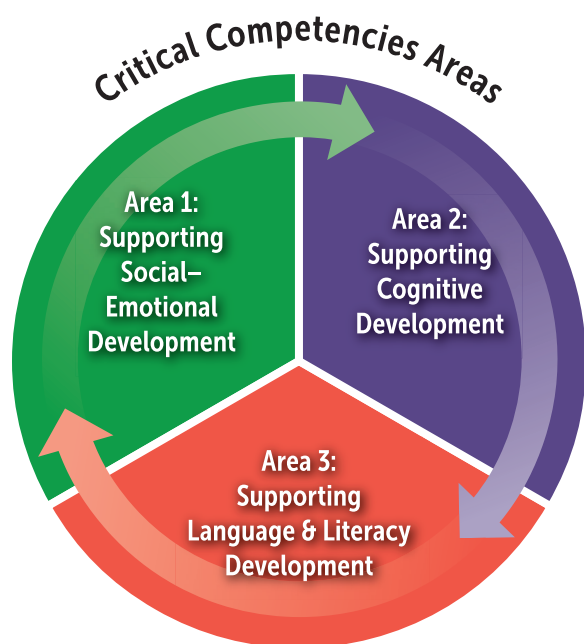
Unit 1: The Growing Brain: The Basics	3 hours
Unit 2: The Growing Brain: The Factors Affecting Brain Growth and Development	3 hours
Unit 3: The Growing Brain: Communication and Language Development	3 hours
Unit 4: The Growing Brain: Cognition and Executive Function	3 hours
Unit 5: The Growing Brain: Social-Emotional Development	3 hours
Unit 6: The Growing Brain: Understanding Behavior	3 hours
Unit 7: The Growing Brain: Everyday Play	3 hours

*Note: The 21 hours is training time and each unit includes only one 10-minute break. *Additional time must be scheduled for additional breaks of any kind.*

Critical Competencies Areas and Sub-Areas

The *ZERO TO THREE Critical Competencies for Infant-Toddler Educators™* define the specific evidence-based teaching methods and practices that support and nurture young children's social-emotional, cognitive, and language and literacy development and learning.

ZERO TO THREE has completed a crosswalk between the *ZERO TO THREE Critical Competencies for Infant-Toddler Educators™* and *The Growing Brain: From Birth to 5 Years Old* training curriculum. Significantly for learners, these two professional development curricula and resources now closely align and complement each other. For more information on the *Critical Competencies* and how you can use them to inform your professional development goals, visit www.zerotothree.org/criticalcompetencies.



Critical Competencies Sub-Areas

Area 1: Supporting Social-Emotional Development

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

Area 2: Supporting Cognitive Development

- C-1 Facilitating Exploration and Concept Development
- C-2 Building Meaningful Curriculum
- C-3 Promoting Imitation, Symbolic Representation, and Play
- C-4 Supporting Reasoning and Problem Solving

Area 3: Supporting Language & Literacy Development

- L&L-1 Promoting Communication Exchange
- L&L-2 Expanding Expressive and Receptive Language and Vocabulary
- L&L-3 Promoting Early Literacy

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Unit 5

Goal: To understand how social-emotional development unfolds in the first 5 years and the brain's role in this process

- Objectives**
- 1: Understand How Social-Emotional Development Unfolds in the First 5 Years and How to Support It in Young Children
 - 2: Identify Areas of the Brain Involved in Social Interactions and Emotional Reactions
 - 3: Understand the Role of Relationships and Attachment in Social-Emotional Development
 - 4: Understand the Effect of Stress on Social-Emotional Development
 - 5: Understand the Development of Empathy

1 Understand How Social-Emotional Development Unfolds in the First 5 Years and How to Support It in Young Children



Social-emotional development includes the child's experience, expression, and management of emotions, as well as the ability to establish positive and rewarding relationships with others.

Loving relationships provide young children with a sense of comfort, safety, confidence, and encouragement. They teach young children how to form friendships, communicate emotions, and deal with challenges.

Strong, positive relationships also help children develop trust, **empathy**, compassion, and a sense of right and wrong.

Think About It: Beginning at birth, young children rapidly develop their abilities to experience and express different emotions, as well as their capacity to cope with and manage a variety of feelings (National Scientific Council on the Developing Child, 2004/2011).

Social-Emotional Development

Social-Emotional Development From Birth to 12 Months

Over the course of this first year, the most important task for babies is to develop a secure attachment to their caregivers. The quality of a child's attachment to her primary caregivers has a significant effect on her long-term development.

Starting from birth, babies are learning who they are by how they are treated. In this first year, babies are developing an understanding or recognition of themselves as individuals in their environment, as separate from their caregivers.

What's going on in the brain?

- Several emotion-related brain structures are already developed and active, such as the **amygdala** and other structures of the **limbic system**.
- The brain also matures during the first year in ways that prepare the baby for focused social interaction.

➔ What are some ways that you see the babies in your care developing social-emotional skills?

Social-Emotional Development From 12 to 24 Months

Young toddlers are starting to develop a growing awareness that they are separate and independent from others. This new knowledge helps them understand that other people have thoughts and feelings that may be different from their own and helps children begin to develop empathy.

➔ Record the definition of empathy:

The awareness that they are separate from others also leads toddlers to behaviors that declare their independence, such as starting to protest, or even say "no" when they don't get their own way.

➔ What are some examples of how you see the toddlers in your care developing social-emotional skills?

What's going on in the brain?


The baby's brain is growing significantly during the second year. One of its achievements is the growth in language skills due to development of the language-related regions of the **temporal lobe**.

UNIT 5

Social-Emotional Development

Social-Emotional Development From 24 to 36 Months

Two-year-olds' growing independence, their understanding that they are fully separate beings with their own thoughts and feelings separate from those of others, and their ability to communicate with words, all mean that you may hear a lot of "Mine!" "No!" or "I do it!"

Starting around 2 years old, children also begin to play more interactively with their peers. You will also see a big increase in pretend play, which shows that children are reaching a critical social-emotional and cognitive milestone: the development of **symbolic thinking**. 

➔ Record the definition of symbolic thinking:

➔ What are some examples of how you see 2-year-olds in your care developing social-emotional skills?

What's going on in the brain?

- Children between 2 to 3 years old have difficulty with self-control, waiting, and managing their emotions because the part of their brain that helps children exert self-control, the **prefrontal cortex**, is still developing.
- The parts of the brain that process emotions, such as the **limbic system**, are more fully developed in children at this stage. This difference in areas of brain development are why we see children with little self-control and big emotions.

Social-Emotional Development From 3 to 5 Years

From 3 to 5 years old, the growth in the prefrontal cortex allows children to begin to exert greater self-control and to engage their **executive functions**.

➔ Record the definition of executive functions:

What's going on in the brain?

Maturation of the prefrontal cortex still has a long way to go (it continues to develop for 20 years). Therefore, self-control is still limited at these ages. So it is typical to see children struggling to manage their emotions, especially in social situations.

Preschoolers' self-concepts are also developing rapidly, due to their growing independence and ability to do things for themselves, and their increasing ability to reflect and reason.

➔ What are some examples of how you see preschoolers in your care developing social-emotional skills?

Use Handout 5.1 at the back of this chapter to assist you.

2 Identify Areas of the Brain Involved in Social Interactions and Emotional Reactions



Brain Development and Social-Emotional Development

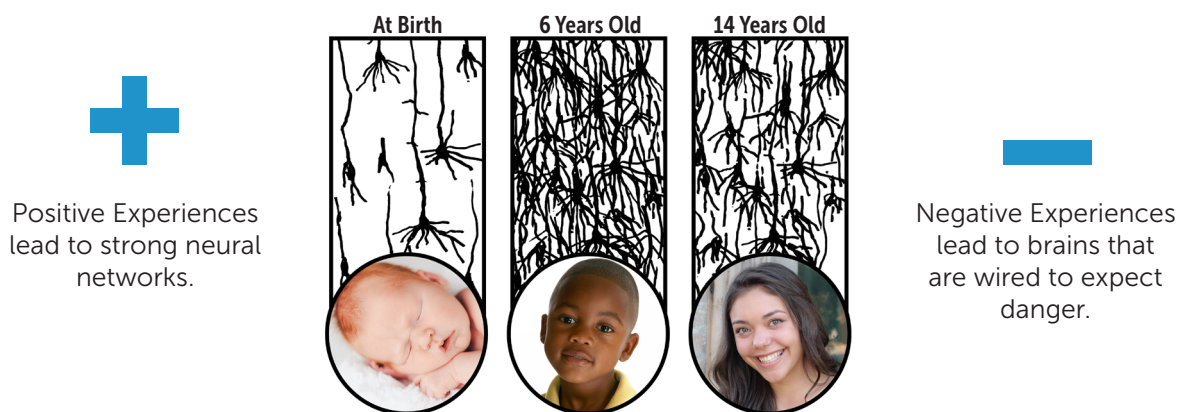
Social-emotional development and brain development are linked, with one influencing the other. This relationship between social-emotional and brain development underscores the critical role that parents and providers play in the long-term health and well-being of the children in their care (National Scientific Council on the Developing Child, 2004/2011, 2005/2014).

Experience Shapes the Structure and Functioning of the Brain

While the science suggests that most of our brain cells (called **neurons**) are present at birth, the connections between these neurons are still developing and multiplying at a rapid-fire pace—more than 1 million neural connections per second in the first 3 years (Center for the Developing Child, n. d.).

Although many of these connections are genetically determined, they are also influenced by early experiences. These experiences may be provided by parents, caregivers, providers, friends, community members, and others who play an important role in the life of a child.

Brain connections are **experience-dependent**.



Plasticity

The brain's ability to organize and reorganize itself based on an individual's experience is called **neuroplasticity**. Although plasticity continues over the course of a lifetime, the brain is most adaptable and shaped by experiences in the early years (Thompson, 2014).

Think About It: The early childhood is a period of both opportunity (if the child's experiences and interactions are positive) and vulnerability (if the child's experiences and interactions are negative).

**Use It or Lose It**

In the early years, the brain is genetically programmed to produce more connections than it can use. This large number of neural connections helps to prepare young children for a wide range of experiences, environments, and interests. Over time, through a process called **pruning**, those neural connections that are not used will weaken and, eventually, disappear.

Think About It: The elimination of underused connections is helpful to keeping the brain efficient in carrying out its daily functions (Siegel, 1999; Society for Neuroscience, 2016).

3 Understand the Role of Relationships and Attachment in Social-Emotional Development



Attachment

One key factor in children’s social-emotional development is the nature of their **attachment** to primary caregivers. Babies are wired from the start to attach to at least one special person who will help keep them safe—not only physically but also emotionally.

The relationship with a parent or caregiver serves as the **secure base** from which a young child feels comfortable to play, explore, and discover—key ingredients for healthy brain development (Bowlby, 1988).

Over time, this pattern of interactions becomes part of the young child’s expectations for relationships. Attachment theorists refer to this internalized idea of how relationships work as an **internal working model**.

Think About It: The internal working model influences how young children feel about themselves, as well as how they approach and navigate relationships throughout their lifetime (Ainsworth et al., 1978; Bowlby, 1988).



Early Social Interactions

Beginning at birth, babies seek out social partners, such as mothers and fathers. These early social interactions affect the developing brain (Meltzoff & Kuhl, 2016). Connections are also made in the baby's brain for positive emotions related to communication and connecting with others. The more those connections are reinforced, the stronger they become, and the stronger the baby's expectation that relationships are positive and pleasurable. **SE-1** **SE-2**

Think About It: Children who expect to be treated lovingly, respectfully, and sensitively are more likely to develop relationships that are characterized by these attributes than children who have come to expect that relationships are not supportive or loving (Lamb, Morrison, & Malkin, 1987).

- ➔ How can providers nurture social-emotional development and how does it support healthy brain development?

Use Handout 5.2 at the back of this chapter to assist you.

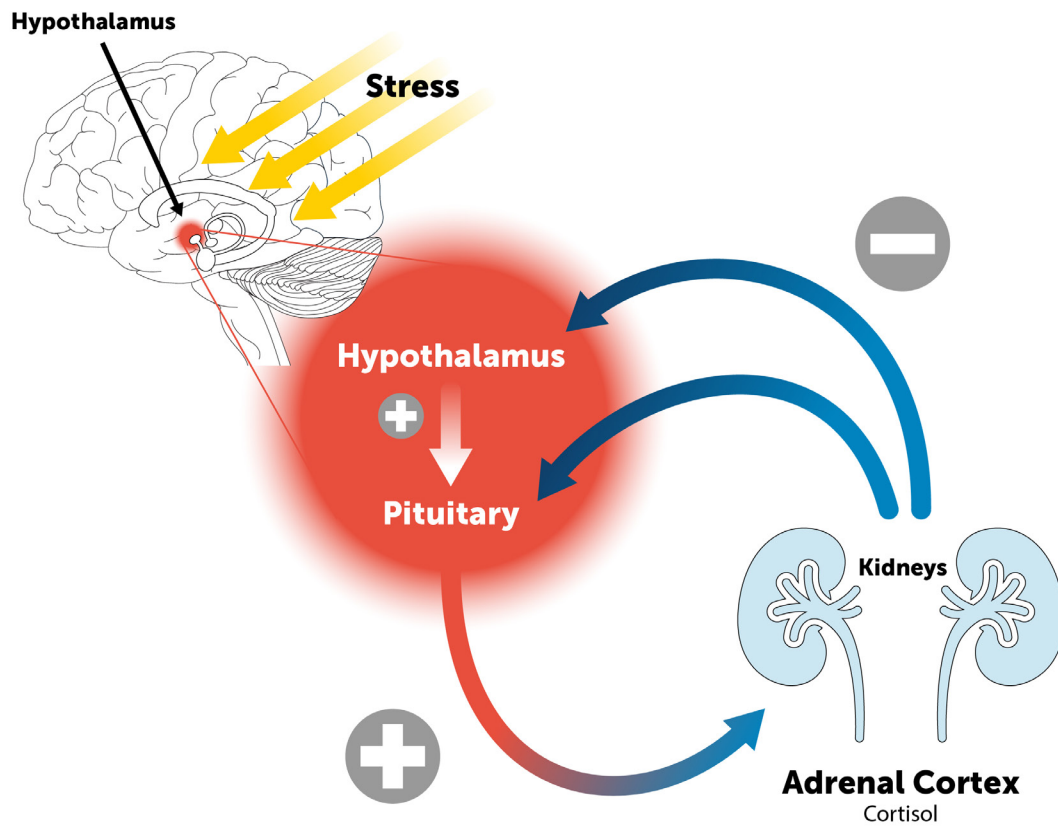
4 Understand the Effect of Stress on Social-Emotional Development

The Impact of Stress on Social-Emotional Development

Strong, secure attachments are vital for the development of future relationships and healthy brain development. Having a parent or primary caregiver who is emotionally unavailable or unable to support the child, especially in coping with life's stressors, is not good for children's growing brains. Stressful or traumatic situations and events tend to have a ripple effect. Stress spreads out across the household and affects family dynamics, interactions, and routines.



Think About It: Just as consistent, nurturing, and tuned-in care can help wire the brain for optimal development, chronic or unrelenting stress can undermine long-term neurological and physiological health.



Stress and the Brain

The parts of the brain that are most heavily involved in the regulation of stress include (take notes on each part of the brain involved in the regulation of stress below):

➔ The **amygdala**:

➔ The **hippocampus**:

➔ The **hypothalamus**:

The **hypothalamic-pituitary-adrenocortical (HPA) axis** is the central stress response system.

What are some strategies to help calm the stress-response system?

Think About It: Early childhood is a time of great opportunity and vulnerability for the developing brain and for a child's social-emotional development. The experiences children have with their primary caregivers during this time have the power to shape the structure and change the functions of the brain.

5 Understand the Development of Empathy



Empathy

Empathy is the ability to recognize the emotions and feelings of others, to imagine how someone else is feeling and respond sensitively. Children develop empathy through shared interpersonal experiences, such as playing together, which typically begin when children are between 2 and 3 years old (Decety, 2010).

Think About It: By 12 months old, infants begin to comfort others. They may gently pat the back of another child who is crying. And by 14–18 months old, children display spontaneous helping behaviors, such as offering a caregiver a toy to put on a shelf.

➔ Can you think of other examples of how infants, toddlers, or preschoolers display empathy?

Social-Emotional Development

UNIT 5

Strategies for Supporting Empathy and Social-Emotional Development

Document classroom strategies for supporting social-emotional development at different ages.

Birth to 12 Months

12–24 Months

24–36 Months

3–5 Years

Let's Review! Key Messages:

- The developing brain is affected by children's experiences and interactions with the important people in their lives.
- Adults play a critical role in supporting young children's social-emotional development.
- Brain connections are experience dependent; early experiences last a lifetime.

Action Planning

In the next _____ days, I am going to _____.

One thing that will help me achieve my goal is to _____.

Notes

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Social-Emotional Development

UNIT 5

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Handout 5.1

Social-Emotional Milestones From Birth to 5 Years

Birth to 12 Months

- Read and respond to adult cues and signals
- Use simple gestures to start or reciprocate interactions
- Seek and develop relationships with one particular adult
- Express distress and other negative emotions when separated from primary caregiver
- Demonstrate interest in others
- Influence the reactions and behaviors of others

12–24 Months

- Engage with others through complex back-and-forth interactions
- Feel secure to explore independently
- Begin to take turns with support from adult caregivers
- Recognize self in mirror or picture and refer to self by name
- Become more independent; move farther away from caregivers to explore
- Cooperate by helping to put things away
- May become angry if activities are interrupted or if they don't get their way
- Respond to simple commands by adult
- Begin to realize that they can't have everything their own way (but still have a hard time managing when they can't have what they want)
- May hit, bite, or fight over a toy
- Imitate adult behaviors in play
- Show a complete range of emotional expressions
- Begin to move from parallel to more interactive play as he or she nears 24 months
- Ask for what they want with gestures, sounds, and/or words

24–36 Months

- More strongly distinguish themselves as a separate person
- Become more aware of gender differences
- Separate more easily in familiar surroundings; need help transitioning to new situations
- Feel strongly possessive of loved ones
- Experience a peak in frustration and tantrums between 24 and 30 months
- Enjoy wider range of relationships; eager to meet new people
- Begin to obey simple rules
- Play simple games

(continued)

- Play more cooperatively with peers
- Communicate about experiences and the thoughts and feelings of others
- Share their own ideas
- Complete complex tasks independently
- Share and exchange materials and objects with others

3–5 Years

- Solve more complex problems
- Play more complex games
- Engage in collaborative play with others
- Engage in more advanced pretend play, developing stories with a beginning, middle, and end
- Describe own feelings and wants
- Respond to others' emotional needs
- Comfort others to help them feel better
- Greater impulse control
- Able to use words to express complex feelings
- Regulate attention, thoughts, and feelings with less support from an adult

Handout 5.2

Supporting Social-Emotional Development: Sample Scenarios

Scenario	What It Might Mean	What You Would Do	How Your Response Supports Brain Development
You are playing with a baby. She begins to arch her back and turn away.			
A toddler is trying to fit a shape into the shape sorter and is getting very frustrated. He ultimately tosses the toy, and it hits another child.			
A 2½-year-old plays by herself most of the day. When other children try to engage her, she turns away.			
A group of 3-year-olds are playing in the sandbox. They decide that the sandbox is going to be an ocean where their sea critters live. One child insists the sandbox is not the ocean—it's a farm. When the other children won't budge, he dumps a whole bunch of sand out of the box and storms off.			
A 4-year-old consistently argues with the limits the teacher sets, telling her that she's not the boss of him. He turns away and laughs when she tries to correct him.			

Handout 5.3

Key Terms

- **Amygdala:** A structure located in the temporal lobe of the forebrain that perceives and evaluates a potentially threatening event or circumstance. Its functioning can be affected by an increase in stress-induced cortisol. The amygdala matures early in life and plays a critical role in the body's learned response to fear (National Scientific Council on the Developing Child, 2010; Society for Neuroscience, 2016).
- **Attachment:** The enduring bond that children form with their regular caregivers based on the experiences they have with those primary adults in their lives beginning in their early years. Classical attachment theory sets forth that our early relationships with our caregivers influence our expectations of relationships throughout our lives.
- **Bottom brain functions:** This is a term used to refer to the brainstem and structures in the temporal lobes—most important, the amygdala, hypothalamus, and other structures of the limbic system (Ochsner et al., 2009).
- **Brain stem:** The part of the brain made up of the hindbrain and midbrain. Its functions include those needed for daily living, such as controlling breathing, heart rhythm, blood sugar levels, sleep/wake patterns, alertness, motor control, and eye movement.
- **Cerebellum:** The part of the brain at the back of the skull that is responsible for the coordination and regulation of muscular activity.
- **Cerebral cortex:** The outer layer of the cerebrum that consists of four lobes: frontal, parietal, occipital, and temporal. The four lobes of the cerebral cortex are responsible for the important functions of processing cognitive, emotional, behavioral, and sensory information (Society for Neuroscience, 2016).
- **Cortisol:** A hormone produced to help the body prepare for and respond to stressful conditions (Thompson, 2014).
- **Empathy:** The ability to recognize the emotions and feelings of others; to imagine how someone else is feeling and respond with sensitivity.
- **Executive functioning:** A set of cognitive skills that controls impulses and filters out distractions. Executive functions allow children to focus their attention, organize information, put a plan into action, and also have a back-up plan if necessary (Diamond, 2006).
- **Experience-dependent:** This describes connections in the brain that happen only if the child receives the environmental stimuli to build those connections.
- **Hippocampus:** The hippocampus is responsible for the storage of long-term memories as well as for the memory of the location of objects or people (Society for Neuroscience, 2016).
- **Hypothalamus:** The hypothalamus is the structure responsible for controlling our body temperature, thirst, hunger, sleep, circadian rhythm (sleep/wake cycle), moods, and the production of many of the body's essential hormones that help control different cells and organs (Society for Neuroscience, 2016).
- **Hypothalamic-pituitary-adrenocortical (HPA) axis:** The HPA axis is the central stress response system. It is part of the neuroendocrine system and is another key player in the body's response to stress. The HPA axis is activated when the brain perceives danger. The hormone cortisol is produced to help the body prepare for and respond to stressful conditions (Thompson, 2014).
- **Internal working model:** A cognitive framework comprising mental representations for understanding the world, self, and others. The child's attachment relationship with the primary caregiver leads to the development of an internal working model (Bowlby, 1988).

- **Limbic system:** A complex set of structures that lies on both sides of the thalamus, just under the cerebrum. It includes the hypothalamus, the hippocampus, the amygdala, and several other nearby areas. It is primarily responsible for our emotional life. It controls the basic emotions (e.g., fear, pleasure, and anger) and drives (e.g., hunger, sex, dominance, and care of offspring). It also plays a major role in the formation of memories.
- **Neural networks:** Neurons communicate, or connect, with one another by sending nerve impulses from one neuron to another, forming long chains. These chains eventually create complex networks. Neural networks look like long chains, all crossing each other.
- **Neuron:** A nerve cell used to pass messages across the nervous system.
- **Neuroplasticity:** The phenomenon that connections in the brain are influenced by a person's experiences in the world. The brain is more adaptable during early childhood years and becomes less adaptable as individuals grow older. Two types of neuroplasticity are experience-dependent and experience-expectant.
- **Prefrontal cortex:** The front part of the frontal lobe. This region of the brain is widely considered the center of executive functions and is responsible for regulating thought, emotions, and actions.
- **Pruning (or synaptic pruning):** The process by which neural connections are refined. Neural circuits and connections that fire more often (are used more often) are retained, while those that are not used are removed (Society for Neuroscience, 2016). Pruning allows brain circuits to run more efficiently. Early experiences affect the nature and quality of the brain's developing architecture by determining which circuits are retained and which are pruned through lack of use. In this way, each child's brain becomes better tuned to meet the challenges of his or her particular environment (Siegel, 1999; Society for Neuroscience, 2016).
- **Secure base:** This is provided by an attachment figure who meets the child's needs and to whom the child can turn as a safe haven when upset or anxious and in need of reassurance.
- **Social-emotional development:** This includes the child's experience, expression, and management of emotions and the ability to establish positive and rewarding relationships with others (Cohen, Onunaku, Clothier, & Poppe, 2005). It encompasses both intrapersonal and interpersonal processes.
- **Spinal cord:** The part of the central nervous system that receives information from the skin, joints, and muscles. It also carries all the nerves that control all of our movements. Via the spinal cord, our brains receive information from our ears, eyes, nose, mouth, and the rest of our bodies.
- **Symbolic thinking:** A developmental milestone beginning around 18 months old, where children represent people, objects, ideas, or events with images, words, or in play. For example, holding a banana up to one's ear and mouth as though it were a phone.
- **Temporal lobe:** The temporal lobe has a variety of important functions, which include (Society for Neuroscience, 2016):
 - processing auditory information—such as hearing different pitches of sound,
 - language recognition—understanding what words mean,
 - storing visual memory—such as remembering a familiar face,
 - short-term and long-term memory—through a structure called the hippocampus, and
 - emotional responses—through a structure of the temporal lobe called the amygdala.

Supporting Social-Emotional Development

Research clearly shows that young children’s social-emotional development is one of the most important influences on success later in life, both academically and socially. Starting from birth, babies learn who they are by how they are treated. Loving relationships provide young children with a sense of comfort, safety, and confidence. They teach young children how to form friendships, communicate emotions, and deal with challenges.

Here are some of the skills that support healthy social–emotional development: making friends, showing anger in a healthy way, figuring out conflicts peacefully, taking care of someone who has been hurt, waiting patiently, and following rules. Like any skill, young children develop these abilities in small steps over time.

What you can do:

Tune in to your child’s cues and follow his lead. For example, your 10-month-old might start kicking, babbling, and grabbing at mealtime to show you he really wants to hold his own spoon. You know that he’s not yet able to feed himself, so you give him a baby spoon to hold in his hands while you continue feeding him with another. This is responsive care because you took the time to think about what your baby’s behavior means and figured out a way to support him.

Tune in to your child’s unique needs and approach to the world. What are her likes and dislikes? Which toys are her favorites? What daily schedule works for her? What experiences does she thrive on, and for which does she need more support?

Be affectionate and nurturing. Touching, holding, comforting, rocking, singing, and talking to your baby all send the message that he is special and loved. While it’s easy to be affectionate when babies are cute and cuddly, it’s also important to nurture babies when they are difficult, fussy, crying a lot, or colicky. When you can be there for your baby during the tough times, children learn that they are loved for who they are—no matter what.

Help your child feel safe and secure. You help your baby feel safe and secure when you respond to her cries and other communications—for example, picking your baby up when she lifts her arms in the air as if to say, “Up!” Babies also feel secure when they get lots of affection from you and when their days are predictable. It is the love and trust you share that helps your child learn that you will always be there for her. This trust gives her confidence.

Establish routines for your child. Knowing what to expect helps babies feel safe, confident, and in control of their world. Try to keep daily routines, like meals and bedtime, in the same order and at the same general time each day.

Help your toddler become a confident problem solver. Give your child some time to try to figure out a problem on his own—like how to get his rain boots on. When you see him start to get frustrated, give him the help he needs to master the challenge. For example, you may line up the boots with the feet in the correct position and then suggest the child lean on a chair while he slides a foot in.

Praise the process, not just the result. The goal is to help children feel good about their efforts, not just the outcome. When you notice your child’s efforts (“You are working so hard on that puzzle, really thinking through where each piece fits”), it lets her know how important it is to be persistent and keep trying.

Help children learn to resolve conflict in healthy, appropriate ways. You have probably noticed that toddlers want what they want when they want it. They have little self-control, which means they are not very good at waiting and also have a hard time stopping themselves from acting on their desires.

- **Show them how to share.** You might set a kitchen timer to give them a visual reminder of how long they have to wait for their turn. Comfort children who have trouble coping with waiting. Help them get involved in something else in the meantime.
- **Play turn-taking games.** Try taking turns hitting a foam ball off a tee, passing balls around a circle, or playing together in water or sand. Activities like these help children “practice” the art of sharing.

Help your child understand her feelings, and show that you have confidence she can cope. “You are feeling sad that Carly got the cupcake with the butterfly on it that you wanted. I know that’s hard, but now you can choose the blue cupcake or the green one.” Teaching children the words for emotions is important because, over time, it gives children the ability to talk about their feelings instead of acting them out.

Help your child express his feelings in age-appropriate ways. Offer acceptable ways to share strong feelings. For example, toddlers can rip paper, stomp their feet, or throw a foam ball when they are very mad. Help your little one understand there are many healthy, non-hurtful ways of expressing feelings.

Encourage early friendships. Children need practice to learn to share, take turns, resolve conflicts, and experience the joy of friendship. Playing with peers helps children develop all of these important skills. When you provide fun choices for activities, a safe, supportive environment for play, and the needed guidance to help children share and resolve conflicts, they will discover the pleasure of early friendships.

Help your child see others’ points of view, which encourages empathy. “Casey is feeling sad because his daddy just said good-bye. Let’s see if he wants to read a book with us.”