



Caring Relationships: The Heart of Early Brain Development

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Of all that brain science has taught us over the last 30 years, one of the clearest findings is that early brain development is directly influenced by babies' day-to-day interactions with their caregivers. Even before birth, babies have a built-in expectation that adults will be available and care for their needs (Shonkoff & Phillips 2000). Their very survival depends on this availability. If babies' expectations for protection and nurturance are met, their brains experience pleasure and delight. These pleasurable early interactions stimulate the brain, motivating the baby to relate to those who care for them with confidence and ease. If their expectations are less than adequately met, their confidence in getting their needs met through relationships may be challenged. When this occurs, emotional and social development suffer, and, because babies' emotional base is the foundation for all other learning, so do intellectual and language development (Greenspan 1990; IOM & NRC 2015).

A baby's early experiences in relationships, whether at home or in an early education environment, set the stage for future brain functioning. The information gathered in these early relationships is at the heart of a rich and complex brain-building process. As babies experience responses from their caregivers, their brains start to form expectations for how they will be treated and how they should respond. For example, when a baby fusses or cries, consistent adult responses that provide comfort help the child anticipate similar responses in the future. As the expectations are strengthened by similar experiences being repeated, babies' brains construct perceptions of the social and emotional world in which they live. Those perceptions influence how babies understand their environment, relate to others, and engage in learning. When those experiences are primarily positive, children perceive the behaviors and messages of others in positive ways and are motivated to explore more and more of the world (including people and things). When babies have repeated adverse early experiences, they come to expect the behaviors and messages of others to be negative, and they start to perceive new experiences with others in a negative way.

In early brain growth, experience creates expectation, which alters perception.

Whether babies' early relationships are largely positive or negative significantly impacts their ability to manage stress. From birth to age 3, stress can have an especially adverse effect on brain development (NRC & IOM 2009). When children have positive early relationship experiences, they develop emotionally secure attachments with their caregivers that can buffer stress at various levels of intensity. If stress is severe and persistent, it becomes toxic and the emotional buffers provided by secure relationships are crucially important (Center on the Developing Child 2007). When children have to cope with tolerable (less intense and temporary) stress, emotionally secure relationships help children regulate their responses and, once the stress subsides, refocus on exploration and learning. What we have learned from brain research in the last 30 years is that the "tender loving care" advocated by early childhood educators for many decades is not only the kind way to treat children but a crucial part of early brain development.



Healthy early brain development from birth to age 3

During the first three years of life, children go through a period of "prolonged helplessness," dependent on others for safety, survival, and socialization (Gopnik 2016). Because babies' brains are programmed to learn from their caregivers, this period of helplessness is a strength, not a weakness. Infants' and toddlers' time with others wires their brains for survival in anticipation of future functioning (Hamburg 1995). The brain

builds crucial structures and pathways that serve as the foundation for future social, emotional, language, and intellectual functioning (Schore 2005; Drury et al. 2010). Therefore, the relationships a child experiences each day and the environments in which those relationships play out are the building blocks of the brain. By participating in learning experiences with their caregivers, babies shape their brains to function in the *particular* physical, social, and linguistic environments of those who care for them. Babies learn, largely by attending to their caregivers' modeling, how to feel, think, and act. Simple, daily interactions have an enormous impact. For example, a caregiver who performs routines in a gentle way and uses language to help the child anticipate what will happen next teaches the child to learn about caring relationships and supports language development. During this formative period it is critically important for caregivers to create a climate of care with healthy brain growth in mind. Simply stated, young children develop and function well when provided care in safe, interesting, and intimate settings where they establish and sustain secure and trusting relationships with knowledgeable caregivers who are responsive to their needs and interests (Lally 2006).

The infant brain is at once vulnerable and competent; both of these attributes need to be addressed simultaneously for healthy brain development. The vulnerable baby is dependent on relationships with adults for physical survival, emotional security, a safe base for learning, help with self-regulation, modeling and mentoring social behavior, and information and exchanges about the workings of the world and rules for living. Yet at the same time, the baby comes into the world with great competence as a curious, motivated, self-starting learner—an imitator, interpreter, integrator, inventor, explorer, communicator, meaning seeker, and relationship builder. For the brain to grow robustly, it needs a context of caring relationships that simultaneously provide emotional predictability for the baby's vulnerable side and a climate of intellectual novelty for the competent side (Lally 2013).

Preconception and prenatal development

When do caring relationships start to influence the development of the brain? Earlier than most of us think. Although this article primarily focuses on relationships established during the time period from birth to age 3, the developing brain before birth—and even before conception—deserves some attention. (For more information on supporting growth during preconception and pregnancy, see chapters three and seven in *For Our Babies: Ending the Invisible Neglect of America's Infants* [Lally 2013].)

A woman's health and habits before becoming pregnant shape the development of the embryo. From at least three months before conception, the prospective mother's food, drinks, drugs, toxins, stresses, and other experiences influence the early womb

environment in which the brain develops; this may affect the child's future learning. Since many women become pregnant while in poor health or while engaging in unhealthy habits, the connection between preconception (particularly from three months before conception to awareness of conception) and healthy brain development needs to be addressed (Atrash et al. 2006; Kent et al. 2006). In addition to a public education campaign for all citizens about the preconception risks to the development of the brain, the United States should provide a safety net of preconception services to women of childbearing age and universal screening for depression and other mental health issues.

Once conception occurs and brain development starts in the womb, the fetal environment may positively or negatively influence the developing brain. Brain growth is more rapid during this period of life than any other, with neurons being produced at an astonishing rate. The neurons then migrate to the area of the brain where they will reside for a person's entire life, beginning to form connections and differentiate brain functions. Fetuses use information—such as the kind and amount of nutrients received, the stress experienced, and the languages and voices heard—to shape their brains and bodies to anticipate experiences once born. Just two-thirds of the way through pregnancy, a good portion of the basic wiring of the brain is already completed (Thompson 2010).

Birth to 9 months: Caring relationships and the brain during the attachment period



During the first stage of development outside the womb, much of babies' initial attention focuses on forming and strengthening secure connections with their caregivers. Rather than passively receiving care, babies actively seek it out. They come into the world with physical skills and social competences that prepare them to play an active role in their development. They are wired to react to those around them in ways that elicit interest and increase the likelihood of contact and closeness (Marvin & Britner 2008). Based on the feedback babies receive from early exchanges, they direct attachment behaviors toward developing secure relationships with their primary caregivers. Research has shown that this attachment-seeking fits with the finding that during the first two years of brain development, emotional wiring is the dominant activity. The brain builds crucial structures and pathways of emotional functioning that serve as the base for attachment, future emotional and social activity, and the language and intellectual development that will follow (Schoore 2000). In this earliest stage, babies start using messages from caregivers to develop perceptions of the extent to which they are loved. Infants then use these perceptions to create an initial working model for how to engage with others. Thus,

the care babies receive during these early exchanges directly affects the quality of attachment they form with their caregivers and influences the emotional stance they will take in interactions with others.

Young babies need relationships with caregivers who are:

- Sensitive to their needs and messages
- Timely in responding (especially to messages of distress)
- Accurate in the reading of their cues
- Understanding of appropriate levels of stimulation (Bornstein 2012)

Seven to 18 months: Caring relationships and the brain during the exploration stage

Between 7 and 18 months of age, babies are driven to search out their local environment, objects, and people; to build a primitive definition of self; and to test the strength and use of relationships. Using their emerging motor skills to explore, they venture from the safety of the physical closeness of their caregivers and test the strength of relationships. They come and go while carefully observing their caregiver's attentiveness and emotional availability. They are, in a sense, practicing independence (Calkins & Hill 2007; Eisenberg, Hofer, & Vaughan 2007). Also at this stage, babies' brains are preparing for a life that does not revolve entirely around physical proximity to the caregiver. Based on their caregivers' reactions to their actions, babies and toddlers begin to hold in mind lessons learned, such as which independent explorations are considered socially appropriate and which are not, and what activities are dangerous, like playing near an un gated stairway.

Babies' communication and language skills increase dramatically during the exploration stage. Although babies can say only a few words, they come to understand many more (Thompson 2011). The words they hear from adults stimulate the language development pathways in the brain. It is not only the words that matter, but also the larger patterns of communication—not just what is said, but how it is said and re



ceived (Pawl & St. John 1998). After repeated exchanges with their caregivers, infants start to build a primitive sense of self. They come to expect:

“I am listened to *or not*.”

“What I choose to do is valued *or isn't*.”

“How I express my emotions is accepted *or isn't*.”

“I am allowed to explore *or not*.”

“Mostly my needs are met *or not*.”

The thoughts, emotions, and shared experiences that the developing brain processes in interactions with adults have a profound impact on the developing child's self-perception and actions.

Fifteen to 36 months: Caring relationships and the brain during the self-definition stage

During the third stage, young children are developing an awareness of their separateness from their caregivers and peers as well as a sense of themselves as individuals (Vaughn, Kopp, & Krakow 1984). They begin to exhibit self-conscious emotions, are particularly sensitive to others' judgments, feel shame and embarrassment easily when others critique their behaviors and appearance, and start to develop a conscience. This stage is also characterized by an explosion of brain growth in several areas of development (in addition to the emotional development that was dominant earlier). Intellectually, children hold ideas in their minds briefly, engage in pretend play, and become increasingly able to focus their attention on topics, people, and objects introduced by others. Their use of spoken language increases greatly. They use many new words and complex sentence structures. Children develop perceptual and motor skills that allow them to run fast, climb high, and hit hard—making the development of self-control especially important (Brownell & Kopp 2007).

Fortunately, this self-definition stage also brings the early emergence of executive function skills, which include the development of working memory, mental flexibility, and self-control (Center on the Developing Child 2012). These emerging skills influence all areas of development, increasing children's capacity to explore and learn about their social environment—and to navigate conflicts with others. As children gain a clearer understanding of independent, separate interests, they realize they have choices, which is quite liberating. However, with choices—particularly those involving caregivers and peers—comes a dawning awareness of responsibility. This choice–responsibility tension is central to the drama of this stage. Once again, caring relationships play a prominent role in how the young brain becomes structured. How adults react during this tension filled period of life greatly affects how young children come to see their rights and others' rights. Interactions children have with their caregivers, peers, and others shape their brains' social and emotional future. What toddlers experience in their day-to-day lives forms their expectations for what constitutes appropriate behavior toward others (Barry & Kochanska 2010). These early experiences provide lessons for developing moral and ethical codes, gaining control of impulses and emotions, and learning and adapting to the rules of their family, culture, and society. As young children experience a growing sense of independence and self-control, their brains' capacity to regulate their behavior continues to develop; but they still need guidance from adults, and this guidance most often comes through caring relationships.

Caring Behavior During the Stage of Self-Definition



Predictable routines in safe, clearly defined environments; respectful responses; and consistent guidance provide the kind of care that strengthens self-regulation and the beginnings of executive function.

The young brain needs adults to act in ways that honor the child's rights to desire, hope, explore, and show preferences, while also helping the child learn to honor the similar rights of others. Although the child is growing older and more independent, the young brain remains vulnerable. Caring relationships, with clear rules for behavior that are consistently applied in reasoned ways, provide safety while the brain is still being formed, ensuring that individuation experiences and socialization lessons occur in a fair and predictable environment.

Conclusion

What we are learning from brain science helps us better understand the multiple factors that influence young children's development and provides us with caregiving strategies that are in harmony with the developing brain. In essence, brain development is about the whole child, from the health of the mother to the child's early experiences in the culture and language of their family, their community, and their early learning program. The foundation of brain development is social and emotional development grounded in caring relationships. If caregivers are mindful of how a child's whole experience—particularly the emotional tenor—influences the developing brain, they can provide caring relationships that help the child feel secure and open up to an engaging world of exploration and learning throughout the early years.

References

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