

# Development in the First Years of Life

Ross A. Thompson

## SUMMARY

Any discussion on how we care for infants and toddlers must begin with the interests and needs of the children themselves. Therefore, this issue opens with an overview of the dramatic development that takes place during the first three years of life, which turns the dependent human newborn into a sophisticated three-year-old who walks, talks, solves problems, and manages relationships with adults and other children.

This article explains the new understanding of brain development that has captured public attention in recent years, and links it to developments in infant behavior that are equally impressive and influential: the growth of the body (size and coordination), the growth of the mind (language and problem-solving abilities), and the growth of the person (emotional and social mastery). It emphasizes how much early experiences and relationships matter.

The article highlights themes that resonate across these aspects of development:

- ▶ A drive to development is inborn, propelling the human infant toward learning and mastery.
- ▶ The opportunities for growth that enrich the early years also bring with them vulnerability to harm.
- ▶ The experiences that greet children in their human and physical surroundings can either enhance or inhibit the unfolding of their inborn potential.
- ▶ People (especially parents and other caregivers) are the essence of the infant's environment, and their protection, nurturing, and stimulation shape early development.

The author envisions a society that stands beside the families and caregivers who nurture young children, equipping them with knowledge and resources, and surrounding them with supportive workplaces, welfare policies, and child care systems.

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*Ross A. Thompson, Ph.D., is Carl A. Hoppold Distinguished Professor of Psychology at the University of Nebraska.*

The mind and heart of the young child have captivated adults for centuries. Young children have been represented as many things: pure innocents, balls of clay, self-centered egoists, confused dependents, a cauldron of impulses and, more recently, information-processing machines and beloved suitors for affection. In their efforts to understand early development, scientists and parents alike have asked: Do early experiences leave an enduring impression on young minds and personalities? Do the first relationships—with parents and other caregivers—shape lifelong self-understanding and social relationships? Is the infant’s world a “blooming, buzzing confusion” for which adults must provide clarity and organization? Are there truly windows of opportunity in the early years when critical environmental catalysts are required for healthy development? These questions endure because the behavior of young children is hard to interpret. What do the apparently aimless gazing of a newborn, the squeals of a baby’s delight or distress, or the casual play of a toddler reveal about the workings of the mind?

The answers to these questions are important because they define the nature of early development and the responsibilities of adults. After all, the obligations of caregivers are established by the needs of young children. Thus, it is important to know if early relationships are formative or peripheral because the answer has implications for how much society values those who care for young children. It makes a difference if young minds are malleable and how they are shaped, because therein lies the importance to children of what happens at home and in child care.

Fortunately, developmental psychologists have devoted concerted research efforts to answering these questions about development in the first years of life. Recently, their efforts have been aided by developmental neuroscientists whose initial conclusions about brain growth complement the findings of behavioral scientists. Here is what they have learned.<sup>1</sup> The early years are important. Early relationships matter. Even in infancy, children are active participants in their own development, together with the adults who care for them. Experience can elucidate, or diminish, inborn potential. The early years are a period of considerable opportunity for growth, and vulnerability to harm.

This article explores these questions and answers by considering growth in the early years in four domains:

- (1) The growth of the *body* (physical size, motor coordination, health);
- (2) The growth of the *mind* (thinking, language, concepts, problem solving);
- (3) The growth of the *person* (relationships, social understanding, emotions); and
- (4) The growth of the *brain* (development of neurons, synapses, and the influence of experience on brain growth).

These four interrelated domains of early development highlight the central accomplishments of early childhood and underscore the obligations of caregivers to provide relationships that are warm and nurturant, experiences that provoke the mind and brain, and protection from physical danger and biological hazards. In the final section, the accomplishments of infancy are reconsidered in light of the importance of the environment to early development, and the opportunities and vulnerabilities of the early years.



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## Sensitive parenting—not educational toys or Mozart CDs—provides the essential catalysts for early intellectual growth.

### The Growth of the Body

Some of the most impressive developmental accomplishments of the early years are the most visible. The young child grows faster during the first three years than he or she ever will again.<sup>2</sup> Not only does the child grow physically larger but body proportions also change. The top-heavy newborn evolves into a five-year-old with a body more closely resembling that of an adult. These changes in body proportions (together with the remarkable advances in brain development that integrate neural pathways governing behavior) help to account for the striking changes in motor coordination, balance, and dexterity that also characterize the early years. The physically uncoordinated newborn learns to sit up by six months of age, stand and walk shortly after the first birthday, and (impatiently, exuberantly, or anxiously) jump in place by the second birthday. The rudimentary grasping reflex of infants evolves into more sophisticated, deliberate eye-hand coordination that enables them to pick up small objects (such as a pea on a dinner plate) by the end of the first year. By age two, toddlers are using their hands to build towers, and by age three, to draw circles on paper.

These physical advances are also fostered by growth in sensory acuity. Because of changes in the eye, ear, and other sensory organs, and developments in brain organization, infants quickly learn to scan the visual field and to discriminate sounds in much more sophisticated ways. And there are other changes in the young child that derive from the growth of the body. Parents welcome the greater regularity of sleep-wake cycles, the diminishing of crying and unexplained fussiness, and the enhanced predictability in mood that derive from rapid growth in neurobehavioral organization.

There is a tendency in this culture to attribute these remarkable physical achievements to an inborn maturational timetable. Often overlooked is the extent to which these accomplishments rely on crucial catalysts from experience and the environment. But it is a truism of development that the periods of most rapid advance are often periods of greater vulnerability because of the many changes that occur in a short span of time. The rapid growth of the body is metabolically demanding,

for example, which means that a nutritionally adequate diet is one of the most crucial requirements for healthy early physical growth. Deficiencies in iron and vitamins owing to chronic undernutrition in the early years can result in cognitive delays, listlessness, and diminished resistance to disease.<sup>3</sup> Young children are also vulnerable to exposure to infectious diseases, drugs and other controlled substances, and environmental toxins (like lead-based paint). In children whose developing physical systems are still maturing, such exposure can result in more profound harm than if it occurs at a later age. Moreover, accidents are a leading cause of injury and death for the very young, owing to children's characteristically poor judgment about potentially dangerous circumstances.

Consequently, healthy physical development in the early years hinges critically on caregivers' determination to protect young children from the harms that might occur. This includes efforts to ensure a healthy, adequate diet; timely immunizations; early vision and hearing screening to detect and correct sensory deficits before they endure; regular health care; and efforts to monitor children's safety in a physical environment that is friendly to the needs and interests of young children.

### The Growth of the Mind

How does the mind grow? Does it depend on crucial inputs from the environment? Or is it driven by its own innate information-processing abilities? What parent has not gazed at the casual play of a toddler and wondered if she or he is doing enough to stimulate intellectual growth? Developmental scientists respond to this parent's question in this way: the young mind is astonishingly active and self-organizing, creating new knowledge from everyday experiences. Sensitive parenting—not educational toys or Mozart CDs—provides the essential catalysts for early intellectual growth.<sup>4</sup>

#### Thinking and Learning

From birth, a newborn's mind is active even though behavior is disorganized. Consider all of the intellectual equipment that enables newborns to begin engaging the world with their minds.<sup>5</sup> From birth, newborns

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crave novelty and become bored with familiarity. Their eyes, ears, and other sensory organs are attuned to events that are new and from which they can learn. Their eyes are drawn to sharp contrasts and movement that help them discern the boundaries between objects and derive sophisticated inferences about object shape, size, rigidity, and wholeness. Newborns are capable of integrating knowledge gained from their different senses. They look toward the source of an interesting sound, or gaze at an object that matches the texture of the pacifier in their mouths.

These early capabilities provide the foundation for astonishing growth in concepts, causation, memory, and even problem solving in the early years. Consider concept development. The mind of an infant naturally clusters objects together that are similar in shape, texture, density, and other properties; and a toddler's mind categorizes faces, animals, and birds according to their properties (like nose size or leg length). On this basis, three- and four-year-olds make remarkably logical inferences about new members of a category—appreciating that a dolphin breathes like the mammal it is rather than the fish it resembles<sup>6</sup>—and enjoy displaying their new knowledge, as any parent of a dinosaur-loving preschooler knows. Consider, also, causation and problem solving. Infants are fascinated with “making things happen” through their actions. For example, they rapidly learn how to pull on a tablecloth to reach the milk. By preschool, young children become adept at manipulating physical objects and people to obtain their goals. Memory development also proceeds at a rapid pace. A baby's fragile memory for the past develops into a young child's flexible memory for routine events. And with an adult's help, preschoolers can remember unique and personally meaningful experiences, such as a trip to Disneyworld<sup>7</sup>, long afterward. Even numerical reasoning begins to emerge as an early awareness of the difference between small quantities grows into a young child's dawning ability to use number concepts (such as one-to-one correspondence) even before learning to

count. Each of these accomplishments reveal an active mind that promotes its own growth by continuously revising its understanding based on how the world responds to its initiatives and observations.

### Language

A young infant's innate readiness to learn from experience is apparent in other ways as well. Newborns have a natural capacity for discriminating speech sounds that are used in all the world's languages, even those they have never heard and which their parents cannot discriminate. Newborns are, in a sense, “citizens of the world,” innately prepared to learn any language. It is only later in the first year that their speech perception becomes specific to the sounds of the language they overhear at home. Newborns also prefer the appearance of human faces to other sights, and the sound of human voices to other sounds. Indeed, one experimental study<sup>8</sup> showed that newborns prefer, above all, the sound of their mother's voice reading a story that she had repeatedly recited late in her pregnancy.

In early childhood, even more significant advances occur in language development. A three-year-old is already putting words together into simple sentences, mastering grammatical rules, and experiencing a “vocabulary explosion” that will result, by age six, in a lexicon of more than 10,000 words. New words are acquired at an amazing rate (five to six new words daily) as children employ intuitive rules for understanding the meanings of words on their first exposure to them.<sup>9</sup> Young children thus quickly grasp the meanings of the words they overhear (even words they are not intended to hear). Language enables children to put their developing ideas and concepts into words they can share with others, and language revolutionizes thought by giving children access to the concepts, ideas, and values of other people. Although many important achievements in language development remain for the years that follow, early childhood establishes the basis for complex human reasoning and communication.



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### Learning and Relationships

All of this learning occurs in a social context, of course. Even newborns respond in special ways to social stimuli, orienting to the people who provide their care and who offer the most interesting and stimulating experiences from which they can learn. Babies' interest in social sights, sounds, and speech focuses their active minds on interpreting and understanding human words, facial expressions, vocal intonations, and social behavior during even the most casually playful encounters.

The achievements of the mind draw upon, and contribute to, a young child's emotional and social development. A baby's delighted laughter, while kicking her legs to make the crib mobile shake, reveals the powerful emotional incentives that drive her to understand experience and master the world. Early word learning is built upon a toddler's interest in the intentions of an adult speaker. As young children begin to understand the hidden properties of animate and inanimate objects, they also discover the hidden psychological dimensions of other people, and begin to explore how beliefs, desires, and emotions influence the human actions they observe. This is why promoting school readiness is not simply a matter of encouraging literacy and number skills. It must also incorporate concern for enhancing the social and emotional qualities that underlie curiosity, self-confidence, eagerness to learn, cooperation, and self-control.

Young children thus do not learn about the world by themselves. A young mind's innate capabilities and its incessant activity each provide powerful avenues for understanding when aided by everyday experience and the behavior of other people. Safe, secure environments and playthings within easy reach permit a young child to explore things that can be examined, combined, and taken apart. Additional catalysts for intellectual growth arise from the natural, spontaneous behavior of sensitive adults. Caregivers do many things to stimulate mental growth. They create daily routines that enable young children to anticipate, represent, and remember routine daily events, such as preparing breakfast together, going to day care, or taking a bath before bed. Caregivers structure shared activities that are manageable for the children and that promote new skills and pride in achievement, such as working on a jigsaw puzzle or sharing a story.<sup>10</sup> Caregivers promote language growth, from their sing-song "parentese" (which is optimally suited to enable babies to learn the sounds of the native language) to the continuing verbal patter they share with barely conversational young children (which enables children to begin to understand the significance of their everyday experiences). Parents and other caregivers do many things intentionally to promote learning and cognitive growth, but the most important intellectual catalysts they provide are uncoached and arise naturally from their unhurried, untroubled, sensitive encounters with the children they love.



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## The Growth of the Person

Individuality flourishes during the early years. This is because the temperamental qualities that make each newborn unique become elaborated in the development of close attachments, the unfolding of emotional life, and the growth of self-regulation, self-awareness, and social understanding. Studies of early personality development show that the relationships a young child shares with caregivers are crucial to these accomplishments. For this reason, this is a period of great opportunity or vulnerability for psychosocial health, depending on the quality and stability of these relationships.<sup>11</sup>

### Attachments: Secure and Insecure

The first attachments of a baby to its caregivers are as biologically basic as learning to crawl and walk.<sup>12</sup> Throughout human evolution, close attachments have ensured species survival by keeping infants protected and nurtured. The development of emotional attachments by age one is preceded by months of animated social interaction during which infants and their caregivers exchange playful smiles, gazes, touch, and laughter together. In the life of an infant, secure attachments provide a sense of security that enables confident exploration and offers reassurance in the face of stress.

A secure attachment reflects the warmth and trust of early caregiver-child relationships. It provides a foundation for positive relationships with peers and teachers, healthy self-concept, and emotional and moral understanding. However, although virtually all infants become attached to their caregivers—including fathers, regular child care providers, close relatives, and others, as well as mothers—not all infants develop the secure attachments that arise from sensitive, responsive care. The effects of insecure attachments can be observed in the distrust or uncertainty that young children feel with their caregivers, as well as negative self-image and difficulties in coping adaptively with stress.

A secure attachment early in life does not guarantee healthy psychosocial outcomes, however, any more than an insecure early attachment ensures later difficulty. Attachment security and its outcomes can change in

childhood in response to changes affecting family interaction, such as marital stress, parental job change, or a sibling's birth. Sensitive, responsive care thus remains a continuing need of young children throughout the early years at home and in child care.<sup>13</sup>

### Self-Regulation and Social Understanding

The early years provide lessons in relationships, including lessons in conflict management and cooperation. As they mature, toddlers become increasingly active, assertive, and goal-oriented, and their caregivers increasingly set limits and expect compliance. Throughout early childhood, adults “up the ante” in their expectations for the child's cooperation and consideration for others. Adults increasingly guide a young child's behavior by using indirect strategies like explanation and bargaining that rely on the child's developing capacities for self-control. At the same time, young children become much more competent at exercising self-regulation, especially when this skill is enlisted for achieving personally meaningful goals (like getting dessert).<sup>14</sup> Although young children do, in fact, become increasingly compliant with adult expectations as they mature, they also show a growing tendency to refuse before they comply, and to negotiate, compromise, and assert their own preferences in other ways. At the same time that attachment security is taking shape, therefore, caregiver-child relationships are also influenced by the behavioral expectations of adults and the willingness of young children to comply. This means that conflict—as well as warmth and security—becomes part of the parent-child relationship.

Beneath the surface of these difficulties of the “Terrible Twos,” however, milestones in social understanding are emerging. Nothing focuses a young child's attention on what other people are thinking or feeling more than the realization that a conflict must be resolved. And because toddlers are acquiring a more sophisticated awareness that others' feelings and desires can be different from their own, the caregiver-child interaction becomes a laboratory for exploring these differences and their consequences.<sup>15</sup> For instance, a two-year-old whose hand inches closer to the forbidden VCR while carefully

watching her parent's face is testing her best guess about the adult's expected reaction.

Other features of psychological understanding also curb the young child's misbehavior, including a growing capacity for empathy with another's feelings and a developing understanding of how adult expectations for behavior apply to specific situations. Caregivers contribute to this understanding when they firmly, but warmly, focus a toddler's attention on the consequences of misbehavior or the child's responsibility for causing harm to another.<sup>16</sup> A three-year-old, whose indoor roughhousing has resulted in a crying younger sibling, can learn from an adult about the connections between exuberant running and inadvertent collisions with a smaller person. Equally important, these encounters between a young child and an adult strengthen the child's understanding and concern for others' feelings and needs, which is one of the most important developing curbs on impulsivity and violence.

### Self-Awareness

One of the most charming features of personality growth is how young children learn to answer the question, "Who am I?," in ever more insightful ways. Developing psychological understanding provides avenues toward greater self-awareness. Infants gradually learn that there is a difference between "self" and "other." During the second year, children develop visual self-recognition (in a mirror) and verbal self-reference ("Andy big!"). This is followed by the period when an assertive three-year-old refuses assistance and insists on "doing it myself" to assert competence and autonomy. During the preschool years, the child's self-correction in drawing, tying shoelaces, and performing other everyday activities reflects developing capacities for self-monitoring and the motivation to succeed.<sup>17</sup> Beginning at age three, moreover, preschoolers begin to remember events with reference to their personal significance, constructing an autobiographical memory that helps to establish a continuous identity throughout life's events.<sup>18</sup> Self-awareness and self-understanding are highly dependent on the evaluations of others, of course, especially those to whom the child is emotionally attached. Consequently, the two- to three-year-old's emotional repertoire broadens beyond the basic emotions of infancy to include emotions like pride, shame, guilt, and embarrassment that are elicited in social situ-



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ations in response to the evaluations of others.<sup>19</sup> A young child's relationships with others thus establish the cornerstone of self-concept through the image reflected in the eyes of another.

### Temperament and Emotional Growth

Young children vary, of course, in their temperamental qualities. Inborn characteristics like mood, soothability, and adaptability affect young children's behavioral tendencies (for example, to approach or withdraw from unfamiliar peers), their emotional qualities, and their capacities to tolerate stress. As infants mature into young children, they begin to learn strategies for managing their emotions because doing so contributes to social competence, self-confidence, and feelings of well-being.<sup>20</sup> Their strategies may be simple—such as looking away from a scary TV show, or saying, "Mommy will come soon," during a lonely first day at preschool; or retreating to an adult when threatened by a peer—but they begin the lifelong process of learning to regulate emotions consistently with one's temperamental qualities.

Unfortunately, the close relationships with caregivers that ordinarily support and constructively guide emotional growth in the early years can also put young children at risk when these relationships are disturbed or dysfunctional. Sadly, some children are so buffeted by conflicted family environments, chaotic child care settings, or unpredictable challenges in daily experience that their capacities for managing their emotions quickly become taxed, and healthy personality development is imperiled. Emerging research in the field of developmental psychopathology reveals the surprisingly early

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origins of emotion-related disorders like depression, conduct problems, anxiety disorders, and social withdrawal. These studies also show how relationships with caregivers who are emotionally neglectful, physically abusive, or psychologically inconsistent can (especially when combined with risk factors like temperamental vulnerability) predispose certain young children to the emergence of psychopathology.<sup>21</sup> Thus, the conclusion that relationships are central to healthy psychosocial growth in the early years is a double-edged sword. It highlights how sensitive caregiving provides many opportunities for enlivening early social and emotional capacities, but also how markedly inadequate care renders young children vulnerable to psychosocial harm.

## The Growth of the Brain

In view of recent public excitement over early brain growth, it might have been appropriate to begin this summary of the early years with a discussion of brain development. Instead, this summary began with the growth of the mind and the person because developmental scientists know considerably more about cognitive, socioemotional, and personality growth than they know about brain development. Indeed, developmental neuroscience is a recent addition to the study of the child. Furthermore, processes of brain development are best understood when considered in relation to the pace and timing of concurrent mental, emotional, and social advances of early childhood, because these behavioral achievements provide clues about what is likely to be happening within the brain.

Unfortunately, considerable misunderstanding of early brain development occurs when neurons and synapses are considered independently of the development of thinking, feeling, and relating to others.<sup>22</sup> Time-limited windows of opportunity—during which critical stimuli from the environment are necessary for healthy brain development—are exceptional rather than typical, consistent with the gradual course of most features of early development. Brain development is lifelong, not limited

to the early years, consistent with the enduring capacities for growth in thinking, feeling, and adapting throughout life. And although the talking, singing, and playing of caregivers are valuable stimulants of early brain development, so also are the caregiver's efforts to provide adequate nutrition; to protect young children from the hazards of drugs, environmental toxins (like lead), and uncontrollable stress; and to obtain early vision and hearing screening. Each of these elements is an important requirement of healthy brain growth.

## Blooming and Pruning of Brain Connections

Developmental scientists' observations of early development provide other important clues for what to expect in the developing brain.<sup>23</sup> For example, the powerful innate capabilities that underlie the newborn's readiness to learn suggest that brain growth begins early and advances quickly during the prenatal months. And indeed it does. Brain development begins within the first month after conception, when the brain and spinal cord begin to take shape within the embryo. By the sixth prenatal month, nearly all of the billions of neurons (nerve cells) that populate the mature brain have been created, with new neurons generated at an average rate of more than 250,000 per minute. Once neurons are formed, they quickly migrate to the brain region where they will function. Neurons become differentiated to assume specialized roles, and they form connections (synapses) with other neurons that enable them to communicate and store information. Neurons continue to form synapses with other neurons throughout childhood. By the moment of birth, the large majority of neurons are appropriately located within an immature brain that has begun to appear and function like its mature counterpart.

Furthermore, given the newborn's hunger for novelty, attention to sensory experience, and preference for social stimulation, significant changes in the brain's neuronal architecture would be expected after birth. This is precisely what occurs, although the manner in which the



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brain becomes organized (or wired) in the early years is intriguing. Both before and after birth, an initial “blooming” of brain connections occurs: Neurons create far more synapses with other neurons than will ever be retained in the mature brain. This proliferation of synapses creates great potential for the developing brain, but it also makes the young brain inefficient and noisy with redundant and unnecessary neural connections. Consequently, this proliferation is soon followed by a stage of “pruning” when little-used synapses are gradually eliminated to reach the number required for the brain to operate efficiently.

How are synapses selected for retention or elimination? Early experience plays an important role. Stimulating experiences activate certain neural synapses, and this triggers growth processes that consolidate those connections. Synapses that are not activated progressively wither over time. Through this “use it or lose it” principle, therefore, the architecture of the developing brain becomes adapted to the needs of everyday stimulation and experience. The effects of this principle can be observed behaviorally in the early years. Vision, for instance, is an example of this principle. During the early months of life, visual acuity increases because the neural pathways connecting eye to brain become consolidated while infants gaze at the world around them. But if infants experience prolonged visual deprivation (which can result, for example, from congenital cataracts), those pathways will remain unorganized. If the cataracts are removed in childhood, there may still be irreversible deficits in vision because the neural connections were never consolidated. In this respect, therefore, early vision develops according to a sensitive period that begins abruptly (at birth) but very gradually tapers off.

Other features of early behavioral development may also reflect the brain’s early blooming and pruning of connections. Consider language learning. Newborns can discriminate universal speech sounds, but over time their speech perception becomes limited to the sounds of their native language. This change in perception may reflect the initial proliferation of connections in brain regions governing language and their later refinement.<sup>24</sup>

Neuroscientists offer similar accounts to explain the early development of memory ability,<sup>25</sup> the growth of early categorization and thinking skills,<sup>26</sup> and early emotional development and emotion management.<sup>27</sup> However, the blooming and pruning of brain connections for these capacities takes place on an extended timetable compared to the narrower window of opportunity that exists for vision.

The timetable for brain development thus varies by region, and it continues throughout life. Sensory regions, which govern sight, touch, hearing, and other sensations, undergo their most rapid growth early in life, while the brain areas guiding higher forms of thinking and reasoning experience blooming and pruning of brain connections into early adolescence. Indeed, the recent discovery that the mature adult brain generates new neurons<sup>28</sup> raises the possibility that brain development continues into maturity in yet unknown ways.

### Brain Growth and Experience

At least two forms of brain development occur throughout life.<sup>29</sup> The first, called “experience-expectant,” describes how common early experiences provide essential catalysts for normal brain development. Without these essential experiences, brain growth goes awry. The dependence of vision on early visual stimulation is one example. Scientists believe that typical experiences of hearing, exposure to language, coordinating vision and movement, and other common early experiences likewise contribute to the young brain’s developing organization. The developing brain “expects” and requires these typical human experiences, and relies on them as a component of its growth.

The second form of brain development occurs throughout life. It is called “experience-dependent” and describes how individual experience fosters new brain growth and refines existing brain structures. These experiences can be unique to an individual. For instance, the brain of a musician who plays a stringed instrument differs from the brain of a poet who works with words and abstract ideas because they have exercised different brain regions throughout life.<sup>30</sup> In this respect, the

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experiences that refine brain functioning throughout life are individualized rather than typical. These experiences influence neural connections uniquely in different individuals, as they account for new learning and skills.

### Vulnerability of the Developing Brain

The foundation for these achievements is established in the early years, however, and the rapid pace and broad scope of early brain growth means that the immature brain is a vulnerable organ. Beginning at conception and continuing after birth, healthy brain development is imperiled by exposure to hazardous drugs, such as alcohol, cocaine, and heroin; viruses, like HIV and rubella; and environmental toxins, like lead and mercury. The brain is also vulnerable prenatally and postnatally to poor diets that lack essential nutrients, such as iron and folic acid. Chronic maternal stress during pregnancy and after birth can also threaten healthy brain development because of stress hormones that have a toxic effect on developing brain structures.<sup>31</sup> Stressful experiences of chronic abuse or neglect, as well as head injuries resulting from accidents, also pose significant risks. The greatest dangers to the developing brain arise, of course, from the combined and cumulative effects of these hazards, such as when children in poverty are malnourished, exposed to hazardous drugs or environmental toxins, or experience head injuries. Enduring harm also arises when early problems are undetected and are allowed to endure uncorrected.

Parents and other caregivers contribute to healthy brain development by talking, singing, playing, and reading to a child. These activities are valuable, especially if they are developmentally appropriate and are attuned to a young child's interests. But more significant contributions occur when parents obtain prenatal and postnatal health care; protect children from environmental hazards, dangerous drugs, and viruses; secure appropriate immunizations, and early vision and auditory screenings; and prevent accidents. The continuing efforts of parents to keep stresses manageable and environments safe for secure exploration offer significant protections to the development of healthy brains and minds.

### The Importance of the Environment

When scientists seriously consider the remarkable

achievements of the first years of life, it is unmistakable that early experiences matter. The early childhood years are crucial to the quality of the life course. But parents are concerned about their young children not just as an investment in the future, but also because children are themselves valuable. Parents seek to create every opportunity for healthy, optimal growth because of the excitement of contributing to enhancing the unique qualities that each child possesses. Likewise, practitioners and policymakers should also strive to strengthen the opportunities, and reduce the vulnerabilities, of early development because children merit society's commitment to them.

This is why the environment of a child matters. Because early experiences can enhance or diminish inborn potential, the environment of early experience shapes the opportunities and risks that young children encounter. The environment that influences early growth is multifaceted. The physical environment, for example, provides opportunities for toddlers to safely explore and learn, poses hazards for accidental injury, and enlivens young children's emotions by the barriers it sets to achieving goals. The biological environment (which begins to influence development prenatally) affects the developing brain and body through the quality of early nutrition, health care, immunizations, sensory screening, and protection from dangerous drugs, viruses, and environmental toxins.

The irreducible core of the environment during early development is people. Relationships matter. They provide the nurturance that strengthens children's security and well-being, offer the cognitive challenges to exercise young minds, impart many essential catalysts to healthy brain growth, and help young children discover who they are and what they can do. Remarkably, most of the significant ways that caregivers promote healthy development occur quite naturally during the course of sensitive adult-child interaction. For instance, the "parentese" that facilitates early language, the caregiving routines that promote predictability and memory skills, the patient structuring of an activity to make it manageable for a child, and the protective nurturance that manages a baby's emotions show that when sensitive adults do what comes naturally, their behavior is



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optimally suited to promoting early cognitive, socio-emotional, and neurobiological growth. In a sense, just as children's developing brains intrinsically expect that eyes will see light and ears will hear sound because of their developmental self-organization, so also do children's developing minds and hearts expect that adults will talk in special ways to them and that caregivers will nurture them as they mature. Normal human development draws upon these natural and unrehearsed features of everyday early experience far more than it requires special educational toys, Mozart CDs, or flashcards.

Unfortunately, "doing what comes naturally" does not always support healthy early development when caregivers are depressed, stressed, absent, or otherwise have neither time nor energy to devote to caring for young

children. In these circumstances, attachment relationships become insecure, conflict negotiation results in coercion, self-concept is shaped by denigrating evaluations of the child, and young children do not develop the sense of secure self-confidence that is their birthright. Society's commitment to ensuring the healthy development of every child requires far more, therefore, than standing on the sidelines and wishing parents the best in their efforts to benefit their offspring. It requires enabling parents to integrate work and child responsibilities constructively through family-friendly job conditions, welfare reform that does not endanger stable parent-child relationships, affordable and desirable child care arrangements, and wage policies that ensure adequate family incomes. It requires helping parents to obtain the prenatal and postnatal health care that

screens children for developmental difficulties before they become severe, guarantees adequate nutrition, and can protect young children from debilitating diseases and hazardous exposures. Society's commitment to ensuring the healthy development of every child begins with the parent-child relationship, and requires that the broader institutions affecting the family stand alongside parents in their efforts to ensure the well-being of young children.

The relationships that matter do not end with the immediate family. They also include the relationships that young children develop and depend upon in child care. Society's commitment to ensuring the healthy development of every child requires far more, therefore, than hoping that market forces make available high-quality, affordable care for young children. It requires equipping care providers with the knowledge and resources required to provide young children the kind of focused, sensitive care that offers essential catalysts to healthy psychological growth. It requires esteeming the relationships between children and caregivers sufficiently that there are incentives (in wages and benefits, the structure of child care work, and public support) for these relationships to provide stable, reliable support for young children. Society's commitment to ensuring the healthy development of each child requires that all the relationships that young children rely upon are valued and supported.

Recognizing that the early years are a period of unique opportunity and vulnerability means that the environments of early childhood should be designed so they facilitate, rather than blunt, the remarkable intrinsic push toward growth that is characteristic of every child. Doing so not only enhances the well-being of young children, but makes a long-term investment in the well-being of all individuals. A society that is concerned with problems of violence and self-control, school readiness, and social civility wisely takes note of the fact that the origins of these social, emotional, and intellectual qualities take shape early in the life course. In committing itself to the well-being of the youngest citizens, society can promote the well-being of all.

## Conclusion

Although the processes of early development remain something of a mystery, enough is known to enable

twenty-first-century parents, practitioners, and policy-makers to foster the healthy growth of the body, mind, person, and brain. Because the early years are important, young children merit a high priority, even though they cannot speak for themselves. Because early relationships matter, society is wise to value those who relate to young children daily. Because children are active participants in their own development, the most sensitive care is that which is aligned with the child's interests, needs, and goals. Because experience can elucidate, or diminish, inborn potential, early environments must be designed to ensure young children's health, safety, and well-being. And because the early years are a period of considerable opportunity for growth and vulnerability to harm, society wisely does not take for granted the well-being of young children. Instead, we share responsibility as adults to guarantee for each child the opportunity to thrive in the early years of life.

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