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Chapter 1

How Our Young Children Learn

How do our young children learn? This is a relatively new question in human history. For millennia we have simply lived the answer in Nature’s exquisitely devised blueprint. Now, though, we have ever more subtle scientific instruments whereby we can measure learning, and also creative minds eager to begin the exploration of the vastly interconnected answer. An in-depth look at this ancient, elegant and forward-thrusting continuum of evolution—the human capacity to learn—is a life’s work. We can thank the many scientists, educators, visionaries and others who have given their lives to understanding the workings of the human mind-body-environment connection. Slowly their light is seeping into our collective understanding.

To simplify their findings, we can say that young children learn

a) through sensory experience
b) through both energetic and fine movement, and
c) through imitating everything they see modeled in their environment.

If this is enough information for you, and you would like to get on with the business of what to do, here and now, with your preschool child, then turn to the following chapters. There you will learn

1. how to design environments that foster a broad, diverse sensory experience for your child,
2. how to encourage movement that is purposeful, finely focused and vigorous, and
3. how to provide Nature’s imperative, adequate modeling, which works in tandem with the young child’s natural gift of imitation.

How do children learn?
Through sensory experience
Through both large and small motor movement
Through imitating everything in the environment

Is this enough information for you?

Turn to the following chapters to learn:
How to create environments full of sensory experience
How to encourage healthy movement
How to optimally use the principle of imitation
If, on the other hand, you would like a thumbnail sketch of the biology of learning, then read on!

A Five-Minute Tour of the Developing Human Brain

The primary way young children gather information from their environment is through sensory input—touching, tasting, pushing, smelling, seeing and so forth. The way they make this information meaningful is largely through emotionally responsive movement, i.e., they move toward the cat if they have a positive emotion about it, or away if they have a negative one. Through balanced sensory input and free exploratory movement, young children make meaning of life—they learn. This principle remains true even for adults, because it becomes a foundation for abstract thought. The entire human body is a brilliantly tuned instrument designed to gather information at levels far more subtle than the conscious mind. This sensory information is gathered, a personal emotional connection is registered, and a responding movement occurs. In recent years there has been an outpouring of new brain research, all of which supports the ancient notion that learning is a lifelong event involving the body, emotions and mind. The bulk of this book will deal with helping you, the parent, make choices and create environments that foster a broad sensory education as well as a skillful continuum of movement for your child.

Unlike most other creatures with whom we share this earth, we human beings are born “unfinished.” We are given the astounding gift of our human brain, which remains “unfinished” even into old age. Our capacity to learn ever more complex systems is a product of the brain’s ability to continually remodel itself until the day we die. A bear will never decide she’s just not in the mood to hibernate this year, but a human being can decide nearly anything at all, and then proceed to create that reality.

But sensory experience and movement are not all children need in order to learn. Working in conjunction with these two essentials is a third: the child’s innate ability to imitate, and the need for a human model. It takes human modeling to create a human being. In the New York Longitudinal Study, 133 people were followed from infancy to adulthood. Three factors in the early learning
environment were required to produce competency in adulthood. First, a rich sensory environment was necessary, both indoors and out; second, free exploratory movement was vital; and third, a parent was available for interaction when questions arose. As Joseph Chilton Pearce tells us, “The first imperative of nature is simple as rain, and as natural: no model, no development.”

To understand how modeling and imitation work, we need to take a tour through the development of the embryonic brain in utero. Our human brain is a beautiful example of the slow, meticulous way Mother Nature builds toward higher states of being.

In the first trimester of pregnancy, the oldest part of our brain, often called the reptilian brain, is formed. All sensory input and sensory learning are routed through the reptilian brain, which contributes toward our species’ survival by categorizing all stimuli as either “friend” or “foe.” Astonishingly, this system is “grown” through the embryonic responses to the tones of the mother’s voice. Each phoneme, a language’s smallest distinctive audible unit, elicits a unique and specific muscular response from the fetus. This movement in response to the sounds modeled lays down neural pathways, or conduits of information, in the baby’s developing brain. Through this ballet in the embryonic waters, the brain is forming the foundation of all future learning. At birth, these movements are still visible and easily observed, as the baby’s arms and legs wave and dance. Although they rapidly become too small to be seen, these movements in response to sound can still be detected by instruments throughout life.

In the second trimester, the mammalian or limbic brain is formed. The mammalian brain is the seat of emotion, or the emotional-cognitive brain. In our western worldview, we tend to separate emotion from rational thought, believing that we can engage our mind without involving our emotions. Neuroscience, however, is showing us the inherent intelligence in the “body-knowing” that is emotion. All relational learning, especially memory, which depends on emotional flagging of information, is founded in the limbic brain. Emotional knowledge provides the cognitive thought process with information that is essential for survival. Emotional knowledge also stimulates cascades of hormones that foster our mammalian instinct to nurture. In turn, the pregnant mother’s emotional state, and the hormones she releases in consequence, dramatically influence the development and functioning of the

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**Third trimester of pregnancy**

**The neocortex develops.**

*Seat of verbal-intellectual capacities*

*Ever-responsive information network*

*Calls functions of reptilian and mammalian brain into its service*

*Carries new ability: to imagine the future*

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**The Necessity for the Human Model**

*The mother’s emotional state during pregnancy impacts fetal brain development.*

*If she is healthy, happy, well cared for, and relatively stress-free, the whole brain can develop to its highest potential.*

*If she is in danger, anxiety-ridden, uncared-for, and emotionally distraught, the stress hormones released prepare her for flight or fight.*

*The constant presence of these hormones “wires” the fetal brain to be used for defense.*

*The baby is conditioned to respond to stimuli through the lower, defensive brain center.*

*Higher functions receive less stimulation.*
limbic, emotional brain in the second trimester and the continued growth of
the neocortex in the third trimester. Nature builds on the old forms, progressing from
the most primitive, survival-oriented capability of the reptilian brain in the first trimester to
the connecting, relating ability of the limbic brain in the second trimester and finally to
the highest imaginable verbal-intellectual capacities of the neocortex. We know of no limits
to the ever-responsive information network of the neocortex, and it is thought that we use
only a fraction of its capacities. Whereas the reptilian brain registers only the present
tense, and the mammalian brain registers both present and past (hence
its connection to memory), this third brain gives us the gift of envisioning a future. It is primarily
the experiences of the emotional brain that determine whether we step toward the future with
curiosity and trust, or go reluctantly, in fear. Both of our old brains, reptilian and
mammalian, can be called into the service of the high brain, the thinking capacity of the neocortex.

The mother’s emotional state has great impact on whether this occurs or not. As the emotional/hormonal
model, the human mother is the pivot. Here is how it works, in a rough outline: If the mother is well cared for
and happy, the hormones released will foster the continued evolution of development and “use” of the whole
brain. The emotional brain and the neocortex will continue to form, and the elaborate wiring that helps them
to work together with the reptilian brain as a whole will become fully developed.

If, on the other hand, the mother is unsafe, undernourished, anxiety-ridden or under great stress, her
limbic brain sends out stress hormones that call the old reptilian brain into play. Remember, its job is to
discern friend from foe, and to prepare us for battle or flight. She becomes caught in the repeating cycle of fear, fight or flight. Her hormones set patterns
for neural pathways in the developing fetus’s brain that “wire” the unborn child for this automatic defense response, diminishing the functioning of the
high brain. It is not that the higher areas of the brain are not developed, but that the “wiring pattern” is habituated to the older “defense model” of the lower brain. The “life energy” then goes into protection and defense, rather than being free to move toward intellectual curiosity and exploration.

We all know what this feels like. Do you remember the anxiety you felt as a child, walking into a classroom toward a test you were not well prepared for? And do you remember being so stressed you simply couldn’t think, even if you knew the answers? The urgency of the emotion and the body responses eclipsed the more refined powers of thought. For some children, walking into any challenging, adult-critiqued situation creates the same feelings: stomach-ache, short and shallow breaths, tight shoulders. These body sensations are caused by adrenaline and other stress-related neurotransmitters that serve the old brain in its primal desire to outrun the tiger. The tiger may be long gone in today’s human societies, but we still live with the “protective devices” so well designed by Mother Nature a long time ago.

**This Is Just the Beginning of Imitation and Modeling**

The necessity for a human model continues after birth, and involves the comparatively newest part of our brain. This is the development of the prefrontal cortex, which lies immediately behind the ridge of our brow. Until as recently as thirty years ago, this area was called “the silent area” because its function was largely unknown. Today, neuroscientists have a variety of viewpoints concerning its function, but some researchers have attributed to the prefrontal cortex our higher virtues of compassion, empathy and understanding; MacLean called this part of the brain the “angel lobes.”

This last and perhaps finest part of the brain begins its major growth after birth, and continues this primary growth spurt for about the following nine months. Again, the emotional state of the mother or caregiver and the quality of nurturing that the infant receives can affect the prefrontals at a cellular level. Prefrontal growth and development is dependent upon the infant’s environment, as determined by the human model, the parents.

Let us assume we have a happy mother, well nourished and safe. She has given birth to a baby whose brain has been wired to reach its highest
functioning. Now what do we do to help foster lifelong learning and zest for life? Again and again throughout this book you will hear me say, “Let Nature be our guide.” So let’s see how Nature intends our new arrival to continue learning.

We know that movement in response to the vibrations of the mother’s voice does not stop at birth but continues into infancy, laying down neural pathways in the brain and strengthening the sensory-motor response system, making a strong foundation for all sensory learning. And we know that the main avenue of discovery for the first several years of a child’s life is through sensory stimulation. For maximum sensory stimulation, it is critical that the child be kept “in arms” in the first weeks or months. All indigenous cultures have known this truth and kept their babies close. They have designed various devices that attach babies to the mother’s body, giving her free range of motion and allowing her to continue to go about her work, or they have handed the baby into another pair of arms in their large extended families or tribal groups.

The sensory information digested during the “in arms” period is critical to all future learning. For example, the human face, which is the only object a newborn baby can actually see, becomes the pattern upon which all future sight is built. All visual learning is in reference to the familiar face; then, slowly over the course of the first year, as visual patterns are built and expanded and the visual system develops, the face becomes unnecessary as a reference. During the baby’s first few weeks, however, the parent’s face needs to be close to the baby, six to twelve inches away, for most of the child’s waking hours. Nature has provided well for this necessity, offering a whole cascade of maternal hormones that keep us peering wonderingly into this brand new being’s eyes!

Only part of the vast quantity of sensory information taken in during these first weeks is visual. The vestibular sense, or the experience of the body in movement, gravity and balance, and the proprioceptive sense, or the experience of body position and body parts, are also beginning to develop as the baby is held. All the jostling, swinging, walking, the pressure of bodies in contact, help to form these subtle but critical senses. Children who do not develop these have difficulty in later developmental stages. This can show up as a lack of awareness of the physical body and its boundary. They may bump
into people or things, to get a “feel” for their boundary, or, conversely, may show a stiff lack of coordination. They may also crave fast spinning movement or show the opposite extreme, an apprehension about movement and being touched, a fear of feeling.  

So, wear your baby! Front, back or sideways, it doesn’t matter, just do it! I attached a set of tiny chimes to the frame of my baby backpack, so we made music as we moved! Baby front packs and backpacks are great not only for an outdoor stroll, but also for use inside the house. Wear your baby as you wash dishes, fold laundry, go up and down stairs, make the bed… everywhere! Besides, as a new mother concerned about “getting your figure back,” you’ll never have to go to the gym, carrying this precious and ever-increasing load!

You may wonder, as a new mother, “How will I ever take a shower, or pay the bills?” This is where the next activity critical to baby’s future learning comes into play: creeping.

The baby is laid on the carpet on his back and allowed to simply be, to move, explore, experience frustration, perhaps to cry, to eventually problem-solve toward rolling over, to wiggle toward a toy as he stretches his capacities. The communication between the core (trunk) muscles and the brain continues to develop these senses of touch and proprioception, and to strengthen the vestibular system. Eventually the baby develops the core strength and the coordination to push up and creep, inching along in what is often called “the army crawl.” To be on the tummy, moving, stretching and rolling, is empowering to the baby; this allows him an active exploration of life. He is “in touch” with his own body and the world; he is learning the relationship between the two. He experiences movement as filled with purpose. And this purposefulness will radiate through his whole being. Perhaps we know a few young people or adults who radiate a sense of purpose and knowing their place in the world. This confidence begins as the baby is held in arms and also laid on the floor, to creep purposefully toward his future.

After creeping, another essential step to insure baby’s continued brain development is crawling. The importance of crawling cannot be stressed enough! Crawling, because of the cross-lateral use of arms and legs, patterns the cross-lateral communication of the different hemispheres of the brain. It activates both hemispheres in a balanced way, and the corpus callosum, or

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**What can we do to foster this growth?**

*Wear your baby! Get a front pack or sling, and eventually a baby backpack.*

*Avoid the 45°-angle baby seat/carriers, except for traveling.*

*Put your baby on the floor. Let her wiggle, roll over, rock, and finally creep.*

*Let your baby try hard and discover all of this on her own, no prodding or helping.*

*Model, in these games, the cross-lateral use of arms, legs, ears, eyes. This means you crawl, too.*

*Let her walk on her own.*

*She will discover, all by herself, how to pull herself up on the furniture and coast along.*

*Avoid baby walkers.*

*Walkers encourage toe-walking, foreshortening and tightening the calf muscles.*

*The brain interprets this calf constriction as a sign of danger (ready to run), which produces stress.*
the part of the brain that orchestrates the processes between the hemispheres, becomes more fully developed. Crawling involves not only the coordinated use of both arms and legs, but also eyes, ears, hands and feet. Children who miss the crucial crawling stage may show learning difficulties later on.

I worry for children who are held passively at a forty-five-degree angle in the new baby carriers that do triple duty. These devices act as a baby seat that can be set on the counter or desk and rocked when Baby cries (instead of picking him up), as a baby carrier for going to and from the car or in and out of the store, and can be strapped into a car for travel. Every minute of Baby’s new life is an opportunity for essential learning. When he is passively watching life from a supine position, he is not in immediate physical contact with the rhythm and pressure of another human body, or wriggling or crawling along his exploratory way. This is critical time lost for brain development.

Now for a word about walking. The baby needs to be allowed to stand up in her own time, in her own way, and to walk at her own pace. Mother Nature did not design those round plastic “walkers,” and there are reasons to avoid them. Core muscles are not well exercised, because the device supports the baby’s weight, rather than her own growing strength. For the same reason, the walker does not allow the baby to practice the all-important skill of balance. Finally, there is the tendon guard reflex. This reflex involves the tightening and shortening of the calf muscles and was designed to prepare us for flight in times of danger. It is meant to function only for short periods, to help us outrun danger, but babies who are put in walkers can develop shortened calf muscles by constantly flexing their toes in order to propel themselves along. Neurophysiologist and educator Carla Hannaford, and colleague Paul Dennison, in their work with autistic and speech-impaired children, have seen a link between shortened calf muscles and difficulty with speech.

Nature has set a plan in motion, over the course of millennia, that has satisfied all the needs of the developing infant’s brain: the need for touch, pressure, movement, the need for the closeness of the face, the need for nutrition, and the need for heart contact with the mother. In utero the baby’s heart beats in rhythm with the mother’s, responding to the electrical, hormonal, neural and sound patterns of her heart. After birth, the baby’s heart rhythm needs to become stabilized over the course of the first year by being held...
close to the mother’s heart. In one fell swoop, Nature has provided generously—for when we nurse our babies, all of these needs are met.

There are many books devoted to the benefits of breast-feeding, and the La Leche League is a tremendous resource for pregnant and newly nursing mothers. Be sure to see the Chapter Notes for information on the multidimensional benefits of breast-feeding.

As you can see, human beings grow according to very specific developmental patterns. We are discovering the powerful necessity of each of these stages as they unfold, step by step, to foster our child’s ever-growing capacities. If your child has missed any of these critical stages, and you are seeing subtle or not-so-subtle developmental difficulties or delays, help is available! A brilliant system of activating, patterning and rewiring the brain for optimal functioning has been developed. Look in the Chapter Notes for information about the Brain Gym system. Using simple and fun body movements, Brain Gym systematically goes about undoing the damage of our modern, “movement-deprived” lifestyle. The human brain is an open-ended system that has a nearly limitless capacity to repair itself! Brain Gym is also powerful for adults, so be sure to look into it.

**Sensory Experience, Movement, and Imitation Are Still Critical**

In the last few pages, we have seen many ways in which sensory input, movement and the imprinting of a human model are critical to embryonic and infant brain development, and therefore critical to early learning. These principles remain vital throughout the child’s early years. Sensory experience and movement remain essential to learning into adolescence and even into adulthood. Movement and a sensory involvement with life are prescribed as both prevention and treatment for stress, depression and most disease, for all ages.

Let’s look specifically at the role imitation, or the relationship with the model, plays in the life of the toddler, preschool and kindergarten child. This time we will examine the process not from a biological standpoint, but from that of “felt experience.”
I often think of the young child’s capacity for imitation as *nutritional.* The way the child imitates is akin to the way she digests the food we offer. She simply takes it in, and depending on the nutritional value of the meal, she is well fed or undernourished. By creating indoor and outdoor environments that nourish your child’s lifelong learning, and by establishing healthy life rhythms that will nourish your child’s sleep times, mealtimes, work and play times, and so forth, you will lay essential foundations for learning.

We can also use this understanding of imitation in the way we approach daily activities. A simple rule is this: if we want the child to do something, then we must do it ourselves, in order to offer him someone to imitate. If you say, “Come brush your teeth,” have your toothbrush in hand, too. Or, if it’s time for breakfast, be sure you, also, are having a portion. If you wish your child were more active outdoors, put on your jacket, get out the rake and get going yourself.

The young child does not watch us carefully, and then in a studied way choose to imitate, for instance, the tone of our voice as we talk to the cat. Rather, the young child, who is so new to life, simply *lives into* our actions and makes them her own. We, her parents, are the template of what it is to be human. In the same way that the mother’s face is the template upon which all visual learning is based, we are the pattern for what it is to be human. The young child has not yet developed the capacity to recognize her separateness yet. She experiences herself as merged with the environment, and when we understand this, we can consciously arrange ourselves as the emotional environment, and our home as the physical environment, in such a way that she is imitating the best we have to offer.

In each of the many small tasks we do with our child, remember that we are showing him not “our” way, or the regional way. From his perspective, we are offering the secrets of the universe, showing him *The Way.* So, let’s do each thing with as much consciousness as we can bring to the task. Think of the ancient Zen master, who rakes the sand garden or pours tea with a simple economy of movement and grace.

Often when I talk to parents about the profundity of the role of imitation, I see a small wave of panic run through them. “How on earth can we measure up, and show them what it is to be human? We’re just regular peo-
ple.” It will be a long time before your children recognize that you are “just regular.” The only way I ever learned to carry the weight of my children’s admiration, their need and expectation, was to know deep in my bones that I would never, ever be perfect, or even close. But I also knew that Love is perfect, and also perfectly reliable. So, with all the imperfections that occur in a day, I always relied on Love, knowing in the end all my transgressions (against my own ideal, by the way, not theirs!) were washed clean by Love’s great generosity. So you can relax and enjoy the rest of our discussion about imitation.

**Hurrying and Imitation**

What about hurrying? This is the disease of our time, and we are all exposed to it in varying degrees. We must each find our own way to inoculate ourselves against it. For if we hurry our family’s lives along, our young child will incorporate this hurrying into his own body. Hurrying causes stress, and the American Medical Association tells us that over ninety percent of illness is stress-related. So practice breathing slowly, observe yourself as you model a task for your child, make mental notes, and try to bring more awareness to it the next time. Because your child imitates *everything*, she will imitate your comfort, ease and joy in movement. She will also imitate your deep intention to do it better next time!
Speaking with Imitation in Mind

Another way you can use your understanding about imitation is in the way you speak to your child. Young children imitate so perfectly because they are not, as yet, separated from that which they imitate. So when you talk to your child, a magic wand you can wave is the use of the golden “we.” Your child still belongs to the awareness of “we,” and is not yet an “I.” You will be amazed at the power of addressing your child in exactly the place where he exists. It is often easy to address a baby as “we”—for instance, “Now let’s change our diaper.” As the child moves out of the baby stage, and seems to us so much more of an individual, this can become more difficult. We must realize that for about the first five or six years (yes, that long!) he is still a “we” at heart. Whenever you have a “command,” such as, “Come for dinner!” try to place it in the great “we,” and see how this can smooth the road. Though this may seem like a fine point, I think of it as a very slender wand that produces great magic.

We can also employ the principle of imitation in answering our children’s questions. The child still has a feeling of being “at one” with the world. For her, this world is full of mystery. It is our adult awareness of separateness that gives us the ability to “understand” the world in a conceptual manner. We understand the world by thinking about it. The child understands the world by moving through it, experiencing it bodily. The meaning exists in the interface between the child’s body and the thing itself. So when our child comes to us with one of her astonishing questions, let’s practice answering, not in concepts, but in images she can “feel her way into.”

A perfect example of this happened in my classroom. A very little boy of three years came to me, one autumn morning, with this question: “Do pumpkins grow on the moon?” In my utter delight, and while my mind did flips to find an image with which to reply, I stalled. My assistant came to my rescue and said, “Pumpkins are round, just like the moon!” He was completely satisfied and danced away, singing, “The pumpkins and the moon! The pumpkins and the moon!” All he was asking for was confirmation of his own joy. By not closing the door, by refraining from talking about oxygen, water and sunlight, my assistant allowed him to revel in roundness.

Tip

Speak with imitation in mind:
Use the golden “we.”

What about children’s questions?

Answer with imitation in mind:
• Remember that he experiences himself “at one,” part of the great mystery.
• He learns through bodily explorations; answer in images he can “feel his way into.”
• Save scientific explanations for later.
• Affirm his curiosity and joy.
• Assure him that you wonder about things, too.
• Be ready for his reply: a window into his soul!
My youngest son asked many times, when he was just three, where the water from the toilet went. I would always say, “See, it goes round and round before it goes down.” He then would offer me a window into his growing imagination through stories of underground water worlds and the creatures that lived there. Often, if we hold back from “answering” a question like this, if we just offer an image that affirms their observations, we will then be treated to an inside view of the child’s soul.

A great reply to carry in your back pocket is, “Hmmm… I wonder about that, too.” When we say this, we give our child permission to hold open a door to wonder, to recognize that she, even into adulthood, can participate in the great Mystery.

In our ability to conceptualize, and in our very western training of the mind, we believe we have the “answers,” and are often glad to give scientific explanations to our children. But the new science, the new physics, points us back to our roots, back to the great unitive Mystery.23 Let us allow our children to live in this natural wonder and freedom.

**Stress and Learning**

Earlier we discussed the effect of the pregnant mother’s stress on the developing embryo. Let’s look now at more specifics of stress. During stress, adrenaline, cortisol and other neurotransmitters prepare the body for danger, helping us to run, or turn and fight. It is in the lower brain and the brain stem that this activity begins, spreading from there to our entire body. Studies have shown that the release of adrenaline, through a complex biochemical event, negatively impacts our ability to focus and control our thought.24 This is because the body-mind complex has routed the focus toward the periphery, readying us muscularly, visually and vascularly for threat. In other words, the life energy is being spent on protection, not focused thought. Cortisol increases blood sugar levels to face the oncoming ordeal, and constricts the blood vessels at the surface of the body (to reduce wound bleeding), which increases blood pressure to the core of the body. Ever wonder why, under stress, you feel like you are in a pressure cooker? It is no wonder that increased cortisol is correlated with decreased learning and memory, as well as attention problems.25
We know that stress is a health risk, and many physicians today urge patients to work toward stress reduction through exercise, nutrition, recreation and so forth. What we are just discovering now is how detrimental stress is to learning. The first studies on the effects of stress were conducted with men in the work force, because they were exhibiting physical symptoms. As women began to join the work force, they began exhibiting the same symptoms. Now we see that this malady has also reached our children. We see stress in the schools, with test scores dropping and behavior deteriorating. What is going on, and what can we do about it?

Stress is a bodily response to perceived danger. Each of us is unique, and so we will perceive situations differently. We no longer live in a world in which “stress” is confined to the roar of the tiger or the danger of the hunt. What one person may interpret as “friend,” another may experience as “foe.” As adults, we can learn to retrain our reptilian brain-induced body reactions through the conscious use of the frontal lobes, through conscious choice. We can discuss the problem or verbally express our emotion; we can learn to breathe slowly while under stress; we can take up a meditation practice.

But how do we keep our young children, who do not yet have full use of their frontal lobes, stress-free? Stress-free living supports dynamic brain development, and a well-developed brain supports stress-free living. Like so many things in life, we can move into an upward spiral of abundance, or a downward spiral of depletion. Where do we begin?

Poor Brain Functioning Produces Stress

Optimal brain functioning supports the child’s ability to perceive and interact with her world in a positive, optimistic way. This builds strong self-esteem. Strong self-esteem is a primary protector from stress. When a child’s brain function is weakened, her interactions lack skill and coordination, which can negatively impact her sense of self. Here are a number of common factors in early childhood that, if attended to well, will support vigorous brain development, and thereby help to protect our child from the experience of stress.

As you read the following, you’ll want to get out your journal and make notes. Plan concrete actions: make water available at child level, put
a sign on the mirror reminding you to “PLAY”; perhaps when your digital watch chimes at the hour be sure you and your child are in movement, and so forth. The sections below will flesh out these beginning ideas, so let’s begin now!

To Support Vigorous Brain Functioning

Drink adequate water: Brain functioning is primarily an electrical activity. Water conducts electricity. The brain, and in fact the whole body, is comprised primarily of water, and in fact, our entire bodies are. Be sure your child drinks plenty of water each day, to avoid stress. Herbal teas can “count,” but not milk or fruit juices, and certainly not sugary sodas. About one third of an ounce per pound of body weight is usually recommended. Caffeine is a diuretic and, rather than increasing body fluid, actually depletes the body of its necessary moisture. Chocolate and many soft drinks contain caffeine. Keep a source of water in a low place that is accessible for your children. If you put a pitcher and a small cup on a low table, they can also practice eye-hand coordination and experiment with weight, volume, and displacement of liquids!

Eat adequate protein: Proteins and fats are the building blocks of the whole body, but especially the brain. Pregnant women and children—especially before the age of five, but throughout the whole of childhood—need extra protein for the essential work of building a well-developed brain. Children with learning difficulties often have inadequate protein intake. Think of cheese, nuts, a hard-boiled egg and milk when snack time arrives. Be cautious of offering store-bought yogurt, which is often overly flavored and sugared. Sugar is counterproductive to optimal brain development.

You can make nutritious yogurt at home! In a quart jar, place three cups room-temperature milk, one-half cup dry milk, (to thicken it), a spoonful of honey, a spoonful of acidophilus from the health food store, and one-half cup plain unflavored yogurt in a quart jar. Shake it well and wrap a heating pad around it. Set the pad on high for four hours, then on medium for twenty-four to thirty-six hours. Voila! Flavor it with fruit, and your family will be in heaven. If it seems thin, serve it as a smoothie and add more dry milk next time. If your heating pad runs hot, and you end up with a soft
cheese, add garlic and scallions, serve on crackers, and experiment with the temperature setting next time.

Establish regular home rhythms: All learning takes place as a slowly building process. All of us, but especially our young children, learn by moving from what is familiar toward the new. The experience of the new is built on the foundation of the familiar. Offering our child a regular, rhythmic home life sets in place an optimal learning environment. We can look at this not as a rigid adherence to time, but rather as a gentle flow of energy. Think of moving from one activity of the day to the next in the same way morning imperceptibly climbs toward noon. The chapter on “The World of Rhythm” offers you simple, joyous ways to plan your days and weeks. “Celebrating Festivals Together” helps bring a rhythmic pattern to the years.

Offer plenty of time to play: Play is crucial to children’s cognitive development. It is through play that the child takes sense experience and organizes it into mental and emotional patterns. As the child grows and matures, these patterns become ever more complex. The three-year-old will play “making dinner” at the toy stove. You may be offered the same bowl of soup over and over again. Here we see the development of motor skills, eye-hand coordination and the budding of care and nurturance, to mention only a few abilities. The five-year-old’s game becomes more elaborate. She and her sister may have spent the last hour in the “hospital” bandaging all the stuffed animals’ wounds with baby powder and toilet paper, and now, acting as not only the vet but also the restaurant owner, she stands at the toy stove making pizza for all her patients. Having built the pizza delivery truck of chairs and pillows, Sister is ready, and off she zooms. The learning that takes place in a well-developed imaginative scenario like this is astonishing. Eye-hand coordination, both large and small motor skills, balance, movement, motor planning, social cooperation, emotional self-monitoring, speech, hearing and language development, as well as the remarkably elastic conceptual skills of imagination and thought, are all employed in the world of make-believe. See the chapter on Indoor Play to learn more about the necessity for play in childhood, as well as how to create optimal play spaces.

Much of modern preschool children’s time is now taken up by either structured activities, such as “enrichment classes,” or passive activities like media exposure. The prime imperative for the young child is movement through play. It is
our responsibility to make as much time available for imagination-rich play as possible.

Offer plenty of time to move: We have seen how essential movement is to brain development, and therefore to every aspect of the child’s life. You will want to choose, from the many ideas offered in this book, where you would like to begin to enrich your child’s movement and play environments. Choose just one idea, implement it, experience the magic, incorporate it into your family life, and then choose the next! Let’s look now at just a few movement activities that will foster balanced brain development. Get your journal ready:

**OUTDOORS:**

- Bouncing on a “hippety-hop ball,” the kind that is straddled, with a handle. You can stake a tarp down for bouncing, to avoid punctures.
- Plenty of sand and water play. Put the water at a distance from the sand to encourage running, balance (try carrying a bowl full of water!), strength and cooperative play. Bowls and spoons for mixing.
- Plenty of mud play. Mud is very different from sand, and every child I know prefers mud to sand, or likes to mix the two.
- Swinging—on swings, gliders (the kind of swing that two children ride together, back to back), hammocks, rope swings.
- Imaginative play in natural structures—hay-bale houses, bamboo-pole tipis, butterfly-bush houses and such.
- Outdoor building projects. Have lots of building materials available, like board ends, firewood, stumps, sticks, pine cones, bricks, stones, garden pots, pieces of slate, lengths of bamboo, rope and so forth.
- Using tools. Go to the Salvation Army to get cheap tools. Look for small, lightweight ones—hammers, wrenches, pliers, paintbrushes—that will fit your child’s hands. Screwdrivers are usually too sharp.
- Seesaw play. It’s great for balance, strength, overall coordination, a hands-on experience of weights and balances, social cooperation.
- Pushing and pulling. Get a wagon and add building materials!
- Interacting with bugs and insects. Get a small screened “bug house.”
- Roly-poly time. Roll in the grass, or on a small hill. Bear-hug down the hill.

**INDOORS:**

- Artistic experience. Watercolor, play dough, finger paint, clay, scissors with old magazines and glue, tissue paper art, pastels. Your library is full of idea books.
• Water play. At the kitchen sink, in the bathtub, at a “tea party,” helping to scrub bathroom and kitchen, washing the doll’s clothes.

• Sand play in the kitchen. See the chapter on Indoor Play for ideas about an indoor sandbox. Add small figures, vehicles and animals for imaginative play. Some child psychologists use a sand tray for therapeutic purposes because this kind of play allows the child to “play through” the emotions.

• Imaginative play. In the chapter on Indoor Play you will learn how to create an open-ended playspace to foster your young child’s imagination—for child’s play is transformed into thought.

• Cook together. Chop, mix, stir, beat, knead, fold, grate. Excellent for honing fine motor coordination and helping with visual focus.

• Clean together. Sweep, dust, wash, scrub, polish, fluff. Each activity sharpens different senses and activates different parts of the brain.

• Rough and tumble. Children love to roughhouse with their parents, who are utterly challenging, impervious to pain, and entirely safe. Be careful of tickling, though, because it can constrict the breath. With my younger son, all I had to do was look like I was going to tickle him to send him into gales of laughter. A fun game is Steamroller: put him in a “pillow sandwich” and then roll your body across him, inside his pillows.

• Dress-ups. Keep the best of your next Salvation Army load for the dress-up corner. Old hats, gloves, shoes, ties and shawls are all heavenly.

• Rocking. Have a large rocker for yourself and a small one for your child, so you can rock together in one chair, rock together in your own chairs, or your child can work at rocking in your big chair. Rockers can also be turned upside down at playtime, and used for... well, anything!

• Roly-poly time. After lunch, before your pre-nap outdoor play, have your child log-roll on the living room carpet. You can take a couple of rolls, too. It is an amazing experience, and you’ll understand why your child loves it.

• Bear hugs. This is whole-body stimulation, with a firm squeeze from head to toe. It involves all the senses, is excellent “brain food” and feels great for both of you. “Hug sandwiches” are the best.

• Baths. Warm and bubbly, with water toys, pouring and squeezing.

**Offer plenty of time for stories:** The use of language promotes the development of the left neocortex, involving the sensory, auditory, visual, motor speech and other areas. Listening is fundamental to language, and hearing stories strengthens this ability. Language is a primary avenue through which we express our unique self, and therefore is crucial for self-esteem. When
modeling the use of language through stories, you will want to choose material that is age-appropriate. See the chapter on the Wonder of Stories to understand the developmental needs as your child grows.

**Offer plenty of time for conversation:** Have conversations with your child throughout the day. Be aware and use full sentences. This allows the child to hear and then imitate full ideas. Incomplete speech patterns lead to incomplete thought patterns. See the chapter on Home Rhythms for a fuller discussion about conversation at the dinner table.

When we attend to each of these areas, we provide our child with a balanced “diet” of sense experience, and offer an excellent foundation for cognitive functioning. This in turn helps our child experience positive interactions as she grows, which establishes strong self-esteem. Strong self-esteem will help shield our child from the various stresses life entails.

**THE MEDIA AND LEARNING FOR THE YOUNG CHILD**

There are many ways in which the media, whether TV, movies, video games or computers, negatively impact the young child’s development. We will touch briefly on the media’s impact on the child’s all-important movement, the capacity to imitate, social development, language development, and development of the imagination. See the bibliography for books that delve more deeply into this critical subject. We will also discuss alternatives to media experiences.

Ninety-eight percent of American homes have at least one television, and the average television is on for over seven hours a day. The average American child spends forty hours a week watching various forms of visual electronic media, more time than in any other waking activity, including playing. A six-month-old infant spends an average of one and a half hours a day watching TV, and the average preschooler spends more than four hours daily in front of a screen.

With this much time spent immobile, what is happening to the child’s powerful imperative of movement? Some parents believe that monitoring the content of their child’s viewing is all that is needed to avoid damage. Let’s consider this. As we know, movement in response to sensory input lays down neural networks in the brain. Less movement means less neural networking. Less
neural networking means less communication between the different regions of the brain. Less communication means a lack of sensory integration. Less sensory integration means less adaptability in learning new skills. In *Television and the Aggressive Child*, Huesmann and Eron write, “Children of lower intellectual achievement generally watch more television...and behave more aggressively.” Time spent before a screen is time lost to movement and healthy development.

And what kind of model does the media provide for movement in our children? The physical gestures we typically see in the media are often overly dramatized, since in order for movement to translate to the screen, subtlety is often sacrificed. Movements are also frequently hurried, voices are loud, and responses are quick. Regularly, in talking to parents, I have said, “You will never see a video program of someone watching through the window as the rain falls.” And yet, how soothing it is to focus and refocus first on the distant rain against the background of trees, and then on the tiny rivulets created on the glass. For a child there is tremendous imaginative potential in a scene as simple as this. This powerful experience can never translate to electronic media. Will the child’s sense of subtlety be blunted by the over-dramatization electronic media requires?

Language development is critical as a foundation for cognitive learning as well as emotional intelligence. As we mentioned earlier, in order for the child to learn to think complete thoughts, she must hear this demonstrated before her, through language. Much of the language in the media is truncated, and slang is used as a dramatic effect. Often, even in children’s programming, a kind of cynical humor is introduced, and allusions that the child does not understand are left hanging in the air. This situation deprives the child not only of exposure to whole language, but also—since children mostly view the media without their parents—of the opportunity to ask a question when she doesn’t understand. Unlike conversation, in viewing the media we use the passive skill of listening without the partner skill of actively speaking. Children learn language not only by listening but by actively participating through speech. Overexposure to the media can negatively impact the child’s developing language acquisition.

Of course, speech is only one avenue through which meaning is expressed in real life. Parents who are attuned to their children respond in integrated
multiple sensory modes, so all the senses are at work when parents and children interact. During a pregnant pause in a conversation, the child may be aware of subtle facial movements, or the restful rhythm of his own heartbeat. He may hear the ticking of the clock or birdsong out the window. This multisensory awareness offers constant opportunities to glean meaning and perspective. The media, however, depends primarily on the visual, and secondarily on the auditory function, to the exclusion of the other senses. Especially for the young child, this creates a deficit in the sense of movement and “embodiedness.” Because the eye responds to movement, there can be few pauses in media programming, and children, following the imitation imperative, mimic the hectic, incoherent pace they observe there.

The young child is geared to experience certain environmental stimuli as stressful. Chief among these are facial displays of alarm, anger or disinterest. The media is full of these: they “sell,” whereas quiet joy and focused attention are not money-makers. Other stressful stimuli are excessive noise and lack of coherence. How many media programs for children are characterized by just these qualities, and what are the effects in terms of imitation? Although to an adult viewer the actions on the screen may seem coherent, the young child is just learning, in a multisensory fashion, how human coherence works. When an exchange happens in real life and the child does not understand the coherence, there is an opportunity for inquiry (the familiar “Why?”). As noted above, however, most of the time children view the media without the company of parents, who may use the media as a means to occupy the child’s time while they try to get household work done. In this situation, the child’s stimulus-response pattern can be affected. When viewing an event on the screen, the child encounters a visual stimulus, but there is no opportunity for an appropriate response. The child cannot reach out and touch, smell, taste or interact with what she sees. Not only that, but with the hurried pace of many television shows suggesting that a life situation can be experienced, worked with and resolved, all in the short time between commercials, there is no time for understanding to grow. Finally, screenplays are written in a very formulaic way, each “movement” following a very patterned course in terms of timing, action and resolution. Life, on the other hand, is full of twists and unexpected events. The young child needs to be allowed to imitate our

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**Facts on Media and Learning (cont.)**

The media focuses on visual and auditory stimulation, to the exclusion of other sensory stimuli, especially the sense of movement.

- The child’s stimulus-response pattern is affected: the child encounters a visual stimulus, but no appropriate response can be made. The child cannot reach out and touch, or interact with what she sees.
- Programs are too fast-paced to ask for help.
- Parents tend to use the media as a babysitter, so often no adult is present to ask.

Often children do not understand interactions they see on the screen.

- Visual electronic media can produce stress in children.
  - Media violence goes against instinctual species survival.
  - Excessive noise and lack of coherence, as well as facial displays of anger, alarm and indifference—all common in children’s media—produce stress.
human capacity to adapt to the new, and not be constrained by imitating these prescribed patterns.

When it comes to media violence, imitation is not the only concern. In a study conducted at Stanford University, television viewers’ brains responded to movements on the screen as if they were actually real, preparing the nervous system for a physical response. When children, and adults as well, witness television violence, their bodies interpret it as though it is a real occurrence.

We know from our discussions above that when the “fight or flight” mechanisms of the brain are activated, this diminishes the efficacy of the higher cognitive capacities. When preparing for battle, it is nearly impossible to think rationally. Einstein tells us, “It is impossible to simultaneously prepare for and prevent war.” When humans see aggressive or threatening behaviors onscreen, and the ancient brain interprets this as reality, this repeated activation of the defense mechanisms reduces the engagement of the young child’s higher brain centers. There is less of the necessary “life force” available for the development of these higher functions. The capacity for dialogue and rational thought is fettered.

According to the American Academy of Pediatrics, research has associated exposure to media violence with “a variety of physical and mental health problems for children and adolescents, including aggressive behavior, desensitization to violence, fear, depression, nightmares, and sleep disturbances.” In over thirty-five hundred research studies investigating the association between media violence and violent behavior, they claim, all but eighteen have shown a relationship—and some indicate that aggressive behavior associated with media exposure persists for decades. They go on to cite a National Television Violence study that evaluated ten thousand hours of broadcast programming from 1995 to 1997, and found that sixty-one percent contained interpersonal violence,
eighty percent of which was portrayed in a glamorized manner. The highest proportion of violence was found in children's programming, with violent incidents increasing year by year.\textsuperscript{42}

Remember, the brain interprets movements seen on the screen as actual happenings. This means children who are exposed to media violence believe they live in a world with ever-increasing acts of violence. What kind of human being does this create? And what happens to social behavior?

Because of the enormous role of imitation in mental development, children learn through media violence that aggression is an acceptable way to achieve goals and solve problems. The National Association for the Education of the Young Child voices these concerns about media violence:

- Children may become desensitized to the pain and suffering of others.
- They may be more likely to behave in aggressive ways toward others.
- They may become more fearful of the world around them, perceiving the world as a mean place.\textsuperscript{43}

This third scenario is perhaps the most insidious. “Research has revealed,” the NAEYC warns, “that violence on television plays an important role in communicating the social order and in leading to perceptions of the world as a mean and dangerous place.”\textsuperscript{44} Again, we have the old fight-or-flight defense mechanism being called into action, to the detriment of higher cognitive function. It is also worth noting that it is not just violent programs that stimulate aggressive behavior. Frenetic, hectic programming that creates a high level of arousal in children can also create the same effect.\textsuperscript{45}

\textit{My Personal “Research”}

In my own experience as a classroom teacher, children who view too much media are hampered in their capacity to play collaboratively, in their imaginative capacity, in their creativity, in their ability to imitate and in their movement. Over the last thirty years, I’ve observed that my little TV watchers need to play and replay the actions seen on the screen. As we know, children make meaning by “playing through” the actions they see around them. Because the media is so fast-paced, and often beyond a child’s understanding,
these confusing scenarios lie unresolved in the child. In the classroom, the capacity to play collaboratively is hampered by the pressing need to keep playing through media situations, hoping for resolution. Also, because collaboration is not a venue that plays well on the screen, the child has no model for cooperation in her quest to understand the confusing, often “anti-species survival” (i.e., violent) and emotionally laden material. Instead, her old-brain defense system is activated by these unresolved, stress-producing scenarios. All of this does not bode well for the subtle intricacies that cooperative creative imaginary play requires. The NAEYC says “media children” are “less likely to benefit from creative imaginative play as the natural means to express feelings, overcome anger, and gain self-control.”

These children suffer in their imaginative capacity, also. All conceptual thought lies on the foundation of our innate ability to create and remember mental images. Without this “image-making capacity” we would meet each thing new, as though for the first time, every time. The only way we can talk about a horse, for example, is to carry a mental image of the horse within. When the child is young, this work of “image-making” is critical. With use, the brain develops neural networks that strengthen and reinforce this essential human capacity. Each experience augments this growth. When, on the other hand, the child is fed predetermined images of someone else’s imagining, opportunities to strengthen their own image-producing facility are diminished. If the average American child is watching forty hours of electronic media each week, what is happening to our collective foundation of intelligence?

I have seen, though, that when screen time is dramatically reduced, there is a blossoming of imagination in the child. It is the child’s natural, biological inclination to creatively imagine her world. Given a chance, this impulse will reassert itself. Since time immemorial, children have gone outdoors and created phenomenal worlds of intricate detail, all with sticks, bark, stones, water… whatever materials were available. In my classroom, as well as in my home, I have tried to offer these same kinds of open-ended toys and play materials. Children who are too influenced by media lack the imaginative ability to see how these very simple, open-ended creative props can be used. It is difficult for them to imagine how a seashell could possibly be a cell phone; they want a toy cell phone as a prop for their game! However, if we give
children very little exposure to the media, they will discover many opportunities to creatively express their very own twenty-first-century life. Here is one example.

One of our kindergarten toys is a basket of shiny gold paper cut into various odd pieces, which lends itself to a variety of games. One day, when the children were playing “store,” the little store owner had collected all the “gold coins” in payment for his wares, and now hoarded them. The other children felt impoverished and came to me for assistance. I had him bring me the basket, and announced that the bank had now opened, and I would be glad, as the banker, to share the wealth. The little culprit, knowing his power had been usurped, thought about this quietly. Unwilling to be on par with everyone else, he gave me back his gold coins, picked up a corn cob, stuck it through his belt and said as he sauntered off, “I’ll just use my credit card!” A modern application of an ancient toy!

But how can essential human activities, the “dailiness” of life, compete with media images that are larger than life? I worry that such images, which are designed to hold the eye’s attention, overwhelm the child’s capacity to create his own inner images from the imitation of ordinary scenes of daily life. Often I have found, particularly during circle time, when the child’s academic foundations are being prepared through movement, song, story, gesture, rhythm and rhyme, that the “media children” have difficulty following the intricate sequencing, the movement patterns and language use. They miss out on the enormous potential for brain development because their imitative capacity is overwhelmed by media images. How can a song with gestures,
about a pony galloping through the autumn fields, pique their imagination, when they have just come from early morning cartoons, filled with all the media’s over-exaggeration?

In summary, to quote Brown University’s Mary G. Burke, “the concerns about VEM (visual electronic media) are

- They overstimulate the visual system, at the expense of other sensory systems.
- They deprive the child of necessary social interactions that foster self-regulation and contradict the child’s innate ability to recognize the significance of facial affect.
- They arouse the child, but in a situation where he lacks the means for appropriate containment of his arousal.
- They blunt his capacity for generating symbols and imaginary problem-solving.
- They interfere with the development of autonomy.”

What to Do?

The good news, as I mentioned earlier, is this: the human brain is capable of enormous self-repair. Factors that diminish media-induced behaviors are: moderation in use, family activities, parents who are attuned to the child and model coherent behavior, and a large repertoire of alternative activities, particularly those that offer the child a sense of mastery. The Brown University Letter states, “The cheapest, least invasive and least risky intervention we can prescribe to families is to turn off the TV and play together.”

Turn Off the TV and Play Together!

“But, I don’t know where to begin!” you may say. You hold in your hand a recipe book for exactly this. Turn the page and you will find ideas ranging from how to get the children to bed on time to the specifics of making a tipi or an indoor sandbox. You will find how to create family celebrations you will all remember for a lifetime, as well as how to arrange the family work day. You will learn how to let Love lead in discipline situations, and how to
make up the best bedtime stories. This book is a broad, in-depth study of family life. You and your family have a long, long time to work with it!

Relax, be creative and enjoy!

*One Last Thought about the Media*

You may be thinking, “But how will I have a minute to myself, or even make dinner without the TV? How could I ever talk on the phone?” Let me just tell you my experience, as a mother of three, who worked full time and performed the daily juggling act this involved.

I would never have survived with the media in our life! I was far too busy to deal with the whining discontent the media creates in children! *Because I relied entirely on my children’s innate capacity to create, imagine, be active, and entertain themselves, they did exactly that.* They never came begging for my attention, wanting to be entertained. How could I, a dull old grown-up, compare to their free-flying imaginative world?

Eventually, my boys did learn the word “bored.” I believe they learned it from friends, and saw the power it contained. They tried using it from time to time, to see if it was as effective as it seemed. My standard reply was, “Hmm… you know, when you are bored, this is a good thing! It means there is a little empty space inside, just waiting for an excellent idea, a really great game. Why don’t you run along, and come back to tell me when you have the new idea?”

*What I am trying to say to you is that this is the easy way! Of course you are concerned for your own well-being, and that you have a few moments of personal space. Cut out the media, give your children open-ended toys and plenty of story as fodder for the imagination, and you will have the time you need! This is the secret to excellent parenting: trust your children’s natural capacity to create, be courageous, and leap! You will not regret it.*