

## Praise for *How to Build Your Baby's Brain*

“Give your child the greatest opportunity to reach her fullest potential, both emotionally and intellectually. In *How To Build Your Baby's Brain*, Dr. Gross gives new meaning to every cuddle, every hug, every touch, with explanations of how they effect a baby's brain development. This is must reading for parents and grandparents and settles the old argument of nature vs. nurture with enough neuroscience to explain the gene factor and helpful advice for the nurturing.”

—**Pat Mitchell, media executive, producer, curator of TEDWomen**

“Every touch, sight, smell, and interaction . . . impacts the wiring of your child's brain.’ In the face of such a formidable statement, how very lucky we are to have Gail's beautiful, wise, important book to guide us toward being the best that we can be for our children. Ultimately, *How to Build Your Baby's Brain* is not only about helping kids grow, it is about building a better world. As always, Gail builds her case and teaches us with rigor, intelligence, and above all, her trademark compassion.”

—**Mariska Hargitay, Golden Globe and Emmy Award-winning actress**

“In *How to Build Your Baby's Brain*, Dr. Gail Gross tells us about the neuroscience of early childhood development, teaching parents not only the stages of brain growth, but also how they can give their children the greatest opportunity to reach their full potential, both emotionally and intellectually. A must-read for all parents.”

—**Arianna Huffington, founder & CEO  
of Thrive Global and founder of The Huffington Post**

“Though your genes are a blueprint, they're only a two-dimensional look at what will be a three-dimensional child. And now we know that the old argument between the influence of nature versus nurture has been settled, pointing to a 50/50 split of equal impact. Though nature supplies your genes, it is the experiences your child has that determine which genes are expressed and which are suppressed. In a sense, your child's brain develops in reaction to the stimulation it receives, and every cuddle, every hug, every touch, will affect her brain development. As Dr. David Rice stated, ‘biology is not destiny.’ *How to Build Your Baby's Brain* is about the neuroscience of early childhood development, teaching parents not only the stages of brain growth, but also how to positively affect them. This will give your child the greatest opportunity to reach her fullest potential, both emotionally and intellectually.”

—**Goldie Hawn, Academy Award and Golden Globe-winning actress**

“Dr. Gross teaches you how your baby’s growing brain is a work in progress, and how you can be part in helping your child attain their fullest potential. The science is there. Make this your manual for giving your child or grandchild the greatest gift you can offer them, the gift of higher intelligence.”

—**Alberto Villoldo, PhD, bestselling author of *One Spirit Medicine***

“Even the most loving and well-meaning parents can inadvertently make mistakes because they don’t understand how a child’s brain grows and develops in those formative first years. In this pioneering book, child development and parenting expert Dr. Gail M. Gross explains steps you can take to boost your child’s ability to learn and succeed in school and life. This practical approach to nurturing young minds is a must-read for every new parent.”

—**Lynda Resnick, entrepreneur and businesswoman**

“A ‘loving, nurturing, present parent’ is the most important element in the development of a child’s brain, says Dr. Gail Gross. A must-read for all new parents.”

—**Marlene Malek, vice chairman of Friends of Cancer Research**

“We all want our children to reach their maximum potential. But we are not all aware that we already possess the power to do so. With her signature brilliance and heart, Dr. Gail Gross proves in relatable terms how YOU can shape your child’s brain—and future.”

—**Lyn Davis Lear, MFT, PhD, social and political activist and philanthropist**

“Dr. Gail Gross has written another outstanding book, *How to Build your Baby’s Brain*. When you find out you are having your first child, you experience both happiness and fright. The frightening part is that you have the responsibility of raising this child. You as a parent have that power. You build your child’s brain by stimulation—cuddling, reading, singing, etc. Bond and nurture your child; your time with them is powerful. Take control and mold this baby into a healthy, happy child who is ready to take on the world. *How to Build Your Baby’s Brain* will point out the tools you need to do this. Know in your heart that you have these tools.”

—**C. R. “Bob” Bell, Vice Admiral (retired) United States Navy**

“Gail Gross is a genius in taking complex issues and making them easy to understand. Every young couple—as well as grandparents—should read *How to Build*

*Your Baby's Brain*. It is powerful in teaching us how to be a major influence on our child's brain development."

—**Michael B. Yanney, Chairman Emeritus of the Board of Burlington Capital**

"Even the most loving and well-meaning parents can inadvertently make mistakes because they don't understand how a child's brain grows and develops in those formative first years. In this pioneering book, child development and parenting expert Dr. Gail M. Gross explains steps you can take to boost your child's ability to learn and succeed in school and life. This practical approach to nurturing young minds is a must-read for every new parent."

—**Lynda Resnick, American entrepreneur and businesswoman,  
owner of The Wonderful Company**

"We all want the children in our lives to grow into happy, successful adults. In her new book, *How to Build Your Baby's Brain*, Gail offers clinically proven guidance and actionable advice for boosting your child's positive mental and physical trajectory."

—**Renee Parsons, businesswoman and philanthropist,  
founder of the Bob & Renee Parsons Foundation**

"Dr. Gail Gross insightfully and persuasively affirms parents' ability to affect the mental, emotional and psychological identity of their children: they become who they are largely through the experiences we share with them. This is a welcome and timely reminder of the gravity and importance of our children's formative years: a must-read for all present and prospective parents.

Rich, stimulating experience and loving, compassionate relationships are the foundation to becoming all you can be. With important new data and incisive wisdom, Dr. Gail Gross is our guide to being a fulfilled parent of a child who is eager to learn and filled with wonder about the world and their place in it.

In these days when we connect to each other through devices and data, Dr. Gail Gross reminds us of the vital importance of emotional bonding, physical connection, and quality time in raising a child that is healthy and happy in body, mind, and spirit. There is much compassionate wisdom in these pages, and I encourage you to experience it."

—**Tara Guber, president and founder of Yoga Ed**

“*How to Build Your Baby’s Brain* is a how-to guide on best practices for parents to ensure a baby’s optimal brain health. An engrossing read.”

—**Michelle Robson, founder of EmpowHER**

“Dr. Gail Gross has written a book with a keen observation that escapes many mothers but is an absolute. Bonding cannot be done by proxy; Mom has only one chance . . . the key to early childhood development is being there.”

—**Ambassador Joseph and Alma Gildenhorn**

“In 1980, my husband and I started our family of four children, and began the life-long journey of parenting. For me, an integral part of being a mother was being our children’s first teacher. Every day was a day to explore together the world around us. I read the latest, most cutting-edge books on parenting and child development but found nothing to support or explain what I was observing in our children’s development. *How to Build Your Baby’s Brain* was exactly the book I was looking for and yearned to read. I can personally attest to the tremendous benefits you will find in your own child’s growth and future development—even through their adulthood—by applying the principles and techniques found in Dr. Gail Gross’s book. What I was learning by trial-and-error and without understanding why some things worked and others didn’t, you will discover in this book. I highly recommend that every parent, teacher, and grandparent read this brilliant work and utilize what you will learn to maximize the potential of the little ones you love and cherish. You will find that you can and will profoundly contribute to their bright future. You will be building your baby’s brain!”

—**Renée Brinkerhoff, founder and driver, Valkyrie Racing and Valkyrie Gives**

“Knowing Dr. Gail Gross as well as I do, knowing how passionate she is about her profession and reaching out to help people, knowing the tremendous amount of love she has in her heart, and not to say the least about her exceptional intelligence, I strongly urge every parent and parent-to-be of a newborn to read every word she has written in *How to Build Your Baby’s Brain*. It can have a very positive impact on your child’s future.”

—**Ronald M. Simon, Founder of RSI Home Products  
and The Simon Foundation for Education and Housing**

“Dr. Gross has an innate ability to take highly complex subjects, in this case raising our children, and break them down to their most accessible roots. Her writing will

both inform and inspire you to take a deeper look into the relationship between parent and child.

What I find particularly remarkable about her writing is how well she blends the science with compassion, a sweet spot that is rare to find in highly personal topics such as this. I wish I had this book when I was raising my kids, but I will be sure to pass it along the day they have kids of their own.”

—**Sheryl Lowe, jewelry designer**

“Once again, Dr. Gail Gross has provided us with invaluable information that will enhance and improve lives. Every parent should read this scientific, yet approachable book about how our children will thrive when we learn how their brains develop and respond. As in her past writings, Dr. Gross communicates what can be a highly complicated subject, in understandable and loving terms.”

—**Ann Rubenstein Tisch, founder and president  
of Student Leadership Network**

“The importance of early childhood experiences in the development of an individual has been well established. In our busy world, we often look outward towards the latest new gadget or technological advancement to help in our child’s growth. Dr. Gross’s book is a welcome invitation back into the home, providing parents a practical outline to reengage with their child and foster emotional and social development. *How To Build Your Baby’s Brain* is a great book for the new and seasoned parent alike.”

—**Dr. Jeff Meyrowitz, MD**

“*How to Build Your Baby’s Brain* is bursting with the key insights for parents to ensure they give their child the best start possible in life, and it gives readers a wealth of practical information they can start applying today in the vital quest to optimize their child’s future.

Dr. Gail Gross, the author of this authoritative book, is a human behavior expert and family and child development specialist. She serves as a discerning and compassionate guide on the journey to understanding the developing brain by sharing insights from her own commitment to parenting and knowledge gained throughout her career.

With patience and wisdom, Dr. Gross helps parents unlock the importance of genetics, the impact of environment, and the key role of bonding in triggering the blossoming of their child’s brain. She encourages parents to ‘optimize the window

of opportunity' so their children can develop the emotional skills that contribute to social and intellectual growth. And she cheers readers on so they can be perfectly positioned to make the difference in their children's lives that only they can make.

I am honored to call Dr. Gross my friend, and grateful to have her in my life. She understands the intricacy of our human existence and the scientific principles that can generate the results we seek. This book is a magnificent testimony to her devotion and service to others, and a must-read for anyone who has ever wondered if they could be doing more to support their child's developing brain."

—**Melani Walton, cofounder of the Rob and Melani Walton Foundation**

"We're obsessed with the latest gadgets to make us better. Turns out the most advanced gadget is still the human brain. Dr. Gail Gross just delivered to us the manual."

—**Deborah Duncan, television host**

"*How to Build Your Baby's Brain* is a beautifully written must-read for parents interested in truly understanding their responsibility and power in shaping their children's developing brains."

—**Glenda Greenwald, founder and president of the Aspen Brain Institute**

"Gail's book has given Extraordinary Clarity of the Miracle of Life. Each page gives the Wisdom and understanding of how early nurturing is essential to life's long growth. I'm in total awe of *this book*. I found it to be so insightful. And on every page, I felt Gail's heart and passion. *How to Build Your Baby's Brain* takes an in-depth look at the turmoil of our world today. And, it should be a part of our education, as parenting is the most important job we will ever have. I'm honored to be included in this extraordinary journey."

—**Tova Borgnine, American-Norwegian businesswoman,  
founder of Beauty By Tova**

"Dr. Gail Gross is a dynamo! *How to Build Your Baby's Brain* is a gateway to the deepest understanding of your child's intelligence and well-being. It helps you to teach your children the right things at the right time. Dr. Gross integrates the intellectual, the spiritual, and the psyche into a harmonious whole.

This book will benefit everyone. It lives up to its title and I intend to share it with all of my friends and their children. I could go on and on but I hope everyone will just take my advice and read it!"

—**Lauren King, American actress**

# HOW TO BUILD YOUR BABY'S BRAIN

A Parent's Guide to Using New  
Gene Science to Raise a Smart,  
Secure, and Successful Child

**DR. GAIL GROSS**

Foreword by *Dean Ornish, M.D.*



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*To my beloved husband, Jenard Gross, who makes all things possible, including me. You are my sun, my moon, my stars, my heart. You are the love of my life.*

*Your children are not your children.  
They are the sons and daughters of Life's longing for itself.  
They come through you but not from you,  
And though they are with you yet they belong not to you.*

*You may give them your love but not your thoughts,  
For they have their own thoughts.  
You may house their bodies but not their souls,  
For their souls dwell in the house of tomorrow,  
which you cannot visit, not even in your dreams.*

*You may strive to be like them,  
but seek not to make them like you.  
For life goes not backward nor tarries with yesterday.*

*—Kahlil Gibran*

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## FOREWORD

This extraordinarily wonderful and important book by Dr. Gail Gross may have a bigger impact on your child's life and development than any other book you've ever read.

As she writes, *you* are the single greatest determinant of your child's personality, intellect, and future. This book will profoundly empower you to nurture, guide, and support your child in the most meaningful ways for both of you.

Many people are surprised to learn that much of this development occurs in the first one hundred days and especially during the first four years of a child's life. And while a child's genes are a factor, what we do as parents plays an even more important role. Genes are only a predisposition, not their fate.

Scientists used to believe that education began at kindergarten. We now know that it actually starts at the moment of birth—and as some studies have shown, even in utero. Children who have the positive parenting experiences that Gail describes in this book during their first four years of life have a significant advantage over children who do not.

As Gail writes, "Your child's brain builds and grows in response to the stimulation it receives, which means *each and every one* of your child's physical and emotional experiences biologically impacts the development of your child's brain. It's a lot of responsibility—and a lot of power."

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The basic, primal instincts that all parents have are the ones that our children most need—to love, nurture, and spend time with them. Just as exercise builds strong muscles, spending time with your child builds a strong brain. Any parent can do it—here, Gail shows how.

Talking to your child, reading to them, playing with them, interacting with them in supportive and nurturing ways builds billions of connections between the neurons in their brains every time this occurs. This increases your child's IQ and potential for success throughout their life. Connections between neurons mirror connections between a parent and child.

This occurs primarily before age four—use it or lose it. Children who have parents who don't spend much time interacting with them by then may have a hard time catching up later.

As Gail explains, "This process, called synaptic pruning, makes it possible for your child's brain to develop correctly. Simply put, stimulation enhances connections and pruning discards what is not being used. And though synaptic pruning extends over the course of a lifetime, it is the most active during early childhood."

This pruning process eliminates billions of connections between neurons that would have been preserved if a parent had spent time talking, playing, singing, reading, and hugging their child.

Spending time on television, iPads, and other devices does not have this beneficial effect. It's why many of the people who invented and built these devices don't allow their kids to use them. Screen time is no substitute for real time.

In short, this is a revolutionary book that can empower our children's lives for the better and, as such, transform the world we live in. It should be required reading for every parent.

—Dean Ornish, MD

Founder and president, Preventive Medicine Research Institute  
Clinical professor of medicine, University of California, San Francisco  
*www.ornish.com*

# INTRODUCTION

## IT TAKES A FAMILY, NOT A VILLAGE

You are well aware that your child's future prospects hinge upon her academic performance. You're inundated on all sides by frenzied statistics, scores, and scholastic stress—and it's all starting earlier and earlier. Our curriculum-obsessed culture has convinced you that to raise a successful, high-achieving child, you need to outsource her education to those who are “more qualified” (with those who stand to benefit doing most of the convincing). You may even believe that scientific advances and new technologies in education and learning can make your child smarter, provided you can secure a spot for her in the right program.

However, contrary to what you've been taught, you don't need talking heads or a host of expensive programs and toys. The truth is you're wasting money and time on programs that put the cart before the developmental horse, ultimately keeping your child from where she needs to go. My forty-eight years of experience as an educator and leading expert on child and family development and human behavior make it easy for me to see what empowers certain children to achieve, and what handicaps others. It is the child who comes to school *ready* to learn, read, think critically, and process on a higher level, instead of frantically accumulating information, who enthusiastically embraces her education, finding out where her true gifts, talents, and efficacy lie.

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You, and you alone, can ensure that your child have what she needs to do this, but you have a narrow window: the first five years of her life.

The problem is that you think someone else can do it better, so, like many, you scramble to outsource your child's training too soon, gambling away your child's most precious resource: *you*. You are, in fact, more than just a parent: you are your child's true gene therapist. You have the capacity to alter the expression of your child's genes by the environment you create. This means you can influence which aspects of your child's personality and potential are activated or suppressed. It is the experiences of that early environment that instruct and direct your child's genes, enhancing some and turning others off. Your child's genes are the mixing board, and you are the sound engineer. Once you learn how to tap into that, to flip the right switches, you can expand the limits of your child's potential in ways you may not realize. You can lay the emotional and intellectual groundwork that allows your child to seize opportunities for success fearlessly, naturally, and enthusiastically. As Maria Montessori explained, when discussing childhood education: "It is not acquired by listening to words, but in virtue of experiences in which the child acts on his environment."<sup>1</sup> Therefore, education begins in utero.

It is essential, however, to know how and when to activate those experiences. Your parental superpower wields the most strength during very specific and optimal windows of your child's development. This is critical: what happens within these developmental windows can set the course for the rest of your child's life. It's not just *what* you do that matters, but *when*, as research shows the most significant windows are closed by age five. According to Dr. Alexis Carrell, "The period of infancy is undoubtedly the richest. It should be utilized by education in every possible and conceivable way. The waste of this period of life can never be compensated."<sup>2</sup>

Don't panic. Yes, the stakes are high, but this means parenting is much simpler than you dared to imagine. Great parenting comes down to one mission: you have to be prepped and *present* for those windows, so that you



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can take full advantage of them and help your child develop into a smart, successful, self-sufficient adult.

That starts with providing an emotionally safe, structured environment. It's the springboard for your child's future. The secure child with a strong central core and good self-esteem isn't likely to fall victim to the influence of the "cool kids" or be pressured to please others who don't have his best interests at heart. Rather, he charts his own course, follows what sparks his intellectual curiosity, and adheres to his own values. For example, the confident, well-loved child is self-actualized, focusing on problem-solving while digging for answers, and doesn't fear the stigma of the science fair or chess match. Children who don't succumb to anxiety and peer pressure are strong enough to explore and express what makes them stand out; they follow their own authority.

In this book, I will teach you how to create parental bonds that inoculate your child against the fear of failure and the discipline problems that can inhibit both intellectual and psychological growth. Through an understanding of the stages of your baby's development, you'll learn to create a world that your little alchemist can explore with wonder, confidence, and ease. I know from my own personal studies and research that as your child's most important teacher, it is your job to create an environment that is not only secure, but rich with printed letters and numbers as well as physical objects he can observe and manipulate. These tools can help him develop the cognitive and emotional skills that in turn contribute to linguistic, cognitive, emotional, and social growth. This not only lays the groundwork for literacy, but expands your child's potential exponentially. And it's not just the environment you create; scientific studies show your presence is the biggest stimulator of linguistic, cognitive, emotional, and social development, so much so that the tension from your absence has the capacity to inhibit and even damage the way your child processes and learns information. I know that to provide a secure life for your child, you can't be there all of the time. Don't worry! In this book, I will show you how to compensate for your time apart by maximizing your time together.

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However, you can't *just* be there—you have to know what to do, as well. When you're actively involved with your baby's development, you are present, to observe and enhance those qualities that truly make your child unique. You recognize the potential for a piano protégé and you're there to catch the first signs of a learning or hearing disability, which can be successfully corrected or treated if spotted early enough. The key to being your child's true gene therapist lies in your ability to activate the requisite switches at the appropriate time, which will determine your child's success. In so doing, you will effectively reduce your child's stress, identify his individual gifts, and permanently remove potential obstacles to create a self-actualized child.

Most important, you will gain a full understanding of your child's multiple developmental timelines and how to get them to work in tandem. Too often society conditions you to compartmentalize aspects of your child's growth. As an educator, I saw many bright students who fell behind because their emotional immaturity blocked them from engaging effectively with their school material. The windows in your child's development for progressive and expanded growth are best optimized when they are approached with the full picture in mind. After reading this book, you will have a firm grasp of everything it takes to raise a happy, high-achieving, confident, empathic, and successful child.

This book could not come at a more crucial time in our culture. Our children face a more threatening world than many of us remember from our childhoods. Far too many have been "hurried" to grow up too fast—resulting in an epidemic of stress, mental illness, physical ailments, violence, and emotional and mental shutdown. You, as a parent, want what's best for your child because you love her. I believe your job has never been more important—not only for your child's future, but for ours. We need more children who dare to break from the group and chase the questions that intrigue them. We need the next generation to be grounded in the empathy and connection bred from the security you provide. Most of all, we can't survive without a new generation of fearless innovators and leaders. This book will not only teach

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you how to provide a happy, brilliant, and successful future for your child—it will help you secure your contribution to our collective success.

### MY STORY

My mother did not have the “Donna Reed” model of family life. Her parents were wonderful, loving people who showered her with affection in her formative years. Though my mother’s mother died when she was barely five years of age, and her father when she was nine, my grandparents had already instilled a strong central core in my mother that allowed her to not only survive, but to thrive. Her inherent ability to love, connect, and bond made her a strong, wonderful mother (albeit sometimes lacking in practical parenting skills).

My mother created a home environment that was rich in learning, creativity, and exploration. She scoffed at the idea of “toys.” Instead, we were encouraged to read a book, paint, play with clay, or pursue any creative endeavor my mother considered of “value.” Most important, she actively played with us and incorporated our play into her daily life. I loved to play grocery store, shaping vegetables out of clay as she chopped away making our actual dinner. Playtime and discovery were filled with the connection and communication of ideas. I was encouraged to interact, share, and check in with a mother who was never out of reach.

The transition to kindergarten was jarring. I started school early, at four and a half. I was excited to share my reactions to new materials and discoveries but quickly found that my teacher’s job was to educate the class on the benefits of good conduct rather than to foster enthusiasm. I soon picked up on the subtleties and nuances of when to speak and when to be silent.

Frankly, I was completely unprepared for Ms. Meade. A long teaching career had left her short on patience. One afternoon, my class crush knocked over a planter as we raced to get in line. Because I was first, Ms. Meade assumed that I was the culprit. Without a fair trial, she lit into me. Unable to betray my kindergarten love, and completely unaccustomed to

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screaming as a form of discipline, tears filled my eyes. This only elicited further scolding to “stop crying.” At the end of school, traumatized, I bolted out of the classroom and ran all the way home, sobbing and wetting my pants. By the time I reached my mother, I was so distraught that she promised me I would not have to go back to school until I was ready. A little lacking in practical parenting skills, my mother kept me home for three weeks. A call from the school, warning I would have to repeat kindergarten if I didn’t immediately return, prompted a parent-teacher conference with Ms. Meade. When my mother explained how Ms. Meade’s behavior had traumatized me, she was incredulous. “She’s four years old! There’s no way she remembers that I yelled at her a month ago!”

I not only remembered then, but I still remember as an adult! It changed my entire educational journey. From that moment on, I was anxious about making mistakes and especially cautious around teachers. As an adult, I realized that we consistently underestimate the impact we have on our children and the lasting effect we can have emotionally and structurally. As a psychologist and educator, I know these events are more than significant; they shape the very neurological makeup of our children and can determine the course of their lives.

When it was my turn to be a parent, I not only sought to create the same environment as my mother, but I took it to the next level. I built a print-rich home full of complex language. I actively taught my children stress-management techniques like meditation, creative imagery, and music. Not only did I want my children to be better prepared for the challenges of school, but I was also keenly aware that their generation was facing an intense, anxiety-ridden educational system with a score-driven, high-stakes atmosphere. After raising my children, my pursuit of multiple advanced degrees in psychology and education opened my eyes to a wealth of crucial parenting information that our culture stifles or even contradicts. Now, it is my mission to share this information with parents to ensure that the next generation get the foundation it deserves and desperately needs.

## HOW TO BUILD YOUR BABY'S BRAIN

*How to Build Your Baby's Brain* will teach you how to transfer information from the latest neuroscience research to your everyday experiences with your child. This will allow you to guide your child through every age and stage of his neurological development, so that you and he can take full advantage of both the information and experiences necessary to lead your child toward emotional maturity and academic success.

By correlating your child's neurological stage with his appropriate age, you can help him unfold into the ultimate expansion of his potential. Not only that, this down-to-earth information will guide your child toward emotional maturity so that he can access and use his abilities. All of this can happen as simply as ABC.

**A.** Bond with baby and support her emotional development.

**B.** Coordinate the age and neurological stage of baby's development to enhance his learning potential.

**C.** Teach stress-reduction techniques, creative visualization, and exercises to help your child focus and concentrate.

Steps A and B will designate every important developmental marker in your baby's life. They will teach you how to incorporate your baby's linguistic, cognitive, emotional, and social development. This parallel development transitions into not only mental and physical maturity, but moral maturity, as well. At every step along the way, I will show you how to help your child integrate all three steps.

As you recognize what your child requires to successfully move from one developmental stage to another, you will be able to structure his environment to create a successful passage. Of course, timing is everything. Neuroscience tells us that there are optimal timelines or windows of opportunity when your baby's brain is uniquely receptive to particular kinds of stimulation. Thus, when you amplify the appropriate ideas and tools at the right time, your baby's brain will be in a heightened state, and thus more receptive to age-appropriate knowledge and skill. As a result, the range of your baby's responses is expanded exponentially with the ease of learning, as she absorbs information naturally. Hence, you and

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your baby can experience the joy and satisfaction of each educational milestone.

*How to Build Your Baby's Brain* offers you exercises and activities that are not only easy to navigate but fun, with the added bonus of enhancing your child's self-esteem and building a stronger central core. Each exercise and activity is coordinated to your child's age and developmental stage, giving you the opportunity to learn more about your child, so that you can structure an environment uniquely designed for him. By paying attention and getting to know your child, you can create specific learning models that will help merge not only your child's linguistic, cognitive, and social development, but moral and spiritual development, as well.

Step C incorporates stress-reduction techniques in early childhood development. In fact, teaching your child how to cope with stress, as well as how to focus and concentrate, is one of the most important tools in the neuroscience toolbox, yet it is often disregarded by other early childhood development books, perhaps because it is discounted and therefore overlooked. Every stage and age of early childhood growth in *How to Build Your Baby's Brain* is accompanied by stress-reduction techniques. For example, massage, yoga, creative visualization, meditation, music, qigong, and so forth are all integrated into each stage of your child's development. These techniques, skills, and tools will help not only your child, but you as well, to lower your anxiety and regulate the stress hormone cortisol, allowing you both to access and process information more effectively. It is not true that you use only a small part of your brain. In reality, when exposed to stress-reduction exercises, your brain is used completely, just like an orchestra. Moreover, neuroscience research states that when you are stressed, anxious, frightened, or unable to cope, you overproduce the stress hormone cortisol, which changes brain architecture and impulse control . . . especially in a developing brain.

*How to Build Your Baby's Brain* will show you how to incorporate stress-reduction techniques into everyday life with your baby, teaching her how to manage stress, lower anxiety, focus, and concentrate. Stress-reduction

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techniques will show your child how to access her own inner resources. This by itself helps her to build a strong central core, which will increase self-esteem and enhance her ability to not only manage her stress, but also to process information effortlessly. However, children who can't reach inward for stress-reduction techniques, and who don't learn how to cope with stress, may find themselves unable to learn or develop successfully. Cortisol can change the brain, and consistent stress can change the brain irrevocably.

A 24/7 news cycle, technology, and the constant overstimulation of information promote a more threatening world than children experienced even ten years ago. Through the permeation of computer games and television, used all too often as a way to help harried parents, you can see how children can be introduced too early to inappropriate and socially advanced material. Dr. David Elkind, in his books *The Hurried Child: Growing Up Too Fast Too Soon* and *Miseducation: Preschoolers at Risk*, explains the dangers of children growing up more quickly than their internal maturation can accommodate. This accelerated exposure to inappropriate and advanced material causes children to feel anxious and out of control. According to Elkind, "early miseducation can cause permanent damage to a child's self-esteem, the loss of a positive attitude a child needs for learning, the blocking of natural gifts and potential talents."<sup>3</sup> In a sense, children who are pressured to perform or taught the wrong things at the wrong time begin to display stress-related behaviors. By the time they reach the end of concrete operations and enter abstract operations, at approximately the fifth-grade level, they quit rather than try, simply shutting down. Furthermore, there is extensive research to support the idea that children between birth and five years of age who receive such pressure demonstrate not only psychological problems later in life, but intellectual and physical problems, as well. Thus, you can see the danger of putting the brain power of the next generation at risk, which would be a loss of human capital and natural resources for us all. On the other hand, when children in early childhood receive conscious parenting and a time-sensitive education, they unfold in a natural and

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spontaneous manner, actively and successfully exploring and experiencing their immediate environment.

The exercises and activities that follow are fun to do. They are adapted to each stage of your child's development and will help you, as a parent, to get to know your child better. Most important, these playful interactions will help your child integrate emotional and intellectual as well as moral and spiritual maturation.

By the end, you will be fully equipped to give your child the strategies and skills he will need throughout life to cope with whatever the world throws his way . . . and to succeed.



# **HOW TO BUILD YOUR BABY'S BRAIN**



# PART ONE



## TAP INTO YOUR INNER GENE THERAPIST—THE SCIENCE BEHIND YOUR SECRET PARENTAL POWER

Your child's DNA is not destiny; you are at the helm, guiding his course. The truth is that nature and nurture are in a delicate dance akin to Fred and Ginger's famous choreography: if one goes too fast, the other one falls. Science tells us that early childhood experiences actually have the capacity to structure and alter the brain. That means you didn't just supply your child's DNA—you're still shaping it, and it's only by wielding that power that your child will activate his full potential. You are truly a gene therapist, manipulating and guiding your child's genetic makeup, based on the experiences you create for him. The longer you abdicate your power to shape your child's genetic makeup *after* he's born, the more you leave his development to chance. In this chapter, I'll explain the nuances of your secret parental power—and teach you how to harness its full potency.

As a human behavior expert and family and child development specialist with a PhD in psychology and an EdD in education, I am often asked to comment on how parents can awaken their child's potential. My answer always begins the same way: parents have the power. You are not merely a factor; you are the single greatest determinant of your child's personality, intellect, and future. Your power extends way beyond providing a boost in potential or a push to succeed; you, as a parent, are capable of shaping and are, to a great degree, responsible for the very structure of your child's

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brain. As a parent, you have the ultimate responsibility for the trajectory your child takes in life. The good news is that you have everything you need to give your baby what she needs.

Your child's genes may be a blueprint, but that's still only a two-dimensional potential mock-up of what will be a three-dimensional person. That old argument of nature versus nurture has been settled, and the truth is that both have about equal influence. Nature may supply the genes, but those genes express themselves in reaction to stimulation from their environment—the environment *you* create and control. So, you can see that you are your child's true gene therapist, and your presence and the environment you create actively determine which of your child's genes are expressed. Your baby's brain builds and grows in response to the stimulation it receives, which means that *each and every one*<sup>1</sup> of her physical and emotional experiences affects the biological development of your baby's brain. It's a lot of responsibility—and a lot of power. And regrettably, far too many parents aren't aware of just how much influence they wield.

Your baby is born with approximately 100 billion neurons and over 50 trillion synapses. This may seem like a lot, but it's only a fraction of the neural connections that she will develop—more than 1,000 trillion in the first year alone. Out of your baby's 24,000 genes, 12,000 of them establish these neural connections in the brain, which designate how the central nervous system will be created and function. However, those 12,000 genes aren't nearly enough to activate all those neural connections. Therefore, it is your baby's heightened experiences, both emotional and physical, that specify and determine those connections. Because the brain is highly efficient, it actually dumps unused neurons while strengthening those used consistently. This process, called *synaptic pruning*,<sup>2</sup> allows your child's brain to develop correctly. Stimulation enhances connections, and pruning discards what is not being used. Synaptic pruning extends over your lifetime, but it is the most active during early childhood. Synaptic pruning means that every experience counts. Every touch, sight, smell, and interaction positively or negatively affects the wiring of your child's

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brain—each experience, whether positive or negative, is a signal that strengthens, weakens, or reinforces synapses. Think of it as two roads diverging in a yellow wood—except your child's brain will always take the road *most* traveled by.

As a result, either the environment will alter your baby's brain architecture, or you will do it on purpose by shaping and influencing baby's environment to that end. This is not a construction process that can or should be outsourced—nature has gone to great pains to signal its preference for parental guidance. Biology ensures through bonding that you hold greater power to stimulate brain development—and the turning on and off of genes—than anyone else in your child's life. Remember that flood of unconditional love you experienced the first time you held your baby? That's a survival instinct (and nature's strongest incentive), put in place to ensure that you will want to be present and engaged in this crucial, formative time of your baby's life. The quality of that experience is determined by bonding: quantity and quality time, attention, care, and nurturing that is physiologically and emotionally essential to your child.

Acts of love like cuddling, soothing your child with your voice, responding to her needs, and reading a book may sound simple, but they are the stimulation your baby's developing brain needs and builds upon most effectively. The more you interact with and stimulate your baby, the more you increase his neuroglial cells. That increase in cells also leads to an increase in activity, and it's easy to see how that promotes faster and more complicated patterns of thought. You're building the highways and infrastructure for high-traffic learning later.

The impact of bonding can't be overstated. The absence of secure bonding and nurturing not only deprives your child of the brain stimulation she needs to thrive, but can cause serious neurological harm. As Laurie Larson points out in her pivotal study on maternal touch, babies who are not fondled or touched can die from lack of physical contact. When that secure bonding is present, the impact is huge: we're talking about influencing your child's IQ by 20 to 40 percent.<sup>3</sup> American psychologist Florence

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Goodenough, revered for her work in child psychology, suggested that environmental factors, including complicated language, accounted for between 20 and 40 percent of a person's intelligence score, which she took to be a measure of cognitive development.<sup>4</sup> That can be the difference between average and high achieving—just because you showed up and parented.

## HARDWIRED TO LEARN

Babies are hardwired to learn. They are tiny scientists discovering their world through familiar experiments. You don't need formal training or a fancy degree to build your child's brain. Your child—every child—is born with what renowned doctor and educator Maria Montessori called “an inner teacher.”<sup>5</sup> Montessori believed that children do not need formal education to learn much of the important social, emotional, and intellectual behavior experience in their early years. They are naturally driven to explore. What children do need, she argued, is an environment rich with the toys and tools that help them master the progression of skills necessary to build confidence and competence, which leads to good self-esteem and, ultimately, academic success. Your child learns by testing herself against her environment. The very act of venturing out beyond her reach and making discoveries about how the world looks, feels, and tastes stimulates your baby's neurons, which in turn adds to the mass of connections in the brain. With each outing into unknown territory, your child moves to a higher level of intellectual and emotional advancement.

But the most important element in your child's world of exploration—the one thing that will ensure that she reach her full potential—is you. If she can look back and see you or call for you and hear you, she experiences emotional stability, solidifying the intellectual, physical, and emotional progress made in each foray. The secure feeling that comes from strong bonding lowers anxiety, leading to a strong central core, the resource necessary for emotional maturity—which is why your child will learn more at her mother's knee than anywhere else. When your child learns to trust you,



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she learns to trust herself. At no other point in your child's life will your presence be such a viable and invaluable gift.

### WITH BONDING, MORE IS MORE

Until three years of age, your baby sees you as a physical appendage and extension of himself. He does not yet understand that the two of you are separate. And just as you'd be terrified if your child were kidnapped or torn from your arms by a stranger, your baby experiences separation anxiety every time you two are apart. That anxiety bathes your child's brain in potent stress hormones, specifically cortisol, which, while it has other critical functions in the human body, when overproduced can have disastrous effects on its development. Psychologist Daniel Goleman explains, "Cortisol stimulates the amygdala, while it impairs the hippocampus, forcing our attention onto the emotions we feel, while restricting our ability to take in new information."<sup>6</sup> He explains that the amygdala overrides the prefrontal cortex when the brain is in "fight-or-flight" mode.<sup>7</sup> Your hippocampus and prefrontal cortex are the regions of your brain responsible for learning, memory, and high-level thinking (executive function). Therefore, if stress is bathing your baby's developing brain in cortisol, it's also blocking the brain's capacity to build the higher-level thinking and reason needed for your child to thrive.

Not convinced? According to a 2001 study by Flinn et. al., published in *Development and Psychopathology* and cited in the journal *Neuroscience Behaviors*, a child's cortisol levels measurably increase the longer a parent is away from him, which can result in long-term dysfunction in the neurobiological system, with negative effects on emotional health, digestion, and even your child's immune system.

That means you have to be there. Your presence isn't merely a bonus or a positive influence; your absence negatively impacts your child. More important, nursery schools, babysitters, and nannies are not equipped to understand the developmental needs of your child and thus can't

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deliberately or attentively guide the transition from one stage to the next. Timing is everything. In order to unlock your child's gifted potential, her brain's neurons must be stimulated and guided during her optimal windows of growth. When you're not present, you risk leaving that development to chance, and your absence can cause the overproduction of the stress hormones that may literally change the brain's neurological and emotional framework. When cortisol is produced to excess, or persists over a long duration, it washes over the developing brain like battery acid, changing its structure and affecting neurotransmitters.

I'm not saying that you can't have a career, but you must compensate and accommodate to override the stress that your child experiences when waiting to be reunited with you. Our society does not make it easy to be present—as a working mother, I can attest to the very real obstacles, frustrations, and struggles that working parents experience. But I believe that those obstacles raise the stakes and require an even deeper understanding of which of your emotional assets wields the most influence over your child's growth and success. Nothing is more important than your time.

## **YOUR TIME IS MORE POWERFUL THAN YOUR MONEY**

You may believe, like so many, that more money means more opportunity, and that quality time is a necessary casualty in the rat race to buy your child more things, better schools, memberships, and opportunities to succeed. A study conducted by the Programme for International Student Assessment (PISA) in 2009 indicates that this is a cultural myth. According to PISA's findings, your socioeconomic status accounts for only 10 percent of the variance in your child's academic success.<sup>8</sup>

In a research project in England in 1984, Sarah Bayliss and her team set out to determine whether a parent-involvement program was able to close the gap in education between third graders from poor working-class families and their wealthier upper-middle-class counterparts.<sup>9</sup> They found that the

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pupils from the poor working-class families, whose parents were involved and supported their children, outperformed those pupils from wealthier families, even those who were given private tutoring from professionals. The only variable in this study was that the children from poorer families were emotionally supported by parents who were involved in their daily activities.

Here in the United States, a similar study confirms the same. Dr. Burton White conducted a three-year study called the Missouri Project, which involved three hundred families and demonstrated that when parents are taught about child development—including how to structure discipline without suppressing natural curiosity and the impulse to explore—children thrive. Students whose parents participated in the study reached higher than average levels of aptitude in linguistic and cognitive ability by the age of three.<sup>10</sup> As a result, it was White who argued that education should begin at birth. White's study led to one of the most groundbreaking programs for parents interested in parental involvement in early education. Because the Missouri Project convinced officials that parents were the most powerful force in early education, Missouri funded PAT (Parents as Teachers) to teach parents how to actively be involved in their child's early education. The PAT program is so successful that it now has both national and international affiliates. The longitudinal results of the PAT programs in California and Missouri indicate that those children whose parents are actively involved in their nurturing and education from birth to three years score significantly higher than comparable children on almost all levels, including linguistic, cognitive, social, and academic abilities.<sup>11</sup>

Because of the results obtained in the Missouri Project, White discovered that after the age of three, it becomes much more difficult to try to remediate both linguistic and intellectual deficits; therefore, a commitment to early childhood education is critical. However, educators now believe that the effects of parental involvement in early education are cumulative and still continue far beyond age three. Children likely retain the positive benefits of the active role their parents played in their early education throughout their lives.<sup>12</sup>

The best news of all? Making that impact isn't nearly as time-consuming as you'd think; you can start seeing results in a matter of weeks, not years. Professor of education Lowell Madden, reporting on the remediation of poor readers in elementary school, states that parents who were taught how to interact with their children by reading in their own home over a six-to-eight-week period multiplied their children's comprehension rate by six times the normal rate.<sup>13</sup> Even more stunning, researchers today believe that 85 percent of all children in the United States labeled educable but mentally challenged could have attained average intelligence had they received sufficient stimulation in their families of origin in their developmental years. What that means, for you and your child, is that regardless of *your* income or education level, you can learn how to expand your child's learning ability if you act during pivotal times in her life.

All this research together illuminates—and refutes—the social fiction that your child needs socioeconomic advantages to have a limitless future. It simply isn't true. You just have to be prepped and present to take advantage of critical, optimal windows of opportunity in your child's development.

## OPTIMIZE THE WINDOW OF OPPORTUNITY

So you're a parent, you're ready to get started . . . and you're probably panicking because you don't know what to *do*. You don't need to be a formal teacher or have an advanced degree to foster your child's social, emotional, and intellectual growth. What you *can* do, as your child's most important teacher, is create an environment that is not only secure, but rich in learning materials, print, and objects to manipulate and observe. These tools can help your child develop the emotional skills that in turn contribute to social and intellectual growth—and ultimately academic and personal success.

For example, language starts earlier than you may think, as babies start learning rhythm, meter, and sounds listening to your voice from the fourth month on, in the womb. If you want to expand her potential exponentially, you have to learn to speak in complex language and listen actively.

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In this book, I'll teach you how to communicate with your child to spur higher-level neurological development. You'll learn the active listening skills that enable you to catch red flags, spot hidden talents, and internalize the important feedback that your child shares with you. In addition, you'll learn why the old adage "children should speak only when spoken to" rips apart the scaffolding you've worked so hard to build for your child.

The connection between language, reading, and the development of your baby's brain cannot be overemphasized. Talk to your baby constantly. Timing is especially critical where language and reading are concerned. Because the brain stem develops before the cerebral cortex, infants gain control of their five senses first, which means they start out being able to distinguish and imitate sounds, even if they can't make sense of them. This receptivity of language begins four months after gestation; renowned speech scientist and psychologist Dr. Patricia Kuhl says that your baby learns the beginning of her native language from listening to your voice in utero. Thus, your child can learn whatever language she hears. After birth, if your child is exposed to many languages consistently during this window between birth and five years of age, she can learn them all (as long as each language is spoken specifically by one person at a time), and she can learn them with greater ease and speed than at any other time in her life. The important window for language acquisition begins to shut down by the age of five, so if a child learns a new language at the onset of adolescence, she may learn to speak it but will do so with a foreign accent. In due course, language acquisition evolves into reading and writing.<sup>14</sup>

Teachers universally agree that reading is one of the most important factors in your child's academic success. The key to boosting your child's literacy lies in reading to her early and often. And I mean early: while a newborn can't comprehend what you're saying, her associative map is expanded just by the sound and rhythm of your voice, the warmth of your body, and the time spent together. Gradually, your child will learn to anticipate what's coming next and begin to mimic your reading. By allowing your child to "read" to you by reciting what she's memorized, without bothering to correct her, you

are paving the way for her to start connecting symbols, sounds, and words. You can also create a print-rich environment by labeling objects in large print, as well as pointing out objects around the house and in the neighborhood.

## THE IMPORTANT ROLE OF DAD

While almost any man can father a child, there is so much more to the important role of being Dad in a child's life. Let's look at *who* Father is, and why he is so important.

Fathers are central to the emotional well-being of their children; they are capable caretakers and disciplinarians. Studies show that if your child's father is affectionate, supportive, and involved, he can contribute greatly to her cognitive, linguistic, and social development, resulting in academic achievement, a strong inner core resource, sense of well-being, good self-esteem, and authenticity.<sup>15</sup>

## HOW FATHERS INFLUENCE OUR RELATIONSHIPS

Your child's primary relationship with his father can affect all of his relationships from birth to death, including those with friends, lovers, and spouses. Those early patterns of interactions with Father are the very patterns that will be projected outward onto all relationships: not only your child's intrinsic idea of who he is as he relates to others, but also the range of what your child considers acceptable and loving.

Girls will look for men who hold the patterns of good old Dad, for after all, they know how "to do that." Therefore, if Father was kind, loving, and gentle, they will reach for those characteristics in men. Girls will look for in others what they have experienced and become familiar with in childhood. Because they've gotten used to those familial and historic behavioral patterns, they think that they can handle them in relationships.

Boys, on the other hand, will model themselves after their fathers. They will look for their father's approval in everything they do and copy those behaviors that they recognize as both successful and familiar. Thus, if Dad

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was abusive, controlling, and dominating, those will be the patterns that his sons will imitate and emulate. However, if Father is loving, kind, supportive, and protective, boys will want to be that.

Human beings are social animals, and we learn by modeling behavior. In fact, all primates learn how to survive and function successfully in the world through social imitation. Those early patterns of interaction are all children know, and it is those patterns that affect how they feel about themselves and how they develop. Your child is vulnerable to those early patterns and incorporates those behavioral qualities in his or her repertoire of social interaction.

It is impossible to overestimate the importance of Dad. For example, girls who have good relationships with their fathers tend to do better in math at the eighth-grade level. Well-bonded boys develop securely with a stable and sustained sense of self. Also, children of involved fathers are less likely to get upset when detached from a parent. This is probably because fathers reassure children that they're okay by giving them more freedom and space to explore their surroundings. This ability to stay back and observe children without too much interference encourages individuation. Parenting styles of fathers seem to reinsure and challenge emotional growth, while the parenting styles of mothers is more protective. Fathers allow children to venture out two times the distance that Mother would find comfortable. Moreover, when exposed to a new situation, mothers immediately move in, while fathers stay back and let baby work it out. Both styles are important to baby's psychological growth. Consequently, children of involved fathers have high IQs, greater social skills, greater impulse control, and display less violent behavior.<sup>16</sup> Who we are and who we are to be, we are becoming, and now we know that fathers are central to that outcome.

### CHANGING FAMILY ROLES

Only 20 percent of American households consist of married couples with children.<sup>17</sup> Filling the gap are family structures of all kinds, with dads stepping up to the plate and taking on myriad roles. When they are engaged, fathers can really make a difference. They may be classically married, single,

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divorced, widowed, gay, straight, adoptive, stepfather, a stay-at-home dad, or the primary family provider—the only important thing is that he be involved.

The emergence of women into the job market has forever changed how society views the traditional roles of fathers and mothers. Feminism and financial power have shifted classic parenting trends, and today approximately 60 percent of women work.<sup>18</sup> Add to that the shift in marriage, divorce, lowered birth rates, and family structures of all types, and you can see the emergence of a softening and changing of traditional parenting roles. This transition in economics, urbanization, and sexual roles has led to more open, flexible, and undefined functions for fathers.

A recent study by the National Institute of Child Health and Human Development indicates that dads are more engaged in caretaking than ever before. The reasons for this are varied, but they include mothers working more hours and receiving higher salaries; fathers working less; and more psychological consciousness, better coping skills, mental illness intervention, intimacy in marriage, social connection, and better role-modeling for children.

Children who are well bonded with and loved by involved fathers *tend to have fewer behavioral problems* and are *somewhat inoculated against alcohol and drug abuse*. When fathers are less engaged, children are more likely to drop out of school earlier and to exhibit more problems in behavior and substance abuse. Research indicates that fathers are as important as mothers in their respective roles as caregivers, protectors, financial supporters, and, most important, models for social and emotional behavior. In fact, a relatively new familial structure that has emerged in our culture is the stay-at-home dad. This prototype is growing daily, thanks in part to women's strong financial gain, the recent recession, increase in corporate layoffs, and men's emerging strong sense of self.

Even when fathers are physically removed from their families, there are ways for them to nurture healthy relationships with their children. For instance, recognizing the important role fathers play in daughters' lives,



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Angela Patton started a program in which young girls went to visit their fathers in prison for a father-daughter dance. It was a successful program that has spread across the country and not only helped daughters find connection, love, and support from their fathers, but also helped fathers feel important in the lives of their daughters.<sup>19</sup>

When fathers are separated from their children after a divorce, *there are many ways they can remain bonded with their children*. Though divorce is traumatizing to boys and girls alike, strong, consistent, and loving parenting from fathers can help make the transition successful.