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The Female Brain

Louann Brizendine M.D.

About the Book

Did you know that every brain begins as a female brain and that it only becomes male eight weeks after conception? This is when excess testosterone shrinks the communication centre, reduces the hearing cortex and makes the part of the brain that processes sex twice as large.

In this groundbreaking book, Dr Louann Brizendine reveals how the uniquely flexible structure of the female brain determines not only how women think and what they value, but how they communicate and whom they will love. Based on decades of research, and complete with fascinating facts and case studies, this accessible guide also provides the neurological explanations behind why …

A woman remembers fights that a man insists never happened.

Thoughts about sex enter a woman's brain perhaps once a day, but may enter a man's brain about once every minute.

A woman over fifty is more likely to initiate divorce than a man.

A woman tends to know what people are feeling, while a man can't seem to spot an emotion unless someone cries or threatens bodily harm.

With this accessible, fun guide, women will discover that they have a lean, mean communicating machine at their

disposal – and men will find that they finally have a key to understanding their relations with women.

CONTENTS

The Female Brain

Louann Brizendine, M.D.

For my husband,
Samuel Barondes,

My son,
John Whitney Brizendine,

And in loving memory of
Louise Ann Brizendine

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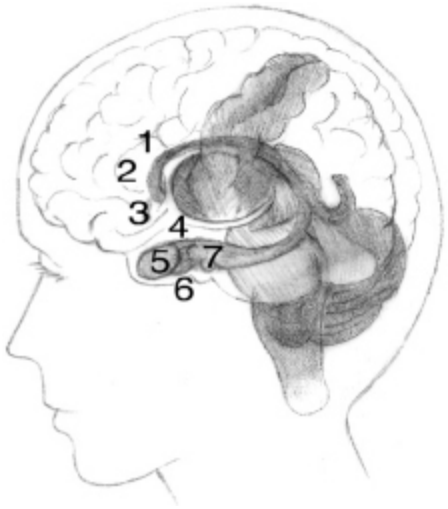

1. Anterior Cingulate Cortex (ACC): Weighs options, makes decisions. It's the worry-wort center, and it's larger in women than in men.
2. Prefrontal Cortex (PFC): The queen that rules the emotions and keeps them from going wild. It puts the brakes on the amygdala. Larger in women, and matures faster in women than in men by one to two years.
3. Insula: The center that processes gut feelings. Larger and more active in women.
4. Hypothalamus: The conductor of the hormonal symphony; kicks the gonads into gear. Starts pumping earlier in life in women.
5. Amygdala: The wild beast within; the instinctual core, tamed only by the PFC. Larger in men.
6. Pituitary Gland: Produces hormones of fertility, milk production, and nurturing behaviour. Helps turn on the mommy brain.
7. Hippocampus: The elephant that never forgets a fight, a romantic encounter, or a tender moment – and won't let you forget it, either. Larger and more active in women.

THE CAST OF
NEURO-HORMONE CHARACTERS

(in other words, how hormones affect a woman's brain)

THE ONES YOUR doctor knows about

ESTROGEN—the queen: powerful, in control, all-consuming; sometimes all business, sometimes an aggressive seductress; friend of dopamine, serotonin, oxytocin, acetylcholine, and norepinephrine (the feel-good brain chemicals).

PROGESTERONE—in the background but a powerful sister to estrogen; intermittently appears and sometimes is a storm cloud reversing the effects of estrogen; other times is a mellowing agent; mother of allopregnenolone (the brain's Valium, i.e., chill pill).

TESTOSTERONE—fast, assertive, focused, all-consuming, masculine; forceful seducer; aggressive, unfeeling; has no time for cuddling.

THE ONES YOUR doctor may not know about that also affect a woman's brain

OXYTOCIN—fluffy, purring kitty; cuddly, nurturing, earth mother; the good witch Glinda in *The Wizard of Oz*; finds pleasure in helping and serving; sister to vasopressin (the male socializing hormone), sister to estrogen, friend of dopamine (another feel-good brain chemical).

Cortisol—frizzled, frazzled, stressed out; highly sensitive, physically and emotionally.

Vasopressin—secretive, in the background, subtle aggressive male energies; brother to testosterone, brother to oxytocin (makes you want to connect in an active, male way, as does oxytocin).

DHEA—reservoir of all the hormones; omnipresent, pervasive, sustaining mist of life; energizing; father and mother of testosterone and estrogen, nicknamed "the mother hormone," the Zeus and Hera of hormones; robustly present in youth, wanes to nothing in old age.

Androstenedione—the mother of testosterone in the ovaries; supply of sassiness; high-spirited in youth, wanes at menopause, dies with the ovaries.

Allopregnenolone—the luxurious, soothing, mellowing daughter of progesterone; without her, we are crabby; she is sedating, calming, easing; neutralizes any stress, but as soon as she leaves, all is irritable withdrawal; her sudden departure is the central story of PMS, the three or four days before a woman's period starts.

PHASES OF
A FEMALE'S LIFE

HORMONES CAN DETERMINE what the brain is interested in doing. They help guide nurturing, social, sexual, and aggressive behaviors. They can affect being talkative, being flirtatious, giving or attending parties, writing thank-you notes, planning children's play dates, cuddling, grooming, worrying about hurting the feelings of others, being competitive, masturbating and initiating sex.

	Major Hormone Changes	What Females Have That Males Don't	Female-Specific Brain Changes	Reality Change
Fetal	Brain growth and development left unperturbed by the high testosterone of a male brain	Brain cells are XX, which means more genes for fast brain development and female-specific circuits	Female brain circuits for communication, gut feelings, emotional memory, and anger suppression grow unabated – there is no high testosterone of the male around to kill all those cells.	More brain circuits for communication, reading emotions, social nuance, nurturing skills, able to use both sides of the brain
Girlhood	Estrogen is secreted in massive amounts from age 6 to 24 months, then the juvenile pause turns off hormones	High estrogen for up to 2 years after birth	Verbal and emotional circuits are enhanced	Major interest in playing and having fun in connection with other girls, not boys
Puberty	Estrogen, progesterone, and testosterone increase and begin to cycle monthly	More estrogen and less testosterone; girls' brains develop 2 years earlier than boys'	Increased sensitivity and growth of stress, verbal, emotion, and sex circuits	Major interest in sexual attractiveness, desperate love interests, avoidance of parents
Sexual maturity, single woman	Estrogen, progesterone, and testosterone change every day of the month	More focus on relationships, finding a lifelong mate, and choosing a career or job compatible with raising a family	Earlier maturation of decision-making and emotional control circuits	Major interests in finding a mate, love, career development
Pregnancy	Huge increase in progesterone, estrogen	Focus more on nesting, how the family will be provided for; less on career competition	Stress circuits suppressed, brain calmed by progesterone; brain shrinks; hormones from the fetus and placenta take over brain and body	Major interest in own physical well-being, coping with fatigue, nausea, and hunger, and not damaging the fetus; surviving in the workplace; and planning maternity leave
Breast feeding	Oxytocin, prolactin	Focus more exclusively on the baby	Stress circuits still suppressed; sex and emotion circuits hijacked by infant care	Major focus on coping with fatigue, sore nipples, breast milk production, making it through the next 24 hours
Child rearing	Oxytocin; cycling estrogen, progesterone, and testosterone	Less interest in sex, more worry about kids	Increased function of stress, worry, and emotional bonding circuits	Major interest in well-being, development, education, and safety of kids, coping with increased stress and work
Perimenopause	Erratically cycling estrogen, progesterone, and testosterone	Fluctuating interest in sex, erratic sleep, more fatigue, worry, moods, hot flashes and irritability	Decreasing sensitivity to estrogen in certain brain circuits	Major interest in surviving day to day and coping with the physical and emotional ups and downs
Menopause	Low estrogen and no progesterone, high FSH/LH	The last precipitous brain change caused by hormones	Circuits fueled by estrogen, oxytocin, and progesterone decline	Major interest in staying healthy, improving well-being and embracing new challenges
postmenopause	Low, steady estrogen and testosterone, lower oxytocin	More calmness	Circuits less reactive to stress, less emotional	Major interest in doing what you want to do, less interest in taking care of others

INTRODUCTION

What Makes Us Women

MORE THAN 99 percent of male and female genetic coding is exactly the same. Out of the thirty thousand genes in the human genome, the less than one percent variation between the sexes is small. But that percentage difference influences every single cell in our bodies—from the nerves that register pleasure and pain to the neurons that transmit perception, thoughts, feelings, and emotions.[1]

To the observing eye, the brains of females and males are not the same. Male brains are larger by about 9 percent, even after correcting for body size. In the nineteenth century, scientists took this to mean that women had less mental capacity than men. Women and men, however, have the same number of brain cells. The cells are just packed more densely in women—cinched corsetlike into a smaller skull.

For much of the twentieth century, most scientists assumed that women were essentially small men, neurologically and in every other sense except for their reproductive functions. That assumption has been at the heart of enduring misunderstandings about female psychology and physiology. When you look a little deeper into the brain differences, they reveal what makes women women and men men.

Until the 1990s, researchers paid little attention to female physiology, neuroanatomy, or psychology separate

from that of men. I saw this oversight firsthand during my undergraduate years in neurobiology at Berkeley in the 1970s, during my medical education at Yale, and during my training in psychiatry at the Massachusetts Mental Health Center at Harvard Medical School. While enrolled at each of these institutions, I learned little or nothing about female biological or neurological difference outside of pregnancy. When a professor presented a study about animal behavior one day at Yale, I raised my hand and asked what the research findings were for females in that study. The male professor dismissed my question, stating, “We never use females in these studies—their menstrual cycles would just mess up the data.”

The little research that was available, however, suggested that the brain differences, though subtle, were profound. As a resident in psychiatry, I became fascinated by the fact that there was a two-to-one ratio of depression in women compared with men.[2] No one was offering any clear reasons for this discrepancy. Because I had gone to college at the peak of the feminist movement, my personal explanations ran toward the political and the psychological. I took the typical 1970s stance that the patriarchy of Western culture must have been the culprit. It must have kept women down and made them less functional than men. But that explanation alone didn’t seem to fit: new studies were uncovering the same depression ratio worldwide. I started to think that something bigger, more basic and biological, was going on.

One day it struck me that male versus female depression rates didn’t start to diverge until females turned twelve or thirteen— the age girls began menstruating. It appeared that the chemical changes at puberty did something in the brain to trigger more depression in women. Few scientists at the time were researching this link, and most psychiatrists, like me, had been trained in traditional psychoanalytic theory, which examined childhood

experience but never considered that specific female brain chemistry might be involved. When I started taking a woman's hormonal state into account as I evaluated her psychiatrically, I discovered the massive neurological effects her hormones have during different stages of life in shaping her desires, her values, and the very way she perceives reality.

My first epiphany about the different realities created by sex hormones came when I started treating women with what I call extreme premenstrual brain syndrome.[3] In all menstruating women, the female brain changes a little every day. Some parts of the brain change up to 25 percent every month.[4] Things get rocky at times, but for most women, the changes are manageable. Some of my patients, though, came to me feeling so jerked around by their hormones on some days that they couldn't work or speak to anyone because they'd either burst into tears or bite someone's head off.[5] Most weeks of the month they were engaged, intelligent, productive, and optimistic, but a mere shift in the hormonal flood to their brains on certain days left them feeling that the future looked bleak, and that they hated themselves and their lives. These thoughts felt real and solid, and these women acted on them as though they were reality and would last forever—even though they arose solely from hormonal shifts in their brains. As soon as the tides changed, they were back to their best selves. This extreme form of PMS, which is present in only a few percent of women, introduced me to how the female brain's reality can turn on a dime.

If a woman's reality could change radically from week to week, the same would have to be true of the massive hormonal changes that occur throughout a woman's life. I wanted the chance to find out more about these possibilities on a broader scale, and so, in 1994, I founded the Women's Mood and Hormone Clinic in the Department of Psychiatry at the University of California, San Francisco.

It was one of the first clinics in the country dedicated to looking at women's brain states, and how neurochemistry and hormones affect their moods.

What we've found is that the female brain is so deeply affected by hormones that their influence can be said to create a woman's reality. They can shape a woman's values and desires, and tell her, day to day, what's important. Their presence is felt at every stage of life, right from birth. Each hormone state—girlhood, the adolescent years, the dating years, motherhood, and menopause—acts as fertilizer for different neurological connections that are responsible for new thoughts, emotions, and interests. Because of the fluctuations that begin as early as three months old and last until after menopause, a woman's neurological reality is not as constant as a man's. His is like a mountain that is worn away imperceptibly over the millennia by glaciers, weather, and the deep tectonic movements of the earth. Hers is more like the weather itself—constantly changing and hard to predict.

NEW BRAIN SCIENCE has rapidly transformed our view of basic neurological differences between men and women. Earlier scientists could investigate these differences only by studying the brains of cadavers or the symptoms of individuals with brain damage. But thanks to advances in genetics and noninvasive brain-imaging technology, there's been a complete revolution in neuroscientific research and theory. New tools, such as positron-emission tomography (PET) and functional magnetic resonance imaging (fMRI) scans, now allow us to see inside the human brain in real time, while it's solving problems, producing words, retrieving memories, noticing facial expressions, establishing trust, falling in love, listening to babies cry, and feeling depression, fear, and anxiety.

As a result, scientists have documented an astonishing array of structural, chemical, genetic, hormonal, and

functional brain differences between women and men. We've learned that men and women have different brain sensitivities to stress and conflict.[6] They use different brain areas and circuits to solve problems, process language, experience and store the same strong emotion. Women may remember the smallest details of their first dates, and their biggest fights, while their husbands barely remember that these things happened. Brain structure and chemistry have everything to do with why this is so.

The female and male brains process stimuli, hear, see, "sense," and gauge what others are feeling in different ways. Our distinct female and male brain operating systems are mostly compatible and adept, but they perform and accomplish the same goals and tasks using different circuits. In a German study, researchers conducted brain scans of men and women while they mentally rotated abstract, three-dimensional shapes. There were no performance differences between the men and women, but there were significant, sex-specific differences in the brain circuits they activated to complete the task.[7] Women triggered brain pathways linked to visual identification and spent more time than men picturing the objects in their minds. This fact merely meant that it took women longer to get to the same answer. It also showed that females perform all the cognitive functions males perform—they just do so by using different brain circuits.[8]

Under a microscope or an fMRI scan, the differences between male and female brains are revealed to be complex and widespread. In the brain centers for language and hearing, for example, women have 11 percent more neurons than men.[9] The principal hub of both emotion and memory formation—the hippocampus—is also larger in the female brain, as is the brain circuitry for language and observing emotions in others.[10] This means that women are, on average, better at expressing emotions and remembering the details of emotional events. Men, by

contrast, have two and a half times the brain space devoted to sexual drive as well as larger brain centers for action and aggression. Sexual thoughts float through a man's brain many times each day on average, and through a woman's only once a day. Perhaps three to four times on her hottest days.[11]

These basic structural variances could explain perceptive differences. One study scanned the brains of men and women observing a neutral scene of a man and a woman having a conversation. The male brains' sexual areas immediately sparked—they saw it as a potential sexual rendezvous. The female brains did not have any activation in the sexual areas. The female brains saw the situation as just two people talking.[12]

Men also have larger processors in the core of the most primitive area of the brain, which registers fear and triggers aggression—the amygdala.[13] This is why some men can go from zero to a fistfight in a matter of seconds, while many women will try anything to defuse conflict.[14] But the psychological stress of conflict registers more deeply in areas of the female brain. Though we live in the modern urban world, we inhabit bodies built to live in the wild, and each female brain still carries within it the ancient circuitry of her strongest foremothers, engineered for genetic success but retaining the deeply wired instincts developed in response to stress experienced in the ancient wild.[15] Our stress responses were designed to react to physical danger and life-threatening situations. Now couple that stress response with the modern challenges of juggling the demands of home, kids, and work without enough support, and we have a situation in which women can perceive a few unpaid bills as a stress that appears to be life-threatening. This response impels the female brain to react as though the family were endangered by impending catastrophe.[16] The male brain will not have the same perception unless the threat is of immediate, physical danger. These basic,

structural variances in their brains lay the groundwork for many everyday differences in the behavior and life experiences of men and women.

Biological instincts are the keys to understanding how we are wired, and they are the keys to our success today. If you're aware of the fact that a biological brain state is guiding your impulses, you can choose not to act or to act differently than you might feel compelled. But first we have to learn to recognize how the female brain is genetically structured and shaped by evolution, biology, and culture. Without that recognition, biology becomes destiny and we will be helpless in the face of it.

Biology does represent the foundation of our personalities and behavioral tendencies. But if in the name of free will—and political correctness—we try to deny the influence of biology on the brain, we begin fighting our own nature. If we acknowledge that our biology is influenced by other factors, including our sex hormones and their flux, we can prevent it from creating a fixed reality by which we are ruled. The brain is nothing if not a talented learning machine. Nothing is completely fixed. Biology powerfully affects but does not lock in our reality. We can alter that reality and use our intelligence and determination both to celebrate and, when necessary, to change the effects of sex hormones on brain structure, behavior, reality, creativity—and destiny.

MALES AND FEMALES have the same average level of intelligence, but the female brain's reality has often been misinterpreted to mean that it is less capable in certain areas, such as math and science.[17] In January 2005, Lawrence Summers, then president of Harvard University, shocked and enraged his colleagues—and the public—when in a speech to the National Bureau of Economic Research he said: "It does appear that on many, many different human attributes—mathematical ability, scientific ability—

there is relatively clear evidence that whatever the difference in means—which can be debated—there is a difference in the standard deviation, and variability of a male and a female population. And that is true with respect to attributes that are and are not plausibly, culturally determined."[18] The public surmised that he was saying that women are therefore innately less suited than men to be top-level mathematicians and scientists.

Judging from current research, Summers was and wasn't right. We now know that when girls and boys first hit their teen years, the difference in their mathematical and scientific capacity is nonexistent.[19] That's where he was wrong. But as estrogen floods the female brain, females start to focus intensely on their emotions and on communication—talking on the phone and connecting with their girlfriends at the mall. At the same time, as testosterone takes over the male brain, boys grow less communicative and become obsessed about scoring—in games, and in the backseat of a car. At the point when boys and girls begin deciding the trajectories of their careers, girls start to lose interest in pursuits that require more solitary work and fewer interactions with others, while boys can easily retreat alone to their rooms for hours of computer time.[20]

From an early age, my patient Gina had an extraordinary aptitude for math. She became an engineer but at twenty-eight years old was struggling with her desire to be in a more people-oriented career and one that would allow her to have a family life, too. She relished the mental puzzles involved in solving engineering problems, but she missed daily contact with people, so she was considering a career change. This is not an unusual conflict for women. My friend the scientist Cori Bargmann told me that many of her smartest girlfriends dropped science to go into fields that they felt were more social. These are value decisions that are actually shaped by hormonal effects on the female

brain compelling connection and communication. The fact that fewer women end up in science has nothing to do with female brain deficiencies in math and science. That's where Summers really went wrong. He was right that there's a dearth of women in top-level science and engineering positions but dead wrong in implying that women do not end up in these careers because of lack of aptitude.[21]

The female brain has tremendous unique aptitudes—outstanding verbal agility, the ability to connect deeply in friendship, a nearly psychic capacity to read faces and tone of voice for emotions and states of mind, and the ability to defuse conflict.[22] All of this is hardwired into the brains of women. These are the talents women are born with that many men, frankly, are not. Men are born with other talents, shaped by their own hormonal reality. But that's the subject of another book.

FOR TWENTY YEARS, I've eagerly awaited progress in knowledge of the female brain and behavior as I have been treating my women patients. It was only at the turn of the millennium that exciting research started to emerge revealing how the structure, function, and chemistry of a woman's brain affect her mood, thought processes, energy, sexual drives, behavior, and well-being. This book is a user's guide to new research about the female brain and the neurobehavioral systems that make us women. It draws on my twenty years of clinical experience as a neuropsychiatrist. It culls from spectacular advances in our understanding of genetics, molecular neuroscience, fetal and pediatric endocrinology, and neurohormonal development. It presents samplings from neuropsychology, cognitive neuroscience, child development, brain imaging, and psychoneuroendocrinology. It explores primatology, animal studies, and infant observation, seeking insights into how particular behaviors are programmed into the female brain by a combination of nature and nurture.

Because of this progress, we are entering an era, finally, when women can begin to understand their distinct biology and how it affects their lives. My personal mission has been to educate interested physicians, psychologists, teachers, nurses, pharmacists, and their trainees to benefit the women and teen girls they serve. I have taken every opportunity to educate women and girls directly about their unique brain-body-behavior system and help them to be their best at every age. It is my hope that this book will benefit many more women and girls than I can personally reach in the clinic. It is my hope that the female brain will be seen and understood as the finely tuned and talented instrument that it actually is.

ONE

The Birth of the Female Brain

LEILA WAS A busy little bee, flitting around the playground, connecting with the other children whether or not she knew them. On the verge of speaking in two- and three-word phrases, she mostly used her contagious smile and emphatic nods of her head to communicate, and communicate she did. So did the other little girls. “Dolly,” said one. “Shopping,” said another. There was a pint-size community forming, abuzz with chatter, games, and imaginary families.

Leila was always happy to see her cousin Joseph when he joined her on the playground, but her joy never lasted long. Joseph grabbed the blocks she and her friends were using to make a house. He wanted to build a rocket, and build it by himself. His pals would wreck anything that Leila and her friends had created. The boys pushed the girls around, refused to take turns, and would ignore a girl’s request to stop or give the toy back. By the end of the morning, Leila had retreated to the other end of the play area with the girls. They wanted to play house quietly together.

Common sense tells us that boys and girls behave differently. We see it every day at home, on the playground, and in classrooms. But what the culture hasn’t told us is that the brain dictates these divergent behaviors. The impulses of children are so innate that they kick in even if

we adults try to nudge them in another direction. One of my patients gave her three-and-a-half-year-old daughter many unisex toys, including a bright red fire truck instead of a doll. She walked into her daughter's room one afternoon to find her cuddling the truck in a baby blanket, rocking it back and forth saying, "Don't worry, little truckie, everything will be all right."

This isn't socialization. This little girl didn't cuddle her "truckie" because her environment molded her unisex brain. There is no unisex brain. She was born with a female brain, which came complete with its own impulses. Girls arrive already wired as girls, and boys arrive already wired as boys. Their brains are different by the time they're born, and their brains are what drive their impulses, values, and their very reality.

The brain shapes the way we see, hear, smell, and taste. Nerves run from our sense organs directly to the brain, and the brain does all the interpreting. A good conk on the head in the right place can mean that you won't be able to smell or taste. But the brain does more than that. It profoundly affects how we conceptualize the world—whether we think a person is good or bad, if we like the weather today or it makes us unhappy, or whether we're inclined to take care of the day's business. You don't have to be a neuroscientist to know this. If you're feeling a little down and have a nice glass of wine or a lovely piece of chocolate, your attitude can shift. A gray, cloudy day can turn bright, or irritation with a loved one can evaporate because of the way the chemicals in those substances affect the brain. Your immediate reality can change in an instant.

If chemicals acting on the brain can create different realities, what happens when two brains have different structures? There's no question that their realities will be different. Brain damage, strokes, pre-frontal lobotomies, and head injuries can change what's important to a person.

They can even change one's personality from aggressive to meek or from kind to grumpy.

But it's not as if we all start out with the same brain structure. Males' and females' brains are different by nature. Think about this. What if the communication center is bigger in one brain than in the other? What if the emotional memory center is bigger in one than in the other? What if one brain develops a greater ability to read cues in people than does the other? In this case, you would have a person whose reality dictated that communication, connection, emotional sensitivity, and responsiveness were the primary values. This person would prize these qualities above all others and be baffled by a person with a brain that didn't grasp the importance of these qualities. In essence, you would have someone with a female brain.

We, meaning doctors and scientists, used to think that gender was culturally created for humans but not for animals. When I was in medical school in the 1970s and '80s, it had already been discovered that male and female animal brains started developing differently in utero, suggesting that impulses such as mating and bearing and rearing young are hardwired into the animal brain.[1] But we were taught that for humans sex differences mostly came from how one's parents raised one as a boy or a girl. Now we know that's not completely true, and if we go back to where it all started, the picture becomes abundantly clear.

Imagine for a moment that you are in a microcapsule speeding up the vaginal canal, hitting warp drive through the cervix ahead of the tsunami of sperm. Once inside the uterus, you'll see a giant, undulating egg waiting for that lucky tadpole with enough moxie to penetrate the surface. Let's say the sperm that led the charge carries an X and not a Y chromosome. Voilà, the fertilized egg is a girl.

In the span of just thirty-eight weeks, we would see this girl grow from a group of cells that could fit on the head of a pin to an infant who weighs an average of seven and a

half pounds and possesses the machinery she needs to live outside her mother's body. But the majority of the brain development that determines her sex-specific circuits happens during the first eighteen weeks of pregnancy.

Until eight weeks old, every fetal brain looks female—female is nature's default gender setting. If you were to watch a female and a male brain developing via time-lapse photography, you would see their circuit diagrams being laid down according to the blueprint drafted by both genes and sex hormones.[2] A huge testosterone surge beginning in the eighth week will turn this unisex brain male by killing off some cells in the communication centers and growing more cells in the sex and aggression centers.[3] If the testosterone surge doesn't happen, the female brain continues to grow unperturbed. The fetal girl's brain cells sprout more connections in the communication centers and areas that process emotion.[4] How does this fetal fork in the road affect us? For one thing, because of her larger communication center, this girl will grow up to be more talkative than her brother. In most social contexts, she will use many more forms of communication than he will.[5] For another, it defines our innate biological destiny, coloring the lens through which each of us views and engages the world.

Reading Emotion Equals Reading Reality

Just about the first thing the female brain compels a baby to do is study faces.[6] Cara, a former student of mine, brought her baby Leila in to see us for regular visits. We loved watching how Leila changed as she grew up, and we saw her pretty much from birth through kindergarten. At a few weeks old, Leila was studying every face that appeared in front of her. My staff and I made plenty of eye contact, and soon she was smiling back at us. We mirrored each