I

Understanding the Science of Gender

> Human evolution has created two different types of brains (male and female) designed for equally intelligent behavior.
>
> —RICHARD HAIER, PROFESSOR OF PSYCHOLOGY, UC IRVINE

IT CAN BE DIFFICULT TODAY TO TALK COMPLETELY AND HONESTLY about how men and women feel at work. Respectful humor is often helpful.

A number of years ago, a story began to circulate on the Internet. Some people thought it began with Stephen R. Covey, though no one knows for sure. It is a fictional transmission between a U.S. Navy aircraft carrier and Canadian authorities that provides us in the gender world with a humorous metaphor for beginning a dialogue. We get a special chuckle from this story because Barbara is Canadian and Michael is American—but the story could involve any countries and any cultures.

CND: Please divert your course 15 degrees to the south to avoid collision.

USA: Recommend you divert your course 15 degrees to avoid collision.

CND: Negative. You divert *your* course 15 degrees to avoid collision.

USA: This is the captain of a U.S. Navy ship. *Change your course now or countermeasures will be taken to ensure the safety of this ship.*

CND: This is a lighthouse. It's your call.

A lighthouse and a ship—they both have something essential to offer. At first, neither one understands what the other one is. Once they understand, perspectives change.

Is the lighthouse one gender and the ship another? No. For our purposes, the lighthouse represents human nature (*gender*), and the moving ship represents cultural shifts in use of gender (*gender roles*). In the science-based paradigm, gender comprises the male/female characteristics we are born with and the context in which we receive our early nurturing; gender roles are the roles that our society and we ourselves decide we should fulfill as women and men.

In this model, the lighthouse is "hard-wired"—it's been there a long time. The ship can't deny the lighthouse exists, nor change the "course" of the lighthouse—and, perhaps most important, it *needs* the light shining from the lighthouse to help chart its safe course. Though the ship initially feels threatened by the presence of the lighthouse (not knowing what it is), once it learns the character and value of this other presence, it can in fact navigate more safely.

The moving ship is the "soft-wired," changing part of the gender equation. The ship represents the gender roles we each bring to the workplace. These can change from generation to generation and from person to person.

When the ship doesn't have all the information the lighthouse possesses, our sense of gender roles, as individuals and a society, will often limit either women or men, increase gender stereotypes, misrepresent who we are as individuals, and lead to confusion, fear, and, ultimately, anger and anguish. When, however, the ship acquires crucial information about human nature—gender—it realizes the lighthouse is there, and it can more safely and more effectively navigate gender roles, gender issues, executive team development and trust, individual and personal concerns between women and men, and the whole workplace culture.

??? Did You Know ???

Gender Experiments Surprise Even the Experts

In the 1990s, the Canadian Broadcasting Corporation (CBC) created a short film that recorded an experiment in leadership

styles between women and men. CBC didn't tell the participants the objective of the work they would do that day; the director simply divided the male and female leaders into two teams, and gave those team leaders the same instructions: build an adventure camp. The teams were set up in a somewhat militaristic style at first, including team members wearing uniforms, but also with the caveat in place that the teams could alter their style and method as they wished, as long as they met the outcome in time.

Leader one immediately created a rank-and-file hierarchy and gave orders, even going so far as to assert authority by challenging members on whether they had polished their shoes.

Leader two did not have the "troops" line up and be inspected, but instead met with the other team members in a circle, asking, "How are we doing? Are we ready?" "Anything else we should do?" "Do you think they'll test us on whether we've polished our shoes?" Instead of giving orders, leader two was touching team members on the arm to reassure them.

As part of the program, CBC arranged for corporate commentators to watch the teams prepare. Initially, the commentators (mostly men) were not impressed by the leadership style of leader two; the second team wasn't under control, members weren't lined up, and they lacked order (or so it seemed). The commentators predicted that team two would not successfully complete the task. Yet when the project was completed, team two had built an impressive adventure camp, as good as team one's, with some aspects that were judged even better.

When debriefing their observations, the commentators noticed that when team one was building the structures for their camp, there had been discord regarding who stood in charge and who had completed which job and who hadn't. Team one showed a lack of communication during the process of completion that created problems (for example, "Wasn't someone else supposed to do this?").

Team two, on the other hand, took longer to do certain things, but because of its emphasis on communication and collaboration

during the building and enactment of the task (such as "Let's try this" and "What do you think about that?"), the team met the goal of building the adventure camp in its own positive way, and on time.

Which leader do you think was a man, and which one a woman? You probably saw the answer coming—the woman was leader two. The commentators who watched this experiment certainly knew about authentic leadership, different management styles, and the idea of diversity. But they weren't quite ready for the female leader to succeed so completely with her "nonmale" leadership style. They were—as many organizations' succession planning committees can be—unconsciously (and consciously) thinking the woman "just doesn't act like a leader," "just doesn't have things under control," "won't meet deadline," "is run by her staff." The committee may know she gets results, and it may even have her name on a short list, but the members can't quite get their heads around the fact that a woman's authentic leadership style doesn't need to look like a man's authentic leadership style.

The CBC experiment is just one ray of light coming from the lighthouse. The light being sent out into the world from experiments like this illuminates the differences between the male and female brain at work, especially in leadership roles. Although of course anything can happen in a social experiment that is being filmed—and in all the gender-related science we explore in this book, you'll be able to think of "exceptions to the rule" (you'll learn, in fact, about women and men who are actually hard-wired toward the middle of the gender/brain spectrum—that is, they have higher-than-average amounts of the other gender's brain characteristics)—at the same time, wherever you travel in the world, you will find that female leaders often share certain traits that are different from male leaders. Let's explore the biology of this difference, for it crosses all cultures, and it is fascinating!

Getting to Know the Gender/Brain Spectrum

The human brain is hard-wired (genetically coded with) its gender. As *gender* is not one thing or type, but very diverse, you will find throughout this book that your brain's male/female coding fits somewhere on a wide *gender/brain spectrum*. To start very practically discovering where your particular brain fits on the spectrum, go to the Appendix and fill out the gender/brain spectrum survey. We have developed this as a personal tool, usable by anyone. You can also go to the website www.bbc.co.uk/science/humanbody/sex/add_user.shtml and take the BBC's "What Sex Is Your Brain?" test. It is very detailed and accessible. If you have time, you may enjoy doing both.

Tools of Science: How the Female and Male Brain Are Studied

Beginning in the 1970s, researchers began to use medical technologies and computers to study gender in the brain. There are three techniques most used:

- *A PET scan* uses positron emission tomography to identify areas of neural activity. Scientists can locate the regions that become active while a person speaks, works, relates, loves, performs tasks. By comparing these "brain pictures" to those taken before or after a task, scientists gain insights about brain organization. PET scans from all over the world show that male and female brains are organized differently.
- *MRI scan* uses magnets to detect signals from particles with a positive electronic charge that act like compass needles in the magnetic field. Because the amount of oxygen found in blood affects its magnetic properties, MRI detects regions with changes in levels of blood oxygenation due to activity-related changes in blood flow. MRI can provide both anatomical and functional information for each subject, helping researchers accurately determine which brain regions are active in each task. MRI studies have shown that the regions of the male and female brain activate differently, no matter the subject's culture or continent of origin.

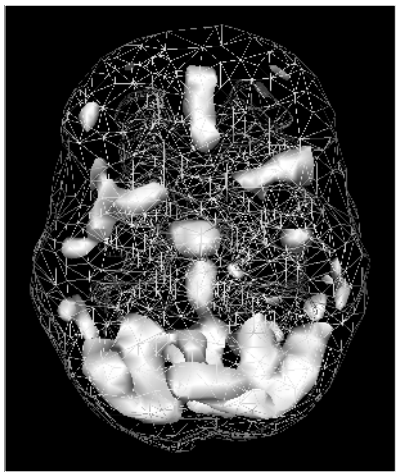

Figure 1.1. *Female at Rest.*

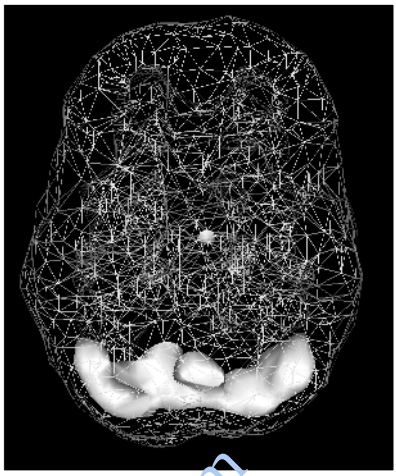

Figure 1.2. *Male at Rest.*

Source: Brain scans courtesy of Dr. Daniel Amen. Used by permission

- *SPECT imaging,* similar to PET and MRI, uses single photon emission computed tomography to provide lower-resolution images; it is much less expensive than PET. As you can see in the SPECT scans in Figures 1.1 and 1.2, the male and female brain look quite different in terms of brain activity. (These SPECT scans appear courtesy of one of the Gurian Institute's scientific advisors, Daniel Amen, M.D. He and his team at the Amen Clinics have done thirty-eight thousand brain scans.)

Equal but Different Intelligence

As brain science becomes more sophisticated, the results of studies consistently indicate that although men and women produce equivalent intellectual performance, their brains do it differently.

We are different in the following ways:

- *How and what we remember.* Women take in more through each of their five senses than men do, on average, and store more of this material in the brain for later use. Thus they tend to remember more details during a conversation, for instance.

- *How we process words (and how many and what kind we use).* Women use more words than men. This includes reading and writing, not just speaking; that is, a man and a woman may speak the same amount of words in a week, but will not generally read and write the same amount.
- *How we experience the world.* New studies are indicating that even the cells in our retina may well be different, with female retinas tending to have more P ganglion cells (which see color and fine detail), and male retinas tending toward more M ganglion cells, which more easily see physical motion of objects moving in space around them.
- *What we buy and why we buy it. Because of these sensory differences,* women's buying is often more linked to immediate complex sensory experience than men's; for example, women more readily enjoy walking through a store and touching and feeling objects, while men will get less pleasure from this. Men, on the other hand, link more of their buying to both spatial enjoyment (such as video games, which are all about objects moving around in virtual space) and to performance competition and aggression identification. Thus we find more men interested in buying memorabilia from sports teams with which they passionately identify.
- *The way our midbrain (limbic system) and emotional processing works.* The approach to developing self-esteem and emotional intelligence can be quite different in women and men, especially because women's brains tend to link more of the emotional activity that is going on in the middle of the brain (the limbic system) with thoughts and words in the top of the brain (the cerebral cortex). Thus a man might need many hours to process a major emotion-laden experience, whereas a woman may be able to process it quite quickly. This often creates a lot of tension between women and men.
- *The amounts of white matter and gray matter in the brain.* Women have more white matter and men have more gray matter related to cognitive functioning in the brain. White matter connects brain centers in the neural network, whereas gray matter tends to localize

brain activity into a single active brain center. The white/gray matter difference is one reason the genders bring different perspectives to the same problem or design. Women tend often to be able to make crucial connections between widely disparate elements that men don't make; simultaneously, men tend to task-focus on one element or pattern without distraction better than women do.

How Does the Brain Get Hard-Wired for Gender Differences?

Each of us is a woman or man at a certain place on a gender/brain spectrum. Michael, for instance, might have more gray matter than his brother has, as well as more than Barbara has; Barbara might have more white matter than her sister or another woman, and so on. Although all women will tend to have more white matter and all men more gray matter, within these gender characteristics there is variety—that is the gender/brain spectrum.

How do the gender characteristics along this spectrum get wired into us individually? The answer can be best understood as a three-stage process. Where you fit as a particular woman or man on the broad gender/brain spectrum depends, in large part, on these elements:

1. On every X and Y chromosome are genetic markers for fetal development of female and male in the body and brain. You have your own genetic markers, coming from your parents and their genetic lines. This first stage of wiring occurred in you at your conception, when the particular X and/or Y chromosomes were passed to you.
2. The second stage occurs while a fetus is gestating in utero—your chromosome markers alerted your mother's body, and then your own fetal system, to produce hormonal surges from within testes or ovaries that helped your male or female body and brain grow.
3. After a child is born, genetic personality, temperament, needs, and gender traits signal who we are to parents and caregivers. As you grew, your body and brain continually guided your maleness and

femaleness, while the society and family nurtured various aspects of each (of course, during this time parents and society may have actually missed aspects of who you were, or tried to change who you were—even gender stereotyping who you were).

By the time you arrived at your first workplace, your gender was genetically, hormonally, neurally, and socially wired. It was and is a natural part of you.

Can the Brain Be Reprogrammed for Gender?

When we share this hard-wiring information in our workshops, someone inevitably asks, "But isn't the brain plastic and changeable?" They are asking, "But I thought gender was socially developed, not inborn, so we should be able to get women and men to be androgynous, right?"

If you've followed the current dialogue about brain science in the media these days, you've probably heard the term *plasticity*. That term is what the questions are about. "Anyone can learn to do anything." "Anyone can become anyone else." It can feel uncomfortable to say anything else, especially when talking about gender.

And so you might hear someone say, "Look, if you gave boys dolls every day for a year and you gave girls toy trucks every day for a year, wouldn't the 'plastic brain' finally change itself? The boy would become a kid who loves dolls and emotion-talk, and the girl would become a kid who loves construction sites and ninja video games."

In a recent training, a CEO asked the question this way: "If you talk to boys about their feelings every day for hours (and have them read and write about them), won't they end up becoming men who talk (and read and write about) feelings as much as women often do? Isn't the brain plastic, so these guys' brain centers would change to fit how they've been nurtured?"

This kind of question arises not only from our innate human curiosity but also from our personal and cultural fear that if we discover the human brain's gender characteristics to be hard-wired, this fact will keep boys from becoming emotionally healthy men and, perhaps most frightening, keep women from gaining equity in the workplace.

It is natural and socially very important for us to at first be suspicious of any kind of thinking that limits our opportunities based on sex and gender. We don't want to be restricted in abilities or self-expression! So we ask these questions.

As you may have yourself, we've asked these questions now for twenty-five years, in concert with male and female colleagues in the sciences and in corporations and communities. The brain-based answer is immensely liberating, for it includes both nature and nurture:

- First, gender in the brain is not as plastic as some other aspects of brain development—nor as plastic as the feminist movement theorized. Gender in the brain is, in part, chromosomally and neurally "locked in" in the same way that the genetic personality you are born with (extravert or introvert, sensing or perceiving, and so on) is, in part, chromosomally and neurally "who you are." Children who were born with male brains, for instance, but have had their genitals removed (in medically ordered procedures to solve specific medical problems) have still remained "male" in their thinking and being, in the same way that they remained extravert or introvert. Part of gender is hard-wired.
- Simultaneously, the genetic and nurtured expression of our genes—our DNA, then our neural formatting—is definitely and profoundly affected by the external environment. Every biological organism or mechanism exists in—and is shaped, to some extent—by its environment. Although the place we will inherently fit on the gender/brain spectrum is not as plastic as we once thought, the effectiveness of our functioning in a team with the other gender (and in marriage, family, and every aspect of life) can be affected profoundly by how gender intelligent our parents, society, and workplace become.

There is no either/or here, no nature versus nurture. That is ultimately what is most liberating about this brain-based/nurture-dependent point of view. Nature (who we are) is nurtured by environment (how we fit who we are into the environment we live and

work in). Although genetics of gender preclude us from changing a boy into a girl or vice versa, environments affect the extent to which different genes get expressed and are viable—in this lies the heart of the opportunity debate in women's and men's lives. Equal opportunity must be given to each individual man and woman so that they, as differently but equally intelligent women and men, can discover how to nurture and express their own inborn nature in cohesive groups.

As you absorb this information and this thinking, you are standing at an evolutionary point in gender history. Whereas once a culture might well stereotype women and men when talking about difference, the new brain sciences can now move us forward to true partnership. Two hundred years ago—even thirty or forty years ago—nearly any information about women and men could be manipulated and skewed, as it was opinion, not science. Hypothetical scenarios about raising kids could be posited and debated, no matter how far-fetched. People came to believe that adult gender equality depended on erasing gender differences and making everyone the same.

Now, science is available, and corporations such as IBM, PricewaterhouseCoopers, Deloitte & Touche, Procter & Gamble, Unilever, and many others—that have paid attention to how inherently different the genders are—actually do *better* at advancing women's and men's success in the workplaces. Paying attention to who we really are makes it possible to create policies that satisfy our deepest needs as women and men, create partnerships based in mutual respect and support, and improve bottom lines through gender intelligence, gender balance, and evolving opportunities to become people of depth and vision.

For this to work, though, we all need to make sure we understand how much gender is tied up with our lighthouse genetics: this is the crux of gender intelligence. To move deeper into understanding the gender/brain information, and to move clearly into pushing beyond a nature-versus-nurture kind of thinking (to a nature-with-nurture approach), add *low plasticity* and *high plasticity* to your gender vocabulary. Leaders often find these terms intriguing, and a worthy distinction, one made by neuroscientists that we can understand and use immediately in our teams.

Personality (such as introvert/extravert) and gender (where you fit on the gender/brain spectrum) are aspects of who you are that have *low plasticity.* On the other hand, the language or languages you learn as a child involve brain functioning that is *highly plastic.* The languages you learn depend on what cultures you grow up in and move to (French in France, Japanese in Japan, English in the United States or UK, and so on).

Similarly, although *gender roles* can change based on your culture, your brain will still show up as male or female on PET, MRI, or SPECT scans, no matter where you go. So *gender* does not depend on where you grew up—the costume of how you manifest it will be affected by culture, but because it is something that has been developing over about a million years in our DNA, you'll see women in Saudi Arabia using more emotion-laden words than men, and women in the United States doing the same; you'll see women in North Africa remembering more sensory details than men, and women in America doing the same; you'll see men in all countries crying fewer tears, on average, than the women in those same countries.

Low plasticity does not mean there won't be cultural effects on your brain/gender genetics. For instance, you can certainly train boys to not cry and end up stifling their tears, and you can encourage boys to cry

??? Did You Know ???

Male and Female Tear Glands Are Different by Nature

Women throughout the world have higher levels of prolactin, which controls, among other things, the development of tear glands. Your gender base in prolactin levels will not change unless it is interfered with by a medication or chemicals; hence, generally, wherever you go (even in a culture that is friendly to male tears, like Italy) you see more tears falling from women's eyes than from men's. The chromosomal development of prolactin in the female body and brain and its resulting genetic expression in larger tear glands is just one aspect of female DNA that has low plasticity.

and girls not to and end up stifling girls' tears. But the changes won't change the children's brains from male to female and vice versa. That's the crux of what we've discovered scientifically in the last thirty years. Your individual genetics can include aspects that don't fit the male and female on your gender/brain spectrum analysis—you could be a man who cries a lot, for instance, or a woman who cries not at all—but when you look at yourself comprehensively from a gender lens, you'll most probably see that you are male or female.

What is the bottom line on all this? The brain is quite adaptable, but in areas of personality and gender it is also hard-wired. Even a boy brought up only by women or a girl brought up only by men will find that although he or she has been affected in certain ways through these life circumstances, he or she is still boy or girl, man or woman. One celebrity example of this that corporate audiences often find compelling is that of football players (or other athletic stars) like Bo Jackson, who talk in interviews about being brought up without significant men in their lives—that is, by a single mom and by other women—but who obviously have low plasticity of the male brain. Male athletes like Jackson who were nurtured mainly by women and ended up high-testosterone, high-muscle-mass, very spatial-kinesthetic, using fewer words than most women are very much male on the gender/brain spectrum.

As you move farther into this material, your internal frame as a leader (both a woman and a man) may well shift toward a next-stage and revolutionary understanding of gender and leadership. Along the way, we hope you'll find that discovering where *you* fit on the gender/brain spectrum feels like discovering a treasure: a liberating (albeit complex) part of who you are.

Burning Question: Are There Exceptions to the Gender Rules?

Having established that there is hard-wiring of male/female difference, it is crucial to not go forward without looking at exceptions to the rule. You may be one of these!

Ten years ago, Michael coined the term *bridge brain* to help people understand the exceptions: these include people whose brains share a number of characteristics of the other gender's brain, transgendered individuals, and people who just sense their brains may be toward the middle of the gender/brain spectrum. In Michael's corporate work especially, women would come up to him and say, "You know, I think I fit a lot of the qualities you're presenting as 'male brain.' I was a total tomboy as a kid; I couldn't sit still; I didn't like dolls much, which got me rejected by other girls; I was really good at physics but avoided reading for pleasure; I still prefer working alone to talking a lot with people; I'm not very emotional. . . ."

This woman is physically, emotionally, spiritually a woman, of course, and she isn't trying to limit or stereotype herself one way or the other; rather, she has always sensed instinctively that her brain doesn't quite work in the same way many other girls' or other women's brains work.

A similar thing happens for some men, as well. Recently a male CEO said to Michael, "You know, I want to say privately to you that all my life I've known I was a bridge brain, though I didn't have the language for it, and I certainly didn't know there were brain scans that could show it. But I was the kid who loved dolls and soft things, I didn't like team sports, I have always been more verbal and emotional than most guys. . . ."

This man pointed out characteristics in himself that show him to be higher in oxytocin and lower in testosterone (we'll talk more about this brain chemistry in the next chapter), with a brain formation that includes more "female" characteristics. Just as the bridge brain woman had humiliating and negative experiences as a girl for "not belonging," so too did this man as a boy for not fitting in with the guys.

What research into bridge brains is showing us scientifically is this: (1) every one of us has both our own gender's and the other gender's hormones and brain characteristics (hormones and the brain are "human," and we all share them); (2) yet if we are biologically male, we will tend toward being more male on the brain/chemistry spectrum, and if female, we'll tend toward female; and (3) some of us are closer to the other gender on the spectrum than others are. Some of us, in other words, are neurological "bridges" between genders.

You yourself might often see bridge brain women in the technology sector, just as you might see bridge brain men in the social services sector. The bridge brain women might be a lot like the woman who spoke to Michael, and the bridge brain men more likely than other men to multitask, care a lot about verbal and emotional material, and not be as competitive as other men or women around them.

Two scientists have especially helped us understand bridge brains in the last decade. They have been interested in how bridge brain activity shows up on brain scans. Both Daniel Amen, M.D. (www.amenclinics.com) and Simon Baron-Cohen, Ph.D. (New York, *The Essential Difference*) have been able to show how different a bridge brain woman's or man's scan looks from a more "male" or "female" scan. Baron-Cohen, for instance, has estimated that around one in seven men and one in five women are in the middle of the gender/brain spectrum.

It is much easier to see male bridge brains than female ones (because the male brain at rest shows up with so little activity, whereas the female's neural web shows up with more activity). If you compare Figure 1.3 to the scan of the male brain in Figure 1.2, you'll notice much more activity in the middle of the brain in this one—in the areas of emotional and verbal expression.

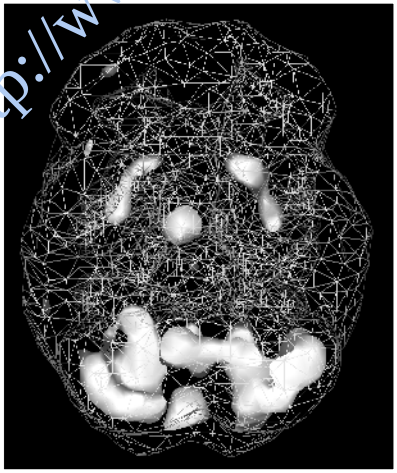

Figure 1.3. *Male Bridge Brain.*
Source: Daniel Amen, M.D.

For more understanding of bridge brain men, you might enjoy Michael's book *What Could He Be Thinking?* For more on bridge brain women, you might enjoy *The Female Brain* by Louann Brizendine. Especially if you are a bridge brain or if you work closely with one, you might find this kind of research very stimulating. It can feel like looking directly into the light coming from the lighthouse. In later chapters of this book, as we explore ways to retain more women at the highest executive levels, especially in companies that have been traditionally dominated by male brains, we will look again into the female bridge brain.

Before we leave the subject here, though, there is a twist in this research and thinking that Barbara began to notice about ten years ago. Some women would come up to her in a training and say, "I think I'm a bridge brain; I operate just like the male managers at work." But when Barbara asked, "Are you this way at home?" some of them paused and said, "No, not at all, just at work."

This answer can become part of the "lighthouse" we are working with in this book. It shows the immense adaptability of human beings to meet the perceived needs of their environments—these women have accessed parts of themselves needed to "become like men" so they could survive at work—but as we'll notice especially in Chapter Eight, when these women train themselves to counter their natural inclinations, they often push back, at some key point in their career, against having to give up "who they are." They end up leaving the workplace that invested immense resources in their development as leaders, but did not understand them as adult women.

Empowering Yourself and Your Corporation by Joining the Scientific Process

As we provide you with scientific information and scans showing various parts of the gender/brain spectrum, we hope you'll join with us and with scientists in using the science to help build your organization to its full power. All the work that each of us do to adapt scientific research for use in corporations would not be successful without the original laboratory work of the primary scientists studying gender in

humans, animals, social history, and societies around the world. As you move into this world, through this book and its tools, it is important to note that the world of primary science does not operate in absolute agreement. Indeed, the science of gender is in constant flux. Increasingly, too, it is part of the public debate, whether in academics, in the media, or in your boardroom. Everyone has an opinion about the male and female brain!

This is where you can come in. As authors of this book, and as gender coaches and social theorists, we make sure to inform our strategies and ideas with scientific studies, and you'll see their application in this book. We hope you, too, will develop and pursue your own science-based opinions about gender. The process of building gender intelligence requires open debate and dialogue, grounded in scientific process.

To help you join this process, we've provided original studies throughout the Notes and Resources section of this book. They are fascinating, especially if you like reading scientific studies. They are also only the beginning of the journey toward gender intelligence. When we and our colleagues have interviewed a number of the scientists noted in this book—including Ruben Gur, Sandra Witelson, and Marianne Legato—we have found them to be enthusiastically at work on some new research design. They are constantly expanding the purview of gender science. We have also found them all to be in agreement on a warning: "Be careful how you use gender science." Stereotyping can destroy the effort to develop gender intelligence in human development. In the workplace, it can be counterproductive.

Join with Scientists in Analyzing Gender

Perhaps there is no more difficult line to walk in gender science than the "Avoid stereotyping" line. Where is the line? If you read just the popular media to get a sense of gender science, you can become very confused indeed! This happened recently when a headline popped up around the world, "Myth That Women Talk More

Than Men Debunked." It referred to a study of a small cadre of university students in Arizona, both male and female, who had been equipped with a device that counted the words spoken in a day. These young women and men spoke, on average, about the same number of words each day. The study's authors announced that, therefore, four decades of research on male/female brain difference was wrong—there is no verbal difference between women and men. If you do a web search on something like "gender and verbal skills," you'll find widespread reporting of this study (for instance, "Study: No Yap Gap," by Helen Kennedy, *New York Daily News*, July 6, 2007).

This study provides a crucial example of how we must all enter the scientific dialogue ourselves in order to see what is really happening with gender. It also shows how careful we must be in pursuit of gender science. It is not superficial stuff. It needs replication. It needs careful analysis.

The Arizona study, for instance, was very incomplete science. Analyzing it here can help create a template for your constant analysis—in your leadership team and in the rest of this book—of gender science.

- The study's authors implied that their study proved men and women use the same amount of words in a day; however, it measured only spoken words, not written and read words. In fact, women read and write more words per day, on average, than men, as has been proven by Ruben Gur and others (see, for instance, Halpern, Benbow, Geary, Gur, Hyde, and Gernsbacher, 2007).
- The study sample included just over two hundred people, all in one place. It did not replicate around the world, where there are around six billion women and men, boys and girls!
- The sample population consisted of university students at a university that relies heavily on verbal skills—this

pool of young people (both young women and young men) is already a more verbal pool than you would find in your neighborhood car mechanic's garage, or a city's construction site, or your own home, or even perhaps the corporation you are now leading.

As authors of this book, gender trainers, and a woman and a man who have each applied gender science for a quarter century, we come to our work knowing these caveats:

- There is no way to get complete agreement from everyone on what a scientific study regarding gender can mean for every individual. Scientists can disagree with one another, and they can disagree with the people who apply the science.
- If a basic idea or application of a piece of science isn't replicated, or carefully provided, or both, stereotyping and confusion can occur.
- Gender science is increasingly useful outside the university or academic laboratory, and thus a nonacademic population (of which you may be a part) is constantly weighing in on the science.

As we have helped corporations and communities apply principles of gender science, we've been able to gather information (what is called *wisdom of practice research*) from tens of thousands of people like you. When you read stories in this book or any of our other books about how corporations, individuals, schools, and family members have applied gender science, you are seeing a priceless kind of proof—corroborative, intuitive, and appearing worldwide.

Ultimately, we believe that for good gender science to be of use it now requires three major actors: the original scientists (many of whom appear in the Notes and Resources); the interpreters of the science for corporations and others (we, as theorists, trainers, and authors, fit in

this category); and the leaders and others, like you, who apply gender principles every day, whether through training or through instinct. When you read this book and apply the science, we hope you'll hear all three voices represented, and we hope you'll listen to all three—especially your own voice, as a woman or a man.

The Lighthouse

For a few decades now, our corporate world has done a lot of wonderful things in the area of gender roles, but we are also stuck in many ways. We've avoided dealing with the lighthouse of gender biology—we've been afraid of it—and so we've been navigating without its light. In today's corporate world, power, leadership, control of assets—*all* are in flux, and economic pressures, globalization, media, the Internet are all affected by gender, even when we don't realize it. We need to be gender intelligent, even a little bit revolutionary! We need to move beyond both the traditionalist and feminist frameworks and look at the light that human nature itself is providing to all of us, now more than ever before: that light that can help guide every leader to the best possible outcome.

You've begun to look at the male and female brain through a biological lens. Can you see interesting applications not only to leadership at work, but also to home and family life? Everything we talk about regarding work has a mirror image in other male/female relationships.

In the next chapter, we'll increase the light and vision into daily manifestations of brain differences in *your* workplace—from self-motivation to management styles to communication styles. You'll be able to look more closely at how brain differences are utterly interwoven with your work and leadership, and you'll see fascinating applications elsewhere as well.

Note: To help you experience and absorb some of the brain differences and specific gender needs we'll show you in Parts One and Three of this book, at the ends of the chapters we've provided situational exercises and specific principles and tasks that you can do and discuss in your team right away.

Situational Exercise

Try this experiment with your leadership team: have a meeting about the material and content that is normal for that meeting—perhaps it is your weekly staff meeting—but end the content portion of the meeting fifteen minutes early. Now tell your team, "Okay, for five minutes write down as many gestures, tones of voice, or other subtle relational signals as you can remember seeing happen during the meeting."

After the writing time, let everyone talk about what they saw and heard.

You'll be amazed at how much more most of the women saw and sensed relationally—how many more facial and physical expressions of emotion, for instance.

First Principle and Task of Balanced Leadership

Principle 1: Gender intelligence and, therefore, gender-balanced leadership begin in the understanding that we are, in large part, hardwired to be who we are. This understanding begins a work/life process of nurturing our own nature and feeling personally responsible to help others nurture their own authentic gender qualities. When we open our thinking to science-based insight about gender, we take a first step in trusting both our own and the other gender's abilities, and we begin to expand into areas of gender intelligence that can lead to authentic and balanced leadership for both women and men.

Task/Actions 1: Begin the process of revisioning your leadership and management philosophy toward dealing with gender issues scientifically. Be open right now to wherever this revisioning takes *your* corporation. Also be open to where it takes you personally, and your leadership team as a group, including gaining an understanding of those individuals who are exceptions to gender "rules."

Summary

1. Gender and gender roles are not the same thing.
2. Gender is hard-wired, and can be understood scientifically.
3. Like any scientific principle, theory, or process, science-based gender study requires constant "lab" work, observation, dialogue, collaboration, adaptation—not stereotyping!
4. PET, MRI, and SPECT scans can reveal a great deal about differences between male and female brains.
5. Genetics research indicates chromosomal roots to our gender traits.
6. Actual and natural brain differences have positive implications for gender-intelligent leadership.
7. The terms *male brain* and *female brain* do not mean one brain for each gender; the gender/brain spectrum is quite diverse and includes bridge brains.
8. Balanced and gender-intelligent leadership is an achievable positive goal of science-based thinking regarding women and men.