

BRAIN SCIENCE PODCAST

With Ginger Campbell, MD

Episode #20

Interview with Dr. Louann Brizendine, Author of *The Female Brain*

Aired September 6, 2007

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INTRODUCTION

This is the *Brain Science Podcast* – the podcast for everyone who has a brain – and I’m your host, Dr. Ginger Campbell. On the *Brain Science Podcast* I explore how recent discoveries in neuroscience are unraveling the mysteries of how our brains make us who we are

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Welcome back to *Brain Science Podcast*. This is [Episode 20](#). Today I have an interview with Dr. Louann Brizendine whose book, [The Female Brain](#), just hit the *New York Times* Best Seller List.

I want to welcome those of you who might be new listeners and tell you just a little bit about the show. I usually either do an interview of an author or a scientist, or I talk about a book about neuroscience that is aimed at general audiences. My goal is to give you the main ideas out of the book so that you will know if you want to take time to read the book, or if you don’t have time—because

most of us don't have time to read as many books as we'd like—you will learn really interesting stuff about how your brain makes you who you are.

With regard to today's interview, I was a little bit reluctant to do a topic called 'The Female Brain' because I was afraid that my male listeners—and I really appreciate the fact that many of my listeners are male—I was afraid you might be turned off by this topic if you weren't a woman. However, what this episode is really about is how hormones and neurotransmitters affect our brains and how this is different according to whether or not we are male or female.

Dr. Brizendine was a wonderful interview, but unfortunately you'll notice that there are some problems with the sound on this interview. I apologize for this and the fact that I am not an audio engineer.

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INTERVIEW

GC: Welcome to the *Brain Science Podcast*. This is Episode 20 and my guest today is Dr. Louann Brizendine, author of the best selling book, *The Female Brain*. Welcome, Dr. Brizendine. I'm so happy you could be with me today.

LB: Hi. Thanks for having me, Ginger.

GC: Before we start I was wondering if you would tell my audience a little bit about yourself and how you came to write your book, *The Female Brain*.

LB: That's an interesting question. My patients in the Women's Mood and Hormone Clinic that I founded in 1994 had for many years been asking me, 'Please have a book,' or, 'Would you refer me to something that I could read about how hormones and various things affect the brain and what the female brain and

hormones have to do with the way I'm feeling?' So, I ended up several years down the pike deciding to write this book for my patients.

GC: That's a good place to start because you have an audience definitely in mind as you're writing. I guess that helped.

LB: Yes, it helped a lot because I knew I wasn't writing for my colleagues, I wasn't writing for other neuropsychiatrists, I was writing for my patients and for the public that would be the type of people who might come to my clinic; as well as, of course, for the men in their lives who might like to have a code book, shall we say, for their beloved female partners.

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Dr. Brizendine's book, *The Female Brain* is now available for audiobook download at [Audible.com](https://www.audible.com). If you'd like to get this book you can go to [brainsciencepodcast.com](https://www.brainsciencepodcast.com) and click on the link. There you can get it as a free audio download if you are a new subscriber to Audible.com.

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GC: You talked about the fact that you are a neuropsychiatrist. I recently interviewed Dr. Elkhonon Goldberg¹ who is a neuropsychologist, and I got him to describe for my audience what a neuropsychologist does. Can you tell me what a neuropsychiatrist does and how that's different?

LB: A neuropsychiatrist is someone who is trained as an MD—who went to medical school—and then has specialized training in neurology. I am board certified in psychiatry and neurology, and I specialize in the area of psychiatry

¹ Elkhonon Goldberg was interviewed in [Episode 18](#).

that has to do with the brain and hormone and neurochemical effects in the brain.

GC: You also did some graduate work in neurobiology, didn't you?

LB: Yes, I did indeed. At UC Berkeley I got my degree in neurobiology before I went to medical school.

GC: Were you already interested in the influences of hormones on the brain when you went to medical school?

LB: Yes, I was. I was interested in all kinds of effects of the cellular development of the brain, and the hormonal effects, and the neurochemical parts of the brain, as well as neuroanatomy. One of my wonderful teachers at UC Berkeley was Miriam Diamond, who was unusual in that she was a woman and a professor, and also was a specialist in neuroanatomy and neurobiology.

GC: It must have been great to have a woman sort of as a mentor. I didn't have very many women ahead of me when I went to medical school.

LB: There weren't very many when I was there, either. She stood alone, and was certainly evidence to all of us younger women that we could do it if we wanted to, because she did.

GC: People forget how important that is, don't they?

LB: Yes. I think it's just the fact that there is someone who has done it that looks like you and seems like you, or has something to do with you—that they could do it means you could do it too.

GC: How did you end up forming the Women's Mood and Hormone Clinic?

LB: Basically I've been interested since medical school in the aspect of women's mental health and women's brain function that has to do with women and depression. Because, as you may know, certainly in all of the cultures worldwide where it has been looked at the ratio of depression in women is 2 to 1—2 to 1 is the female to male ratio—which was always a bit of a shocking statistic, because in biology that's quite a big deal when you've got that much of a difference.

And why that was and how that came about intrigued me. At UC Berkeley I was also part of the first-wave feminist movement in the 1970's, so I had a belief that it probably had to do with the suppression of women and patriarchal keeping women down in different generations; and of course women would be more depressed. But as it turns out it may have somewhat to do with the struggles that women have in our lives in becoming professionals, but it also has something to do with our biology—particularly probably our hormones.

GC: I think you opened your book with the statement that men's and women's brains are different. What do you think the most important differences are?

LB: I think the thing to remember is that from the moment of conception males and females have very similar brain circuits—they're called female-type brain circuits—until eight weeks of fetal life, when the tiny testicles in the male fetus start to pump out huge amounts of testosterone that marinate the brain circuits, then changing the brain circuits into male brain circuits. And by the time we're born the males are born with male brain circuits and the females are born with female brain circuits.

For example, the testosterone fertilizes and increases the size of certain brain areas—like a technical brain area called the area for sexual pursuit is doubled in size to 2.0 or 2.5 times larger in the male human brain than in the female. In other mammals it may actually be up to 7.0 times as large in the male as in the female.

GC: Somehow that doesn't seem like a surprise, does it?

LB: No. I think it's helpful to know that, because the male of the species is meant to pursue the female. And that's been selected for over and over again through millions of years of our evolution. So, we have the principle that the male is supposed to search out the female and fertilize her.

GC: And that's just the way we're made, right?

LB: Yes. I mean we all have to learn to become civilized; we all have to learn to be appropriate. But the male is supposed to search out the female to fertilize her. That's his job.

GC: How do you answer critics who fear that exploring how women's brains are different somehow implies that we are inferior?

LB: Well, that's kind of a bit silly. It just tells you how much they don't understand about some of these general principles. Because it's not surprising that for millions of years the male and female have evolved in slightly different niches. Evolutionarily, for example, the female brain has evolved in a niche that is specialized for having the pregnancy and taking care of the babies. Keeping helpless infants alive is no easy task. So, all kinds of things that have to do with women being better and more facile at that part of the reproductive enterprise of our species are particularly better than in the male brain.

And the male has had to do other things like be the protector and the procurer of large game and things that require larger muscles, and to pursue females for insemination. Those kinds of things have evolved for millions of years. It doesn't mean that our brains aren't more similar than they are different, but there are some specialized aspects that are different. And vive la différence.

GC: You have already partly answered the next question I was going to ask you about how soon the differences appear. You said we start diverging at around eight weeks when the male starts putting out the testosterone. Correct?

LB: Right. We must remember that the female is created by having the XX chromosomes, and then the male is the XY. So, technically speaking, from the moment of fertilization on you're either female or male. It's the testicles that start to evolve at eight weeks of gestation that allow the testosterone to start being pumped out of those tiny testicles and start to actually change the brain circuits themselves and to manifest the difference in the male genes.

GC: Can we apply this to some of what we see in early childhood? You mentioned some examples in your book that I thought were pretty interesting.

LB: There are a lot of differences that have been looked at and have shown up. From birth on females will do more of what's called mutual facial gazing. And from the day of birth up until three to four months old the female increases her mutual facial gazing by about 480%; and the male is at the same level four months later as he was on the day of birth. So, he increases about 0%. It doesn't mean that they don't both do a lot of it, it's just that females do more of it from the get-go.

Now, it's hard to say whether there's been a lot of difference in the behavior of the adults around the newborn up to three or four months old. That's why that is of interest. And of course we notice as boys and girls get more to the preschool age—three, four, five years old—they start to do different things. Like the boys do rough and tumble play and pretend they're heroes. Being a superhero is a fantasy that boys will play out endlessly. Fighting off the enemy is their favorite game—racing around trying to defeat the enemy and to have victory for their side.

Little girls tend to sit there and play at what we call relationship and role playing. Little girls will say, 'You be the daddy and I'll be the mommy,' or, 'You be the teacher and I'll be the student,' and assign roles and play out roles. They do dress-up, or play sometimes with dolls or whatever they have. Assigning different roles is their activity.

GC: Yes, and I guess that's the kind of stuff that the evolutionary psychologists really like to talk about in terms of why we would have evolved in those different behaviors. Is there anything else you'd like to say about that before we move on to a different topic?

LB: I think the one thing that we do know for sure is that males and females can do all the same things. We can be astronauts, we can be researchers, we can be scientists, we can be doctors, lawyers, teachers, childcare providers. We know from experience that males and females can grow up to be the same things—to be politicians, and presidents, and heads of state—so it's important to note that these differences do not mean that you're limited in what you can do.

GC: Absolutely.

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GC: One of the things that seems—as you've already alluded to—to be the key to the differences between our brains is hormones. Is that a fair statement?

LB: Well, I think that one of the things to remember is that our genes are what lay the blueprint down and the hormones kind of come in as if they were Michelangelo, the sculptor, and they sculpt the marble of the genes. And so, what you come out with is a co-creation between the genes that lay down the blueprint, and hormones and other kind of growth hormone factors that make part of the brain and body grow in a certain way and inhibit other parts of the body from

growing down the wrong way. You don't want the male coming down the female direction or the female going down the male direction.

GC: And I will have to insert here also, as we're going to talk about a few examples of specific hormones, that there's no way this can be a complete discussion. Probably every hormone has some role. We're just going to kind of have a superficial discussion of this. But I wanted to start with oxytocin. I've talked a little bit on my podcast about neurotransmitters but I don't think I've ever mentioned oxytocin. Can you tell my audience about oxytocin and why it is so important?

LB: One of the things I say is, it's not OxyContin, it's oxytocin—that's a good way to remember it; you kind of make it sound like something else. So, it's not OxyContin, it's oxytocin. And these days that is sometimes called the hormone of love—or even the hormone of monogamy, believe it or not.

It has lots of what we call prosocial or behavioral aspects to what it does to the brain. And one of the things that turns on the trigger to making the brain make lots of oxytocin—which, by the way, is made in cells in the brain; only in the brain is it made—is high levels of estrogen. High levels of estrogen turn on the trigger to make the oxytocin, and that is why females have more of it than males. Males have some too, they just don't have quite as much.

But if you remember what oxytocin does, it's the hormone that causes the uterus to squeeze the baby out during birth, and it's the hormone that causes the glands where the milk lives in the breast to squeeze the milk out. It acts in the body in certain ways to cause this smooth muscle squeezing that is very specifically related to labor, delivery, and feeding of the infant. And then it triggers all of the maternal brain circuits.

It's what also causes what we call maternal aggression. If you think about that old saying of how you should never get between a mother bear and her cub, this is the hormone that makes maternal aggression. This is why you should never get yourself between a mother bear and her cub or between a human mother and her infant. It gives the mothers a feeling and an ability to be very aggressive and strong when it comes to protecting the infant and has been evolutionarily selected and enhanced for millions of years.

GC: So, men have oxytocin, but they don't have very much because it's not stimulated by any of these things that you mention, including estrogen. Is vasopressin serving a similar role in males in terms of the bonding effects? Is vasopressin the hormone that does that in men?

LB: The male's testosterone increases a hormone that we think of as the brother to this sister oxytocin, if you will. The brother hormone in the male brain is called vasopressin, and it is actually stimulated and increased by testosterone. Males and females both have estrogen, testosterone, vasopressin, and oxytocin; it's just that it's in different proportions and different ratios. Men have a lot more vasopressin in their brains than females do.

And it is called a social hormone in the male brain, as well. The specific aspects of what it does in the male brain are still being worked out, but we do know that it makes males have certain aspects of interaction with others. It increases the likelihood of males being more interactive with other people instead of just isolating themselves into their own cave.

GC: One reason I brought this up is that you mentioned two sources or references in your book that I had read about in another book. I don't know if you've ever seen the book by Steven Johnson, *Mind Wide Open*; which I actually happen to have talked about on my very first episode of this podcast. In that book I somehow got the impression he was saying that the experiments that

involve the male prairie voles—the ones that are supposed to be the monogamous voles—that this was related to oxytocin.

And he made reference to an experiment that I think you referenced, too, by Sue Carter at Wisconsin. He said that when they were injected with oxytocin they were more strongly bonded with others, and when that was blocked they just went around indiscriminately mating, more like other species of voles.

LB: One thing to remember, of course, is that rodents aren't humans. But it's interesting because this little animal called the vole—which looks kind of like a little gopher—the interesting part is that in these prairie voles, which is one subspecies of the vole, the male is very monogamous. It's not that it mates for life; it mates for that mating season. It is attached and mated and highly monogamous to one partner during that mating season. There are other types of male voles, like the montaigne vole, that are not monogamous in that way for the mating season; they just kind of hit and run. They drop their sperm and they're gone. They don't stick around for the pups.

But the monogamous, more paternal vole—the prairie vole dad—is quite protective of the pups, and has much more oxytocin than these montaigne voles. They're working out all the aspects of the vasopressin and oxytocin hormones and genes in that male prairie vole to see what makes the difference between these very promiscuous male voles—the montaigne voles—and the very monogamous ones, the prairie voles.

GC: So, actually it looks like both vasopressin and oxytocin are involved, but their exact relationship and importance isn't really sorted out yet.

LB: It hasn't been sorted out quite yet. How long one of the genes—called the vasopressin receptor gene—is in males who are monogamous is one thing that's very interesting. They've identified 17 different links of this vasopressin receptor

gene. And the ones with the longest gene are the most monogamous males, and the ones with the shortest ones are the most promiscuous males.

GC: It's kind of pretty weird stuff, isn't it?

LB: Yes. All the women scientists joke that, you know how they have those drugstore ovulation kits? Wouldn't it be nice to have this male monogamy kit that women could take home and say, 'OK, honey. Here's your stick. Go and pee on it. I want to see whether you're a keeper or you're not a keeper.'

GC: There is one other thing about oxytocin that you talked about in the book that I think that I want to mention before we move on. You mentioned that teenage girls, if they make out with boys, they're going to get a surge of oxytocin.

LB: Right. As soon as the estrogen starts to go up in the female when she starts to become fertile—that's about 10, 11, 12, 13 years old—as her estrogen goes up, getting into those teen years, her oxytocin also goes up. And things like touching, brushing someone else's hair, sort of stroking them, or whispering intimacies, these things all raise oxytocin in the brain. Scientists are at the stage where they're trying to figure out how to measure that in different human populations. There's lots of interesting work going on now: especially in Sweden, by Dr. Kristen Ulvnäs-Moberg, who does a lot of this work in Sweden, and has for the last 20 years.

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GC: What about dopamine? My listeners are familiar with dopamine and its role in the reward circuits because we've been talking a lot about the prefrontal lobes in the last few episodes. Where does that come in?

LB: Dopamine is a neurotransmitter—it's a monoamine neurotransmitter—that we all need a lot. The place in the brain that we know the most about it is in the

area that might cause Parkinson's when you don't have enough of it. In the substantia nigra there is lots and lots of dopamine. But dopamine travels throughout the brain circuits.

And it is also used in what we call the reward circuit. It stimulates in the ventral tegmental area and other areas of the brain. It's like you hit a bull's eye when you get a surge of dopamine in your reward circuit. And one of the things that we know about early romantic love, or falling in love, is that the dopamine surges that go to the reward circuits are just full-on. All of the floodgates are opened.

GC: Is there an overlap between where oxytocin is released in the brain and where these dopamine receptors are?

LB: They all kind of exist side by side in different areas of the brain. They are scattered throughout the brain. The dopamine neurons and the oxytocin neurons, some of them are in the same areas as each other and some of them are spread far and wide. They are throughout the brain and they do very specialized things.

The oxytocin is something that probably is related to romantic love in ways that the touch and caressing releases the oxytocin and helps the bonding process. The other thing that releases high amounts of dopamine is things like cocaine. That really euphoric high that you get when you fall in love—that you don't need any cocaine or ecstasy for—is stimulating all of those dopamine releases for our reward system. That's one of the things that makes us seek out a partner and want to have that feeling. Mother Nature was very clever, wasn't she? She made the things that make us procreate feel really good and make us want to do it over and over again.

GC: And that dopamine surge is going to happen whether you're a man or a woman.

LB: Yes, indeed. Men and women have dopamine surges. There are some differences throughout the brain. And when you look in the field of addiction medicine there are differences that are quite significant between males and females, and how different stages of both adolescence and adulthood in males and females are different in terms of addictions. And the dopamine system is somewhat different in the male and the female. But the issue of romantic love, that's the full-on opening up of the floodgates of dopamine headed towards the reward center of the brain.

GC: I am going to sort of change topics here because I'm keeping an eye on the time and I don't want to run out. On the subject of emotional cues, you mention in your book that women tend to be better at reading emotional cues than men—that is, the emotional cues from other people. Do we know why this is true?

LB: We don't entirely know why. But there was a very interesting result that came out last summer after my book was published, that I speculated on but now we actually know about it. If you put your index finger above your eyebrows and you were able to stick your index finger into your brain up to the first knuckle you would hit some brain cells called mirror neurons.

Mirror neurons are the things in our brain that allow us to look at the face of another person and know what they are feeling, because they jiggle along and indicate to our brain the same feeling that other person is feeling. And female brains activate those mirror neurons much more actively and wildly when they are looking at a facial expression of either sadness or a subtle amount of anger. Subtle emotions activate the female mirror neurons more than the male mirror neurons.

GC: Do you think this goes back to that early development stage when the little girls are doing more face gazing than the boys?

LB: We think that for some reason most things in biology that are heavily selected for evolutionarily that we see as most profound, shall we say, gender differences, have to do with the fact that that thing—whatever that behavior is—is part of a successful system of behaviors of that gender that has to do with procreation. For instance, the male area for sexual pursuit is really important for the male to search out the female to inseminate her, and that is obviously very important for procreation. In the female all of those kinds of behaviors that would allow her to pick up nonverbal expressions in a helpless infant, or nonverbal expressions in others that will help her protect and raise helpless infants is very, very important and highly selected in the female brain over the male brain.

GC: That makes sense. So, now I'm going to come to the subject of women's intuition. In the last episode of this podcast I talked about a book called [*Gut Feelings: The Intelligence of the Unconscious*](#) by a German writer, Gerd Gigerenzer.² He claimed in his book that the evidence does not support the idea that women are more intuitive. I think maybe his definition of intuition is a little bit broader than the one that you were using in your book. What do you think about the whole issue of women's intuition?

LB: I think that's one of these things that we've just been talking about—the facial expressions and the way the mirror neurons in the female brain activate more when they see some subtle emotional expression on a face; that's been selected for over millions of years because it has something to do with being able to read nonverbal emotional expressions, or expressions on helpless infants' faces or the faces of others—that those kinds of things have been selected for. And this area called intuition is an area of research which I wouldn't say has been mechanized or routinized in a certain way where there's testing as to whether everybody that studies intuition calls it the same thing and tests it the same way.

² [Episode 19](#) was a discussion of *Gut Feelings* by Gerd Gigerenzer.

It's not like doing your blood pressure. But it is an area where the intuition in a female—in terms of her ability to read subtle emotional cues and nonverbal expressions from faces and bodies—has been known for many, many decades to be better on average than in males. This area of what's called gut feelings is tracked by different parts of the brain. But the area called the insula is the place in your brain when you get that queasy feeling in your stomach, or the butterflies in your stomach when you get a little nervous, or even gas pains—all those things go to the same part of the brain. And that's what we refer to as gut feelings.

Often the gut feeling you might get about something happens before the conscious, or thinking part of your intelligent brain says, 'Oh, so-and-so did this because someone hurt her feelings,' or something. Before you actually figure it out in that part of your brain you are feeling it in your body and feeling it triggering that part of the brain—the insula—called the area for gut feeling. We know that females have a more active and larger area in the brain for gut feelings than males do. That's the basis on which I think females have a more intrinsically, on average, superior intuition than males.

GC: What you said really confirms what I sort of suspected. In Dr. Gigerenzer's definition of gut feelings—and I'm not even sure whether there might be a translation problem from the German here—he was really talking about the unconscious decision making that you do, not necessarily in the emotional sense. But his work is involved with determining what kinds of unconscious rules of thumb we use; like the reason we tend to choose familiar brands over unfamiliar—that sort of thing—which I think, if you narrow it down that much, wouldn't necessarily be different between the sexes.

LB: Yes, it sounds like he's into what's called the psychological economics and marketing issues about familiarity and branding and that kind of thing—which is a whole different topic. The economists in the world are really interested in that kind of thing. But we're talking about reading emotional expressions and how it's

tied to this evolutionarily more selected-for part of the female brain that has to do with picking up nonverbal cues in helpless infants.

GC: I guess a point I would like to make is that no matter how you define it we're not talking about some kind of mysterious mystical ability.

LB: No. You know the old witch hunts for females in many eras of human history—this feeling that women could read the minds of others, and that this was against the common religion, and they would be burned at the stake; this kind of thing around having this kind of intuition—as you can see, this is just the natural way their brains work. It's not something that's mystical. It's basically hard wired into their brains.

GC: I know I've spent many years convincing my husband that I can't read his mind; because sometimes he thinks that I know something that he hasn't told me.

LB: I think that's kind of a human problem—that we think other people, just because they love us, already know what we're thinking. I think that's a major mistake we all spend a lot of years realizing: 'Oh, I've been feeling that for a long time but I haven't actually put it in words so my partner can understand what the heck I really mean.'

GC: And that brings us to my next question, which is why does it seem that women often have to cry to get men's attention?

LB: One of the facts I find very interesting is that worldwide in all cultures females cry on average four times more than the typical male. Of course, boys are always told, 'Suck it up, be a man, don't cry like a baby.' You know you hear that a lot from fathers to sons. So, part of it may be that they kind of learn to shut off their tears. But there are some differences in the amount of tears males and

females make. Prolactin and some of the other hormones that we have may have something to do with human tears.

But be that as it may, I often tell my female patients, if you can't get his attention because you're upset with something, don't suck it up and suppress your tears, just cry—because that sometimes is the only way to get his attention. And that comes from a study where males and females were asked to sit and look at standardized pictures of emotional expressions on the face of a woman. If she's crying tears both the males and the females will say that is a sad face, with 90% or above accuracy.

It is clear to both males and females with 90% or above accuracy that that's a sad face. Now, if you drop the expression on that woman's face down to a more what we call subtly sad face you will get a 90% or above accuracy in the females. It will still be there. She will say, 'Yes, that is a sad face.' The males drop down to 40% or above accuracy.

GC: That just goes back to the whole emotional cue issue again then.

LB: Yes. Somehow there is some piece of that. And that's an interesting study and it needs to be replicated. A lot of this is all about standardization in how you do these studies; and there are all kinds of different aspects of how that happens that females are picking up more subtle nonverbal emotional cues.

Criminologists have known for decades that females remember the details of an emotional event much more accurately than males do. That has been known for a very long time.

One of the hypotheses about why that is, is that the area of the brain called the hippocampus is larger in the female brain, and more active. When it comes to an emotional event the hippocampus in the female is putting into long-term memory

many details; like where you were standing in the room, what color shirt he was wearing, what time of day it was, what time of year it was, etc.

And 10 years later you may remember a fight that you had with your husband, and he's looking at you and he doesn't even remember it happened at all. And you're upset with him because you thought if this guy loved you he would remember this really major fight that you guys had over something that was terribly important—deeply important to you—and he can't even remember it happened.

GC: Is there a lesson in here that can go to both men and women?

LB: Yes, I think that women need to know that just because he doesn't remember something that you remember in vivid Technicolor, his brain may just not have been able to lay it down in long-term memory. It's not that he doesn't love you, it's that he's just not quite as good at remembering emotional detail as you are. So, he should be expected to pay a little better attention; but you shouldn't expect the guy to do stuff he can't do.

GC: What do you say to the men when they get upset about their wife crying?

LB: Men are very upset when they see their wife cry. They really feel awful about that. I described that a lot in Chapter Six of my book called "Emotions." My husband told me I didn't even need to write a chapter on emotions. He said, 'Why do you need a separate chapter on emotions in the book called *The Female Brain*?' I said, 'Honey, how could you write a book on the female brain without writing a separate chapter on emotions?'

But at any rate, the emotional aspects of the male and female brain, and what you can teach the men and women about each other in the emotional area—about why she may need to cry, or burst into tears more easily than he would—is that it's a clue to him that she's feeling very, very deeply. And the best thing a guy can

do is take her hand, and pat her hand and say, ‘Honey, I know how you feel.’ Because most men want to immediately go into problem solving mode so she will stop crying. They want to fix it.

And one of the things my husband and I have learned to do is—it’s funny; you laugh, because here it is the neuropsychiatrist and my husband is a neuroscientist—I put a yellow sticker on his computer that says, ‘Honey, I know how you feel.’ And sometimes I’ll come home from the clinic and I’ll say, ‘I had a bad day, this and that happened, so-and-so did this, this administrator did that to us, and they didn’t do this.’ And he used to immediately say, ‘Well, you know what you should do...’

And it used to annoy me. It annoys most women, because you don’t want them to fix it, you’re just venting. And what he does now is he turns to the yellow sticker and he says first, ‘Honey, I know how you feel.’ And even though he’s reading it—and I know he’s reading it and he knows he’s reading it—there’s some part of my brain that feels so relieved that he actually said it. And then when he launches very soon into his ‘fix-it’ and ‘what you should do’ statements I am much more ready to listen.

GC: That’s interesting. And you know from experience that works. That’s better than textbook stuff, right?

LB: Yes, that’s right. Sometimes he’ll look at me and say, ‘I know I’m supposed to say that, but what good will it really do?’ His mind is all set on fixing the problem. And I do, of course, appreciate his ability and his very intelligent mind to help fix the problem. But what I really want in the beginning of my recanting my upset to him, in terms of the female brain I want a little empathy coming back that’s a joining with me of another human being saying that they understand that I am upset—‘Honey, I know how you feel.’

GC: In your book—I'm going to just mention this because I think we're going to run out of time and not be able to talk in detail; and it sounds like now that you're on the Best Seller List, I won't be able to get you on an interview again.

LB: Well, thanks for having me, Ginger. It's so nice to be able to talk with you.

GC: I'm going to mention to my listeners that in the book you go through all the different life stages from childhood, up through teenage, through motherhood, and even into perimenopause and menopause. And these are really interesting chapters. Actually the thing that made me decide to try to interview you was that one of my listeners wrote to me asking, 'What's going to happen to my brain now that I'm pregnant?'

LB: Right. And you know the brain goes through a lot of changes—as you might imagine—when you're pregnant, because you get a 30- or 40-fold increase in your progesterone and your estrogen, and all of this oxytocin. At the moment the baby pops out the oxytocin is everywhere in your brain and it's changing everything into mommy brain circuits, as we say. I think dads should expect that their wife is going to change into a very protective aggressive mom. And he's going to be glad of it, because he would like his offspring protected too.

One of the things that happens, interestingly enough, is that the female brain shrinks 6% during the last trimester. And we don't know what the shrinkage is, but the good news is that it comes back to the same size or larger six months postpartum, after birth. There are a lot of circuit changes that are going on in there. We don't quite know what they're all doing yet.

But it's fascinating, because it's not just a fluid balance issue of that 6%—it's real size. It's been replicated a couple of times now that the female brain shrinks during pregnancy and then regrows six months after to its original or bigger size.

So, it's very interesting what's going on. We don't quite know. But just be assured there are lots of changes in the mommy brain.

GC: Does the father's brain change?

LB: What we know is a huge percentage of males get this thing called Couvade syndrome where they gain 20 pounds along with their wives. And their testosterone drops. Did you know that? Their testosterone actually drops in fatherhood. That's one of the big well-known hormonal effects in males. And the most monogamous males seem to have the biggest drop in testosterone during the pregnancy and after the birth of a baby—which is really probably very protective of the family unit. He's going to stick close to home and not be out there doing sexual pursuit all the time.

GC: If you want to learn more about the various stages you really need to get Dr. Brizendine's book.

LB: That chart in the beginning—it's called "The Phases of a Female's Life"—all kinds of teachers and all kinds of people all over the world are using that in their educational pieces. If you open that up and put it on the Xerox machine you'll get all the phases and all the hormonal changes on one sheet of paper.

GC: I think it's a good book for men, too—although you're working on one about mens' brains, right?

LB: I'm working on *The Male Brain*, and that will probably be out in about a year-and-a-half. It's certainly very interesting what differs in the male brain. And I think, *The Female Brain* having just come out in paperback, I have many men writing to me. I have men writing to me from the oil rigs in the North Sea. I had a truck driver email me the other day, having just read *The Female Brain*, and he said, 'Dr. Brizendine, your final chapter on the mature female brain is just

what happened to me and my wife.’ I think the stories are a pretty easy read, aren’t they, Ginger?

GC: Absolutely. What kind of research would you like to see heading forward?

LB: I’d like them to just continue in the direction that they’re going—sorting out different aspects of all kinds of what we call gender medicine now. Because what the differences are really matter a lot to individuals; and knowing that there is a lot of individual overlap between male and female.

If you look at two bell-shaped curves and you put a flag pole at the top of each of them, and one is the male curve and the other is the female curve, the difference between those flag poles is called the gender difference. But then if you look down at the bottom of those bell-shaped curves they’re not just snuggled up next to each other; they’re overlapping by 10% or so.

Lots of individuals fall in the crossover. I was kind of a tomboy. So, I in some aspects fell more into some of the things that boys do when they’re young. There’s a lot of overlap and a lot of individual variation. I think we have a lot of work left to do to figure out the aspects of individual variation as well as gender differences.

GC: Do you have any particular questions that you really would like to see answered?

LB: I think I’d like to see elucidated more clearly in the next 20 years how the genes and the hormones have an interplay together that makes the difference in development, and all that we don’t yet know about what parts those play throughout the brain.

GC: You have been working with patients with this for how long?

LB: Actually since 1981, but in my clinic since 1994.

GC: What would you say the most important thing you have learned that you would like to share with my listeners might be?

LB: I also do a lot of libido work-ups in my clinic. I'll get a call from a woman saying, 'Dr. Brizendine, you've got to save my marriage. My husband wants more sex than I do and he says he's not going to stick with me for the rest of our lives if I don't get with the program more.' And so, I'll have them in my office and lots of times I'll look at him and I'll say, 'Now, how do you know she loves you? Because obviously the two of you are here because you both want to have a better marriage.'

And he'll say, 'I know she loves me because she wants to have sex with me.' And the woman's face is sort of in shock. And he's being sincere. And then I'll look at her and I'll say, 'OK, Mary, how do you know that he loves you?' And she'll say, 'Because he wants to talk with me about my feelings.' And his face is looking shocked. That one little piece—the pillow talk about emotions, and how she's feeling, and what her worries are—is intimacy to her: that's his loving her.

And a male really feels that if there's not sex going on in the relationship to at least some degree that he wants it, he feels that she does not love him. And he knows that if he weren't having more sex with her it would mean he was out having it somewhere else; or he wasn't loving her.

So, we project our own state of our brain onto the expectations of the behavior of the other person. And I think it's really important for your audience to know that that is a core aspect of why it's important to know about the differences. Because it doesn't necessarily mean the other person doesn't love you. But it does mean that they may have expectations of you as the opposite sex that they aren't very

educated about. And it's helpful to educate each other about what it is that is of the depth of your soul and your heart important to you.

GC: That's not what I was expecting, but I can't argue with you about the importance of that. I've been married 30 years and my husband and I just recently figured out that he loves to go to the grocery store and I don't.

LB: I love it! Listen, let him go, baby, let him go.

GC: I do.

[music]

GC: Do you want to tell me anything about the book, *The Male Brain*? Or is that too far into the future?

LB: Hopefully it won't be too far into the future since the manuscript is due in April. I think it will be the flip side of this, but it will have more to do with the testosterone, the vasopressin, and the aspects of the male brain that have to do with aggression and anger, and how males learn differently than females.

GC: Is there anything else you want to say before we close?

LB: No. I think we've covered some really juicy stuff, don't you?

GC: Do you have time to answer one more question?

LB: Yes, I can do one more before I have to go.

GC: This is one I skipped before because I was trying not to run out of time. It's about anger and the difference between men and women around anger. That's an

issue that really interests me. Do you think it's true that women just have a tendency to bottle up their anger?

LB: One of the things we know about the brain and the amygdala and how it's connected up in females is that there are aspects of all of a sudden feeling an emotion and putting the emotion into words more quickly that happen in the female brain. Often what happens more easily in males' brains is that a feeling of anger goes straight to their muscles—the motor strip in their brain—which goes straight to the feeling of muscle aggression, or punching somebody. Now, obviously males don't do that—they learn to do other things with it. So, they may feel and express anger differently.

A female, then, will tend to chew on the anger a lot more, or try to push it down. She will think about the relationship very quickly—immediately the thoughts come to mind that she is going to ruin the relationship. The fear of upsetting the other person and having the relationship go in a direction she doesn't want it to go comes to her mind very quickly—which inhibits her expression of the anger. Actually it makes her a better social creature, because one of the big keys to relationships for all of us is how much we are able to bite our tongues.

GC: Right.

LB: And the reality is that sometimes we need to figure out a constructive way to express anger, not a destructive way. Anger should be and needs to be expressed in every relationship or you're never going to have a good relationship with another person long-term. But that aspect of the expression of anger and how we express it is vitally important for both males and females. It's part of our lifelong learning process that I think can happen with the maturation of men and women as we get older. I'm 55 now, so I've had a lot of years to learn to try to do it better; but I'm still learning. And I know my husband is still learning—and he's

73.

[music]

GC: I really appreciate your getting together with me to talk, and giving me so much of your time.

LB: I'm just really happy to be here. It sounds like a sophisticated and interested audience. When does your podcast come out?

GC: This episode will hopefully come out next Thursday. I put it out every other Thursday.

LB: Wonderful. Do people download it or link to it?

GC: Both. You can get it off of iTunes and off my website. As soon as it's up I'll send you the links.

LB: I really would appreciate that, Ginger. And the other thing that just came out last week is the audio download of *The Female Brain*.

GC: Is it available on Audible.com?

LB: I know for sure that I saw it on Amazon with the paperback. I know that it must be on Audible.com. I'm the voice; I read it.

GC: Oh, great.

LB: It just came out and it's available for download. They're not putting it out in what they call a CD form, I guess, but it's available in download.

GC: That would be great, because I currently have Audible.com as a sponsor.

LB: Oh, good. They're great. If you want to direct your podcast people to www.thefemalebrain.com or www.louannbrizendine.com they can then read more about all kinds of aspects of this if they want to.

GC: OK. And I'll put those links in my Show Notes, too.

LB: And they can see more about it. It's actually out now in 21 languages.

GC: Was this your first book?

LB: Yes. I'm still a practicing doctor—which is a little overwhelming. The nice thing is that I've just been overwhelmed by the response to the book. It's been really wonderful to have it in 21 languages. It just came out in Korea last week, and it's coming out in both Taiwanese and Chinese in China in September.

GC: That's awesome. I used to dream of being an author, and then I discovered podcasting. Somehow my writing never actually happened; I just thought about doing it.

LB: Well, that's great. I think whatever creative medium you can use is good. I never thought of myself as a writer, as a matter of fact. My husband wrote three books, and I was not the writer in the family when we got married—he was. I had no idea that I had talent in this area until this last couple of years. So, whatever area you can get your message out in is fine; and if it's podcasting, go for it. You're doing a great job, Ginger.

GC: I know you're going to be really busy, but when I get the episode up I hope that you'll be able to listen to it. I know you're going to be doing a lot of interviews. Are you doing any other podcasts that you know of?

LB: I think your podcast is the first and only one that I've done, and probably the only one I'm doing.

GC: I will let you go.

LB: I can't wait to hear the piece. Thanks a lot, Ginger. Good luck to you.

GC: Thank you. Bye, Louann.

LB: Bye.

[music]

I hope that you have enjoyed today's interview with Dr. Brizendine. As always, I'd love to hear your feedback, so write to me at docartemis@gmail.com or post your comments at the Discussion Forum which is found at brainscienceforum.com. You can also leave comments at the website at brainsciencepodcast.com. At brainsciencepodcast.com you can find information for how to subscribe to this podcast either via iTunes, RSS feed, or by email.

And one last reminder: Don't forget that I'm having an Audience Survey which I would really appreciate you doing, even if this is the first episode you've listened to. You can find that survey at wizzardtv.com/survey/brainsciencepodcast.

I want to thank everyone for listening and thank all those of you who have sent me feedback. Please keep the feedback coming, and I'll talk to you again in a couple of weeks.

[music]

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Transcribed by [Lori Wolfson](#)

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