How Boys Learn

by Michael Gurian and Kathy Stevens

> To respect that fury or those giddy high spirits or a body that seems perpetually mobile is to respect nature, much as one respects the strength of a hurricane, the rush of a waterfall.
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> —Sara Ruddick, author and mother

I. The Mismatch between Boys and Conventional Education

The image of a schoolchild as someone sitting and reading has become the poster image for education, especially in the past fifty years. This is not a bad image, but it is an incomplete match with the way the minds of many of our boys work. Perhaps you have seen the mismatch in your own homes and schools: boys struggling to learn in the ways provided for them, teachers and families becoming frustrated, boys being labeled "difficult" or "failures" and becoming morose with self-doubt.

In a recent Gurian Institute workshop, material on "boy energy" and the male brain led to a spirited discussion about the issues our sons face. A teacher raised a key question—a question that is raised in nearly every setting in which the nature-based material is presented: "Should we keep trying to change the boys and their energy, or should we change the educational system they find themselves in?" Another teacher asked, "Is this just a pedagogical issue, or are we now facing a moral one?"

Those are questions each of us must now answer, armed as we are with scientific information about the nature of our sons. The authors believe that every time a teacher wonders why boys are "trouble in the classroom," he or she is asking a moral question. Every time the faculty lounge becomes a place of conversation about why boys are bringing down standardized test scores, the teachers are asking the same question.

Did You Know?

- As of four days of age, girls tend to spend twice as much time as boys maintaining eye contact with adults. Bonding chemistry and the visual cortex of boys and girls already differ at four days old.

- By four months of age, boys are less likely than girls to distinguish between a known individual and a stranger. Memory centers as well as spatial-mechanical pathways already work differently in boys and girls. Male babies are in general more inclined than female babies to spend more time during a day looking at objects moving in space—for instance, mobiles hung from a ceiling. Girls, in contrast, are more likely to turn their gaze immediately to their caregivers.

When a mother and father agonize over whether to put their son on medication, they are asking the question. Among our children themselves, the question is silently resounding as the kids who are having trouble learning their lessons look at others who learn so very well.

Should we keep trying to change our boys, or should we change the educational system in which they are now taught? The answer to that question will require parents, teachers, and schools to decide what parts of nature, nurture, and culture can and should be changed, and what parts can't and shouldn't. It tacitly—or directly—raises these questions:

- Is male nature—the male brain—plastic enough to be changed to fit today's classrooms?
- If it is, how do we better effect change than we are now doing, so that boys no longer get most of the failing grades?
- If it is not, how can our educational system change to accommodate the male brain so that we can gain the positive results we all want for our sons?

II. How Gender *Really* Happens in the Brain

Human nature hardwires gender into our brains in three biological stages. The first stage has been clarified by genetics research, the second by endocrinological research, and the third by psychosocial research.[1]

Stage 1. Chromosome markers for gender are included in the genomes of girls and boys at the time of conception. Researchers at UCLA have identified chromosome markers—built into the fetal brain—for the development of a male and female.

Stage 2. Those chromosome markers compel surges of male and female hormones in the womb that format XX brains to be female and XY brains to be male. In-utero bombardment

of hormones into the brain occurs with intense frequency between the second and fifth months of gestation. Researchers at various universities around the world, including the University of London, McMaster University in Canada, UCLA, and the University of Pennsylvania, can now trace the development of gender in the fetal brain via bombardments of testosterone and other hormones.

Stage 3. The child is born a boy or girl, sending nonverbal and then verbal cues to parents, the nurturing community, and the larger culture. These cues are biological—based in the child's genetics and hardwiring. Mom, Dad, and extended family, then teachers, schools, and community members like you, like us, read the male and female signals, cues, and characteristics. These signals and readings are now being visually traced through SPECT and PET scan research in attachment theory, conducted in many parts of the world, including the University of Denver and Harvard University.

It's important to remember that none of these researchers is involved in a nature-*versus*-nurture framework. All this research recognizes the *vast interplay* between genetic, hormonal, neural, and social forces. All the researchers also recognize that maleness and femaleness are things we start out with: we are born with them. Although it was popular thirty years ago to believe otherwise, scientific research in our era has put to rest the idea that gender is completely a matter of nurture. Gender is inborn and then it becomes socialized by cultures.

Why is the human genome, brain, and bonding system set up to be male and female by nature? No researcher can be completely sure. People with a religious base for understanding human nature say, "This is how God created us." The more science-based work in evolutionary biology suggests that the most probable cause for our male-female brain

- Infant girls also pay closer attention to the words of caregivers. Verbal centers are developing in the female brain more quickly than in the male.

- Little boys, when given dolls to play with, more often than girls pull the heads off, hit them against a table, throw them in the air, or generally engage in some kind of physical, kinesthetic, or spatial play with the dolls. Girls, in contrast, from very early in life, begin to use words with the doll. Given how much earlier the female centers for verbal communication develop in the brain, this comes as no surprise. Because of higher levels of oxytocin, girls form bonds with objects that boys merely use as physical learning tools.[2]

difference lies in the millions of years of human evolution, during which humans primarily hunted and gathered.

Because males mainly hunted, they needed to develop a more spatial-mechanical brain. They needed to see well, but did not need fine-detail sensory awareness as much as did females, who cared for offspring. The male brain was wired, therefore, for more physical movement—with more blood flow in the brain stem than the female brain has—but for less verbal input and output. (Words weren't needed much during the hunt.)

Whether you choose a religious or scientific explanation, the new brain technologies allow us to see the differences for ourselves between male and female in the brain. And even if you don't have PET scan equipment in your living room—none of us does!—you can still see what the geneticists, biologists, and sociologists are getting at.

III. Ending the Myth of Gender Plasticity and Supporting the Way Boys *Actually* Learn

Given the biological and social evidence of male-female brain difference, can a nurturing community, a school, a family, a culture make a boy change the gender of his brain? Can a typical mom, by just talking to or reading to an average little boy, force his verbal centers to be like an average girl's? Should a school compel a boy to become the kind of learner it has decided will be "easiest to teach"?

The new sciences now challenge all of us—moms, dads, grandparents, teachers, policymakers—to come to an informed conclusion about the relationship between a boy's nature, his nurtured life, and his cultural experience. We spend only a few years in a close, day-to-day supervisory relationship with our children: how do we want to spend those years? What kind of care do we want to give to their very human nature, their wonderful minds?

The new scientific research merits concluding that although all children are unique and individual, and although everyone is constantly learning new skills and developing new modes of communication, *the gender of the human brain is not plastic, not a new skill to be learned, not a new mode of communication.* It is as hardwired into the brain as a person's genetic personality. In the same way that you cannot change a shy person into an extrovert, you cannot change the brain of a boy into the brain of a girl.

The idea that not all elements of the brain—especially not gender—are plastic is very important to our dialogue about the state of boyhood in education. Our educational system has bought into the idea of "overall neural plasticity." Because of this mythical concept of the brain as a magical, changing device, very few academic institutions train teachers in the neural sciences of gender. This aspect of human development is ignored, and young teachers, like young parents, are taught that being a "boy" or a "girl" is culturally insignificant in education, that basically all kids learn the same way and can be educated in a way that ensures gender-exclusive, predictable results.

Research from the new gender and brain sciences begs us to move beyond this myth. The move constitutes a second major step toward solving the crisis of male education. As step two finds its way into schools of education, young teachers will be shown PET scans, SPECT scans, and MRIs of the male and female brain and be trained to understand the gender reality we all experience.

You as an individual—and your school as a collective—can become a leader in making this happen. Because our biological sciences are now able to use PET scans, MRIs, and other tests, we can now discern how gender is marked into our genomes from millions of years of human development and still lights up the individual brains of boys and girls. You can bring this information to homes, schools, social policies, and universities and colleges. You can help your community notice how tough the myth of gender plasticity is making life for our sons. When you notice males in educational distress, you can point out that we are creating for our sons an educational system not well suited to certain aspects of their brains; a system that claims they are defective, disordered, or incorrigible because they can't learn; a system that insists that

they should be able to change—even further, that their inability to change is yet another flaw in their character as males, one that supposedly requires medication.

If our civilization continues to buy into the myth of gender plasticity, larger numbers of our sons will continue to do poorly in school. They will emerge from years of waste and failure without the normal development and skills we've all assumed for years that they would acquire, and, during this entire struggle and conflict, *they* will continue to frustrate us by "not changing."

IV. A Boy-Friendly Model for Protecting the Minds of Boys

If you agree with our argument that the current educational system often fails to accommodate the hardwiring of boys' brains and does not provide them with an appropriate system of learning, and if you agree that our homes and schools should do less to try to change our boys and more to help them learn naturally, then you can become an ambassador for boys, a protector of their minds. As an ambassador you'll join us, not in trying to alter the nature of boys or girls, but instead in working toward two goals:

1. Expression and development of the natural self of the child. The child's genetic self is most important to his or her learning, and those who aid the child are charged with helping that self become fully expressive and developed within the frameworks of a humane society.

2. Compensation for areas of inherent disadvantage or fragility. These areas of disadvantage emerge for any child because of particular genetic or environmentally caused weaknesses in his or her learning brain or because the child as an individual carries learning characteristics that don't fit the mass.

Our suggestions detailed in other sections of *The Minds of Boys* avoid joining with any ideologies that measure success of the child's education by *measuring significant alteration* of the child's mind, whatever part of the gender-brain continuum the child is on. We believe that to base a child's education on the hope of altering a brain's inherent method of self-development is an affront to freedom and ultimately leads to suppression or disengagement of the child's true self and potential for success.

A child who expresses himself and learns to compensate for weaknesses is following one of the most natural instincts of our species: to *adapt.* We as adults protect the minds of children when we help the children adapt, using their own natural skills and talents, to the needs of a society. We don't protect their minds by putting a generation of schoolboys on drugs or watching them gradually fail.

Breaking down the myth of gender plasticity is not necessarily a simple thing to accomplish. But our culture has, in a few decades, successfully confronted a great deal of the patriarchal, sexist, and industrial system that was hurting girls, and improved the lives of girls and women. There's still a way to go, but there has been substantial change. And in this process, our culture did not force girls' brains or nature to change in order for them to succeed in our educational system. All of us came together to change the system in order to fit girls.

Specifically, we brought more verbal functioning to our math and science classes, trained teachers to use more writing and group conversation in teaching those subjects, changed our testing of those subjects to include more explanative and discursive essay answers, and developed new ways to encourage our girls at home that fit their natural need for verbal encouragement.

The proof of our success with girls is measurable today: the industrialized world has closed the female-to-male math and science gaps in our schools. Girls now receive grades as good as and better than boys in these classes. In California, girls are now actually outperforming boys in math and science. As we noted earlier, girls are no longer shortchanged in many schools—they are high performers. The changes we made to our educational system worked!

Changing our educational system to help boys will admittedly be harder, because the changes that have been made to help our daughters will actually make boys' education more problematic. Furthermore, in our consideration of girls' needs, we never had to fight the myth of gender plasticity—we never said, "Our girls are defective." We always said, "The system is defective." Changing the system for our boys can be also accomplished—without hurting our girls—and it must be.

Notes

1. Dewing, Phoebe, Tao Shi, Steve Horvath, and Eric Vilain. 2003. "Sexually Dimorphic Gene Expression in Mouse Brain Precedes Gonadal Differentiation." *Molecular Brain Research* 118 (1-2): 82–90; Schore, Allan N. 2001. "Effects of a Secure Attachment Relationship on Right Brain Development, Affect Regulation, and Infant Mental Health." *Infant Mental Health* 22 (1-2): 7–66.

2. Rhoades, Steven E. 2004. *Taking Sex Differences Seriously.* San Francisco: Encounter Books.

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