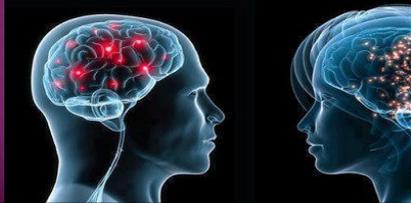


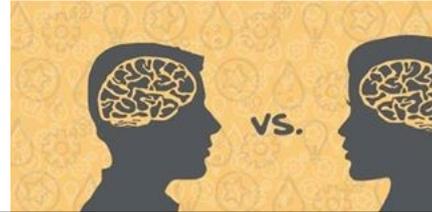
GENDER DISTINCTIONS IN BRAIN DEVELOPMENT

A Guide for Educators
of Children



INTRODUCTION

- Neuroscientists have discovered significant anatomical, chemical and functional differences between the brains of males and females.



INTRODUCTION

- Some audience members may be reluctant to accept the gender distinctions listed in this workshop. The information contained here is drawn from contemporary research from reputable science-based sources.
- The differences presented are simply generalized differences in typical brain functioning, and it is important to remember that all differences have advantages and disadvantages

INTRODUCTION

- “There is no unisex brain. Girls arrive already wired as girls, and boys arrive already wired as boys. Their brains are different by the time they’re born, and their brains are what drive their impulses, values and their very reality.”*
Louann Brizendine, M.D.

INTRODUCTION

“Infants are not blank slates, on whom we scrawl instructions for sexually appropriate behavior. They are born with male or female minds of their own. They have, quite literally, made up their minds in the womb, safe from the legions of social engineers who impatiently await them.” Anne Moir, Ph.D.

EARLY GENDER DISTINCTIONS

- Two newborns are placed in a crib, with a adult’s face on one side and a mobile in motion on the other side. A newborn girl will look to the side of the crib where she can view the face, while a boy will look to the side of the crib where he can view the mobile.

INTRODUCTION

- Humans use both hemispheres of their brain every day
- Which hemisphere we use depends upon the tasks at hand
- Most humans have one hemisphere that is more dominant

LEFT BRAIN, RIGHT BRAIN

- Researchers have concluded that the functions in the left hemisphere of the brain are quite distinct from the functions in the right hemisphere of the brain.
- We will review a handout that describes the distinctions between the two and you may decide how accurately this applies to you.

EARLY GENDER DISTINCTIONS

- The human brain develops in a different sequence in girls than in boys.
- Girls in the womb are awash in estrogen and this affects her biological development in utero
- Boys in the womb are awash in testosterone and androgens, and this affects his biological development

EARLY GENDER DISTINCTIONS

- As a result of this “hormone wash” males process primarily on the left or right side of the brain while females tend to process back and forth much more smoothly.
- Male brains contain about 6.5 times more gray matter-the “thinking matter.”
- Females brains contain about 9.5 times as much white matter-the “processing matter.”

SCIENCE OF THE BRAIN

The corpus callosum is the structure connecting the right and left sides of brain. This pipeline of more than 300 million fibers functions like a powerful, lightning fast, cable that enables both sides of the brain to communicate with each other and process for each other.

BUSTLING BRAINS

Fact: A girl's brain has 15 to 20 percent more activity than a boy's brain at a given time.

Explanation: Male and female brains are wired differently. The male brain distributes its brain activity into less parts than the female brain. Different sections of the female brain can work together at the same time in ways that the male brain does not.

INFANT EXPLORATION

Similarity: Both male and female infants explore their surroundings.

Difference: Girls look at new objects without touching. Boys explore new objects through touch and manipulation. Girls are more likely to reach out to caregivers. Boys are a little less likely as they tend to become more independent from caregivers than girls.

SKILLS OF STRENGTH

Similarity: Girls' and boys' verbal and spatial abilities are relatively similar until 9 to 13 years old.

Difference: Girls perform better during the school-age years in spelling, language measures, and writing. Boys have a stronger ability to visualize and mentally rotate objects

ACTS OF AGGRESSION

Similarity: Both boys and girls display aggression.

Difference: Girls tend to use relational aggression more than boys (name-calling, excluding friends). Boys tend to show more physical aggression than girls (posturing, threatening, yelling or hitting).



LEFT SIDE

- Speaking
- Reading
- Writing
- Listening
- Grammar
- Number skills
- Computation skills
- Analyzing information
- Reasoning
- Logic
- Sequential thinking
- Time awareness
- Controls right side of body

YOUR BRAIN

RIGHT SIDE

- Organizing information
- Abstract meaning
- Context
- Spatial relationships (like map reading or shape recognition)
- Visual information
- Face recognition
- Intuition
- Emotion
- Imagination
- Detecting motion
- Music & art awareness
- Controls left side of body

Injuries on the left side of the brain can cause:

- Difficulty understanding spoken & written language
- Difficulty expressing spoken & written language
- Changes in speech
- Verbal memory issues
- Impaired logic
- Sequencing difficulties

Injuries on the right side of the brain can cause:

- Impairments in attention
- Left neglect
- Memory issues
- Decreased awareness of deficits
- Loss of "big picture" thinking
- Altered creative or music perception

How Brain Injury Impacts Daily Life

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I AM THE LEFT BRAIN

Decisive! LOGIC
011001011
Accurate ANALYTIC
REASON
1 2 3 4 5 6 7 8 9
PRACTICAL Strategic
CONTROL

I AM the Right Brain

Intuitive
Emotion
Imagination
FREE Pa

THE MIND OF GIRLS

- By adolescence, a girl's corpus callosum is 25 % larger than a boy's. This allows more "cross talk" between brain hemispheres.
- Girls are able to multitask better than boys. They have fewer attention span problems and can make faster transitions between lessons.

LEFT BRAIN, RIGHT BRAIN

- You will now be invited to complete an exercise entitled "Alert Scale of Cognitive Styles" that will indicate which side of your brain you prefer using.
- We will then briefly discuss your reactions to this exercise.

HOW GENDER MATTERS

- Girls tend to project a person onto dolls and treat them like people, where males tend to see them as objects and prefer to move them through space.
- Pecking Order - for males it has to do with skill levels and for girls it's about being accepted (more emotional and relational).

HOW GENDER MATTERS

- ADHD strikes more boys than girls. The symptoms displayed by girls and boys with ADHD differ, too.
- Girls with ADHD usually exhibit inattention, while affected boys are prone to lack of impulse control.

Boys and girls display very different ADHD symptoms.

Boys' symptoms are obvious and "external":

- Impulsivity or "acting out" 
- Hyperactivity, such as running and hitting 
- Lack of focus, including inattentiveness

Girls' symptoms are less obvious, and more "internal":

- Being withdrawn
- Low self-esteem and anxiety 
- Intellectual impairment and difficulty with academic achievement
- Inattentiveness or a tendency "daydream" 

HOW GENDER MATTERS

Males tend, after reflecting more briefly on an emotive memory, to analyze it somewhat, then move onto the next task. During this process, they may also choose to change course and do something active and unrelated to feelings rather than analyze their feelings at all. Thus, observers may mistakenly believe that boys avoid feelings in comparison to girls or move to problem-solving too quickly.

YOUTUBE VIDEO

We will now watch a 13 minute video about the differences in male and female brain development by Mark Gungor entitled "A Tale of Two Brains."

Be prepared to present and discuss several distinctions mentioned in the video.

GIRLS ARE MORE LIKELY TO

Entertain selves during boring parts of the school day.

Pay attention to more than one activity at a time.

BOYS ARE MORE LIKELY TO

Find it hard to concentrate on learning when they are upset.

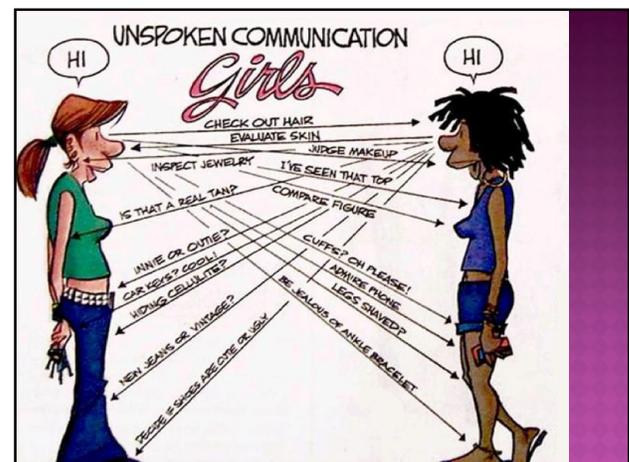
Find it hard to concentrate on learning when they are upset.

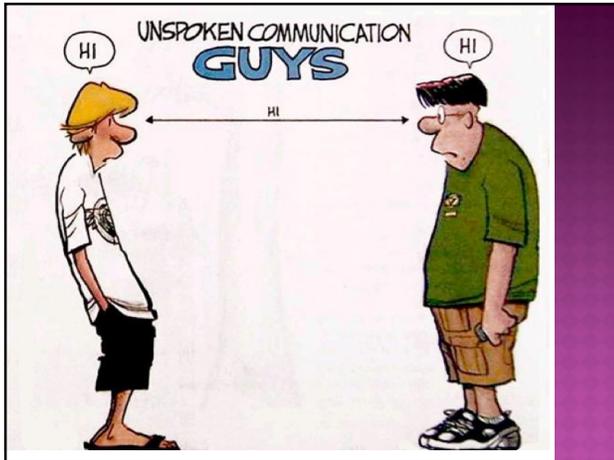
HOW GENDER MATTERS

- Girls' friendships are about being together, spending time together, talking to one another and going places together.
- Boys' friendships usually develop out of a shared interest in an activity.

THE MIND OF BOYS

What helps boys develop a strong sense of morality is extraordinary affection, especially by positive adult males. This affects his cortex and limbic system. Boys who develop a healthy sense of masculinity and male identity tend to have affectionate interactive fathers and/or male role models.





HOW GENDER MATTERS

- Girls' friendships tend to be face-to-face.
- Boys' friendships tend to be shoulder-to-shoulder.
- When girls are stressed, they typically want to hide or to be with others.
- When boys are stressed, they generally want to be left alone.

HOW GENDER MATTERS

Girls hear better. The typical teenage girl has a sense of hearing seven times as acute as a teenage boy. That's why daughters so often complain that their fathers are shouting at them. Dad doesn't think he is shouting, but Dad doesn't hear his voice the way that his daughter does.

HOW GENDER MATTERS

- Boys and girls assess risk differently.
- Boys tend to overestimate their own abilities.
- Girls are more likely to underestimate their abilities.

HOW GENDER MATTERS

Females are more likely to suffer from mood disorders.

Male brains synthesize serotonin far more quickly than female brains, which may explain why females are far more prone to depression. Females are also far more likely to suffer from posttraumatic stress disorder after a traumatizing event

HOW GENDER MATTERS

Males are more likely to suffer from neurological disorders.

Males are more likely to be dyslexic and autistic than females. They are also more likely to suffer from ADHD and Tourette's Syndrome.

LESSONS FROM THE PLAYGROUND

- ◉ Girls seldom fight physically; when they do it is more often with words than fists
- ◉ Boys fight 20 times as often as girls.
- ◉ When girls fight, bad feelings persist.
- ◉ When boys fight, they might end up being better friends afterwards.

LESSONS FROM THE PLAYGROUND

- ◉ Girls who bully typically have numerous friends, are socially skilled, are doing well in school, act in groups to isolate a single girl, and know the girl they are bullying.
- ◉ Boys who bully typically have few friends, are socially inept, are generally doing poorly in school, act alone and don't know the boys or girls they bully.

STRATEGIES TO PROMOTE SUCCESS

- ◉ When working with a girl, smile and look her in the eye. That gives her the assurance that you are her ally.
- ◉ When working with a boy, sit beside him and spread out the material in front of you, so you are both looking at the material side by side. Don't hold an eye stare unless you are trying to discipline him.

STRATEGIES TO PROMOTE SUCCESS

Boys and girls may learn better when physical differences are taken into account. For example, girls hear two to four times better than boys. This may explain why boys seated in the back of class cannot pay attention. So seat the boys closer to the front of the classroom.

STRATEGIES TO PROMOTE SUCCESS FOR GIRLS

- ◉ Encourage opportunities to take risks and make mistakes without personalizing their mistakes.
- ◉ Let girls create their own challenges in which they can take safe risks.
- ◉ Verbally encourage girls who exhibit low self-esteem.

STRATEGIES TO PROMOTE SUCCESS FOR GIRLS

- ◉ Allowing girls to engage in girls-only activities like soccer makes them less likely to be sexually active.
- ◉ Promote leadership by creating project groups and work teams.
- ◉ Schedule physical activities that foster gross motor skills.

STRATEGIES TO PROMOTE SUCCESS FOR GIRLS

Because girls use the language section of their brains when they process numbers, they will learn math more easily if you use practical applications and "story problems."

STRATEGIES TO PROMOTE SUCCESS FOR GIRLS

- ◉ Limit loud or repetitive noises that may distract girls since their hearing is more acute than boys'.
- ◉ Don't shield girls from "skinning their knees", which might foster a learned helplessness.
- ◉ Use female mentors and role models

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- ◉ Keep verbal instructions no longer than a minute. Avoid layering instructions one after another.
- ◉ Use manipulatives that require boys to use their fine motor skills.
- ◉ Use male mentors and role models.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- ◉ Make lessons experiential and hands-on. Use some technology.
- ◉ Surround the room with books so boys get used to their omnipresence.
- ◉ Expect healthy physicality and aggression among boys at times.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- ◉ Boys' brains need more rest times during a day of learning. When bored, boys tend to "zone out" more than girls and require rest periods before reengaging in learning.
- ◉ Ensure the presence of positive male role models (teachers, parents, extended family, tutors, community leaders, etc.) who emphasize the importance of education

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- ◉ Create opportunities for boys to get up and move around during the day.
- ◉ Provide a large learning space.
- ◉ Use spatial-visual tools (pictures and graphics) to assist with boys' neurological needs in achieving literacy.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- Boys learn the “rules of the game” through forceful play. Competition builds camaraderie and organizes peer relationships. Offer chances for this play in PE or other sanctioned activities or it will show up elsewhere inappropriately.
- Link screen time with rewards.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- Use the, “When I say go....” approach to let the brain know more is coming.
- Engage boys by using fact cards for them to share info with one another.
- Get them moving, frequently if possible (Notice how boys love to race)
- In place of raising hands, have them stand up.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- Provide reading materials that boys enjoy: texts filled with spatial-kinetic action, such as sports, science fiction, thrillers, mysteries and suspense.
- Use technical and mechanical books, articles and videos on aerospace, vehicles, sports, skateboarding, and other interactive examples.

STRATEGIES TO PROMOTE SUCCESS FOR BOYS

- Discipline with movement. Have them count supplies or pull weeds rather than go into timeout.
- Hand fidgeting is common, so give them a gadget, object or toy to fidget with.
- Get outside and encourage physical activities.

TRANSITIONING TO ADULTS

Distinctions become more acute in adult brains and are more clearly manifested in adult behaviors. In this next section, we will offer some cool observations.



HOW GENDER MATTERS

In navigating, for example, when driving from point A to point B:

Many women tend to personalize space by finding and using landmarks

Many men see a geometric system and take directional cues in the layout of routes (e.g. north vs. south)

HOW GENDER MATTERS

Research has discovered that the connections in men's brains run more between the front and the back, within the same half of the brain.

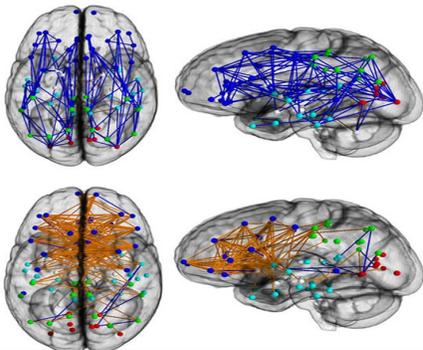
This may help to explain men's advantage with motor and spatial skills over women, since front-to-back connections help link perception with action.

HOW GENDER MATTERS

Researchers noted more overall connections in women's brains between the two halves of the brain.

This may help explain women's better memory and social skills, researchers note, since communication between the halves of the brain helps link intuition with thinking.

MALE AND FEMALE BRAINS



HOW GENDER MATTERS

MRIs show that men listen with only one side of their brain, but women use both. Women can listen to, understand and process as many as seven separate inputs (such as conversations) at the same time, whereas men follow only one.

HOW GENDER MATTERS

High oxytocin levels in women not only stimulate the desire to touch, but it also sensitizes the touch receptors of the skin. This is why women are four to six times as likely to touch another woman during a conversation than a man is to touch another man.

HOW GENDER MATTERS

When a man is dealing with a project, a problem, a stress, or a strong emotion, he will typically become very quiet. While using his right brain to solve problems or deal with emotions, it is difficult for him to use his left brain to listen or speak. His compartmentalized brain is designed to do one thing at a time; it is difficult for him to solve a problem and converse at the same time.

HOMWORK ASSIGNMENT #1

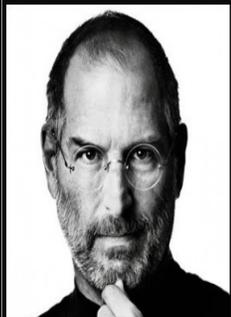
Select three to five items listed in this presentation that you would like to use with your child over the next month or two. Write down specifically how you want to do this.



CONCLUSION

- “The mind is like a parachute - it works only when it is open.” -Unknown
- “If the world were a logical place, men would ride side saddle.” -Rita Mae Brown
- “In the age of information, ignorance is a choice.”

CONCLUSION



We think basically you watch t
turn your brain off, and you w
computer when you want to tu
on.

(Steve Jobs)

CONCLUSION

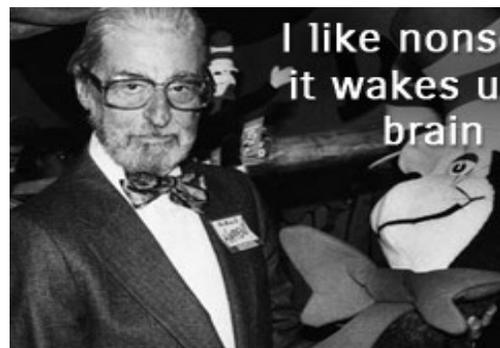
- “I used to think that the brain was the most wonderful organ in my body. Then I realized who was telling me this.” - Emo Phillips



CONCLUSION

- “Biology gives you a brain. Life turns it into a mind.” - Jeffrey Eugenides
- “The emotional brain responds to an event more quickly than a thinking brain.” -Daniel Goleman
- Estimated amount of glucose used by an adult human brain each day, expressed in M&Ms: 250 -Harper's Index

CONCLUSION



ACKNOWLEDGEMENTS

- Information for slides 20 to 36 was drawn from The Wonder of Boys, by Michael Gurian (1996).
- Information for slides 38 to 45 was drawn from “Boys will be Boys, Girls will be Girls,” by William McBride, Ph.D.

SOURCES

Information contained in this power point is drawn from:

- “His Brain, Her Brain” by Dr. Walt and Barbara Larimore, 2008
- “His Brain, Her Brain” by Larry Cahill, Scientific American, October 1, 2012
- “Boys & Girls Learn Differently: A Guide for Teachers” by Dr. Michael Gurian, 2010

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