

# Gender Differences and the Brain: applications for parents

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# Brain differences

Left side of brain develops first in girls, right in boys

- Probably source of girls' verbal skills
- And source of boys' spatial skills

Pre-frontal lobes – Control impulses and make reasoned decisions

- Girls develop by late teens
- Boys may not finish development until late 20s

# What is the effect of differential brain development on learning?

- ▶ Amygdala (emotions) develops first in boys vs. hippocampus (memory) develops first in girls

	Left (girls first)	Right (boys first)
Hippocampus (girls first)	Memory for Nouns/details	Memory for pictures/gist
Amygdala (boys first)	Emotions expressed in words	Emotions expressed through performance

# Cognitive differences

- ∞ Spatial – boys better at rotation and spatial-temporal
  - May supply boys' advantage in mathematical problem solving
  - Traditionally little training in early school which may lead to girls' belief in problems in math
- ∞ Learning Modalities
  - Verbal/auditory
  - Kinesthetic/iconic

# Sensory Differences

## ∞ Hearing

- Girls more sensitive to sound than boys
- Boys have problems with phonemic awareness – may be source of reading difficulties

## ∞ Vision

- Boys have more acute vision than girls and see objects in motion better – reading issues/saccades
- Girls see objects close up, better perceptual speed

## ∞ Touch

- For learning, boys are hands-on, girls may be content to observe, boys need to move for memory

# Emotional Differences

- ∞ Fight or Flight – adrenalin: mostly boys
  - Increase in heart rate, breathing, blood sugar, blood floods muscles and brain, pupils dilate → movement
- ∞ Tend and Befriend – oxytocin: more girls
  - Decrease in heart rate, breathing, blood sugar, blood goes to core, pupils constrict → freezing
- ∞ Do not praise or discipline with global terms – use specific references
  - Without specific references, failure results in boys getting angry and girls getting anxious, boys' bad behavior may not be purposeful

# Learning Differences

**ADHD** – not lack of attention, lack of ability to fix attention – many more boys

- Cause of inattention may be hearing
- Child may not be engaged in the lesson

**Dyslexia** – reading problems, difficulty with input of information – more boys

**Dysgraphia/Dyspraxia** – writing problems, misspelling, difficulty with output of information – more boys

**Dyscalculia** – calculation problems, reversals, problems with mental math – both boys and girls

# Girls and School

- ☞ Believe effort is the key to doing well
- ☞ Stress hinders learning for girls
- ☞ Combination of emphasis on effort and stress type can lead to test anxiety
- ☞ Focus on words, tend to be verbal learners
- ☞ Need practical applications for math
- ☞ Work well in small groups, twos or fours
- ☞ Solve problems face-to-face

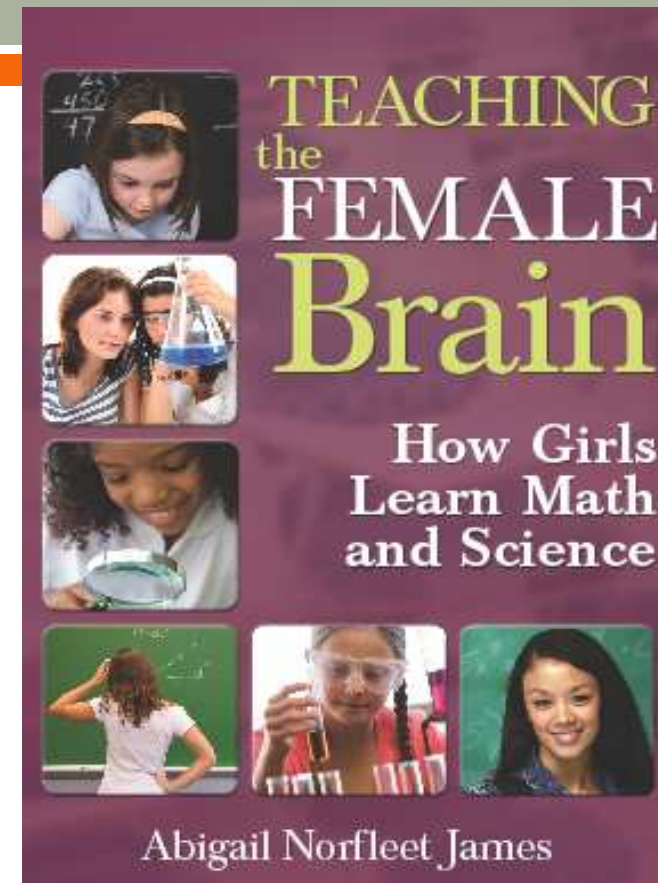
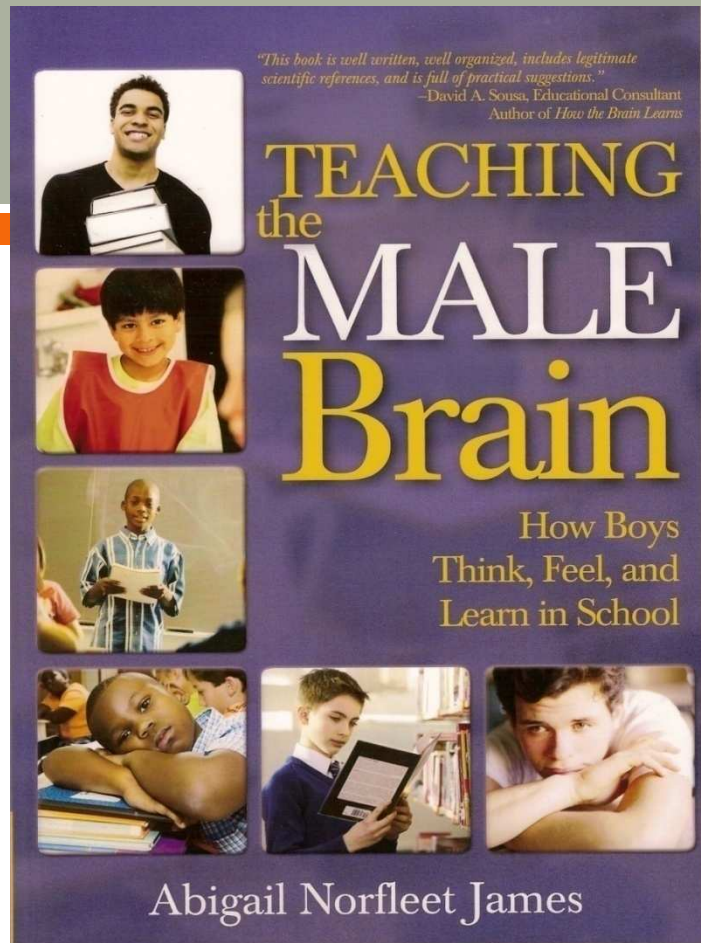


# Boys and School

- ☞ Believe ability is the key to doing well
- ☞ Stress helps boys to learn – standing gets their attention
- ☞ Learn best from seeing and doing, less well from reading and listening
  - Use graphics as a way to access information
- ☞ Work well in groups, problem with staying on task
- ☞ Teacher influence is big
- ☞ Shoulder-to-shoulder when dealing with problems

# Conclusion

- ∞ There are cognitive differences between girls and boys which are brain based
- ∞ Behavioral differences exist which may be brain based or which may result from the interaction between brain and environment
- ∞ Helping children respect their own learning strengths will help them become life-long students



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