

# Teaching the Male Brain

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# Evidence for the Gendered Brain

- Size difference
  - Male brain is larger, but has fewer connections than female brain
- Cellular difference
  - Female brains have more cells in verbal section and more neuropil
- Developmental difference
  - Right side develops more rapidly in males, left in females
  - Amygdala develops faster in boys, hippocampus in females

# What is the effect of differential development on learning?

- Right side/males, left/females – targeting v. language
- Pre-frontal lobes develop more slowly in males

	Left (girls first)	Right (boys first)
Hippocampus (girls first)	Memory of nouns	Memory of pictures & topography
Amygdala (boys first)	Spelling, reading words, verbal intellect, vocabulary	Mathematical calculation & performance

# Accepted Knowledge

- Girls are more verbal
  - Fluency not intelligence or vocabulary
  - Boys will always be behind in spelling and grammar
- Boys are better at spatial relations
  - Connection to math skills
- Boys are more active
  - Activity linked to space available
  - Expectations and biology
- Boys are more aggressive
  - Some thought this is learned
  - However, true cross-culturally
  - Need for roughhousing

# Hearing Differences

- Males have longer cochlea
  - Fractionally delayed hearing, less sensitive
  - Do not hear very high sounds
- Males more likely to have had inner ear infections
  - Some thought that this leads to hearing loss
  - Ear tubes may create problem
- Males have hearing loss sooner
  - Boys need to learn to protect their ears from loud music and engine noises
  - Ear buds are a problem

# Vision Differences

- Color Difference
  - Blue, Black, & Silver
  - Color blindness
- Gazing Difference
  - Boys prefer objects, girls prefer faces
- Boys' gaze is attracted by motion
  - Attention will go to anything in motion particularly if it is unintentional
    - Saccades?
  - Effect this has on early reading problems
- Boys prefer “cool” white light

# Touch Differences

- Higher pain threshold
  - Learned or real? “Boys don’t cry.”
  - Boys do not ask for help until problem is severe
- Greater tolerance for cold
  - Rooms need to be cooler
  - Teach responsible behavior
- Touch to learn
  - Boys learn best when instruction involves hands-on activities
  - Experiential learning taps into the same phenomenon

# Cognitive Differences

- Verbal Skills
  - Knowledge recall – emotionally driven
  - Verbal strategies, will develop over time
  - Communication skills will develop in single sex environment
- Spatial Skills
  - Directions
  - Graphics as key to memory
- Learning Modalities
  - Kinesthetic/iconic vs. verbal/auditory



# Differences in Learning Issues

- ADHD
  - More males due to social bias?
  - Cause of inattention may be something other than learning problem
- Dyslexia
  - More males – but is it a developmental problem?
- Dysgraphia
  - more males – but is it due to social expectations?
- Dyscalculia
  - Actually a problem with memory
  - Girls give up too easily because of social beliefs
  - Boys will avoid math

# Concussions

- Degree of injury
  - Simple, does not require LOC and are the most common type
  - Complex – probably involves LOC and may take some time to resolve
- Immediate effects
  - Short-term memory problems for up to 6 days after even simple concussions
- Long term effects
  - Permanent memory problems
  - Second impact syndrome – death!

# Boys and Alcohol

- ▶ Alcohol affects frontal lobes and cerebellum
- ▶ Boys' frontal lobes develop late
- ▶ Damage to young brain by alcohol does not heal
- ▶ Primary damage is not done by alcohol, but by the products of alcohol digestion
- ▶ Binging produces more damage because of the large amount of byproducts produced in a short amount of time
- ▶ Long term effect is that frontal lobes will not develop and individual never develops good executive function
- ▶ Other drugs

# Social and Emotional Differences

- **Fight or Flight vs. Tend and Befriend**
  - Boys need to be taught how to manage stress
  - Teach boys how to address the issues in a fight, not to sink to personal attacks
- **Frontal Lobe Development – delayed in males**
  - Impulsivity, Emotional decision making
- **Aggression and bullying**
  - Based on competitive nature of boys
  - Use peer mediators

# Discipline

- ▶ Lectures don't work
- ▶ Reference specific behaviors and specific solutions
- ▶ Discipline should be firm, clear, direct, and do not appeal to their better nature

## Use Boys' Competitive Nature in the Classroom

- ▶ Three types of competition: indirect, direct, and cooperative
- ▶ Group work fosters good competition

# Problem Solving

- Help boys learn to ask for help
- Connect behavior to consequences – model delay of gratification & decision making
- Solve problems shoulder-to-shoulder

# Classroom Behavior Differences

- Boys don't ask for help, girls ask too soon
- Girls responsive to the teacher, boys not responsive enough
- Boys believe that ability is all that is needed to achieve and girls believe that effort is more important than ability
- Girls learn different study and test taking strategies from others, boys will persist even if their strategies don't work

# What does a boy do when asked to study?

- Reads the book
- Underlines material (usually the examples)
- Reads handouts

## What is the problem with this?

- Reading may not be easy for a boy
- Reading all the assigned material may take too long
- Reading alone will not provide any organization for review
- Reading is an inactive method of studying



# Why Do Some Boys Dislike Reading?

- Their verbal skills develop more slowly than do those of girls
- In the past, reading has not been a successful way to learn
- Reading is a passive way to acquire information
- Reading in school means sitting in a chair
- Society says they should/Stereotype threat

# How study approaches cause problems with reading

- Emphasis on ability means that you don't need to study
- Boys equate study with torture
  - Reason – they don't do it well
- Reading is too passive for many boys to stay with for long
- Memory based on pictures not words
- Peer activities center on recreation not reading

# Reading Strategies

- Tie material to examples where men use reading skills in the real world
- Focus on the action in the material first, characters second
  - Battles before politics
- Teach the structure of literature as an approach to reading
- Help students learn to separate examples from concepts
  - Underlining/highlighting skills
- Technology as a bridge to writing

# Study Strategies

- Skimming and scanning
- Active reading – underlining skills
- Active note taking – use in class
- Segmenting homework – mole hills
- Effective use of time – note cards
- Generating alternative strategies
- Develop memory cues that work

# Specific Strategies for Boys

- Teach attention management strategies
- Assist boys to develop a variety of learning strategies and approaches
  - Group work will encourage this
- Boys learn best what they like, develop methods to communicate with teachers
- Use stress to advantage in class, get boys on their feet
- Connect behavior to consequences – model delay of gratification

# Learning Skill Strategies

- Spatial Skills
  - Maps, charts, scale models
  - Perceptual speed – slow reading, reading out loud
- Mechanical Reasoning
  - Use appropriate items to teach how to take things apart and put back together
- Memory
  - Girls – focus is on words, heard or read
  - Boys – focus is on active involvement or music
- Study Plan based on learning strengths
- Develop methods to ensure realistic assessment of success and failures

# Science & Foreign Language Strategies

- Science
  - Girls – start with the concept, encourage involvement, use interests, reality based
  - Boys – start with activity then discuss what happened, go outdoors, mechanically based
- Foreign Languages
  - Girls – conversation-based instruction, use social events
  - Boys – book-based instruction, learn vocabulary by writing, dictation to improve auditory skills, sign language – START EARLY

# History & Arts Strategies

- History/Social Studies
  - Girls – focus on social aspects, group projects, big picture
  - Boys – focus on maps, conflicts, politics, debates, specific facts
- Fine Arts/Music
  - Girls – Acquire a critical eye, offer individual music lessons, instrument should have a light sound (at beginning)
  - Boys – Hands on art (sculpture, welding, photography), group music lessons, instrument should be loud



# Do boys have trouble with math?

- Boys in single sex schools report less interest in math than boys in coed schools
- Boys perform less well than girls on teacher-made tests and on NAEP
- Total numbers of students majoring in math and engineering is dropping
- Boys more interested in performance than mastery

# Teach Problem Solving Techniques

- Make problem solving intentional
- Use Socratic method – answer questions with another question
- Games and Puzzles
  - Chess and other strategy games
  - Logic puzzles, Sudoku, 24
- Reality projects
  - Work in groups, present to class
  - Investment club, building contractors, sports tournaments

# Other Math Strategies

- Working at the board
  - Physical involvement/ Structured
  - Reduces calculator doodling
  - Promotes students seeing teacher as resource
- Math Dictionary
  - Keep in back of notebook
  - Write definition and give an example
- Icosahedra dice (20 sided) or dodecahedra (12 sided)
- Box the Operator
- PEMDAS (sort of like 24)
  - 3 8 11
  - 3 8 10 6 5

# Organization Strategies

- ▶ Organization based on child's strengths
- ▶ Weekly backpack check
- ▶ Study until concentration limit is reached, then shift gears – make sure that student does not spend too much time on easy subjects
- ▶ Schedule in appropriate free time – otherwise student may use more than he should.

# Conclusion

- There are cognitive differences between boys and girls which are brain based
- Adapting teaching strategies for those differences improves learning
- Accommodating for learning differences allows students to make use of their learning strengths to compensate
- Remember, education is maximized when all students are allowed to learn the way that best suits them