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

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<thead>
<tr>
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<th>Left (girls first)</th>
<th>Right (boys first)</th>
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<tbody>
<tr>
<td>Hippocampus</td>
<td>Memory of nouns</td>
<td>Memory of pictures &amp; topography</td>
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<tr>
<td>(girls first)</td>
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<tr>
<td>Amygdala</td>
<td>Spelling, reading words, verbal intellect, vocabulary</td>
<td>Mathematical calculation &amp; performance</td>
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<tr>
<td>(boys first)</td>
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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