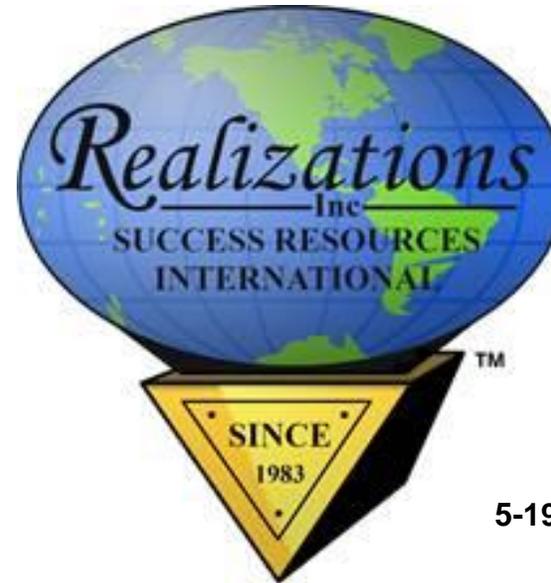
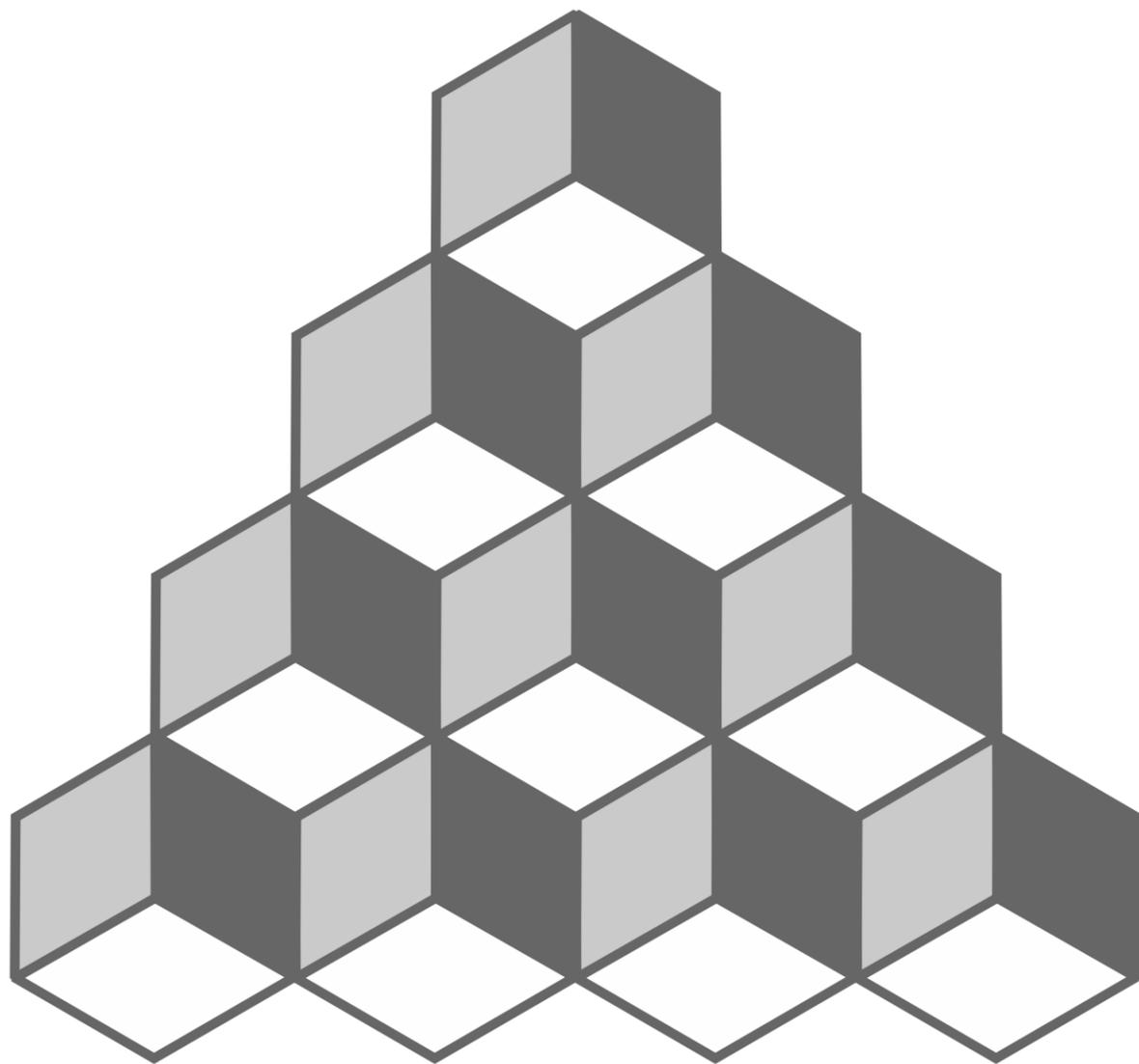


# Connectomes—M-F Brain Wiring Differences

©Arlene R. Taylor PhD  
Brain References  
[www.arlenetaylor.org](http://www.arlenetaylor.org)  
[www.LLM.life](http://www.LLM.life)



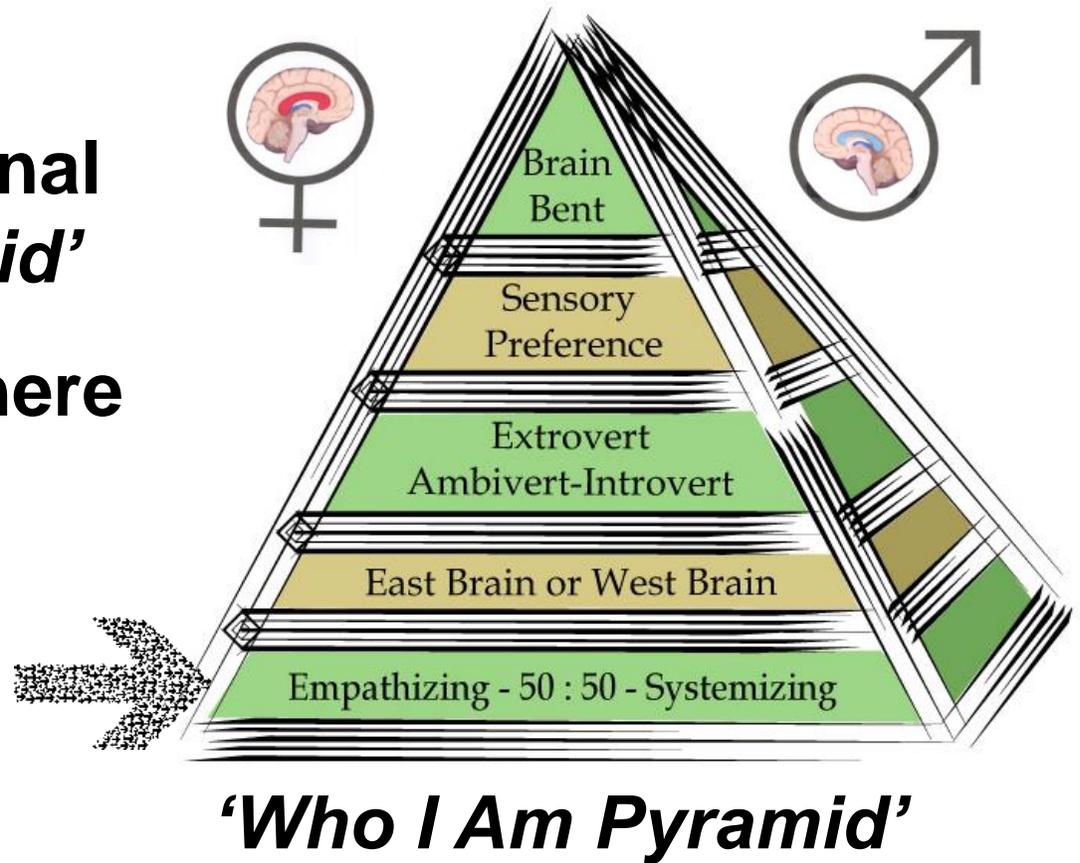
5-19



**Male-female differences are represented by the foundational layer of the *'Who I Am Pyramid'***

**Male-female differences are here to stay—period!**

**You can collaborate and have fun with them or be frustrated and miserable**



## **Conflict is expensive —**

- **Home: contributes to stress, illness, disease, violence, addictions, divorce, murder . . .**
- **Schools and churches: burns out personnel and triggers misunderstandings . . .**
- **Workplace: managers spend 18% of their time managing employee conflicts; doubled since 1996 data**  
—US State News; August 19, 2006



## Two main contributors to conflict:

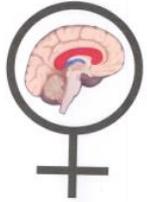
- Low levels of **Emotional Intelligence** or EQ

Successful managers tend to have high levels of EQ, while less successful managers often have high IQ but low EQ (e.g., JOT behaviors)

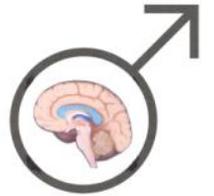


- Misunderstanding of **M-F Differences**

Learning about M-F brain differences and practically applying what you learn can minimize cross-gender conflict



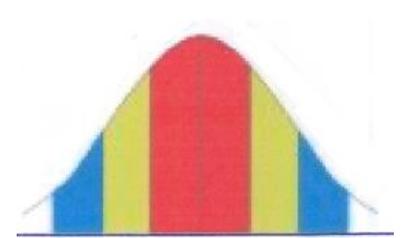
**Over time psychological and behavioral testing have consistently indicated differences between male and female abilities to perform specific tasks**



**Males (40% of body mass is muscle tissue) typically outperform females in some tasks and females generally outperform males in others**

**However: some females can outperform some males and some males can outperform some females on specific tasks (e.g., Indianapolis 500)**

**Study conclusions are typically presented as generalizations on the Bell Curve of Distribution that tend to apply to about 2/3 of the population**



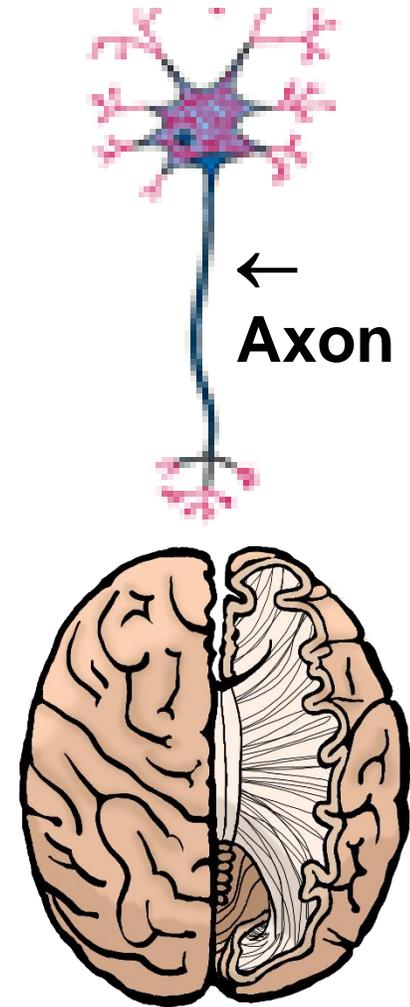
- **Exceptions likely reflect individual uniqueness**
- **Culture may play a role; when your brain processes the same signals over and over and over, those networks tend to increase in strength, like building a muscle**

***Note: Sometimes there are more differences within a gender than between them***

**Diffusion Tensor Imaging or DTI is a new brain-scanning technique that measures the flow of water along a nerve-axon pathway**

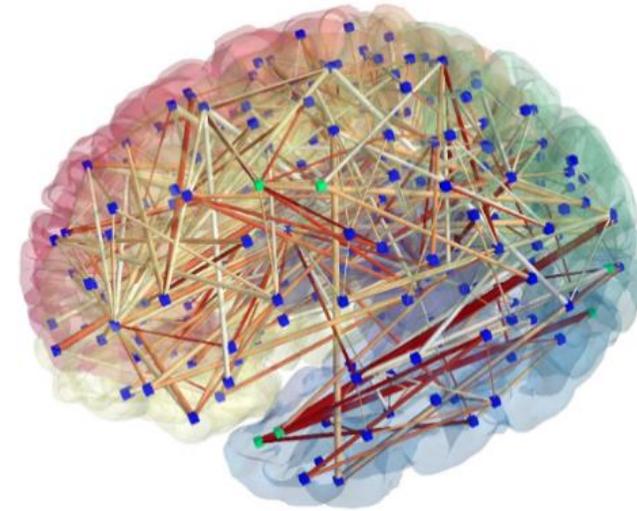
**It outlines the path of myelinated axons that facilitate long-range conduction of electro-chemical signals—part of the brain's white matter**

**Higher numbers of myelinated axons may be found in the right hemisphere and in the corpus callosum**



**DTI results are portrayed as connectomes, a neural map that shows if and how brain regions are physically connected**

**DTI studies have established the level of connectivity between more than 100 regions of the brain**

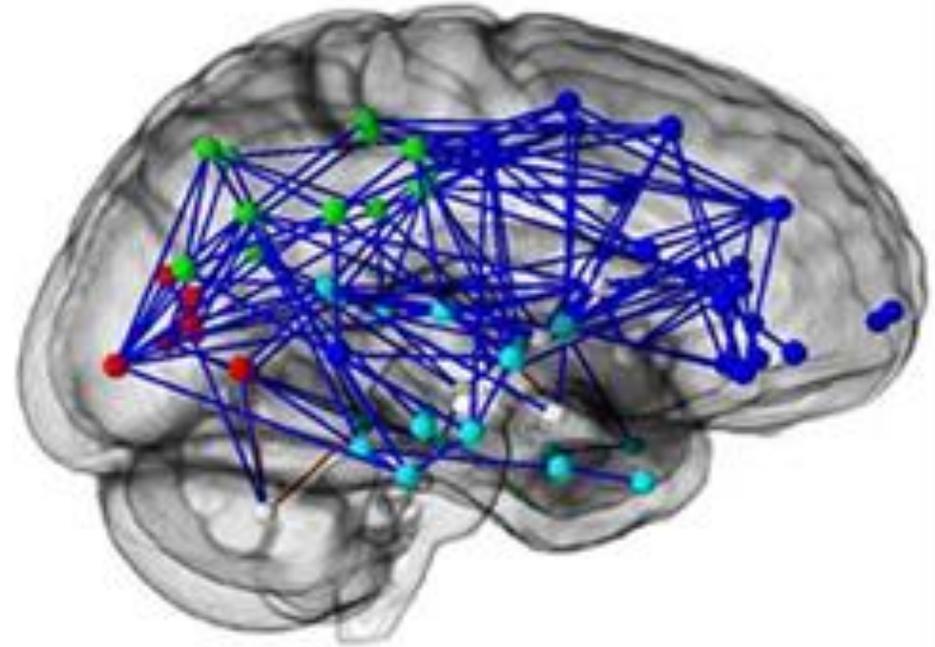


**No surprise, they have revealed significant differences in connectivity patterns between male and female brains**

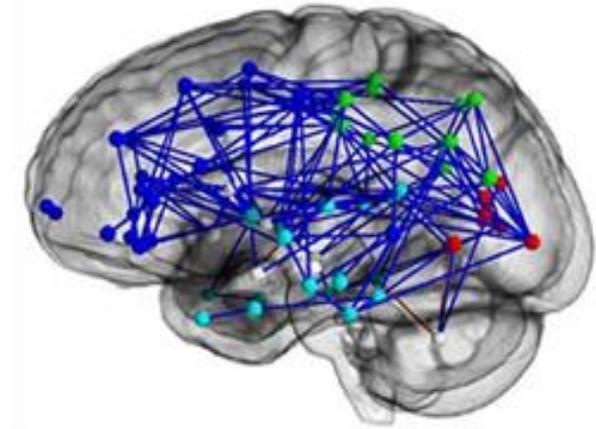
**—Ragini Verma and Rubin Gur, Pennsylvania University**

**Male Brain Connectome: Most of the connections run front to back of the same hemisphere**

**The only portion of the brain where left-right cross-hemispheric connectivity was greater in males (than in females) was in the cerebellum that is linked with motor control**



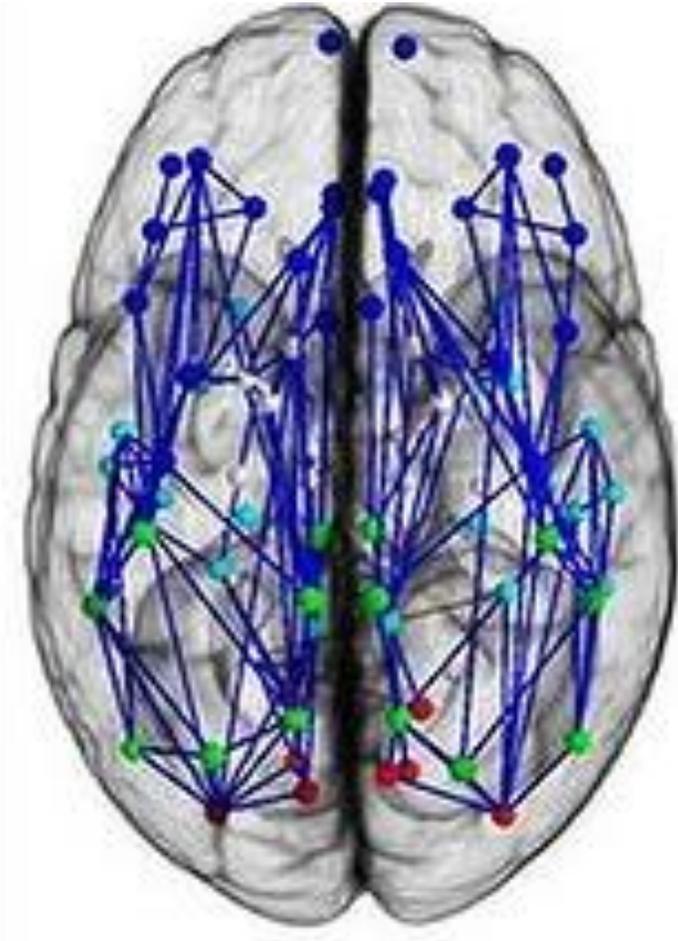
**This configuration may enable male brains to be more attuned to what's going on around them so they can take action if need be**



**They tend to have stronger connections between brain areas for motor and spatial skills; do a better job at tasks that require hand-eye coordination; and are better at understanding where objects are in space, such as throwing and catching a ball or hammering a nail**

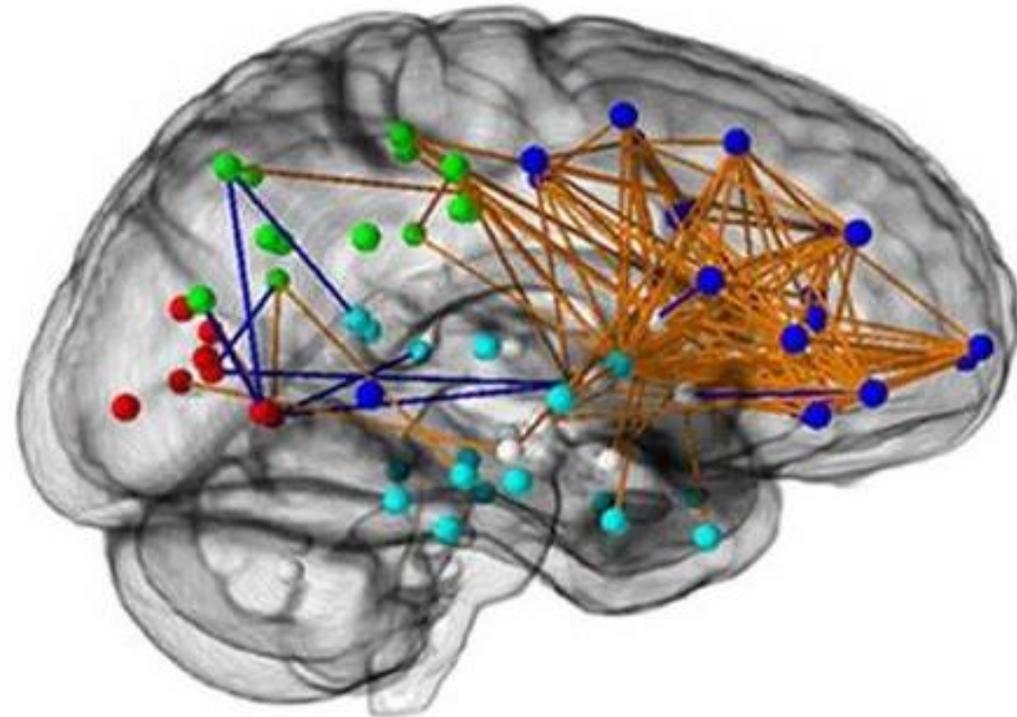
**Wiring style could account for male brains typically exhibiting better:**

- ✓ **Spatial skills**
- ✓ **Motor (muscle) control**
- ✓ **Map reading**
- ✓ **Direction finding**
- ✓ **Vehicle driving**
- ✓ **Translation of perception to motor skills, as in some sports**

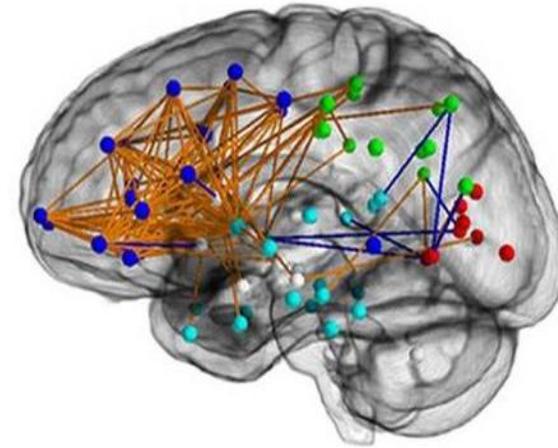


**Female Brain Connectome: Many more connections run side to side between the left and right hemispheres providing much more hemispheric cross interconnections than occur in the male brain**

**This is especially seen between the left and the right frontal lobes of the brain**



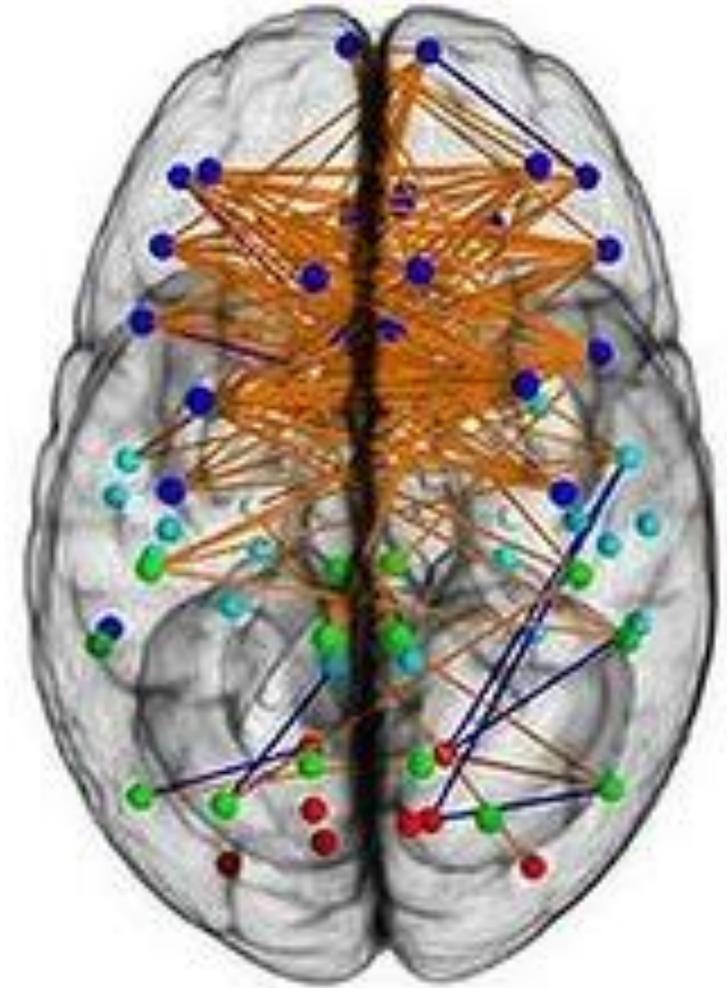
**This configuration could give them an advantage in pulling information together from different sources and drawing conclusions (left hemisphere handles logical thinking while the right is associated with intuition)**

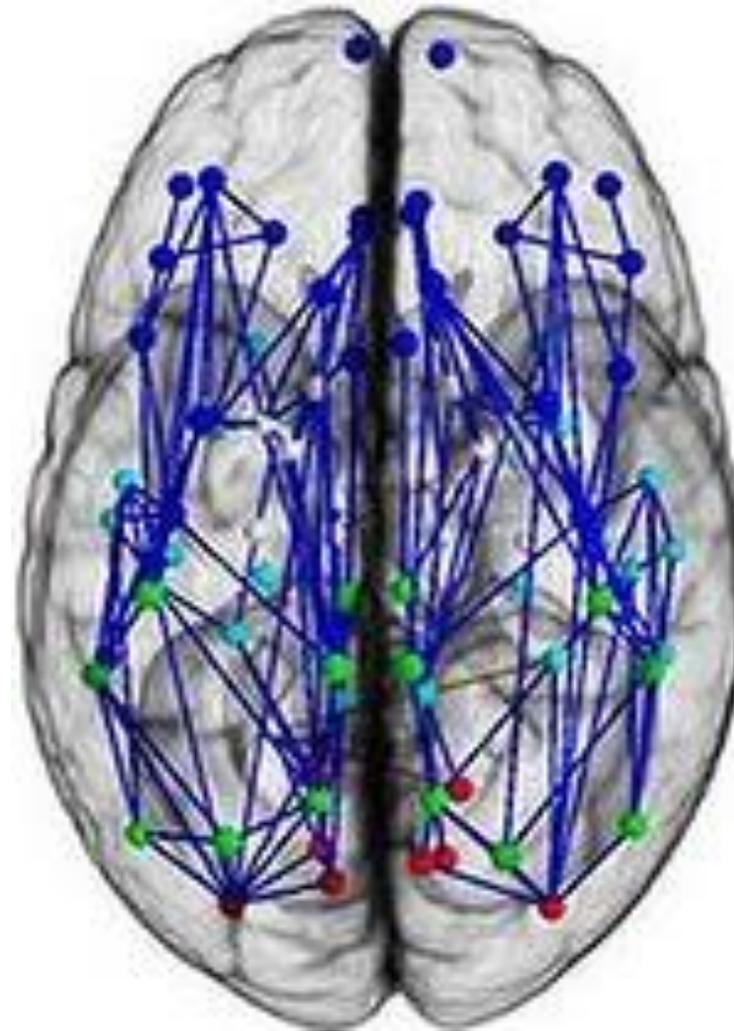
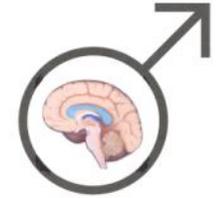
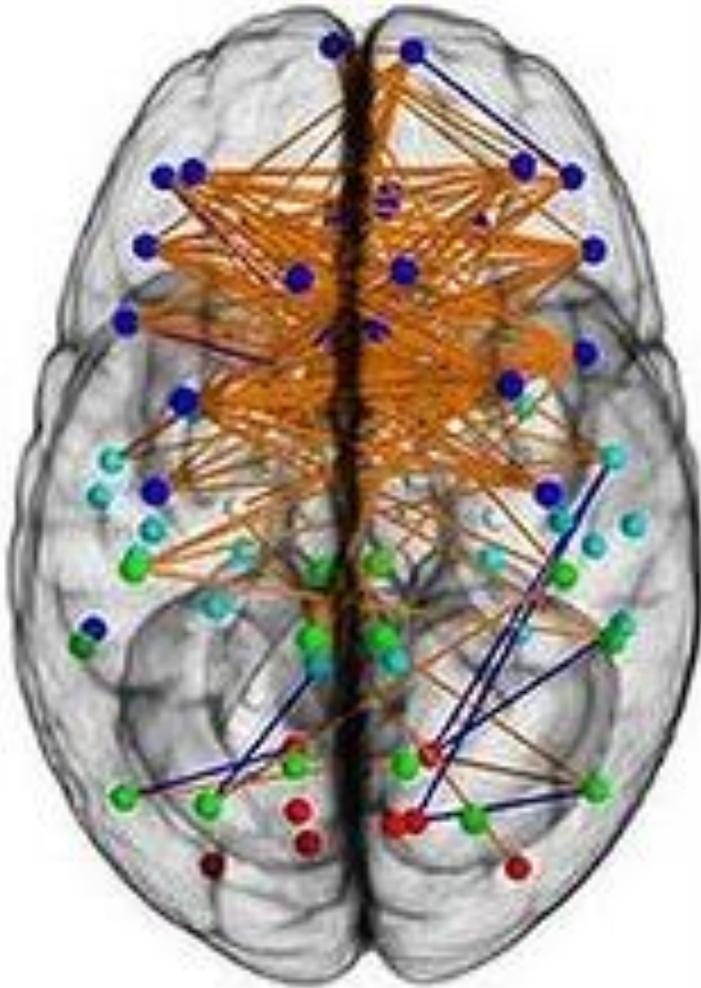
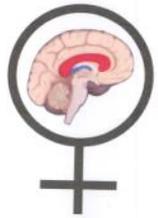


**There is more gray matter in the hippocampus (search engine) and in the left caudate (thought to control communication skills), and more wiring in regions linked to memory and social cognition (understanding how other people are feeling)**

## Wiring style could account for female brains typically exhibiting better:

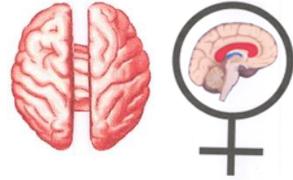
- ✓ Verbal skills
- ✓ Intuitive abilities
- ✓ Memory test results (recalling words, remembering faces)
- ✓ Social cognition test results (attempting to measure EQ skills and empathy)





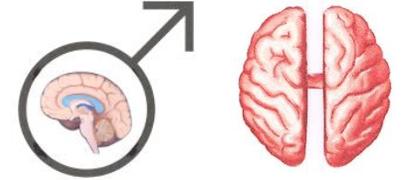
—Ragini Verma, PhD - *Proceedings of National Academy of Sciences*

**A larger anterior commissure and often a larger corpus callosum: larger number of connections provide for a more generalized style of processing**

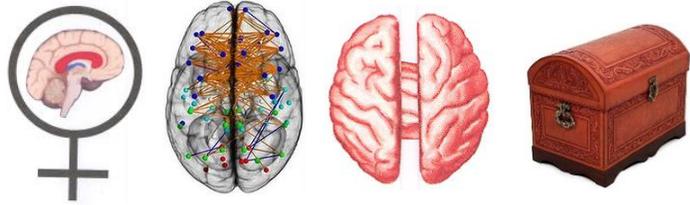


**If any part of the brain is “on” it’s all ‘on’ - so takes more energy to run second for second**

**A smaller anterior commissure, and often a smaller corpus callosum: fewer connections provide for a more lateralized style of processing**



**Hemispheres are somewhat independent, one idles while the other works, so takes less energy to run overall**

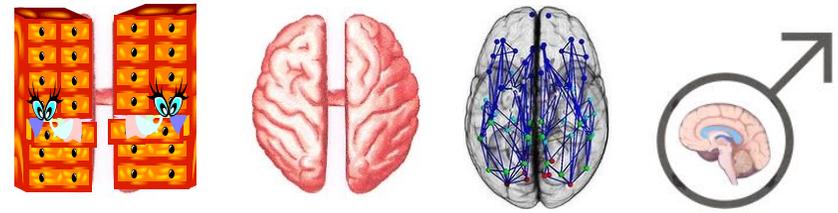


**Think of it as a trunk**

**Metaphorically spends more time on 'highways' due to corpus callosum / brain style**

**Cannot "simultask" or multitask effectively**

**Is able to have rapidly alternating shifts of attention**

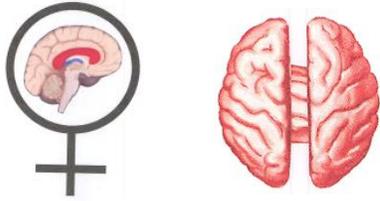


**Think of it as drawers**

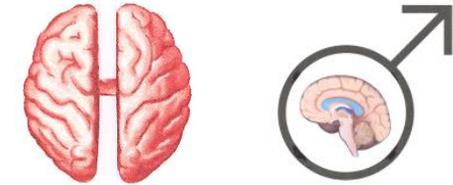
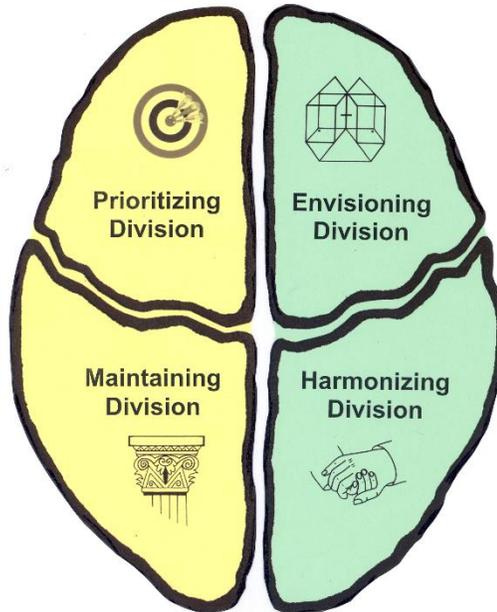
**Metaphorically, spends less time on 'highways' due to corpus callosum / brain style**

**Can "simultask" if each side directs a different task**

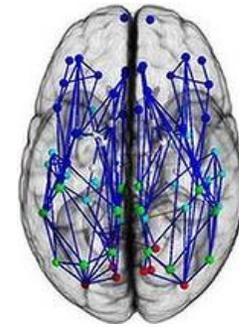
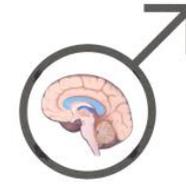
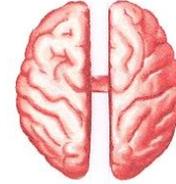
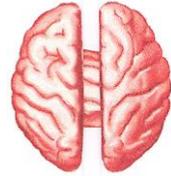
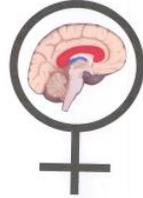
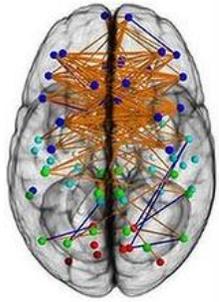
**7 seconds to move attention to the other hemisphere**



**Joy is aligned with  
the L. Hemisphere  
Language is loaded  
in L. Hemisphere  
Tend to talk-out  
their emotions**



**Three protective  
emotions (anger, fear,  
sadness) are aligned  
with R. Hemisphere  
Males tend to act-out  
their emotions**



**Female brains are less skillful drivers overall; more tentative and cautious in driving style; tend to see better at night; have fewer accidents per mile driven**

**Male brains are more skillful drivers overall; tend to act out emotions in exhibitions of speed; tend to see better in daylight; have 14% more accidents per mile (1.6 kilometers) driven**



**Understanding more about differences does not make them go away**

**You can make your life easier or more difficult by your response to differences**

**Increased knowledge can trigger positive communication and collaboration—and it can be so much fun!**

*The End*

