

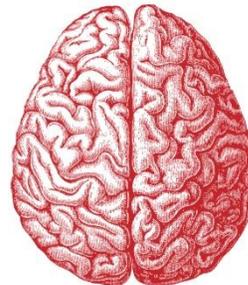
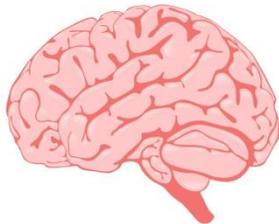
### What Have You Observed?



Developmental Domain	Boys	Girls
P		
I		
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E		
S		

**Boys**

**Girls**



**My Brilliant Brain**

The video does not play in the webinar recording – so here is the YouTube link:

<https://youtu.be/AzNjd8rftIA>

**Big Picture**  
**Cortex**  
**Mental Maps**  
**Reference points**  
**Spatial Awareness**

**Specific Details**  
**Landmarks**  
**Corpus Callosum**  
**Brain Hemispheres**  
**Verbal Reasoning**

**Boys & Girls In Your Classroom**

Room Arrangement & Furnishings

Materials and Games

Visuals and Displays

Schedule

Teacher Communications

Guidance & Discipline



## Brain and Developmental Differences Between Boys & Girls

Boys	Girls
<b>Brain</b>	
<i>The different regions of the brain develop in a different sequence, and different tempo, in boys compared with girls. The differences do not lie in the structure of the brain, per se</i>	
12 – 18 months behind girls	12 – 18 months ahead of boys
Boys are developing back-to-front capabilities, from doing to thinking	Girls are developing front-to-back capabilities, from thinking to doing
Corpus Callosum (part of the brain that connects left & right lobes) is smaller in boys than girls	Corpus Callosum (part of the brain that connects left & right lobes) is larger in girls than boys
Less development in the speech centers in the brain connected to emotional verbal capabilities	More developed emotional verbal skills (Speech centers located within the limbic system)
Brain development complete by around age 30	Brain development complete between ages 22 – 25 years
<b>Physical Activity</b>	
High levels of physical activity in all aspects of their development	Varying levels of physical activity in overall development
Long protracted times of physical activity required	Varying levels of physical activity
Rough & Tumble play builds intimacy	Nurture play builds intimacy
Boys need indoor and outdoor physical activity which includes speed, agility, strength, coordination, and challenge	Girls need indoor and outdoor physical activity which balance, coordination, controlled movements, manipulations, strategy, mastery
Boys require space!	Girls function within the space
<b>Cognitive Development</b>	
Boys are task oriented and will 'pause' (Hodgkins) between tasks	Girls brains are always 'on'
Boys have approx. 5000 words by age 5	Girls have approx. 7000 words by age 5
Learn by doing then thinking in preschool years	Learn by thinking then doing in preschool years
Are more interested in process	Are more interested in product
Develop big picture to details	Develop details to big picture
Stronger in kinesthetic learning	Lesser need for kinesthetic learning
Shorter span of 'sit still & concentrate'	Longer attention span and task completion
Takes longer to develop memory from learning	Takes less time to develop memory from learning
<b>Emotional Development</b>	
Express emotions and empathy in physical, actionable ways	Express emotions and empathy with verbal and non-verbal communication
Weapon play	Nurture play

### Interesting Facts:

- In the male brain, a larger area is devoted to spatial mechanical functioning and half as much to verbal emotive functioning.
- Girls can multitask better than boys because the female corpus callosum is 26 percent larger than the male. The corpus callosum is the nervous tissue that sends signals between the two halves of the brain.
- Girls have the ability to transition between lessons more quickly and are less apt to have attention span issues.
- Boys utilize the cerebral cortex less often than girls and they access the primitive areas of the brain more often while performing the same types of activities or tasks.
- The neural connectors that create listening skills are more developed in the female brain and therefore enhance listening skills, memory storage, and tone of voice discrimination in girls.
- For the male brain to renew or recharge it will go into rest states, while the female brain does so without rest states or sleep.

- Girls make fewer impulsive decisions than boys due to a higher serotonin level.
- Boys have less serotonin and less oxytocin, which makes them more impulsive and less likely to sit still to talk to someone
- The female brain has 15 percent more blood flow than the male brain, allowing for enhanced integrated learning.
- Boys structure or compartmentalize learning due to the fact that they have less blood flow to the brain.
- Because girls have more cortical areas devoted to verbal functioning, they are better at sensory memory, sitting still, listening, tonality, and the complexities of reading and writing (the skills

and behaviors that tend to be rewarded in school).

- Boys’ brains are better suited to symbols, abstractions, and pictures. Boys in general learn higher math and physics better than girls.
- Boys prefer video games for the physical movement and destruction. Boys get into more trouble for not listening, moving around, sleeping in class, and incomplete assignments.
- The male eye is drawn to cooler colors such as silver, black, blue, and gray, and boys tend to draw pictures of moving objects. In contrast, the female eye is drawn to textures and colors. It is also oriented toward warmer colors—reds, yellow, and oranges

### Brain-based Genetic Differences in Girls and Boys



Girls Usually	Boys Usually
Hear better than boys	Have 35 percent less hearing than girls due to the cochlea length in the ear.
Can discriminate between objects better than boys	Locate objects better than girls.
Focus on faces and warm colors	Focus on movement and cold colors
Use the advanced portion of the brain	Use more of the primitive parts of their brains
Can explain and describe their feelings	Find it difficult to talk about feelings.
Develop language and fine motor skills about six years earlier than boys.	Develop targeting and spatial memory about four years earlier than girls.
Multitask well and make easy transitions	Focus on a task and transition more slowly
Friendships are focused on other girls	Friendships are focused on a shared activity.
Find conversation important	Find conversation unnecessary
Self-revelation and sharing are precious parts of a friendship	Self-revelation is to be avoided if possible
Enjoy a close relationship with a teacher	May not ask for help to avoid being perceived as “sucking up” to a teacher
Like to be faced, looked in the eye, and smiled at	Avoid eye contact and prefer you sit beside them
Retain sensory memory details well	Don’t retain sensory details
Do not deal with moderate stress well	Deal with moderate stress well
Want to be with friends when under stress	Want to be alone when under stress
Feel sick or nauseated when faced with threat and confrontation	Feel excited when faced with threat and confrontation
Prefer to read fiction	Prefer nonfiction

## BOYS, BOYS, BOYS!!!

### The Needs of Boys



Gender differences are biological and not just cultural: the biological foundation for gender differences includes hormonal influences on the brain (Berger, 2003).

These differences begin in the fetal stage of development, when the sex hormones begin to influence brain development, which continues to develop throughout childhood. These gender differences in brain maturation produces different overall development, such as the fact that infant girls tend to talk earlier than boys, and their language development continues to be more advanced than boys throughout early childhood (Fenson et al., 1994; Leaper, Anderson and Sanders, 1998).

Anyone who has worked in an early childhood program, or has both boys and girls at home, knows the needs of boys and girls differ widely. Some of the needs of boys, compared to those of girls, include:

**Physical Activity.** In general, boys are simply more physical than girls. Far more boys engage in rough-and-tumble play than do girls (Humphreys & Smith, 1984). Boys also tend to enjoy physical activities on the playground, which is also cultural, as men in our culture engage in physical sports. While boys' need for physical activity may be partly due to culture, it is neurological as well. The brains of boys develop slower than those of girls, even before birth (Berger, 2003). Further, on average, boys tend to be more aggressive than girls, a trend that appears in many cultures (Whiting and Edwards, 1988). Not only is this due to brain development, but also due to male sex hormones, androgens (Berk, 2002).

**Space.** Boys simply take up more space than girls in their daily activities – both indoors and out (Harper and Sanders, 1975). From a teacher's perspective, they seem to spread out, use the far reaches of the playground, and want to push the limits on field trips. Maybe this is one reason boys love to play and work on the floor.

**Kinesthetic Learning.** One of Gardner's eight intelligences is bodily kinesthetic – learning through movement (Gardner, 1983). Bruner talks about three kinds of representations (memory): symbolic (words/numbers), icons (pictures) and enactive representation (muscle memory), and believes

young children's learning is dominated by iconic and enactive representation (1983). Enactive representation is kinesthetic learning. Boys seem to thrive using kinesthetic learning, which fits well with their use of space, need for physical activity, and their aggressive behaviors (Hale-Benson, 1986). They love outdoor projects, gardening, building with units and hollow blocks, field trips, and games.

**Hands-on-learning.** Boys are more advanced than girls in mathematical reasoning, spatial ability, and mechanical ability, while girls score higher on memory, perceptual accuracy, verbal fluency, and language tasks (Aikens, 1987). All preoperational children (before about age seven) need lots of hands-on-learning (Wardle, 2003); but, because of boys' abilities in math and mechanical skills, and their limitations in memory and language, they specifically need lots and lots of opportunities for hands-on learning, rather than verbal instruction, literacy activities, and rote learning.

**Lots of Play.** As I have already mentioned, boys are much more likely to engage in rough-and-tumble play than girls. One expert believes this kind of play helps boys overcome their genetic tendency towards hyperactivity and learning disabilities. Rough-and-tumble play helps develop the frontal lobe of the brain, which is used to regulate behavior (Panksepp, 1998). Further, it is believed rough-and-tumble play assists in the development of motor skills, emotional regulation, and interpretation as well (Pellegrini and Smith, 2001), and Sutton-Smith suggests that play is an ideal forum for learning specific social skills (1997). Play is also a good way to increase brain development (synapse and dendrite growth) and increase speed of messages between all parts of the brain and nervous system – which is particularly important for boys (Berger, 2003).

### Why Boys Struggle in Our Programs

When I first suggested boys struggle in our programs I was roundly criticized for focusing just on boys, and not on the needs of all young children (Wardle, 1991). Until recently the prevailing view among educators was that our education system – including early childhood programs – favors boys (Sadker and Sadker, 1994). While this may have been true of middle and high school – especially in math and science - it has never been true in early childhood programs. Thus we have been extremely reluctant to recognize a problem exists. Other reasons include:

- In general, the development of boys' brains and overall nervous systems is delayed compared to girls (Berk, 2002; Leaper, Anderson & Sanders, 1998). And since the brain affects cognitive

development, attention and emotional regulation, this impacts a boy's overall "school readiness," including activity, attention span, and academic development.

- Most early childhood programs emphasize verbal and literacy activities, the arts, and social-dramatic play. Boys prefer rough-and-tumble play, aggressive activities, hands-on manipulation of concrete materials, and lots and lots of movement. Furthermore, boys have less attention and poorer self-regulation than girls.
- Early childhood programs have a goodness-of-fit between them and girls. Almost all early childhood teachers are women; most women seem to prefer behaviors and activities more often attributed to girls than boys. Many programs notice two things when a male teacher or volunteer is in the classroom: more rough-and-tumble play, more noise and physical activity, and more boys getting involved in activities.
- Added to this dilemma is that many programs do not have adequate indoor and outdoor facilities for gross motor play. Further, programs like Head Start often spend more resources on computers than on equipment for quality outside play (Wardle, 1999; 2000).
- We already know that more boys arrive into our programs with more disabilities than girls (Berger, 2003). Further, many boys simply cannot meet the increased expectations of our early childhood programs. These facts lead to more boys than girls being diagnosed with special needs.

### **Solutions**

There are a variety of things we need to do to make sure boys have equal opportunity to succeed in our early childhood programs. We must:

- Reevaluate our focus on standards. First, we need to radically liberalize academic expectations for young children (up to third grade) – essentially going back to a true application of developmentally appropriate practice (Wardle, 1999). Secondly, we need to insist on developing and implementing rigorous standards for physical activity.
- Increase the presence of men in early childhood classrooms. Through hiring more men, using fathers in the classroom, and attracting male volunteers (seniors, people in service organizations like the scouts, etc), programs can begin to provide more activities and behaviors boys need. However, this approach will be ineffective if an overall passive culture is maintained (an insistence on quiet, no rough-and-tumble play, restrictive outdoor play

rules, no messy activities, no indoor gross-motor actives, etc). Men recruited to work in the classroom should be encouraged to develop and engage in these kinds of activities.

- Train all staff on the unique needs of boys and provide techniques, methods, and approaches to meet these needs. This includes providing lots of physical activities (inside and outside), woodwork, physical games, different science and mechanical projects, and all sorts of hands-on math activities. Training must include instruction in woodwork, math and science projects, and typically 'male' experiences, since many women are uncomfortable or unfamiliar engaging in these activities. In my Head Start program we discovered that a full training day of making things out of wood produced wonders for woodwork activities in the classroom (Wardle, 1991).
- Make the classroom "boy friendly." For example, provide a regular woodwork station, and completely redo the "housekeeping area," changing its name to "dramatic play area." Include a vast array of stereotypical male props: hard hats, brief cases, firefighters' hoses, police uniforms, professional sports hats and uniforms, tools for fixing cars, tool boxes, etc., (Wardle, 1991). One of my graduate students discovered that adding books about sports and sports heroes, how things work, and buildings and inventions, increased her kindergarten boys' reading scores.
- Be extremely cautious when recommending boys for special education services. Remember that in many areas boys are naturally delayed compared to girls.

From: Early Childhood News  
[www.earlychildhoodnews.com](http://www.earlychildhoodnews.com)

## Understanding Girls' Brains

Research about the brain has found subtle but significant biological differences between male and female brains. Among the findings:



- Male brains are six to ten percent bigger, on average, than female brains.
- Female brains have more synapses (connections) than male brains.
- Females have a bigger connecting area (the corpus callosum) between the two hemispheres of the brain. They tend to use both sides of the brain for a particular task more frequently than do males.

### Differences begin before birth.

JoAnn Deak, Ph.D., an expert on brain research, reports that the differences in male and female brains start in the womb. "Many female brains have more neurons in certain areas than male brains, as a result of having more estrogen bathe them during fetal development. A hormonal/chemical wash (estrogen for girls, testosterone for boys) actually enhances certain parts of the brain and changes them structurally before birth. Therefore, each of us is born with different hard wiring."

### Girls' brains develop at a different pace.

Girls and boys appear to have different developmental timelines, due in part to the differences in their brains. "For example," Deak notes, "most girls are born with language processing neurons on both sides of the brain, but most males have them only on the right side." As a result, girls often become earlier readers than boys and begin the writing process sooner. Many girls have less spatial awareness than boys but, at the same time, develop fine motor skills earlier than many boys. Most boys, however, tend to be more attracted to spatial tasks (such as playing with Legos) than most girls.

### Most girls can (and will!) talk about emotion more easily than boys.

Most girls' and boys' brains are wired to process the connection between language and emotion differently. Because of this, according to Deak, many girls may have an easier time talking about their feelings than many boys. In addition, female brains tend to focus a bit

better on details, so that girls can express their emotions at considerable length. Girls (particularly pre-pubescent ones) also have greater sensitivity to noise and tone of voice. As a result, some girls may hear yelling when there is only firmness in an adult's voice, or take feedback on their work as negative criticism, even when it's constructive.

### Girls and boys react differently to stress.

Hormones shape how girls' and boys' brains react to fear and stress. Under stress, everybody releases hormones such as epinephrine or cortisol, which prepare the body for fight or flight. However, recent research shows that females also produce oxytocin, a hormone connected to childbirth that is thought to enhance connection and caring. From a species survival standpoint, this response may increase the probability that females will take care of offspring or band together when threatened. Deak terms this the "double whammy" that makes risk-taking harder. "This increases the likelihood that a threatened female will get out of the situation rather than fight. Boys, on other hand, get a surge of testosterone, which can modulate fear and promote aggression." Deak encourages parents to help their girls take important risks and assert themselves in challenging situations.

### Anatomy is not destiny.

The research does not claim that all girls' (or boys') brains work the same way, or that a girl's behavior is predestined by brain chemistry. Catherine Steiner-Adair, Ed.D., co-author of *Full of Ourselves: A Wellness Program to Advance Girl Power, Health and Leadership*, notes also that the research does not fit all girls. "If 20 percent of girls do not fit this pattern, that's one out of five, and that's a pretty big percentage. We therefore shouldn't make any assumptions about all girls' behavior being the same."

David Walsh, Ph.D., author of *Smart Parenting, Smarter Kids*, points out that while brain science tells us there are differences between boy and girl brains, it is important to note that no two brains are alike and that biology does not mean destiny. It is important not to lock kids into stereotyped expectations, but to let them explore and get involved in a wide range of activities.

## Understanding Preschool Friendships



For many girls, friends form the center of their lives. As girls grow up, it's not unusual for them to find best friends, break up, and reform friendships time and again. Friendships blossom and (occasionally) conflicts begin to bloom in preschool, when girls move from parallel play to playing with others.

### Girl friendships start off magically.

"The magic of friendship really starts when girls are drawn to each other through imaginative play and common interests. When it works, it's like watching a dance or jazz improvisation," comments Lawrence Cohen, Ph.D., co-author of *Best Friends, Worst Enemies* and *Mom, They're Teasing Me*. "Preschool girls often seem in perfect harmony, creating imaginary worlds and games. Big conflicts do occur — but there's flexibility and real beauty in their exchanges. I think when girls get older they often look back and miss that complete connection they once had."

### Preschool girls have an enormous capacity to bond.

Young girls form attachments that have a great deal of importance and meaning to them. They really 'fall in love.' A girl's best friend at nursery school is her anchor, and everything becomes right when that friend walks in the classroom door. Experts recommend you don't force friendships on girls, but you can encourage them to reach beyond their social sphere and become comfortable in a range of situations and with a range of people.

### Girls and boys often stop playing together in preschool.

The shift into gender-exclusive play begins between ages of three and five for many children. When given a choice, many girls tend to be drawn towards art, dolls, and fantasy games, while boys will more often go into the block area or pull out imaginary swords. "With boys, the activity is the main focus," says Cohen, "but with girls, even young ones, the relationship becomes primary."

Although experts differ over reasons why, it is clear that girls care deeply about friendships starting at a young age. However, with these new relationships come new issues and challenges.

### The challenge with threes.

"Having a 'best friend' can make a young child feel very secure," says Jane Katch, a veteran teacher at the Touchstone School in Grafton, Massachusetts, and author of *They Don't Like Me*. "In a game of pretend, both children know who they like to pretend to be and how the plot should progress. It can be hard for them to allow a third child into the mix. They may think the third person will change the rules or won't know how to play it the right way. When helping a third child join in, I might begin by suggesting the new player ask, 'Who can I pretend to be?' If she encounters resistance, I might ask the other two, 'How can you help her join the game in a way that won't spoil what you're playing?'"

### Young girls are taught to bury their aggressive feelings.

"Toddler girls are just as likely to punch and grab and bite as boys," observes Cohen, "but the stage begins to set for girls to suppress their aggressive feelings when authority figures urge them to be nice." As a result, girls are forced to internalize their anger and communicate feelings indirectly, through exclusion, gossip, and meanness. "In my class," says Katch, "girls' meanness becomes quiet. Girls may just refuse to sit next to someone in a circle."

### Power plays and exclusion begin when girls are young.

"Young girls often reach for power by what they say, with statements like 'You can't come to my party,'" observes Katch. This kind of behavior, called relational aggression, involves excluding others and making indirect but deeply hurtful comments. Katch says, "When I see this happening, I talk with the kids. I like to support the child who feels left out while helping the insiders develop empathy. One of the things I ask is, 'How would this feel if you were the one being excluded?' It reminds them all what it feels like to be in that situation and they're more likely to support the odd girl out."

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