

# Making Allowances

*Because teenagers' brains are immature, we should not expect them to function like adults.*

By Kay McSpadden

If you missed Frontline's recent "Inside the Teenage Brain," you will have to wait another month to see it, and only then if you buy it. So many people have ordered the tape that it is currently backordered, an indication of the interest in the discoveries in neuroscience described in the show.

Producer/director Sarah Spinks interviewed scientists, researchers, families and their children to give an updated picture of what actually happens inside the brains of teenagers. What she discovered was both surprising and reassuring.

The biggest surprise is that human brains grow through two distinct growth spurts, one that begins in the womb and tapers off at 18 months, and the other beginning right before puberty and continuing throughout the teenage years and even into the early twenties.

Researchers have long known about the rapid development of infant brains, but the second stage of intense growth in teenagers is new information found during systematic imaging studies.

Scientists such as Jay Giedd at the National Institutes of Health have performed brain scans done at two-year intervals on children from infancy through adulthood and have traced the sudden change in brain development that happens immediately before puberty when the brain goes through an intense overgrowth of cells and connections.

At the onset of puberty, the brain begins the necessary pruning, or refining, of connections, eliminating the unused or weak ones and strengthening the efficient and strong connections.

Giedd argues that "use it or lose it" is the law of brain development. Whatever we spend our teenage years learning and practising shapes the actual connections in our brains and establishes our baseline abilities for the rest of our lives.

Another great surprise about teenage brains is that they are organized somewhat differently from adult brains. Most noticeably, teenagers have not yet developed the frontal cortex which is responsible for higher thinking skills and what scientists call 'cognitive flexibility' or the ability to move gracefully from idea to idea and to reflect and plan effectively.

Instead, teenagers rely on the more primitive, emotional, reactive parts of the brain, such as the amygdala, to interpret data.

This was proven in a recent brain imaging study by Deborah Yurgelun-Todd, the director of neuropsychology and cognitive neuroimaging at the McLean Hospital in Belmont, Mass. She showed adults and teenagers photographs of people's faces and asked them to identify the emotions the people were demonstrating.

Adults in the study correctly identified the emotions 100% of the time. For example, when shown the face of a woman looking frightened, the adults identified fear as her emotion. Teenagers, however, were not nearly so adept, missing the correct identification over half the time.

Yurgelun-Todd speculates that this inability to correctly identify the emotions of others may account for some of the classic miscommunication between teens and adults.

Furthermore, the imaging studies implicate the emotion centre of the brain as the reason for the misidentification — teenagers were using this part of the brain, rather than the rational, reasoning frontal cortex, to analyze the faces.

If teenage brains interpret the world without the rational frontal cortex as a guide, that might explain the other baffling tendencies teenagers have for impulsive behaviour and moodiness. What does this tell adults who are struggling to understand and support the sometimes-difficult teenagers in their lives?

"It's sort of unfair to expect teenagers to have adult levels of organizational skills or decision-making before their brains are finished being built," Giedd argues. Yet public policy is often based on that assumption.

We allow teens with immature reasoning powers and a tendency for impulsive behaviour to drive a car, for instance, and the trend in the justice system has been for stricter sentencing of very young juvenile offenders.

On the other hand, recognition of the critical windows of brain development has already inspired some misguided public policy decision, such as Governor Zell Miller's hasty support of music CDs for each newborn, a theory of enrichment not supported by scientific research.

Likewise, programs which promise to accelerate development are probably ineffective, since the brain seems to follow a pattern of maturation based on the age of the child.

Instead, adults can be most helpful by being patient and present, offering their own wisdom for guidance when teens flounder. Even teenagers seem to recognize this function of adults in their lives.

Not too long ago, one of my students slipped into my classroom before school began and asked if she could discuss a problem she was having with one of her friends. I was pleased but surprised, since this particular student is rather quiet, and our conversations have never been personal in nature.

"I know I could ask my friends what to do," she said after explaining her dilemma, "but they would just have kid solutions. I need a grown-up to help me think about this."

I was happy to lend her my frontal cortex. It was the least I could do.

*(Mrs. McSpadden is a high school English teacher in York, South Carolina. This article was adapted with permission from "The Observer" newspaper, February 9, 2002.)*