



## The Adolescent Brain and Out-of-School Time Programming

*Startling recent discoveries contradict the long held notion that the adolescent brain is finished with its physical development and only lacks experience in order to begin making more mature deliberations. Powerful new scanning machines like PET, SPECT, and fMRI reveal that the teen brain is actually very much a work in progress, a "major construction zone." Understanding what's happening in these construction zones goes a long way toward explaining young people's developmental needs and their behavior. This briefing paper highlights the new science and how it has profound implications for out-of-school time policies and programming.*

### Brains Under Construction

Imagine two adults hurrying down the corridor at a neighborhood community center. Momentarily distracted, they accidentally bump into one another. Their fully developed brains are likely to make the interpretation that they were not paying close enough attention and walked too close to one another. After a brief "Pardon me," chances are that they will continue on their respective ways.

Contrast that with a similar scenario involving two fifteen-year-old boys. Instead of being a quick and fairly pleasant exchange, the conversation may go more like this:

"What's wrong with you, man? Get out of my way. Are you looking for a fight or something?"

"What do you mean, 'wrong with me?' Quit dissing me!"

From there it can escalate to a push or a shove unless someone steps in to diffuse the situation.

A stereotype? Maybe, but one that's actually based on how two brains, an adult brain and one belonging to a teenager, interpret things differently.

### Brain Growth Spurts

The brain has a myriad of circuits that develop in growth spurts. During such periods, the brain cells overproduce cell branches, technically called *dendrites*. Then, the branches that fire get wired into networks while those that don't shrivel up. This process is known as "blossoming and pruning." The body is responsible for the blossoming, while experience handles the pruning. This means that events occurring in a person's life during a brain growth spurt have a greater impact on her or his brain's wiring than at any other time. It is for this reason that the growth spurts are also known as "windows of opportunity" and "windows of sensitivity."

Until now experts believed this developmental process was complete by age ten. Recent research has proven that theory wrong, however. Some of the most important circuits of the brain in fact reach their peak of blossoming and pruning during the adolescent years.

### Pedal to the Metal with the Brakes on Back Order

An important brain circuit that's under construction during adolescence is the prefrontal cortex (PFC). The PFC is the supervisor—the region responsible for planning ahead, considering consequences, and managing impulses. When the PFC

is not fully developed, the results may for some young people include impulsive behavior, risk taking, conflict seeking, and disorganization.

When you add hormones to the mix, the acceleration centers of the brain kick into high gear. For example, a young boy's body experiences as many as seven surges of testosterone every day. Among the effects is stimulation of the amygdala, the brain's flight or fight center. In the young girl's body the ebbing and flowing of estrogen and progesterone cause dips in serotonin, the mood stabilizing chemical. The bottom line for both boys and girls is that the emotional centers of the brain kick into high gear at the very time that the emotional regulator, the PFC, is under construction. If the adolescent brain were an automobile, the gas pedal would be to the floor with the brakes on back order. This is why adolescence is a pivotal time for youth to have experiences through which they can learn to weigh consequences, set priorities, and make decisions in community settings where adults can serve as guides.

## Out-of-School Time Implications

When adolescents are left alone with extended periods of unstructured, unsupervised time, important developmental opportunities are not only missed, they are lost. Young people *need* responsible and caring adults in their lives to act as "surrogate prefrontal cortexes" to effectively support their brain development journey. When they lack these connections, the chances of risky and dangerous behavior increase dramatically. Thus, implications of brain research on the need for high-quality out-of-school time programming go far beyond simply providing safe places and adult supervision. Those who plan and facilitate experiences for young people during this important developmental phase can help wire important circuits for life by intentionally nurturing

developmental strengths. In particular, good out-of-school time programs provide:

- **Adults** who are able to listen, provide guidance, and de-escalate emotional situations.
- **Guidelines** for behavior that reinforce community and society norms.
- **Guidance** that includes limits, consequences, and accountability so that adolescents develop character traits like responsibility and integrity.
- **Opportunities** to practice effective communication.
- **Settings** where young people can safely develop and explore healthy interpersonal relationships.
- **Opportunities** to exercise leadership, decision-making, and other "adult skills."
- **Opportunities** to be of service to others.

When it comes to out-of-school time, our new understanding of the adolescent brain confirms that the stakes are high for youth, for our communities, and for our state. When we engage young people in positive, constructive community activities we ensure that they are in caring, developmentally supportive environments. This increases significantly the chances that they will become conscientious, contributing, confident adults.

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Author: David Walsh, Ph.D.

Dr. Walsh is a psychologist, author, and president of the Minneapolis-based National Institute on Media and the Family. His most recent publication is the best-selling book *Why Do They Act That Way? A Survival Guide to the Adolescent Brain for You and Your Teen* (Free Press, 2004). He has worked with adolescents for over thirty years as a high school teacher, coach, parent and psychologist with Fairview Health Services.

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