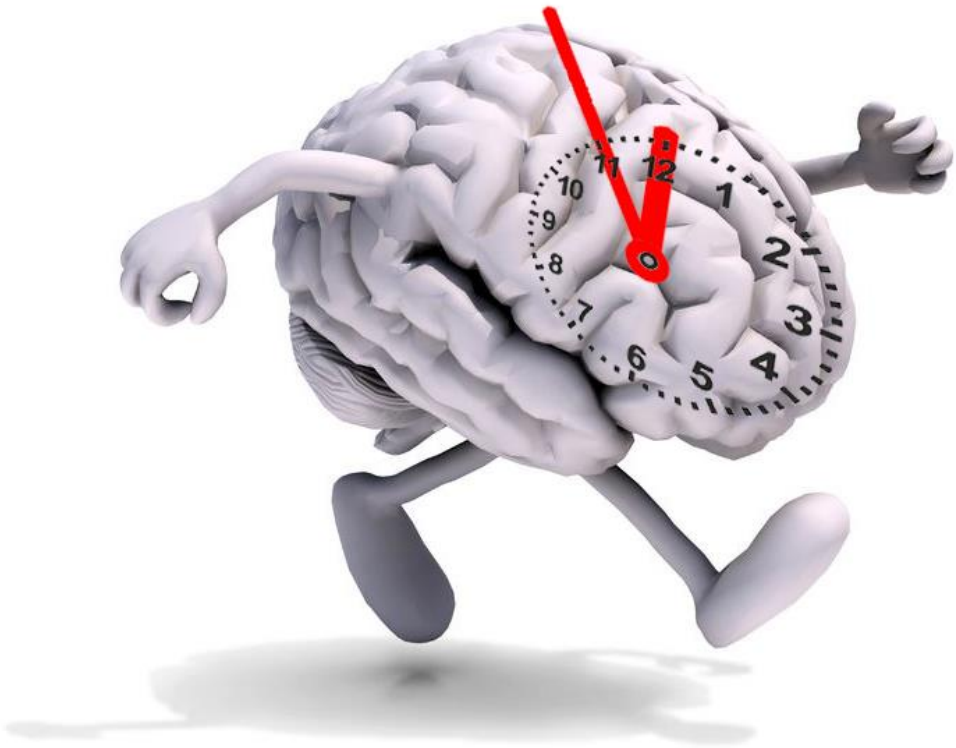
The Race against Time



Four Ways You Can Help Your Adolescent Child Build a Superior Mind

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Game-Changing Insights for Parents

"It's easier to build strong children than to repair broken men."
– Frederick Douglass –
American social reformer (1818-1895)

The other day my wife and I went to a large nursery in Austin hoping to find just the right fountain for the center of our back yard. The nursery was having a promotional event with food and a country rock band, and hundreds of people were in attendance.

As we entered the nursery, a young man greeted us. “Can I help you find something?” He was a tall, polite young man. I assumed he was a student at the University of Texas, working his way through college. We described what we were looking for and Jeff explained how fountains work and what we would need. There was a dizzying array of options, and some of them were priced at ten times what we expected to pay. But our guide patiently took us from one area to another, showing us the possibilities.

As luck would have it, our search ended when we saw a gorgeous fountain at just the right price. When we asked if he would replace the pump with a new one, he said he would check with his manager. His boss turned out to be the owner of the nursery and his step-father, a take-charge fellow who said, “I’ll take care of it for you.”

Jeff took us to the cashier and made sure we got a 20% discount. As he helped us load everything into our car, I found out that he wasn’t a college student. He was only fifteen years old! Something wonderful was happening in his family that resulted in his acting like a responsible, capable adult, instead of a typical 15-year-old kid. He told us that he was involved in the Future Farmers of America program at school.

For me, Jeff is an example of what can happen when a kid is fortunate to have adults around him who encourage him to think for himself and get involved in work and activities that require him to learn, set goals, solve problems, plan, and manage projects.

Most kids aren't as lucky a Jeff.

But to take luck out of the equation, I've written this brief ebook for parents. Because something momentous is happening in the brain of every adolescent child, setting up a once-in-a-lifetime opportunity to lay the foundation for critical thinking, and the future success and happiness of the child hangs in the balance.

When I explain to parents what's happening in the adolescent brain, how it affects the young person's behavior, and the potential for lifelong positive or negative consequences, the typical reaction is one of surprise and gratitude. Surprise because the information was previously unknown to them, and gratitude because these insights can help them create a bright future for their child.

That's why I've written this ebook—to share this life-changing information with as many adults as possible. Usually, many people get involved in the raising of a teenager—parents, relatives, teachers, counselors, ministers, coaches, or other mentors. If they want the kids they're working with to grow up to be successful, happy and independent adults, youth mentors need to understand what's really going on in adolescent brains.

In Part I you'll learn about the changes that are happening in the adolescent brain, the enormity of what's possible, and how quickly this opportunity can be lost. Once you grasp this concept, you'll want to know how you can help your child wire his or her brain for good judgment and critical thinking.

The chapters in Part II address how you can interact with your teen to encourage exercising the prefrontal cortex, the area that handles critical thinking. When you implement the four strategies I describe, you'll help stimulate your child's brain to wire the circuits for conceptual learning, analysis, logical judgment and conscious decision making.

My challenge as a writer has been to be accurate and thorough so you understand what's going on, but brief and clear so you aren't overwhelmed by the science. If you agree that this information is as important as I believe it is, I encourage you to share this ebook with your child and other adults in your "village" who work with young people.

I

What You Need To Know about the Adolescent Brain

It helps to know why teenagers behave the way they do. But that's only the first act of this high-stakes drama.

— Chapter 1 —

The "Teen Brain" Discovery

For decades neuroscientists believed that the human brain was fully developed and ready for advanced learning by the age of ten—an assumption that has turned out to be false.

Chances are you've heard about the "teen brain." During the past ten years quite a few books, articles, and videos have talked about the growth spurt that happens in the brains of adolescents and the impact it has on their behavior. As a result, we have a more tolerant understanding of their often emotional, impulsive behavior.

These insights were made possible by the breakthrough research done by Dr. Jay Giedd and others at the National Institute for Mental Health in the mid-1990s. Previously, it was believed that all phases of brain development were complete by age 10. When Giedd examined the brains of adolescents using fMRI imaging, he discovered that after puberty young people experience a dramatic second wave of brain development.

According to Dr. Giedd, the most significant brain area affected is the prefrontal cortex (PFC), which is located directly behind the forehead. He explains: "The frontal lobe is often called the CEO, or the executive of the brain. It's involved in things like planning and strategizing and organizing, initiating attention and stopping and starting and shifting attention."

These are the functions needed to control impulses. Because the PFC isn't fully developed in the teen brain, the amygdala, a more primitive area, triggers emotional reactions without the benefit of judgment.

This is why young people often don't think before they act. They do what they do, not because they are crazy, perverse or mean-spirited, but because the part of the brain that handles judgment is under construction. This makes it hard for them to foresee consequences and make good decisions.

This insight is welcome news to parents, teachers, coaches and counselors, who are often bewildered by teen behavior. But while knowing why adolescent children act the way they do is helpful, there's much, much more to the story.

It has always been true that some adults are brilliant, while others struggle to connect the dots. Now we know why.

— Chapter 2 —

The PFC's JOB—Critical Thinking

"It's easier to be told by others what to think and believe than it is to think for yourself."

– Neil deGrasse Tyson –

American astrophysicist (1958 -)

In my favorite book about the teen brain, *Why Do They Act That Way*, Dr. David Walsh says: "Because the PFC is the executive center of the brain, its job is to think ahead about the consequences and to control impulses that shoot out of other regions of the brain. Because it is still developing during adolescence, teens do not have the impulse control of adults."

This implication that "impulse control" is the primary function of the prefrontal cortex is echoed in other books about the teen brain. But this explanation dramatically understates what the PFC actually does. It receives input from other areas of the brain for a reason. It relates all this information to "connect the dots," so to speak. As a consequence the frontal lobes are involved in much more than controlling impulses:

- Relating objects, concepts and principles
- Analyzing cause and effect
- Foreseeing future consequences
- Logic—inductive and deductive reasoning
- Empathy
- Insight
- Intuition
- Creativity
- Aesthetic judgment
- Making moral and ethical decisions
- Troubleshooting

- Problem solving
- Analyzing advantages and disadvantages
- Making conscious decisions
- Setting goals
- Making plans
- Getting organized
- Managing follow-through actions

If teenagers can understand the cause-and-effect relationship between "getting high" and reduced reaction time, they can foresee the potential for accident and injury. If they set a goal, they can think about the logical steps needed to accomplish the goal. These are the mental abilities that distinguish human beings from all other animal species. The umbrella term for all these powerful mental skills is "critical thinking."

Not everyone is equally gifted as a thinker. Consider the folks you know and encounter every day. Some of them you might describe as "brilliant" thinkers. Others may be "doing the best they can with what they have."

Wouldn't it be wonderful if your child turned out to be an intellectually gifted adult, someone who is capable of high-level learning, thinking and achievement? Everything depends on how extensively your child's PFC gets wired, which in part depends on how much, how often and how early he or she exercises critical thinking during adolescence and whether your child avoids the damaging effects of alcohol or drug abuse.

To help you understand how this works, I need to explain a few things about how a child's brain develops.

— Chapter 3 —

Brain Wiring 101

The human brain has a special way of constructing itself, very much like an artist taking delivery of a block of marble and then chipping away at it until all that remains is the masterpiece.

Specific brain areas perform their functions only if the brain cells there are physically linked for this purpose. Brain scientists often refer to interconnected brain cells as "wiring," an accurate metaphor.

The human brain has many areas, and each performs a specific function, such as seeing, walking and speaking. ***Each area gets wired at a different stage of growing up.*** A child would be overwhelmed if she had to wire every area of her brain all at once.

Instead, when a certain brain function is needed for the next step of growing up, the brain signals it to begin constructing the foundation for that function. For example, the part of the brain that translates input from the optic nerve into sight begins wiring the moment an infant's eyes open for the first time. Nearly a year later, the area of the brain in charge of language begins wiring for speech.

In any given brain area, ***the foundation skills wire first***, so that more sophisticated add-on skills can be learned later. For example, a child can learn grammar skills and debating skills in school, but the wiring for speech must be present first. A child can learn to ride a bike or dance, but the wiring for walking must be connected first.

The brain has a special way of connecting the foundation circuits. To begin the process, the brain signals a particular area to produce several times more connections than will actually be needed. This initial step is called ***"blossoming."***

When a child repeatedly exercises the basic function of that area, the activity stimulates the required brain cells to fire together as a circuit. Over

time, the unused connections slowly atrophy and are absorbed by the body. Only the connections that were used repeatedly remain. This gradual sculpting away of unneeded connections is called ***"pruning."***

An important point: a brain area doesn't actually "wire itself." ***The child has to do the work.*** The child has to make an effort to exercise the function to stimulate specific cells to form the needed circuits.

And the child doesn't have forever to do this. With pruning going on, the principle of "use it or lose it" is in force. It's like a ***sensitive "window of development opportunity."*** Kids who make a concerted effort while the window is open will stimulate wiring for a robust foundation. The unfortunate children who fail to exercise the function will run out of time before pruning eliminates most if not all of the brain cell connections, causing a deficit or even absence of the function.

Fortunately, normal children are highly motivated to do the work: to grab, throw, sit, crawl, walk, and talk. It's how they get what they want from the world around them.

It's simply not true that teenagers' moody, impulsive, risk-taking behavior is a phase they outgrow by the time they're adults.

— Chapter 4 —

The Crazy, Confusing Consequences of Blossoming in the PFC

Expanding a main road will greatly improve traffic flow, but while it's under construction it will be hard to travel on it.

The prefrontal cortex (PFC), the primary function of which is critical thinking, is the last brain area to undergo basic development. The sensitive window of development opportunity opens at puberty and closes about ten years later at the end of adolescence. It gets wired for basic functioning the same way all other brain areas did earlier in childhood.

The blossoming in a young person's PFC is actually the second blossoming of this area. The first happens at the toddler stage, enabling the kind of cause-and-effect thinking a child needs during the early years. Little kids need to learn why things happen in order to live effectively in the protected environment of a family. This is why they ask "why" a lot at that age.

But the kind of mental capacity they develop as small children won't be enough to serve them when they are independent adults trying to make their way in the complex world of work and relationships. So at puberty the critical thinking part of their brains undergoes a second developmental process during adolescence.

As I've explained, the kick-off event is "blossoming," or the rapid growth of many times more brain cell connections than will ever be needed. An adolescent child who exercises critical thinking will reinforce the needed connections in the PFC.

To suggest how disabling blossoming can be to a pre-teen, I'll use the analogy of road construction.

In the town where I live, the north side of town is in an area of rolling hills, and the south side of town is in a plain. So the main route that goes north through town is flat until it begins a steep ascent approximately in the middle. As the population grew, sections of this two-lane road were widened and improved. The easiest areas—before and after the steep ascent—were constructed first. But the section that climbed the hill remained narrow and became a bottle-neck to traffic.

When the city undertook to shore up the hillside in order to widen and improve the road that climbed the hill, it had to close this area to traffic for more than a year. Predictably, the detours were confusing and inconvenient and caused irritation, delays and a few accidents.

Something similar happens in an adolescent's PFC. Even though powerful new critical thinking pathways are under construction, at first it's harder for a young person to use what we call "good judgment." There are too many unused connections to make efficient functioning possible.

So a "detour" takes them to the amygdala, which is a primitive part of the brain used for emotional reactions. They act impulsively and take imprudent risks just for fun without thinking about the consequences. They experience bothersome mood swings and surges of emotion and don't know why. It's a difficult time of life, both for the child and the parents.

Now that brain science has explained what's going on, we can be more understanding and tolerant of post-pubescent behavior. At the end of adolescence, after the PFC's construction is over, hopefully young adults will enjoy abundant critical thinking capabilities.

Or will they?

Helping young people wire their brains for basic critical thinking skills is a race against time.

— Chapter 5 —

Pruning and the Ticking Clock

While any brain area is being developed, a child has to use the function repeatedly or lose it.

Like the process that governs the basic development of all other areas of the cortex, the second blossoming of the PFC is followed immediately by a period of pruning.

Because this is the area that handles various aspects of critical thinking, each time the adolescent child relates objects, concepts or principles, brain cell connections involved are reinforced. With enough repetition, permanent circuits form. As a teenager thinks about cause and effect in order to imagine future consequences, or as he uses reasoning to solve a problem, more foundation circuits are reinforced. In other words, by using critical thinking skills, the child's PFC will establish wiring for these skills.

But ***it's a race against time.*** The window opens at puberty with blossoming and closes when there are no more unused brain cell connections to be pruned. The process is like a sculptor chipping away at a block of marble. At the end of the artist's work all the unused marble will have been discarded, and only the masterpiece will remain. As far as the PFC is concerned, after pruning has done its work, only the brain cells exercised over and over for critical thinking will remain connected. Hopefully, by the time adolescence is over, the young adult will have exercised critical thinking early and often so that the foundation that remains is extensive and robust.

But what if this doesn't happen? What if a sizable portion of connections in the PFC gets pruned away because the child didn't exercise much critical thinking during adolescence? Every concerned parent needs to consider this question, because most of the activities that grab the attention of teenagers have nothing to do with critical thinking.

The sobering answer: each child's PFC wires differently. The kids who exercised critical thinking a lot will have more foundation skills than the kids who didn't. At the end of adolescence, when there are no more unused brain cells to prune, the foundation circuits that remain are all the young adult will ever have to build on throughout the rest of life. ***These consequences are permanent and irrevocable.*** No do-overs. Adults who constructed a minimal foundation for intellectual capacity can still build on it if they are motivated to do so, but their learning will be difficult and limited. You can't build a great edifice on a tiny foundation.

The stakes are high. The next time you're out in your community, consider the people around you. Not everyone has the same intellectual "gifts." Not everybody has the brainpower to pursue higher education or intellectually challenging careers. Many of the people you encounter in life are bright. Others aren't. It may seem heartless to say so, but some people will never be able to work through the challenges of a university education or a demanding profession. Some people will always struggle as they try to deal with the complexities of modern life and relationships, as they try to make the most of what they have.

So a young person literally has to "use it or lose it." Dr. Jay Giedd, the pioneering researcher who inspired all the books about the "teen brain," said it best: "If a teen is doing music or sports or academics, those are the cells and connections that will be hardwired. If they're lying on the couch or playing video games or watching MTV, those are the cells and connections that are going to survive."

In other words, ***the craziness of teen behavior isn't a phase kids outgrow*** as they get older. They will seem to "grow out of" some of it only to the extent that they exercise critical thinking before the sensitive window of PFC growth closes. At the end of adolescence, young adults who did the work will have ingrained robust circuitry for critical thinking. Others will have trouble connecting the dots—for the rest of their lives.

Another unsettling fact: Unlike small children, who are desperate for the benefits their new skills will give them, ***teenagers aren't internally motivated to do the work***, which is why many of them don't make the

effort. They don't know what critical thinking is, why it's important, how to development it, or the consequences of a failure to do so. It's possible to navigate their way through high school culture without being "smart" about what they do.

But there are elements in a child's life that can encourage them to do the necessary work anyway, even if neither adult nor child understands what is happening:

- Many aspects of education have the potential to stimulate critical thinking, such as philosophy, science, math, engineering, and technology courses. But the child has to take the coursework seriously.
- Many hobbies and extracurricular activities, such as chess, Sudoku, robotics and entrepreneurial pursuits can stimulate critical thinking; but the child has to get involved.
- Many teachers and other adult mentors can stimulate a young person to think for themselves and work through their own problems; but not all the adults in your child's life approach their work this way.
- Some kids are lucky to have parents who challenge them to think for themselves. Do you do this with your child?

In other words, because most adults know nothing about adolescent brain development, ***a kid needs a little luck***. This has always been the way of life. There have always been a few young people who were encouraged to think, which caused them to develop superior minds.

If you have read this far, you understand what's going on in the adolescent brain and can use this knowledge to proactively encourage and support learning, activities and relationships like those mentioned above. By making your child aware of what's happening, encouraging activities that involve critical thinking and coaching your child to do the thinking, you can literally change the game.

Most parents are surprised to learn that they can have a major positive influence on their child's brain development.

II

Four Ways to Help Your Child Develop a Superior Mind

Part I revealed that there are life-long consequences to the brain development going on during adolescence. If a teen exercises critical thinking early and often, he or she can develop a superior mind.

But will your child do that?

You don't have to leave it to chance. While the window of opportunity is still open, here's what you can do:

1. Help your child avoid using alcohol or drugs during adolescence.
2. Encourage involvement in courses and extracurricular activities that stimulate your child to think.
3. Make your child aware of what's happening in his or her brain.
4. Use five communication skills that encourage your child to think.

— Chapter 6 —

True Story—How I Got Lucky

"I'm a great believer in luck, and I find the harder I work the more I have of it."

– Thomas Jefferson –

American President (1743-1826)

If you put into practice the four strategies I describe in this book, they'll work. Like cause and effect, you will take the bull by the horns and proactively help your child build a superior mind. But you'll be the first generation of parents on Earth to do so.

Of course back in the 1950s, this knowledge didn't exist and my parents did no such thing. But like a small percentage of other fortunate young people (and unlike my other seven siblings), I got lucky. I developed a robust PFC anyway. I'll tell you how this happened.

I had caring, supportive parents. But like everyone else at the time, they knew nothing about the prefrontal cortex, its game-changing functions, or how to maximize its development during adolescence. Nevertheless, some of the things they did while raising me had an impact on how my brain got wired, and by the time I was an adult I had established a robust foundation for critical thinking.

When I was young, three interests dominated my life: Little League baseball, scouting, and making A's. My parents encouraged and supported me in all three areas.

Baseball was what I did when I wasn't sitting in a classroom. I loved throwing, catching, hitting and running. My pals and I got together in a vacant grassy lot nearly every afternoon to indulge in this kind of childhood joy. While my father was serving in Korea, my mother bought me the most expensive fielder's glove available at the time and showed up for most of my games. In my last season, I was the league leader in home runs and was selected for the all-star team. Today I realize it was a character-building and confidence-building experience.

Scouting did something more for me. When I was a brand new Tenderfoot scout, I set a goal to achieve the Eagle Scout rank by the time I was 13. Pursuing this goal required a lot of learning, planning, problem solving and hard work, all critical thinking activities at a time when my prefrontal cortex was developing. And my perseverance paid off. I was awarded the Eagle Scout rank a few weeks after I turned 13. Of course I had no idea that all that work was wiring my adolescent brain.

One of my vivid childhood memories was my first day of school. Before I left home, I anxiously told my mother that I wasn't ready, that I didn't know how to read. She smiled and said, "Don't worry. They'll teach you."

But I worried about it anyway, so during my first year of school I became obsessed with impressing my teacher. I wanted her to acknowledge that I was her best reader. And at the end of the year, she did. After that I was hooked. Throughout my 12 years of school I defined myself as someone who never made any grade lower than an A. In middle school and high school, this relentless pursuit of academic success drove me to do the kind of thinking that would continue developing my PFC.

And I was lucky in yet another way: I avoided using alcohol or drugs as a teenager. Once again, it wasn't because I was smart about the damage it could do to my developing brain. Like all teenagers, my friends just wanted to experiment with whatever was forbidden, get high and brag about it the next day.

My own experience with alcohol and drugs wasn't typical. I was raised in a Mormon family; and smoking, drinking and using illegal drugs were a religious taboo. Even caffeinated soft drinks were considered drugs. I

accepted this belief, so I didn't smoke, drink or experiment with drugs—not even once—during my entire adolescence.

In fact, I didn't have my first alcoholic drink until I was 25 years old. It was in the spring of 1970. I was a captain in the U.S. Army, the commander of an infantry advisor team in Vietnam.

One day near the end of my assignment, I attended a promotion party for a Vietnamese lieutenant who had walked shoulder to shoulder with me on many combat missions. The lieutenant's boss, a Vietnamese major, drank a toast to him. Then, to my surprise, the soldiers wanted me to toast their leader, too. Someone filled a tumbler with whiskey and handed it to me. I knew immediately that I had a decision to make. Should I do something that was forbidden by my religion? Or should I risk dishonoring my friend?

I realized that none of the soldiers would understand or accept my reasons for refusing to toast their leader. So I stood up, told the assembled group that my friend was a true hero and that I was proud to have served with him in combat. Then I lifted my glass high and downed all the whiskey in one long drink. The soldiers cheered wildly.

That was an amazing first taste of alcohol. I knew I would soon feel its effects, so I shook the lieutenant's hand and left. My room was only a block away, but by the time I reached it I was pretty wobbly. Fortunately, no mission was scheduled that day, and I fell onto my bed and slept it off.

But I was an adult by then, the sensitive window of brain development was already closed, and the critical thinking part of my brain wasn't threatened.

I had dodged the bullet during the dozen or so years of my adolescence, not because I was trying to avoid brain damage but because I was lucky to be raised in a family where using substances was out of the question.

And while I was still an adolescent, I got lucky in another way.

My father was in the military, so I knew about the U.S. Military Academy at West Point. Throughout my high school years I dreamed of going to college there and becoming an Army officer. The problem is, I had to get an appointment, and many of these decisions are made by politicians. Because

we moved around a lot, I didn't grow up in any single state and I didn't know any senators, congressmen or governors.

I applied for an appointment from Kansas, my dad's home state and therefore my "default home of record." The governor was a busy man and he asked his staff to study the applications and recommend a choice. I guess my resume was pretty strong, because I was one of those selected, even though I had never actually lived in Kansas.

At West Point, attending class was mandatory—over 20 credit hours per semester. I even attended classes on Saturday. I found out there were a lot of guys my age who were smarter than I was. It was humbling. I wasn't used to feeling less than excellent, and I didn't like it. It motivated me to study as hard as I could, in spite of the pressures, which were many.

My courses at West Point were challenging and sometimes interesting, even though I used very little of what I learned in my career. But the courses made me think. I didn't know it at the time, but I was trying like crazy to exercise my PFC to get good grades. Courses like civil engineering, fluid mechanics, strength of materials, quantum physics, and nuclear engineering—all required—involved a lot of analysis and problem solving. Math courses involved studying a procedure at night and the next day solving three problems on a blackboard without referring to the text. At random, one of us would be called on to explain his work in front of the class—for a grade. Military history was all about analyzing why battles were won and lost. Even English classes forced me not just to enjoy literature, but to understand the underlying themes.

The experience was arduous, but from a brain development standpoint, having to take these courses was one of the luckiest things that ever happened to me. By doing the work I constructed a massive foundation for critical thinking, judgment and problem solving. Today, I apply these skills every day as I do my work.

So yes, I was fortunate. Taken together, the activities I became passionately interested in had an enormous impact on the mental capacity I now enjoy as an adult.

But I didn't write this ebook to tell you about luck. The point is, most kids aren't fortunate in this way, and luck shouldn't have to be the primary factor.

What can you do while the sensitive window of development is still open? The good news is that you can make a difference. You can't do the work for your child, but there are four things you can do to guide and influence your child to do the work:

1. Help your child defer using alcohol and drugs until adolescence is over.
2. Encourage your child's involvement in activities that exercise critical thinking.
3. Let your kid in on "the secret"—share the information in this ebook.
4. And the most powerful influencer of all: change how you talk to your child. Instead of reacting emotionally to adolescent situations—as nearly all parents do—learn to use five communication skills that stimulate your child to exercise critical thinking.

The remaining chapters describe how to implement these four strategies.

When adults get drunk they sometimes get stupid and joke about it the next day.

When teenagers get drunk, the diminished intellectual capacity can last a lifetime.

— Chapter 7 —

Strategy #1 – Defer Teen Alcohol and Drug Use

"Sometimes when I'm working with teens, I try to reason with them that if they're doing drugs or alcohol that evening, it may not just be affecting their brains for that night or even for that weekend, but for the next 80 years of their life."

– Dr. Jay Giedd –

Neuroscientist, NIMH

How would you feel if you discovered that your child was using alcohol, cigarettes or drugs?

I assume you'd be pretty upset. You know that substance abuse can harm your child, which is the reason most states make it illegal for minors to buy cigarettes or alcohol. It's also illegal to sell them to minors or for adults to give them to minors, except in rare circumstances, such as in the home under the supervision of a parent.

And of course illegal drugs are, well, illegal, because they're addictive and can be life-threatening.

Most kids drink when adults aren't around. And they almost never do so to relax or make friendly conversation. Mostly they binge drink for the high. Binge drinking by minors accounts for about 10% of the alcohol consumed in the U.S.

The Familiar Consequences

Under-age drinking may seem self-destructive, but kids have their reasons. They drink to relieve the stress of adolescent life. They drink because they're told not to, to rebel against restrictions and feel grown-up.

They drink because they don't want to be excluded from good times and to prove to their friends that they can tolerate drinking to excess. And like doing anything illegal, the risks they take make the forbidden activity seem exciting.

You already know about alcoholism and its impact on work and relationships.

But other bad things can happen when an adolescent child's difficulties using judgment are further impaired by alcohol or drugs. Imagine what can happen when teens do this together in the name of fun. Substance abuse is a common factor in traffic accidents, suicide and just about any awful thing that can happen to kids who are learning how to be adults. Binge drinking can cause alcohol poisoning, which can lead to death. Each year nearly 5,000 under-age kids die from alcohol related incidents. Over half a million teen girls become pregnant every year, and in about a third of the cases, alcohol or drugs was a factor.

And of course there are health risks. According to the National Institute on Alcohol Abuse and Alcoholism, alcohol can damage the heart, the liver, the immune system and the brain.

If the thought of your child getting high with other teenagers frightens you, I'm with you. If it were up to me, it would be impossible for kids under the age of 25 to get their hands on any of these substances. Why? My reasons have to do with a consequence you may know nothing about.

The Hidden Horror

Doctors warn pregnant women that alcohol and drugs can damage a baby's brain. But nobody is warning teenagers.

I recently visited a local outdoor hangout called "The Pour Haus." A large, mostly young crowd had gathered for happy hour, and several interesting craft beers were on tap. After about half an hour of enjoying the festive atmosphere, I found the men's room. As I washed my hands, I noticed a small sign next to the mirror:

- ***Drinking any kind of alcohol can hurt your baby's brain, heart, kidneys and other organs and cause birth defects.***

- ***The safest choice is to not drink at all when you are pregnant or trying to become pregnant.***

- ***If you think you might be pregnant, think before you drink.***

This is a terribly important message, but I was surprised to see it at eye level in the bar's men's room. A shield against liability? I assumed that the same sign was also posted in the women's room. It's the warning nearly every pregnant woman hears from her doctor.

The unborn baby's body and brain slowly develop during the nine months in the mother's womb, and the blood of the mother provides materials to the placenta, which nurtures the growing fetus. If the mother consumes alcohol or drugs during pregnancy, the chemicals can make their way to the baby, and the phase of development that is happening at the time can be disrupted.

THE DANGER: When alcohol or drugs enter an unborn child's brain, it can cause permanent life-limiting damage.

Doctors refer to the range of possible birth defects as "fetal alcohol spectrum disorder," or FASD. The visible body disfigurement can be shocking. The actual damage to the brain can't be seen, but it permanently disables a child's behavior.

If this explanation doesn't give you cold chills, I recommend you view the video, "Moment to Moment: Teens Growing Up with FASDs," available on ntiupstream.com. Doctors' warnings prevent most of these horrors, but not all. In the U.S., over half a million children suffer from a FASD. Tragically,

most of them will never be able to live independently or have normal relationships.

Adolescent children who abuse alcohol and drugs are also at risk of brain damage, but not for the same reason. Obviously, if a teenager's mother drinks alcohol or uses drugs, the substances will not pass to the child.

The difference between an adolescent and an unborn child is that the older child can consume alcohol or drugs directly to damage his or her own brain without the help of the mother.

But this hidden horror goes way beyond the visible craziness, mistakes and mishaps of adolescence. I'm talking about a ***life-long diminishment*** of your child's ability to reason, think critically and use good judgment. Put another way—the equivalent of ***permanent brain damage.*** A good friend of mine told me about his 27-year-old nephew who smoked marijuana and drank a lot as a teenager. He said the young man still lives at home and acts and talks the same way he did when he was 15.

To connect the dots:

1. You learned in Part I that a hugely important area of the adolescent brain—the prefrontal cortex, which handles critical thinking—is still developing and vulnerable to disruption.
2. In the same way that the developing brains of unborn babies can be damaged by their pregnant mother's substance abuse, when adolescents use alcohol or drugs the chemicals can disrupt normal development of their PFC.
3. No one knows how much substance abuse is dangerous or when a teen's brain is most vulnerable. But any damage, whether slight or severe, will be permanent.

THE DANGER: When alcohol or drugs enter an adolescent child's brain, they can derail normal development of the prefrontal cortex—permanently.

Consuming drugs and alcohol is like taking a hammer to a block of marble while the artist is trying to sculpt her masterpiece. If a teen doesn't

take care of his or her brain, none of the other strategies for developing a superior mind will have much effect. To develop a superior mind, your child needs to give his or her brain a chance.

Information about the adolescent brain is relatively new, so few parents are aware that their kids' brains are at risk. And It may be hard for an adult to appreciate this risk, because only adolescents are vulnerable. Adults can get high, be hung over the next day, and suffer all the well-known health-threatening effects—without the risk of derailing their own brain development. For them, the last phase of brain development was over in their early-to-mid-twenties.

My guess about the total number of young people in middle school, high school and college who understand the chances they're taking when they drink alcohol or use drugs: ***zero.***

The simple, essential (but not always so easy) strategy: ***Avoid using illegal drugs altogether, and don't drink alcoholic beverages until after adolescence, i.e., the mid-twenties.***

— Chapter 8 —

Strategy #2 – Encourage Activities That Exercise Critical Thinking

"Whatever we learn to do, we learn by actually doing it: men come to be builders, for instance, by building, and harp players by playing the harp. In the same way, by doing just acts, we come to be just; by doing self-controlled acts, we come to be self-controlled; and by doing brave acts, we come to be brave."

– Aristotle –

Greek philosopher (B.C. 384-322)

Any thought or action that is repeated over and over will wire itself in the brain as a skill, habit, routine or behavior pattern—all of which are exactly the same thing in the brain. This learning process is a survival mechanism so that people don't have to relearn how to do everything when they wake up in the morning.

Adolescent children wire their PFC for critical thinking skills the same way. All they have to do is engage in activities that require them to use the skills.

Of course, most favorite teen activities do nothing to exercise critical thinking. For example:

- Taking "selfies" and posting them on Instagram
- Listening and dancing to pop music
- Attending concerts
- Sunbathing at the beach
- Sleep-overs
- Riding around in cars with friends
- Seeing and being seen where teens gather
- Dating

- Theme parks
- Watching sitcoms on TV
- Playing violent video games
- Texting and posting on social media

This is a short version of what could be a very long list. There's nothing inherently wrong with any of these activities. Young people should make friends and have fun. And a lot of what happens in school doesn't exercise the PFC. Cheerleading, marching band, shop, and typing are examples of beneficial activities that do little to exercise the PFC. Even courses like English or history may not stimulate growth of the PFC if the teacher doesn't make analysis a part of the learning experience.

You shouldn't expect everything a young person does to stimulate development of the prefrontal cortex. However, ideally, your child will be drawn to some activities that do. Fortunately, there are many interesting things an enterprising young person can do to exercise the prefrontal cortex.

Reading. Books, especially non-fiction, can help a child find answers to why, how and what if questions. Most young adult fiction is escapist in nature and doesn't stimulate much thinking. But practically any book has the benefit of expanding a child's vocabulary. The intellect as we know it would be impossible without language. Words are the building blocks of logic and ideas, and concepts are the building blocks of intellect. A person with a vocabulary of fewer than 1,000 words (trust me, there are many such adults) is practically incapable of critical thinking. How can you piece together a puzzle when you have too few pieces? How can you connect the dots when some of your dots are missing? Readers have a huge advantage over non-readers.

Games. Kids love games, and some of them are more mentally stimulating than others. Card games like bridge and poker require awareness, memory, cause-and-effect thinking and strategy. Board games like chess and Go exercise strategic thinking; even dominoes and checkers require some critical thinking.

Experts disagree about the dangers and benefits of video games. The controversy centers on whether participating in virtual violence contributes

to violent behavior patterns. While it's true that many video games such as Grand Theft Auto and Call of Duty are popular because they let the gamer simulate crime, killing and destruction; other "strategic" video games exercise critical thinking without simulating violence, such as Sim City, StarCraft and Civilization.

Video games are a multi-billion dollar industry, and their concern is profit, not whether their games wire a kid's brain for violence. Young people play them for the thrill, so it's up to parents to know what kind of video games their kids are playing, discuss the issue with their child, suggest positive alternatives and agree on boundaries.

Courses. Many of the courses offered in schools require a child to exercise critical thinking: e.g., science, math, computer programming, and philosophy. Even English and history courses can exercise critical thinking, if the teacher's approach is to get students to analyze the stories and events (many teachers do not).

Extracurricular activities. Any activity that involves goal-setting, problem solving, planning and managing can exercise the PFC. Scouting, public service projects, math or science competition, robotics team, debate, Future Farmers of America, and yearbook staff and event planning and execution, especially if the child has a leadership role. Other activities, such as cheerleading and marching band can be character-building experiences, but do little to exercise critical thinking.

Personal goals, projects and money management. When a child wants something expensive, such as stylish clothes, a car, golf equipment, or even college tuition, setting goals and earning money to pay for it can inspire goal-setting, creativity, problem solving, planning, time management, budgeting and financial management, all activities that involve critical thinking skills.

Giving your child money for whatever he or she wants may satisfy your ego, but it kills motivation to get involved in beneficial activities. On the other hand, it doesn't work to require your child to participate. But you can influence your child's choices if you aren't heavy-handed about it. If you know which activities benefit PFC development and if you notice that your

child seems interested, you can show your own genuine interest, share information, express your enthusiasm, and offer support.

— Chapter 9 —

Strategy #3 - Let Your Kid in on the Secret

"Knowledge is power."
– Francis Bacon –
British philosopher (1561-1626)

I sometimes wonder how my life would have been different if when I was a teenager I had known what was going on in my brain. It's a futile "what if," because back then no one on Earth knew anything about the adolescent brain. By the time Dr. Jay Giedd made his momentous breakthrough discoveries, I was 50 years old.

But if you've read this far, you know several game-changing facts about your teen's brain that at least 99% of parents do not. And your new understanding can empower you to help your child develop the mental capacities that will make a huge difference in his or her future education, career and relationships.

One strategy that can make a big difference is shockingly simple: ***let your kid in on the secret!***

How can you expect your teen to cooperate in your efforts to encourage critical thinking if he or she has no idea what's going on? If a teen doesn't know the brain damage alcohol can cause during the sensitive window of development, why should a teenager make the choice to avoid using it?

Knowledge is power. If they know the high stakes and the opportunities, I believe some adolescent children will make better choices about their education and activities. I'm not aware of a single downside to a teenager having this kind of self-awareness. None of the experts who write about the "teen brain" recommend against this strategy. In *Why Do They Act That Way?* Dr. David Walsh gives his opinion: "Educating your teen…about what

is going on in his or her brain can mitigate miscommunication. Teaching adolescents about their brain development will help them keep in mind that they can tend to misinterpret others and overreact."

And yet, you may feel you're not up to the task of explaining the science. The solution is simple. Just give this ebook to your child and encourage her or him to read it. Then the two of you can discuss what critical thinking is, why it's important, and what you can do to build the strongest possible foundation.

The most beneficial thing parents can do for their kids is to change the way they talk to them.

— Chapter 10 —

Strategy #4 – Change How You Talk to Your Child

"A torn jacket is soon mended; but hard words bruise the heart of a child."

– Henry Wadsworth Longfellow –

American poet (1807-1882)

Adolescent children need to go from being naïve, dependent kids to competent, independent adults, and they have only ten years to accomplish this. The goal isn't to preserve the family unit as it has been for a dozen years, but to raise an adult—to help prepare your child to leave home and create a happy, successful life.

If this sounds like a daunting challenge, it is. Helping a teenager learn how to become an adult means dealing with an ongoing series of conflicts, confrontations, crises, problems and mistakes.

Most parents don't handle the challenges well. Since the beginning of time, most parents have made two huge mistakes: (1) reacting emotionally (anger, shouting, criticism, shaming, blaming, arguing, name-calling, put-downs, or even physical violence) and (2) simply handling issues themselves, providing answers and solving problems for the child.

These typical reactions may feel natural and automatic; but it's the easy way out. You may have learned this approach to parenting from how you were raised by your own parents. But these mistakes will cause your child to pull away from you and seek guidance from peers. And it won't prepare them learn to become adults.

When things start to unravel, your alternative is to use five basic communication skills:

- Encourage your child to think
- Listen to understand
- Give feedback

- Engage your child in dialogue
- Resolve conflicts together creatively

These powerful communication skills may go against the typical view of the parent-child relationship, in which wise, experienced parents have all the power and the answers and tell their kids what to do. But teens won't wire their prefrontal cortex and learn to think like adults if they aren't given the chance to do so.

Explaining how the five skills stimulate PFC development is the subject matter of my next book: *The Parent-Teen Game-Changer*. In it I go into a lot of detail about how to use the skills while dealing with the major issues of adolescence.

To help you understand the power of these skills, I'll describe them briefly here.

Encourage Your Child to Think

The basic skill is to ask instead of tell.

Coach your child to interpret and analyze things. Instead of always explaining things, which can come across to a teenager as a lecture, ask open-ended questions to get your child to ***think about why, how and what if***. For example:

- "What caused the problem?"
- "How are these things similar (or different)?"
- "Why do you think I want you to do this?"

Ask your child to foresee consequences. For example, you might ask:

- "If you were in that person's shoes, what would you do?"
- "How do you hope this will turn out?"
- "What's in it for you?"

Encourage your child to think through his or her own challenges, problems, conflicts or issues.

For example:

- "Why do you think this happened?"
- "Which is more important to you, [……..] or [……..]?"
- "How have you dealt with situations like this in the past?"
- "What other options do you have?"
- "What's possible in this situation?"
- "Is there an even better way to [……..]?
- "Why do you feel that's a good (bad) idea?"
- "How will doing this benefit you?"
- "What are the potential downsides?"
- "Why do you feel this option is best?"

Help your child set goals and make plans. For example:

- "What do you hope to achieve?"
- "What will it take for you to do that?"
- "What could hold you back?"
- "What support do you need?"
- "What should you do next?"

Coach your child to learn from experience. It's often said that experience is the best teacher. But kids don't always learn from what happens to them. To help your child analyze what happened, ask questions like these, in roughly this order.

1. **What happened?** Who said what? What was the sequence of events?
2. **Why did it happen that way?** Cause and effect? People's motives? What helped or hindered?
3. **What were the consequences?** Outcomes? Benefits? Costs? Problems? Resolutions?
4. **How would you handle a similar situation in the future?** What lessons did you learn? What basic principles?
5. **What's your plan?** How are you going to apply this lesson in your life?

Of course there's a lot more to learn about this and the other four skills, as well as how to learn the skill so that it becomes an automatic life-long habit.

The Other Four Communication Skills

Listen to understand. Most parents aren't effective listeners. What you should be doing is making sure you really "got" what your adolescent child was trying to tell you. You do this by giving your undivided attention, observing the nonverbal (feeling) message as well as hearing what was said, and then checking what you think you understood. This way of listening needs to be used in concert with the other four skills.

Give feedback. Most parents either over-praise or miss opportunities to express appreciation. And when they're unhappy, their feedback takes the form of criticism. There's a way to call attention to behavior, whether positive or negative, that's both supportive and helpful. The key is to express your feedback in context with what your child has been doing well and then to describe the specific behavior and how you feel about it.

Engage your child in dialogue. When parent and child have differing opinions, usually a lecture or argument ensues. Both try to convince the other of the rightness of their position. In dialogue, both express their opinions in order to understand each other's position without trying to "win," persuade or prove they're right.

Resolve conflict together creatively. When parent and child are at odds because they want different things, there are ways of finding alternative solutions that meet the needs of both. The skill is a "win-win" approach to conflict resolution: both parent and child explain the "need" that's driving what they want. Then together they brainstorm to think of alternative actions that will satisfy both of their needs.

In most parent-child interactions, all the skills mentioned need to be used in concert. That is, in typical conversations a parent will need to engage more than one skill, each at the right time. This is especially true when discussing topics that help teenagers prepare for adult life: freedom, responsibilities and boundaries; friendship, peer pressure and self-esteem;

dating and sex; alcohol and drugs; work, money and budgeting; school, learning and college; social networking, TV and video games; activities, time management and sleep.

Once you're comfortable using the skills, you'll experience several benefits:

- Helping your child wire his or her PFC for critical thinking
- Maintaining a loving, respectful relationship with your child
- Building your child's self-esteem, which is key to resisting peer pressure
- Proactively avoiding typical teen mistakes and problems
- Resolving teen issues when they arise
- Setting the example for adult communication and healthy adult relationships
- Using the five skills to benefit relationships with friends, family and coworkers

My forthcoming book, *The Parent-Teen Game-Changer* will be a companion resource for "Strong for Parenting," a virtual coaching program for building the five skills. You can get more information about this system at www.strongforparenting.com.

Also, new content is posted several times a week on my website www.drdennycoates.com. If you'd like me to send you a weekly summary of these latest posts, you can sign up at http://www.drdennycoates.com/ebook/.

About the Author

Dennis E. Coates, Ph.D., has been the CEO of Performance Support Systems, Inc., since 1987. He has been teaching, training, consulting and publishing learning systems for developing leadership and team communication skills for nearly 40 years. All this work has been based on his enduring passionate interest in how learning happens in the brain, what people can learn that will make the biggest difference in their work and life, and what people need to do to change their behavior.

His current passion is to help teenagers grow stronger to meet the future challenges of adult life. In 2012 he published *Conversations with the Wise Uncle* (for young boys) and *Conversations with the Wise Aunt* (for young girls), story-based books to help parents pass on wisdom about important life issues to their middle-school-age children. In 2013 he introduced specialized versions of *ProStar Coach* to meet the needs of adults who are involved in preparing teens to be successful adults: *Strong for Parenting* (for parents), *Strong for Mentoring Athletes* (for coaches), *Strong for Mentoring Students* (for teachers), *Strong for Mentoring Youth* (for youth program leaders), and *Strong for Life* (for young people). He recently launched the "Rising Stars Initiative," a program that offers scholarships to *Strong for Life* to success-oriented high school students.

His current project is a book for parents of school-aged children: *The Parent-Teen Game-Changer*. Focused on helping parents raise the next generation of strong,

successful adults, this work combines his knowledge of brain development and his 30 years' experience teaching communication skills to adults. In 1994 he created *20/20 Insight*, an award-winning customizable multi-source behavior feedback system for improving leader and team communication skills. Since then, hundreds of Fortune 1000 companies and millions of people worldwide have benefited from this breakthrough assessment program.

To address the need for a technology that supports post-assessment and post-training follow-through reinforcement, in 2012 he introduced *ProStar Coach*, an innovative online virtual coaching service. That same year he published *The Dark Secret of HRD*, a book to help executives and learning professionals understand the brain-based realities of skill-building and what is needed to transform the skills introduced in the classroom into lasting behavior change in the workplace.

A graduate of West Point (1967), Denny retired from the U.S. Army as a lieutenant colonel in 1987. Most of his military assignments were focused on delivering training, creating training programs, and personnel management and included service in Vietnam and Germany. He earned his Ph.D. in English from Duke University (1977) and has served on the faculties of the United States Military Academy, the Armed Forces Staff College, the College of William and Mary, and Thomas Nelson Community College. In addition, he was an adjunct lecturer at the Center for Creative Leadership (1980-90). He has 50 years' experience in leadership positions, and today he is a recognized learning and development thought leader.

Dr. Coates lives and works near San Antonio, Texas, with his wife, Kathleen Scott, who is a free-lance travel and lifestyle writer. His two grown sons are pursuing successful careers in information technology.

Visit his website and blog at www.drdennycoates.com, a portal to the best experts, bloggers, books and other resources for raising teenagers. New information is published several times a week.