

What Parents And Teachers Need To Know About The Teenage Brain And Executive Function



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There is a set of mental skills that's one of the best predictors of a successful life in virtually every way you can

measure success. Yet most people don't even know it exists.

It's called executive function. Usually abbreviated EF, executive function plays a big part in mental health, teaching, parenting – even employment - virtually the entire behavioral food chain of human experience.

If a parent should know one thing about executive function, it's the potent position EF plays in a teenager's life. Its impact is so powerful you could design an entire high school around its care and feeding. I've explored this idea in my most recent book *Attack of the Teenage Brain*. To help you understand what this means, we'll start with a simple definition, move to mental health, visit a classroom, and end in your home.

What is Executive Function?

I define executive function as "the ability to get things done - and not punch someone in the nose while doing it."

Executive function is a set of mental skills that help you get things done. It's located in the frontal lobe of the brain, and can help you manage time, pay attention, multitask, and more. It's also involved in a teen's mental health, which we know is critically important to understand,

The peak onset age of mental illness in this country is 14

years old. Yep, it starts with *teenagers*. That statistic includes affective disorders (like depression), and thought disorders (like schizophrenia). Some researchers believe most mental disorders actually occur during adolescent brain development.

Scientists have been looking at behaviors underlying these disorders for decades. They've uncovered a stunning finding, which underscores the importance of EF. The vast majority of mental health issues are problems in executive function.

Why is Executive Function Important for Teenagers?

Executive function goes by many names, including "self-control." Most researchers agree it's like the Golden Gate Bridge, a structure anchored by two piers.

The first pier is cognitive control, involving things like shifting attention, short-term memory (working memory), and understanding the consequences of one's actions. The second pier is emotional regulation, which includes impulse control. These two abilities, one cognitive, one emotional, are roped together to achieve a goal of some kind, hence the "getting-things-done" descriptor.

You can actually measure EF using psychometric tests, which measure skills, knowledge, abilities, attitude,

personality traits, and education achievement. There are lots of success stories. Kids with high EF get better grades, have fewer anger management issues, and are less moody. A kid's EF score is the only statistic that predicts their future college GPA better than chance. High-EF kids get better-paying jobs when they leave school, enjoy more stable marriages, and work better in teams.

It's an extremely valuable trait to have running around your brain. You want lots of high-scoring EF'ers surrounding your life. You probably want to have a high EF score yourself.

But can you make that happen? Executive function, like any complex behavior, has origins in both nature and nurture. Nature means biological, which in this case means DNA. EF has a whopper of a genetic component, the highest ever recorded for a complex human behavior.

But the skill also has nurture components, just like any behavior. As we're about to see, EF can be greatly affected by what goes on in the classroom and at home.

How can classrooms strengthen executive function?

As a college professor, I've been teaching for a long time. I grew up with it, too - my mom was a 4th grade teacher. I've had a courtside seat to see the gifts of literally hundreds of teachers. The most effective ones appear to display a

behavioral stew made of only two ingredients: an ability to adhere to rock-solid rules while bathing their students with extraordinary warmth and sensitivity. Information seems more effectively transferred in these environments.

The research about quality high school teaching seems to confirm this two-ingredient opinion. The rock-solid rule component is made of firm direction, clear instructions, and high expectations. They *demand* something of their students. Research shows the competent rule-based teachers also infuse their classrooms with an atmosphere of highly responsive, unremitting affirmation. The teachers are there *for* their students, too. The respect this inspires actually makes students want to come to class. Teens lucky enough to be in one of these two-ingredient classrooms strengthen their executive function. Not surprisingly, they also get the best grades.

What can parents do at home to build up their kids' executive function?

EF is also shaped by the emotional stability of the home. The foundational work was done by psychologist Diana Baumrind of UC Berkeley.

She began by asking a really good question: what does it take to raise a high functioning kid? Baumrind found parenting was divisible into four behavioral clusters (call

them “styles”), only one of which produced high functioning, high achieving (*high EF*) kids. The secret sauce? Two ingredients: the proper blend of demandingness - her word - and responsiveness - also her word.

Sound familiar?

It should. She called the most productive style “authoritative parenting.” As one researcher observed:

“There are many similarities between good teachers and good parents. The pattern of classroom variables associated with positive student behavior and attitudes is similar to the authoritative family environment.”

In other words, if home life is big on demandingness but low on warmth, this was parenting as envisioned by Genghis Khan (“authoritarian” is the word she used). Research shows these kids don’t tend to turn out well, measured by behavioral and academic outcomes. If home life was high on responsiveness, but low on demandingness, parents statistically created what we might consider spoiled brats (called “indulgent parenting”). These kids don’t get the behavioral gold ring either. Parents who weren’t demanding or responsive got the worst outcomes. They were scarlet-lettered with “indifferent parenting.” Only homes with readily observable rules soaked in warm responsiveness got

the outcomes most parents desire. That's the aforementioned "authoritative parenting."

Given the importance of EF in the life of every teen – indeed, every *human*, every teacher, and every parent on the planet should know about how it works.

That probably means you, if you're a parent, a teacher, or even interested in working with and supporting kids. Here's where you can start building your child's EF:

Get your child involved in regular aerobic exercise.

Especially if the activity also engages the mind (like an organized sport, as opposed to just running).

Make sure your child gets enough sleep.

No all-nighters, and no "blue light" exposure on screens in the late evenings, especially before bed. Sleep feeds the brain, and kids certainly need it to build their EF.

Help your child eat the right foods.

The so-called Mediterranean diet (lots of fruits and vegetables, white meat, and if there's grease, it needs to be olive oil) can improve working memory, a vital component of EF.

Practice mindfulness meditation—and help your child to

do the same.

But do the right kind. The protocol originally designed by Jon Kabat-Zinn can change EF in as little as 8 weeks.

Consult additional resources.

I've included some resources below that can give parents and teachers a starting point on understanding EF. You'll probably agree that EF is ready for its close-up as you leaf through them.

Additional resources:

Medina's book

- Medina, J. *Attack of the Teenage Brain: Understanding and Supporting the Weird and Wonderful Adolescent Learner*. Alexandria, VA: ASCD, 2018.

Prevalence of psychiatric disorders and teen brain development

- Paus, T., et al. "Why Do Many Psychiatric Disorders Emerge During Adolescence?". *Nat Rev Neurosci* 9 (2008): 947-57.

EF responsible for most psychopathologies

- A Review of Executive Function Deficits and

Pharmacological Management in Children and Adolescents. [S. Hosenbocus and R. Chahal](#), *J Can Acad Child Adolesc Psychiatry*. 2012 Aug; 21(3): 223–229.

Definitions of executive function

- Petersen, S.E., and M. Posner. "The Attention System of the Human Brain: 20 Years After." *Annu Rev Neurosci* 21, no. 35 (2012): 73-89.
- Gandhi, P. "Executive Functioning: Skills Development Program." Neuroassessment and development center, <http://neurodevelop.com/executive-functioning>.
- Miyake, A., et al. "The Unity and Diversity of Executive Functions and Their Contributions to Complex "Frontal Lobe" Tasks: A Latent Variable Analysis." *Cogn Psychol* 41, no. 1 (2000): 49-100.

The SCS assay

- Tangney, J.P., et al. "High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades and Interpersonal Success." *J Pers* 72, no. 2 (2004): 271-34.

Effects of EF scores on behavior and future success (including college GPAs)

- Baumeister, R. F., and J. Tierney. *Willpower: Rediscovering the Greatest Human Strength*. New York: The Penguin Press, 2011. p.

- Willingham, D. T. "Can Teachers Increase Students' Self-Control?" (2011)
https://www.aft.org/sites/default/files/periodicals/Willingham_3.pdf
- Baumeister, R.F., et al. *Losing Control: How and Why People Fail at Self-Regulation*. Cambridge, MA: Academic Press, 1994.

Genetic component of EF

- Friedman, N.P., et al. "Individual Differences in Executive Functions Are Almost Entirely Genetic in Origin." *J Exp Psychol Gen* 137, no. 2 (2008): 201-25.

Relationship between academic performance, parenting and EF

- Liew, J. "Effortful Control, Executive Functions, and Education: Bringing Self-Regulatory and Social-Emotional Competencies to the Table." *Child Dev Persp* 6, no. 2 (2011): 105-11.

Diana Baumrind's parenting work

- Baumrind, D. "Parental Disciplinary Patterns and Social Competence in Children." *Youth & Society*, 9, no. 3 (1978): 239-76.
- Baumrind, D. "The Influence of Parenting Style on Adolescent Competence and Substance Use." *J. Early Adolescence* 11, no. 1 (1991): 56-95.

- Baumrind, D. "Effects of Authoritative Parental Control on Child Behavior." *Child Development* 37, no. 4 (1966): 887-907.

Rigor of authoritative parenting

- Steinberg, L. "We Know Some Things: Parent–Adolescent Relationships in Retrospect and Prospect." *J Res Adolesc* 11, no. 1 (2001): 1-19.

Mindfulness protocol

- Teasdale, J., M. Williams, and Z. Segal. *The Mindful Way Workbook*. New York: Guilford Press, 2014.