

Executive Functioning

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What is Executive Functioning?

The executive in a company is the person who is in charge. She or he is the person who plans out how the resources of the company will be used. She decides what the priorities are. She decides what direction things will take in the long term. When there are conflicting reports or demands, the executive decides what to do about it. In a word, the executive is paid to think about things, look at the big picture, and keep the future in mind.

In the brain, a large part of what the frontal areas do is executive functioning. They are the parts of the brain that decide the big issues like what are we going to do next? They allocate resources to different projects. They are supposed to help a person look at multiple possibilities when a decision needs to be made.

What difference does it make in Child Psychiatry?

It turns out that if you have executive functioning problems, you are going to have a much more difficult time, no matter what psychiatric problem you might also have. Executive functioning deficits are not a diagnosis, but they make any other diagnosis that much worse.

Which disorders are they the most severe?

The deficits are the most severe in Autistic Spectrum Disorders. They are also severe in Fetal Alcohol Syndrome. They are less severe in ADHD and learning problems.

In which disorders are they the most common?

About 15% of children have some problems with executive functioning, but about 50% or so of children and adults with ADHD have problems.(1) They are extremely common in Autism and Fetal alcohol syndrome. If a child has brain damage from slowed growth in the womb or was very premature, they are not too uncommon. In brain injured children, infections of the brain, and those with tumors, they are common, along with a host of rarer diseases. They are not as common in Tourettes, ODD or CD.

What are the executive functions?

There are a lot of different ways of looking at them. Here are is a simple description:

from <http://www.chrisdendy.com/executive.htm>

Working memory and recall (holding facts in mind while manipulating information; accessing facts stored in long-term memory.)

Activation, arousal, and effort (getting started; paying attention; finishing work)

Controlling emotions (ability to tolerate frustration; thinking before acting or speaking)

Internalizing language (using "self-talk" to control one's behavior and direct future actions)

Taking an issue apart, analyzing the pieces, reconstituting and organizing it into new ideas (complex problem solving).

Just because two people have Executive Functioning deficits, doesn't mean they have the same deficits.

Here are some Examples of different people with different deficits

Plan:

When you are 9 years old, you don't have to do much planning, as your parents, family, and school will do this for you. But an adult must plan out each day, and so must teenagers, or nothing will get accomplished.

Joceyln can't plan

At age 16 Joceyln has six subjects in school and a part time job at Subway 10 hours a week. She has no boyfriend, and after failing last year, is not involved in any other activities. Her life is one big crisis, partly due to being unable to plan. She has a research paper due in three weeks. Rather than work on it a little each day or two, she leaves it until the end. Then she throws all her energy into that so that she is late for work, overtired, and behind in school. Then, when the paper is handed in (late), she has to work extra hard at her part time job, because her boss has threatened to fire her. Until her best friend asks her why she never stops by anymore. So, you guessed it, now she is getting behind because she is trying to maintain that friendship above all else.

Prioritize:

By the time you are 12, there are many competing needs and desires in a day and not enough time to satisfy them all. If you can't figure out what is most important, you will be lost.

Matt is lost.

At age 13 Matt is still quite willing to do his homework. But it never seems to get done. He can't figure out what is important. He needs to make a Science project which includes a title page. Before starting on the report he checks virtually every font available on the computer, searches innumerable sites for the perfect clip art, and then finally messes with the sizing of each part until he has it right. He can't understand why his parents aren't satisfied with his "two hours of working on my project"

Persist:

When you are a child, persistence helps, but it is not absolutely necessary for most children. This changes as adulthood nears. Being unable to "stick with" a hard job is very disabling.

Terry is finished, for now

Terry dropped out of school at age 15, and now is working at the boat shop. He is supposed to spend most of his time sanding today. His partner Jeff calls him, "time out". Terry sands for about 5 minutes, then either checks the cord, checks his watch, gets a drink, wipes his eyes, adjusts his mask, replaces the sand paper, or complains. Their boss figures Terry works 50% of the time so he pays him 50% of his wages the first week and explains why. Terry quits.

Organize:

Early elementary teachers spend endless hours organizing their students, but this doesn't happen in high school or at work.

Melinda's mess

Part of the reason Melinda dropped out of school is that she lost everything at school, on the way to school, and at home. Many great projects never got handed in. This week is she is lucky - her sister has found her a temporary job helping at the insurance office while two secretaries are ill with the flu. Melinda has taken the courses, and is excited to start. By the weeks end, six invoices totaling over 10,000 dollars are lost. It takes about a week to undo the "work" that Melinda did.

Multiple tasks:

Teachers, spouses, and employers all expect that someone can do a few things at a time. If you only have enough working memory to do one task, life will be very difficult.

Sarah has failed

In 11th grade history class, Mr. Surette expects the students to listen to what he is saying, read the syllabus he has given them, and make notes in their notebooks if something important is not in the syllabus. Sarah can easily do one or two of these things, but not all. She prefers to listen and try to follow along, but they are graded on their notes. When Mr. Surette sees no notes, she gets a zero. Sarah's reply, "but I can't listen and write at the same time" falls on deaf ears.

Executive function deficits make for a much worse prognosis in ADHD.

If you have these problems, you will not get as far occupationally or academically. Adults with ADHD who also have Executive Functioning Deficits are twice as likely to have failed grades, needed extra help, or ended up in a special classroom. They ended up with lower end jobs, less money, and more legal problems compared to those who only had ADHD. There isn't a big effect of executive functioning on psychological health except for the fact that people are very disappointed in themselves.

How do you know if someone has Executive Functioning deficits?

There are two ways

Complete neuropsychological testing

The advantages of this are that it can test each one of these executive functions plus everything else. The disadvantage is that it is extremely costly, takes hours to test and review.

Brief assessments of Executive Functioning

The advantage is that these can be done in less than a half and hour and can give you a good idea of the total severity of the problem with executive functioning. The disadvantage is they are not exact or complete.

At the moment, I am using one of these instruments in certain circumstances:

To help decide how severe the Executive Functioning problem might be in a child
To get a rough idea of how severe the problem is in high risk children: severe ADHD, Fetal Alcohol Syndrome, and some Autistic patients.

What can be done about Executive functioning deficits?

Medications

The bad news is that these deficits are much less responsive to medications. While hyperactivity and inattentiveness almost always respond to ADHD medications, the executive function deficits often do not.

Outside of ADHD, there is little research on how psychiatric medications might affect executive functioning in children and adolescents.

Non-medical Treatments

There are two types of treatments.

Brain Exercises

First, brain exercises a person can do to improve their executive functioning. So far, there is only a little research about this, and all of it is from the same organizations or companies that actually make these brain exercises. Therefore I can't recommend them at this point.

Linking the child's brain to either a machine or someone else.

If you can not read, either someone is going to have to read to you, or a machine is going to have to assist you. The same applies to Executive Functioning Deficits. Usually, this means that a number of people are going to have to understand what the deficits are and work together to find a solution that will work for that child, with that specific psychiatric disorder, and certain parents.

Examples of solutions using Executive Functioning descriptions by Gioia, GA in

Gioia GA, et al: Behavior rating inventory of executive function. Child Neuropsychol. 2000 Sep;6(3):235-8.

Jason can't get started.

SKILL: Initiate

Definition: Beginning a task or activity\

Dysfunction: Has trouble getting started on homework or chores

When Sony decided to design Playstation 3, the first thing the executives had to do was stop talking about it and start doing something. The same thing happens with people.

In Jason's family, the problem was starting homework. Once he got going, as long as his meds hadn't worn off, it wasn't too bad. But to start was hard. Jason loved rockets, and his Dad was a carpenter. So they built a model rocket that was quite sturdy and when it was time for homework, the count down started. The first stage of the rocket had directions for what to do first to initiate. The second stage had more, and after the third stage instructions were completed (pencils, paper, homework, binders, chairs, TV off, radio off) He lifted the rocket up on to the shelf and they started.

SKILL: Inhibit

Definition: Not acting on an impulse or appropriately stopping one's own activity at the proper time

Dysfunction: Has trouble "putting the brakes" on behavior; acts without thinking

SKILL: Shift

Definition: Freely moving from one situation, activity, or aspect of a problem to another as the situation demands
Dysfunction: Gets stuck on a topic or tends to perseverate

Hannah versus math

Hannah's mom says she would rather change diapers all day than work an hour doing homework with Hannah. Hannah seems to understand what she is doing at the time, but she gets stuck, and even though she knows she is supposed to be doing substration now, she is still doing addition, since that was the last task. So after a half hour of this and that, Hannah and her mother are totally frustrated, as she just can't shift to a new topic.

Then one day her mom turned the stove higher rather than lower to keep the dinner warm. So in the middle of long division, smoke came out of the kitchen, the alarm went on, and everyone ran to throw the dinner in the sink. After a few minutes, Hannah and her mother sat down again to work on fractions, and amazingly, she didn't get the long division and the fractions confused! Hannah suggested they set something on fire after each subject in school to clear her mind, but her mom suggested just lighting some candles for a few minutes, but when she does get confused, her mom will say, "Hannah, do I need to go burn some dinner?!"

SKILL: Plan

Definition: Anticipating future events, setting goals, and developing appropriate steps ahead of time to carry out an associated task or action

Dysfunction: Starts assignments at the last minute; does not think ahead about possible problems

Darren has never met the future

At 13 years old, Darren still lives completely for the moment. Everyone likes him, as long as they don't have to work with him. Most people worry about the future, but Darren's mother wishes Darren could take a pill to make him worry more, not less. Darren has been on meds for a few years for ADHD but they only help in the classroom with the aide nearby. Yet Darren is a great worker with his father. He helps with preparing bait, bands lobsters, and helps fix the traps. His father used to think that there wasn't any problem, but just a lack of good direction on the part of the teachers. One day, his father's hired help couldn't come, so it was up to Darren to get the equipment for making lobster pots down to their shed by the wharf by the time his father came back from town. At first everything went fine, except there weren't enough nails. And there wasn't a long enough extension cord. Darren had moved a bunch of lobster pots to back up the four-wheeler and put them on the bag

full of extra netting which they were going to need right away. The hoses for the compressor to run the nail gun were under another crate. Darren actually did bring everything eventually. His Dad told his mother that night in bed that thanks to Darren they had accomplished two hours of work in only six hours! When his Dad only paid him for two hours of work, even though it took six hours, Darren was devastated, especially when his Dad told him that he thought he was being generous, not charging Darren for the extra four hours of his time it took.

The easy solution would be that Darren would never work for his Dad again. But that wasn't good, either, as he was a good son and was trying. So his father took some pictures with their new digital camera of how to set things up for fixing lobster traps. He took some pictures of what needed to come down. Then his sister, a school teacher, laminated these together in a loose leaf notebook. Now, as long as Darren doesn't lose the notebook, he gets it set up okay. If he loses the notebook, he loses all video privileges for a week, and so far that hasn't happened.

SKILL: Organize

Definition: Establishing or maintaining order in an activity or place; carrying out a task in a systematic manner

Dysfunction: Has a scattered, disorganized approach to solving a problem; is easily overwhelmed by large tasks or assignments

Shanna lives in a hurricane

At age 12, Shanna is in no danger of dropping out of sixth grade. However, her teacher and parents are in danger of giving up altogether. The reason is that Shanna seems to be immune to any attempt to organize her life. The daily agenda is lost. Unless her backpack is packed by her teacher, given to her little sister, and then unpacked by her mother, things are lost. Shanna hates being treated that way. She lost the palm pilot her uncle gave her. She lost her backpack brief case. When all the books are finally home with the right notebooks and papers, they are lost in the house. And if you go to help her find them in her room, you would never find them either, as every drawer has some clothes, some papers, some toys, and who knows what else. With 7th grade coming soon, there did not seem to be any hope, as she couldn't even manage 6th grade.

So the question really was, is there anything she never lost all day long? No, there really wasn't. And what if she had a cell phone, would she lose that? Shanna had been begging for a cell phone for months, but her parents could imagine the difficulties with that. Nevertheless, that is what helped the most. Shanna has a great cell phone and her parents have been able to use it to send her messages, remind her of things, and help organize her. When she can't find it in the house or

classroom, she just calls herself. Things aren't perfect, her room is still a mess, but as Shanna tells you, at least I know where the phone is!

SKILL: Self-monitor

Definition: Checking on one's own actions during, or shortly after finishing, the task or activity to assure appropriate attainment of goal

Dysfunction: Does not check work for mistakes; is unaware of own behavior and its impact on others

Jordan works at light speed

Ms. Surette, Jordan's 8th grade homeroom teacher, almost cries when Jordan hops out of his desk with his test saying, "I'm done" How many times has she asked him if he has carefully checked his work only to find that most of the answers are wrong? What is sad is that when they go over the work, he does understand it. Jordan has never been careful about his work, and now he is failing 8th grade a second time, even though he should never have had problems the first time.

Socially, he isn't the most sensitive person, but since he is, after all, a 14 year old boy, no one is expecting too much in that regard. His parents are afraid he will fail this year and quit for good. Jordan's mom teaches piano, and the more she thought about this, the more it reminded her of her students who would keep trying to play a piece too fast. Once they slowed down using a metronome, they were much more accurate. However, they could never get this across to Jordan. But since Jordan played the saxophone in band, his mother had an idea. First they had Jordan play his lesson piece faster and faster to show him how the number of mistakes increased. Then they had him do a page of math in 10 minutes, 5 minutes, and one minute, and of course the number of mistakes went up. So they made a "mental metronome" for him. This turned out to be his father's watch, which was too complicated for his needs. Jordan, his mother, and his teacher all learned how to set it. When he did work or tests, first they figured out how long each question should take. Then they set the alarm (a quiet one) to go off at that interval. Jordan was not to go on to the next question until the alarm rang. Of his medications, this didn't work, but with medications, it made a big difference. Of course he still had to be tested outside the classroom because of the alarm. What does Jordan want for Christmas? A dirt bike. What does his parents want for him? An alarm that has a vibration mode!

SKILL: Emotional control

Definition: Modulating/controlling one's own emotional response appropriate to the situation or stressor

Dysfunction: Is too easily upset, explosive; small events trigger big emotional response

Dealing with Douglas

Douglas is 9 years old. His mother drank heavily while she was pregnant and Douglas has many features of Fetal Alcohol Syndrome. He is in his second foster home now. He moved in during July, and his foster parents thought things were going to be pretty easy. Douglas was fairly smart, liked to do things with the foster parents, and didn't lie. His temper wasn't too bad either. Then the foster mother's sister came to visit with her four kids. Douglas seemed to have lost all control. The increased stimulation led him to all sorts of stupid and impulsive acts, then he got in trouble, then he flew into a rage, followed by tears. Once the relatives left, Douglas was back in control, at least until school started. He didn't do badly in school, but he just couldn't manage any stimulation. It didn't matter what the rewards or punishments were. His teacher said that if Douglas is around more than two children, Douglas's body might be there, but his mind has gone.

Eventually Douglas trained the school to take care of him. By consistently acting like he had no head with too much stimulation, they were able to figure out what situations to avoid. Now Douglas comes to school 15 min late each day, so as to miss the crowds in the hall. He also leaves 15 min early. During recess he has an aide help him pick out activities with just a couple of people, and the same during lunch and gym. When there are assemblies, Douglas goes and works on his website with his aide.

SKILL: Working memory

Definition: Holding information in mind for the purpose of completing a specific and related task

Dysfunction: Has trouble remembering things, even for a few minutes; when sent to get something, forgets what he or she is supposed to get.

Is Tara doing this for attention?

If you heard Tara arguing with her teacher during a debate, you would assume she was one of the smartest kids in the class. Likewise, she was an excellent musician, was voted most valuable soccer player in the fall, and had lots of friends. Nevertheless, Tara seemed to be completely unable to succeed in school. It was obvious to all that she was plenty smart. The psychological testing showed that she had no learning disabilities but had a problem with working memory.

Tara could not do two things at the same time. She could not listen and write at the same time. She could not spell and write at the same time. In fact, she really couldn't think and write at the same time! When she tried to do any two things at once, she made all sorts of mistakes, and eventually, half way through grade 10, she quit. In 6th grade she had wanted to be an engineer, but now she figured she was

too dumb to do anything. So she started working at Taco Bell, and quickly was promoted. Her manager couldn't figure out why she couldn't manage her new responsibilities. Tara had done great when they used the operations manual, but once they put it away, she couldn't get it. Tara started crying, but the manager figured that the solution was obvious: leave the manual out. After a year, Tara became assistant manager. She carried the manual everywhere, she made all her notes and reports in it and won "the Employee of the Year" award. Her boyfriend started telling her if she could have "working memory in a notebook" for Taco bell, she probably could do it in adult high school. After showing the guidance counselor her greasy notebook, he thought it was a great idea. Eventually Tara graduated from high school and works repairing aircraft engines. As Tara says, Although the notebook is still as greasy as when she was at Taco Bell, it is a lot thicker. And so is her wallet!

In Summary,

If you ignore Executive Functioning Deficits, you will be missing a big cause of disability in children with a variety of psychiatric disorders.

There are many different kinds of Executive Functioning Deficits, and rarely will you find two people with the same profile of deficits.

Medications will not usually fix this.

The treatment has to fit the person, their culture, the deficits, and their family.

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