

CLINICAL EDITOR: The author provides readers with the opportunity to gain a clear understanding of how executive function operates in the minds of children with ADHD allowing practitioners and parents to make small changes that allow for big successes.

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Executive Function

A Key to Understanding the ADHD Mind

On the first weekend of every month, Mia and her 10-year-old son, Jon, visit her parents, two hours away. On this Saturday morning, after breakfast, Mia tells John to feed the dog, get dressed, and bring his suitcase (which they packed last night) downstairs. John nods and smiles. He's looking forward to the trip.



Finish

Fifteen minutes later, Mia is ready to go. As she passes by Jon's room, she sees that his suitcase is still on his bed. She finds Jon in the yard – in his pajamas, playing with the dog. Mia is exasperated. What is his problem? Yes, he has ADHD, but how hard is it to do three simple things? He loves to go to his grandparents' house. Why is it such a struggle to get him to listen?

As Mia hurries Jon along, she knows how her sister Lynn would answer that question. *Jon is just spoiled. He pays attention when he's playing a video game. You need to be stricter!* Lynn thinks that Jon's failure to comply is due to a lack of motivation – if he wanted to do it, he could. But Mia isn't so sure. She's been consistent with discipline. Mia also knows that Jon feels bad about himself when he doesn't succeed at school or when she constantly fusses at him at home. She knows that he has begun to compare himself to his peers. He seems frustrated with his inability to accomplish simple things that seem effortless for his friends. She has heard him refer to himself as "dumb." She can't understand why Jon doesn't comply with the instructions he receives from adults, but she doesn't think it's a lack of motivation. She knows in her heart that he would comply if he could.

Jon's school counselor has invited Mia to a seminar. The seminar is for parents of children with ADHD and will focus on something called "executive function." Mia has no idea what executive function is, but decides that she will attend the seminar. She is determined to understand her son's difficulty and help him find a way to overcome it.

Executive functions are mental processes that give organization and order to our behavior, allowing us to direct our actions through time toward a goal. Executive functions involve mental processes such as:

- Planning for the future, strategic thinking
- Working memory
- Regulating one's level of arousal and motivation
- Accurately sensing the passage of time
- Internalized language
- Inhibiting actions that interfere with goal completion (interference control)
- Initiating actions to achieve the goal
- Self-monitoring
- Shifting between tasks as needed

As an example of executive functioning in everyday life, let's look back to the previous evening as Mia returns home from work. She picks up the mail and sorts through it. Her favorite magazine is in the stack, and she would love to sink in to her recliner and read it. She recalls (working memory) that she needs to make a cake for her mother's birthday. She wants to get the cake baked before she picks up Jon from his friend's house (strategic thinking). She reminds herself (internalized language) how pleased her mother will be with the cake—an old family recipe. She recalls that she was eight years old when she first, with her mother's help, baked the cake. She begins to feel more energized (regulating motivation). As she gets out the recipe (initiating action) her phone rings. She checks the display and decides not to answer (interference control). She'll return her friend's call after the cake is in the oven (strategic thinking). While working, Mia recalls a TV show she had planned to watch; she checks the clock and sees that it is time for the show to start. She makes a decision not to watch it (interference control); if she ends up with free time, she would rather use it talking with her friend (sense of time). She slips the cake in the oven, sets the timer, glances at the clock (self-monitoring) and notes that when the cake is ready it will be time to leave to pick up Jon. She decides to clean the kitchen (shifting between tasks) so she can relax and enjoy the rest of the evening (strategic thinking). When the last dish is put away, she returns her friend's call (shifting between tasks). The two friends talk until the timer rings. Then Mia takes out the cake, remembers to turn off the oven (working memory), grabs her purse and goes to pick up Jon.

Mia's executive functions work smoothly and efficiently. Because this functioning occurs without her conscious awareness, she takes it for granted. But the development of these functions took place over time. If we imagine Mia as an eight-year-old using the family cake recipe for the first time, much of her behavior was probably externally directed by her mother.



It was a gradual process for her actions and sense of time to become internally directed.

Researchers believe that this capacity for self-direction is neurologically based and concentrated in the pre-frontal region of the brain. While relatively little is known about how specific developmental changes in the frontal cortex are related to specific changes in children's executive function, an increasing number of studies are addressing this topic (Zelazo, 2005).

The following week at the seminar, Mia learns that current research regarding ADHD is moving away from an emphasis on impulsivity and inattentiveness and toward an emphasis on executive functions. The speaker explains that children with ADHD can successfully compete with peers when playing a video game because that activity provides immediate external cues and feedback that help to direct their behavior. But in situations where children must rely on internally represented

information and sense of time, the child with ADHD is not competing on an even playing field with his or her peers. Often the child senses this and – no matter how intelligent or talented the child may be – the child feels different, inadequate, or “dumb.”

To provide a more even playing field, many experts in the field recommend that individuals with ADHD compensate by using tools that “externalize” the executive functions (Barkley, 1997). The speaker gives a simple example of a way to externalize an executive function. “When I set out in my car to run errands, I write down a list of things I need to do. I could just rely on my working memory, and hope that I remember everything I need to do. But the list is a helpful tool; it gives external support to my working memory.”

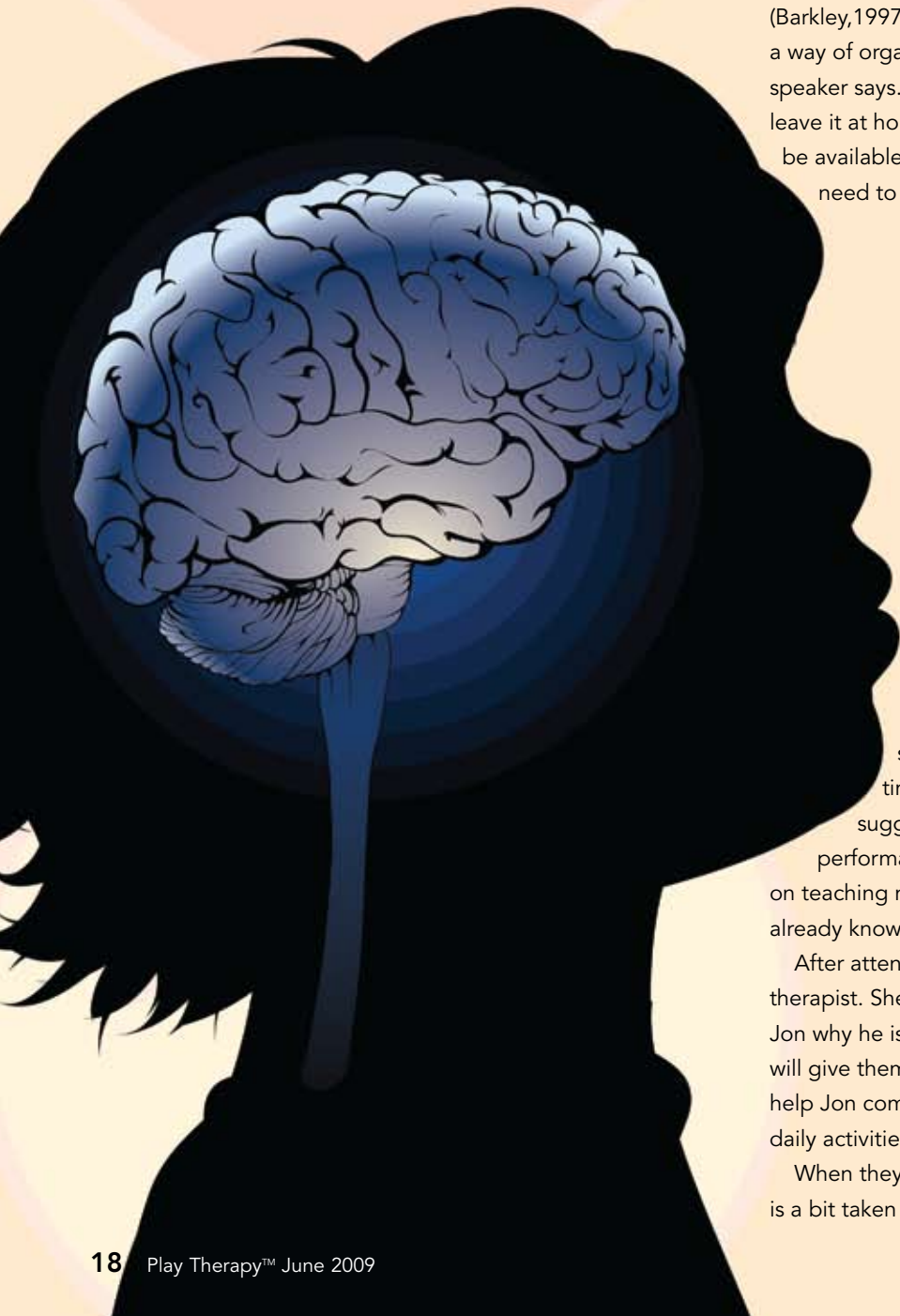
The speaker also points out that, to be most effective, this external support should be available at the point of performance (Barkley, 1997). “Making a list can be helpful in and of itself, as a way of organizing my thoughts about what I need to do,” the speaker says. “But it will be a far more helpful tool if I don't leave it at home. If I have it with me in my pocket it will always be available at the point of performance – when and where I need to remember what to do next.”

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The speaker ends by quoting ADHD expert Russell Barkley. Barkley believes that the person with ADHD usually has adequate knowledge and skills; the problem is in executing the skills at the time and place where they are required. Barkley suggests that ADHD should be viewed as a disorder of performance and that treatment for ADHD should focus not on teaching new skills but on helping people perform what they already know (Barkley, 1997).

After attending the seminar, Mia decides to take Jon to a therapist. She hopes that the therapist will be able to explain to Jon why he is having difficulty. She also hopes that the therapist will give them some strategies and tools that they can use to help Jon compensate for his difficulties and perform better in his daily activities.

When they arrive at the therapist's office for the first visit, Mia is a bit taken aback when the therapist introduces herself as a



play therapist. If there is one thing Jon loves to do, it is play—what Mia wants the therapist to do is to help him get serious and be more responsible.

The therapist explains that play is a natural and developmentally appropriate way that children practice regulating their behavior. In many children's games – Red Light Green Light, Mother May I, Statues, Simon Says, Freeze Tag – the primary objective of the game is for the players to exercise behavioral inhibition. In other childhood games, the child must rely on working memory. Traditional childhood games, while fun, also provide an engaging external framework for children to practice behaviors that are central to executive functioning. The therapist lets both Jon and Mia know that a large part of each session will be devoted to play, and that she will even give some home assignments that involve play.

They next talk about why Jon and Mia are there. Mia relates the history of Jon's diagnosis and treatment over the past three years: the trials of medication, the problems with side effects of the medication, the accommodations that the school has provided, and her own attempts to firm up discipline and provide extra structure and support in Jon's day to day life. Both Mia and Jon are tearful as they describe the tension that has seeped into their relationship. As they talk, it is apparent to the therapist that both of them are frustrated with the continued problems related to Jon's ADHD and that both of them feel

guilty. Mia wonders what she has done wrong. Jon states that other kids sometimes say he is "dumb" and that he thinks of himself as "bad" when his mother fusses at him.

The therapist comments that they have been doing lots of good things. The treatment that they have already set up – medication, school accommodations, and behavior management – are exactly the kind of things that research has shown to be effective in helping individuals with ADHD. One thing that they might want to add to their treatment plan, the therapist says, is for Jon to become a working member of the "treatment team." Up until now, his treatment has been managed by his physician, his teachers and his mother. The therapist explains that she helps children to become partners in finding solutions to their ADHD-related difficulties. She assures Jon that he is neither dumb nor bad. In fact, he already has lots of knowledge, talent and skills that he can use to help solve the problems that he is having.

To demonstrate, the therapist gets both Jon and Mia on their feet, playing a variation of the traditional childhood game of Simon Says. In the course of playing the game, Jon and Mia compete with one another, laugh and joke, smile and relax. The therapist notices that Jon is able to hold information in working memory and, in response to certain cues, initiate required behaviors while inhibiting other behaviors. Jon wants to play the game again and this time the therapist adds more cues,



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representing different required behaviors, making the game more challenging. Several rounds and much laughter later, the therapist explains the concept of working memory to Jon. She points out that everyone is different: some people can remember a lot of things, some people only a few. She says that her working memory isn't always perfect, so she often does things to help it out. She shows Jon some cue cards that she made to help her when she gives a speech. Each cue card has a word and a picture, to remind her of all the things she wants to say in her speech. When she sees each cue, she remembers what to say next, just as Jon had remembered what to do in response to the cues in the game that they played.

The following weekend Jon has an assignment from his therapist. Chores are a sore point in their household. Mia has always been frustrated that she has to remind Jon each and every step of the way. Jon's assignment is to use the time-honored habit of making a list to supplement his working memory and free him from dependence on his mother's reminders. To engage Jon's interest and sense of fun, the therapist has given this tool a playful spin. It will be a "wrist list." Jon sits down at the table and cuts a piece of paper into strips. He then writes his chores on the strips—one chore per strip. Next, with Mia's help, he puts them in the order they are to be done. The final chore is his favorite – taking his dog to the park for a long walk. Finally, Jon puts the strips together to create a

paper chain. Once the chain is completed, he attaches it to his wrist so that it will always be at "the point of performance" as he moves about completing his chores.

An hour later, chores done, Mia, Jon and the dog are on their way to the park. "That was fun," Jon says to his mother. "And I got all my chores done by myself! Let's do that again next week."

Mia reflects that it doesn't matter whether Jon relies on his working memory or uses a list. The results are what she cares about. She is pleased that the chores got done but is even more pleased to see that Jon himself is so pleased. She was right; Jon is motivated to succeed. But she had been expecting him to succeed in ways that were not in line with his development. She has now seen that, with the right external support, Jon can experience the success that he so much wants for himself.

References

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