



Evidence is mounting that medication for ADHD doesn't make a lasting difference to schoolwork or achievement.

Ben Harkless could not sit still. At home, the athletic ten-year-old preferred doing three activities at once: playing with his iPad, say, while watching television and rolling on an exercise ball. Sometimes he kicked the walls; other times, he literally bounced off them.

School was another story, however. Ben sat in class most days with his head down on his desk, “a defeated heap”, remembers his mother, Suzanne Harkless, a social worker in Berkeley, California. His grades were poor, and his teacher was at a loss for what to do.

Harkless took Ben to a therapist who diagnosed him with attention deficit hyperactivity disorder (ADHD). He was prescribed methylphenidate, a stimulant used to improve focus in people with the condition.

Harkless was reluctant to medicate her child, so she gave him a dose

BY KATHERINE SHARPE

on a morning when she could visit the school to observe.

“He didn’t whip through his work, but he finished his work,” she says. “And then he went on and helped his classmate next to him. My jaw dropped.”

ADHD diagnoses are rising rapidly around the world and especially in the United States, where 11% of children aged between 4 and 17 years old have been diagnosed with the disorder. Between half and two-thirds of those are put on medication, a decision often influenced by a child’s difficulties at school. And there are numerous reports of adolescents and young adults without ADHD using the drugs as study aids.

As the drugs have become more widespread, so has their cultural cachet. Stimulant medications have gained a reputation for turbo-charging the intellect. Even news stories critical of their use refer to them as

“good-grade pills”, “cognitive enhancers” and “mental steroids”.

For most people with ADHD, these medications — typically formulations of methylphenidate or amphetamine — quickly calm them down and increase their ability to concentrate. Although these behavioural changes make the drugs useful, a growing body of evidence suggests that the benefits mainly stop there. Studies indicate that the improvements seen with medication do not translate into better academic achievement or even social adjustment in the long term: people who were medicated as children show no improvements in antisocial behaviour, substance abuse or arrest rates later in life, for example. And one recent study suggested that the medications could even harm some children¹.

After decades of study, it has become clear that the drugs are not as transformative as their marketers would have parents believe. “I don’t know of any evidence that’s consistent that shows that there’s any long-term benefit of taking the medication,” says James Swanson, a psychologist at the University of California, Irvine.

Now researchers are trying to understand why. The answer could lie in sub-optimal use of the drugs, or failure to address other factors that affect performance, such as learning disabilities. Or it could be that people place too much hope on a simple fix for a complex problem. “What we expect medication to do may be unrealistic,” says Lily Hechtman, a psychiatrist at McGill University in Montreal.

UNREALISTIC EXPECTATIONS?

In 1937, psychiatrist Charles Bradley noticed that problem children treated with a stimulant, benzedrine sulphate, became quieter, better behaved and more studious. Since then, studies have repeatedly demonstrated that stimulant medications reduce the core symptoms of ADHD, which include incessant, disruptive activity coupled with a lack of reflectiveness and inhibition. Stimulants work by increasing levels of the neurotransmitter dopamine in the brain, affecting regions involved in focus, self-control and the sense that an activity is rewarding. They take effect immediately, and they help as many as 80% of those with ADHD — one of the best response rates for a psychiatric drug.

Years of lab and classroom studies attest that the medications help affected children to perform in school. Treated children fidget less. They do better on laboratory tests requiring concentration and short-term memory. And they take better notes and hand in more homework, making fewer careless mistakes. Nora Volkow, director of the National Institute on Drug Abuse in Bethesda, Maryland, says that these benefits carry over into the real world, at least in the short term. “They help you pay attention,” she says. “The grades do improve.”

But the few studies that have examined the effects of ADHD medication much beyond a year have found that the benefits either vanish or shrink to clinically meaningless proportions.

In the early 1990s, as rates of stimulant prescriptions were beginning to climb, the National Institute of Mental Health in Bethesda, Maryland, funded a study to compare different treatments for the disorder. Known as the Multimodal Treatment Study of Children with ADHD, or MTA, the study randomized 579 children aged between seven and ten with ADHD to receive one of four treatments: stimulant medication, behaviour therapy, medication and behaviour therapy combined or whatever care they had already been receiving.

After 14 months, the groups treated with medication alone and medication plus behaviour therapy showed greater improvements in core ADHD symptoms than the other two groups. For academic achievement, only the group receiving medication and behaviour therapy combined outperformed the group receiving regular care². By three years in, the four groups had become indistinguishable on every measure³.

Treatment conferred no lasting benefit in terms of grades, test scores or social adjustment. Eight years later, it was the same story⁴. “Nothing we did could tease out and say there’s a long-term effect,” says Swanson, who was one of the lead investigators on the MTA.

The MTA’s findings are borne out in most of the studies that followed students for long periods of time. A literature review in 2012, which included studies that tracked children with ADHD for three years or more, found little evidence for a significant effect on standardised-test scores, grades or on the likelihood that a student would be held back a year⁵. A 2013 review of randomized controlled trials longer than 12 months similarly concluded that there is scant evidence for improvements in ADHD symptoms or academic performance lasting much beyond a year⁶.

There is even some evidence that ADHD medication could worsen outcomes. In 2013, a team of economists published a study¹ examining the effects of a policy change in Quebec that resulted in thousands of children being given prescriptions for

methylphenidate. The authors found that children who began taking it actually did worse at school and were more likely to drop out than those with similar levels of symptoms who did not receive drugs. Girls taking the drug had more emotional problems, and both sexes reported worse relationships with their parents.

There are a few studies that do show long-term gains in academic performance, but the boost is not large. A study that tracked 594 students aged 5–11 with ADHD found that those using medication for at least a year scored 3 points out of 100 higher on standardized maths tests and 5 points higher on reading tests than those not taking medication⁷. But this was not enough to close the test-score gap between those with ADHD and those without. And the gains faded over time even if the children stayed on the drugs, according to study co-author Stephen Hinshaw, a psychologist at the University of California, Berkeley.

In 2012, a study in Iceland — the only country where rates of stimulant medication use are comparable to those of the United States — found that although the scores of all children with ADHD declined, on average, on standardized maths tests between the ages of 9 and 12, those of students who started medication earlier during that period declined less than those who waited longer to start⁸.

It is possible that there are long-term benefits that studies so far have not captured. But given the abundance and consistency of the data, the drugs cannot be doing much for most of the millions of children who take them, says Alan Sroufe, a psychologist emeritus at the University of Minnesota in Minneapolis. “If they were, it wouldn’t be hard to detect.”

PUZZLING PARADOX

Researchers are beginning to address this paradox. How can medication that makes children sit still and pay attention not lead to better grades?

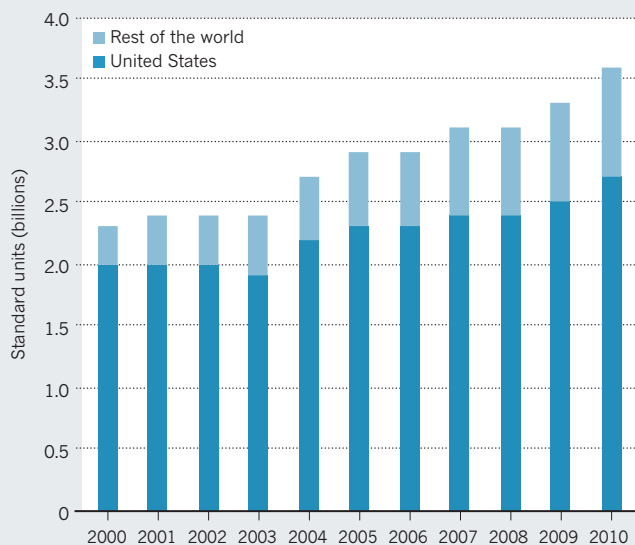
One possibility is that children develop tolerance to the drug. Dosage could also play a part: as children grow and put on weight, medication has to be adjusted to keep up, which does not always happen. And many children simply stop taking the drugs, especially in adolescence, when they may begin to feel that it affects their personalities. Children may also stop treatment because of side effects, which can include difficulty sleeping, loss of appetite and mood swings, as well as elevated heart rate.

Or it could be that stimulant medications mainly improve behaviour, not intellectual functioning. In the 1970s, two researchers, Russell Barkley and Charles Cunningham, noted that when children with ADHD took stimulants, parents and teachers rated their academic performance as vastly improved⁹. But objective measurements showed that the quality of their work hadn’t changed. What looked like achievement was actually manageability in the classroom. If medication made struggling

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POPULAR PRESCRIPTIONS

The United States prescribes many more drugs for ADHD than the rest of the world put together, but other countries are beginning to narrow the gap.



children appear to be doing fine, they might be passed over for needed help, the authors suggested. Janet Currie, an economist at Princeton University in New Jersey, says that she might have been observing just such a phenomenon in the Quebec study that found lower achievement among medicated students¹.

And it may simply be that drugs are not enough. Stimulant medications have two core effects: they help people to sustain mental effort, and they make boring, repetitive tasks seem more interesting. Those properties help with many school assignments, but not all of them. Children treated with stimulants would be able to complete a worksheet of simple maths problems faster and more accurately than usual, explains Nora Volkow. But where flexibility of thought is required — for example, if each problem on a worksheet demands a different kind of solution — stimulants do not help.

BEYOND BELIEF

In people without ADHD, such as students who take the drugs without a prescription to help with school work, the intellectual impact of stimulants also remains unimpressive. In a 2012 study of the effects of the amphetamine Adderall on people without ADHD, psychologists at the University of Pennsylvania in Philadelphia found no consistent improvement on numerous measures of cognition, even though people taking the medication believed that their performance had been enhanced¹⁰.

Increased focus has benefits, say some experts, but many children with ADHD need help in more areas if they are to succeed at school. “Many things go into grades,” says Joshua Langberg, a psychologist at Virginia Commonwealth University in Richmond. “One of those is certainly a child’s behaviour and ability to focus, which medication does a nice job of improving. But they also include a child’s basic abilities in math and reading, their IQ and their ability to manage time and plan. It’s not clear why we would expect medication to impact those things.”

Some researchers think that the lack of evidence for long-term academic benefits is a result of flawed study design. Peter Jensen, a leader on the MTA study, says he believes that if the children had been maintained on the study’s protocol, the initial gains they made would have lasted. Longer randomly controlled trials would be challenging both from a technical and ethical standpoint, but the suggestion highlights another problem, namely the discrepancy between the optimal care given during a trial and that which most children receive.

After the 14-month, randomized trial period, participants in the MTA study began to receive what Jensen calls treatment ‘in the community’. He says it is typically of low quality. Few doctors monitor children closely enough to arrive at optimal dosage or identify and treat co-occurring conditions — such as depression and anxiety — that affect up to 70% of children with ADHD. “Only one in four kids are getting anything close to what we would say is good treatment,” Jensen says.

When the MTA team examined the follow-up data, it found that many non-medical factors play a big part in whether improvements last. The best predictor of a child’s response to treatment wasn’t which treatment they were assigned, but a cluster of factors that were present at the start. Children with more advantages — higher intelligence, better social skills, intact families, higher parental education, fewer conduct problems or higher socioeconomic status — were likely to make big strides and hold onto them no matter what the treatment was, whereas children without these advantages typically progressed more slowly and regressed after treatment stopped^{2–4}.

But disadvantaged children benefited when they received both medication and behaviour therapy. “The kids with the most problems needed the combination,” says Jensen, who adds that parents should have easier access to proven behaviour therapies. The effects of behavioural treatment don’t seem to be longer-lasting than those of medication, however: once active treatment stops, they dissipate.

Future studies might explore whether medication offers subtle benefits that are not reflected in test scores or grades. Many researchers think that a stint on medication, when it is needed, can create an upward spiral of self-esteem that may make a crucial difference to a child’s life — but there are no hard data to support this. “It may be that treatment doesn’t translate into better grades” in the long term, Volkow says. “But what I’d like to see is, are those kids overall better integrated?”

Some experts think that the focus on academic achievement is misguided — that the point of the drugs has never been to improve children’s grades, or increase their chances of admission to the best universities. “Medications are given for their short-term effects,” says Swanson. “Don’t expect medication to get rid of every problem a child has. But if the problem right now is not passing the second grade, or not having any friends in the third grade, we can do something about that now.”

Some parents seem to understand that. Suzanne Harkless says that her hopes for medication are modest. She wants to keep Ben engaged in the fifth grade while she looks for a middle school that might provide him with the structure he needs. “My goal right now is not to get him into a good college,” she says. “My goal is to keep him in school.”

Other parents may pin unrealistic hopes on these drugs as their use goes up around the world (see ‘Popular prescriptions’). “Competition in today’s global economy is fuelling the dramatic increase in the use of ADHD medications, especially in the United States,” says Richard Scheffler, a health economist at the University of California, Berkeley, and co-author of a forthcoming book with Hinshaw on the growing popularity of ADHD drugs.

For Currie, the question comes down to transparency. “Parents do care about how their children are doing in school,” she says. “It’s misleading to tell parents that this will help their children succeed, when there’s no evidence that it’s the case.” ■

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