Scott Adams: Living with ADHD

Scott Adams has had a great deal of professional success. He has worked in advertising. He has worked for ESPN and the California Angels baseball team. He started his own business called Velocity Signs, designing and marketing mechanical sign spinners that are marketed in Panama, Puerto Rico and China.

He's good at a lot of things – but he gets bored easily and frequently feels the need to move onto something new – in work, in love and in life.

Adams has attention-deficit/hyperactivity disorder (ADHD). Growing up in Santa Rosa, Calif., he struggled in school. He would eventually receive a diagnosis, see therapists and be prescribed Ritalin. After completing high school, he would graduate from Sac State.

“Although I've always been successful professionally, I've had like 12 jobs in the past 15 years. I've lived in eight different cities. I love the flashy honeymoon phase of a relationship, but then I get bored. I've struggled with drugs and alcohol,” said Adams, now 37. “I developed coping mechanisms to deal with the problem, some good and some bad.”

Adams agreed to discuss his ADHD, because he hopes that doing so might help others, particularly kids who wonder, as he did when he was younger, “What's wrong with me?”

Frustrated with the peripatetic nature of his life, two years ago Adams decided to see ADHD subtypes

Using a common physiological measure of brain functioning, UC Davis researchers have found differences in the brains of adolescents with the inattentive and combined subtypes of attention-deficit/hyperactivity disorder (ADHD) and teens who do not have the condition, suggesting that there are physiological differences.

The differences were observed in brain waves exhibited during electroencephalograms (EEGs) of teens with the inattentive and combined subtypes of the condition and typical adolescents, illustrating that these groups display distinct physiological profiles.

The research is published online in the October 2013 journal Biological Psychiatry.

When preparing to perform a computer task, the researchers found that the teens with the type whose primary symptom is inattentiveness exhibited different brain-wave patterns from those whose symptoms include hyperactivity and impulsivity.

“ADHD subtypes appear subjectively very different in the clinical setting, but there are few objective physiological markers that have been able to detect those differences,” said Ali Mazaheri, assistant professor at the Academic Medical Center, University of Amsterdam.
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whether there was a better way to cope with some of his challenges, so he reached out to the UC Davis MIND Institute and ADHD expert Julie Schweitzer.

“Dr. Schweitzer gets ADHD,” Adams said, “She understands its effects. Talking to her validated the frustrations and the problems that I have. ADHD kids don’t know what’s wrong with them. It creates depression, and it creates a lot of stress.”

“Julie’s very patient. She can relate to people very well. I’ve gone to a lot of other counselors but they can’t connect. She’s able to really understand,” he said.

Adams said that, working with Schweitzer, he learned methods of coping with that stress, and behavioral training to help him organize his personal and professional life to help him reach his goals.

Difficult diagnosis
He did something that made evaluation and treatment easier – he shared test results and evaluations from his adolescence that confirmed he had been struggling with ADHD for years.

“Diagnosing ADHD in adults can be a challenge, particularly when there is no paper trail to confirm that the adult experienced significant symptoms in childhood, which is required to be diagnosed as an adult,” Schweitzer said.

Through the MIND Institute ADHD Program, Schweitzer and her colleagues work together to show adults with ADHD that they have potential but that they need to recognize their strengths and weaknesses and organize their environment to reach their goals.

“When Scott came in to see me, he was at that point where he was ready to address his concerns. He did not seek treatment because his mother or someone else told him to. He recognized that he could be accomplishing more in his life. He was ready to move forward to make that happen,” Schweitzer said.

That self-recognition and readiness to move forward is crucial in working with adults with ADHD, Schweitzer said.

Program approaches
Schweitzer said that the program at the MIND helps adults identify whether symptoms of ADHD – such as procrastination, inattention, boredom, attraction to immediately rewarding activities or substances create obstacles to achieving personal or professional success.

“For example, classic problems with self-control in ADHD make it less likely that someone with ADHD will eat healthy foods and exercise, stop surfing the Internet to get work done or stop themselves from smoking cigarettes when they get stressed.” ~ Julie Schweitzer

Schweitzer said that many of her patients with ADHD go on to achieve personal and professional success.

“The road often is bumpier than for people without ADHD, but there still is hope,” she said.

And, while there are many excellent treatments for people with ADHD, more are needed.

“The majority of our treatments are very short acting,” Schweitzer said. “We need new interventions that have a long-lasting effect. We hope that, through our research, we can develop novel interventions for our patients of all ages.”
For people with ADHD, the increased responsibilities of adulthood can make problems with organization more obvious than in childhood. Disorganization is often identified as a major detractor that affects their quality of life.

Driving accidents
ADHD symptoms can make some people more likely to speed and have traffic accidents.

Relationship difficulties
Often, the partners of people with undiagnosed ADHD take poor listening skills and an inability to honor commitments as a sign that their partner doesn’t care.

Extreme distractibility
Attention regulation is a key issue of ADHD. Many people find that distractibility makes it hard to finish tasks, which can lead to problems in many workplace situations.

Restlessness, difficulty relaxing
Adults with ADHD often exhibit restlessness or find they can’t relax.

Poor listening skills
Problems with attention result in poor listening skills in many adults with ADHD, leading to a lot of missed appointments and misunderstandings.

Difficulty starting a task
Adults with ADHD often delay starting tasks that require a lot of attention.

Chronic lateness
Adults with attention-deficit/hyperactivity disorder are often late. They are easily distracted and also tend to underestimate how much time it takes to finish a task.

Angry outbursts
Attention-deficit/hyperactivity disorder often leads to problems controlling emotions. Often, adults with ADHD feel as if they have no control over their emotions. Many times, their anger fades as quickly as it flared.

Prioritizing Issues
Often, people with adult ADHD mis-prioritize, failing to meet big obligations while spending countless hours on something insignificant.

ADHD facts
- ADHD persists into adulthood for 60 to 70 percent of children.
- The high school drop-out rate is 30 percent for students with ADHD and 15 percent with no psychiatric disorder.
- Inattention symptoms at age 6 predict academic success in high school.
- The regions of the brain responsible for good self-control develop last, at around 25 years for typical adults. Evidence suggests this happens later for adults with ADHD.
- Twenty-five percent of all college students receiving disability services have ADHD.
- ADHD is more commonly diagnosed in boys during childhood but in adults it affects men and women equally.
- Girls with ADHD are at higher risk for suicidal behavior.
- Teens and adults with ADHD are at higher risk for substance abuse.
- People with ADHD are overrepresented among those who have traffic accidents and emergency room visits.
- Medication is highly effective in the short-term for the target symptoms of inattention and distractibility, but current research suggests that behavioral interventions in conjunction with medication support the greatest improvement.
- A tremendous need exists for the development of new, better, long-lasting treatments to address the range of symptoms associated with ADHD.
ADHD subtypes

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the Netherlands, and guest researcher at the UC Davis Center for Mind and Brain. “This study shows that there are changes in brain waves related to visual processing and motor planning that can be used to distinguish ADHD subtypes.”

According to the U.S. Centers for Disease Control and Prevention, in 2007 an estimated 9 to 10 percent, or approximately 5.5 million children 4 to 17 years of age, were diagnosed with ADHD; the percentage of children with parent-reported ADHD increased by 22 percent between 2003 and 2007. ADHD is approximately twice as common among boys as girls, and is one of the most commonly diagnosed psychiatric illnesses among children.

EEG research

The study was conducted in 57 children between 12 and 17 years, 23 without ADHD and 17 participants who fell into each of the inattentive- and combined-type groups. The collaborative study was conducted between 2009 and 2013 by the UC Davis Center for Mind and Brain and UC Davis MIND Institute.

The teens’ brain waves were assessed using EEG caps with 32 electrodes during evaluations of their performance on a computer task in which they received visual cues that could help aid their performance. Some cues were more helpful than others, so the task required the participants to sometimes override an initial impulse in order to respond correctly. Such situations are particularly challenging for people with ADHD.

For example, brain waves were recorded during evaluations of the subjects’ performance on a computer task during which they were asked to look at a series of arrows pointing in different directions on a computer screen, and then indicate the direction in which the center arrow pointed by pressing a button for either left or right. In the following series of arrows the center arrow is pointing to the left:

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The researchers examined the teens’ alpha and beta brain waves after they viewed the visual cues, and found differences between the teens with the subtypes of ADHD and typically developing teens. The alpha wave patterns of teens with the inattentive type revealed that the teens did not process the important information in the visual cues, limiting their ability to succeed.

The researchers also examined the subjects’ beta waves, which are associated with the performance of motor tasks. These also differed among those with and without ADHD and were most deficient in teens with the combined type, suggesting that these teens had greatest difficulty preparing a motor response – pressing a button.

Regardless of subtype, the participants with ADHD were less able to control attention to the task than were those without the disorder, validating a finding reported by the current research team in 2010.

“Researchers in the field of ADHD have questioned whether the ADHD combined subtype simply represents a more severe form of ADHD,” said Catherine Fassbender, a research scientist with the MIND Institute. “Our study suggests differential impairment profiles in the ADHD subtypes, and not simply an additive effect of impairments in the ADHD combined subtype,” Fassbender said. “The inattentive group had problems processing the cues, whereas the...”
combined type had problems using the cues to prepare a motor response.”

“These differences, alpha wave changes in the brain’s visual cortex related to visual processing, and beta changes in the brain's motor cortex related to motor planning could represent unique impairments between the two subtypes,” she said.

**Clues for treatments**

“This research also gives us clues regarding the development of treatments to address the underlying processing differences between ADHD subtypes,” Fassbender said. “Most treatments for ADHD do not take subtype differences into account. Our findings suggest targets for treatment should differ for the ADHD inattentive versus combined subtypes, and that advanced analysis of brain waves may provide a biomarker for testing treatment responses.”

Study authors include Mazaheri with UC Davis and the University of Amsterdam. Other study authors, all of UC Davis, include Fassbender, Sharon Coffey-Corina, Tadeus A. Hartanto, Julie B. Schweitzer and George. R. Mangun.

The study was funded by grants MH055714 and MH066310 from the National Institute of Mental Health of the U.S. National Institutes of Health, a Klingenstein Third Generation Foundation ADHD Fellowship; a UC Davis MIND Institute Pilot Research Grant and a grant from the Netherlands Organisation for Scientific Research.

**Select publications**


**Recent grants**

Identifying Markers for Treatment Response to Cognitive Training in Autism Spectrum Disorders, Department of Defense

Developmental Changes in Neural Processes Underlying Impulsivity and ADHD. National Institutes of Health

Cognitive Training for Fragile X Syndrome, John Merck Fund

Effects of Lisdexamfetamine on Cognitive Control and Reward Response in Adolescents and Young Adults with ADHD: Neural and Clinical Outcomes, Shire Pharmaceuticals

Virtual Reality Applications for the Study of Attention and Learning in Autism and ADHD, Institute of Education Sciences

Identifying Cognitive and Neural Risk Factors for Substance Dependence in ADHD, National Institutes of Health
Current ADHD research

ADHD team researchers are seeking participants from 8 to 50 and with ADHD and typical development, to enroll in their leading-edge studies, to help learn more about ADHD and develop new therapies.

Mapping Impulsivity’s Neurodevelopmental Trajectory (MINT) Study

Recent research suggests that substantial new learning and brain development occurs in the teen and young adult years. In this study, we are trying to understand more about these exciting changes. Our main focus is the development of self control and academic performance. We are tracking the same individuals over four years as they reach early adulthood and self-reliance. For 2013/2014, we will be continuing to recruit teenagers and young adults ages 12 to 23 who are developing typically or who have ADHD to participate in the MINT Study. The study involves completing questionnaires, testing and functional magnetic resonance imaging (fMRI) scans of the brain. Participants receive compensation. Funding is from the National Institute of Mental Health. PI: Schweitzer.

Identifying Markers for Treatment Response to Cognitive Training in Autism Spectrum Disorders

Children with autism spectrum disorder frequently experience co-occurring disorders and the presence of other disorders may have the potential to identify how well children with ASD respond to treatment. We will look at whether baseline rates of attention-deficit/hyperactivity disorder symptoms and fragile X syndrome predict treatment response to cognitive training. This project will enable us to use both behavioral and genetic approaches to determine potential treatment responses and whether they improve learning, language and other important functional behavior in children with ASD. The study involves children from ages 8 to 17. Funding is from the Department of Defense. PI: Schweitzer, co-PI: David Hessl.

Lisdexamfetamine’s Effect in ADHD (LEIA) Study

Lisdexamfetamine (Vyvanse®) is approved by the Food and Drug Administration for treating attention-deficit/hyperactivity disorder in children, adolescents and adults. The purpose of this type of study is to collect more information about the ways lisdexamfetamine affects how teens and young adults with ADHD make decisions related to real-world outcomes. Physicians will meet with participants taking either the study drug or placebo over the course of 10 weeks. We will analyze how the study drug affects brain activity using fMRI and how participants make decisions on computer tasks. During 2013-2014, researchers will recruit teenagers and young adults ages 12 to 25 with combined-type ADHD to participate in the LEIA study. There are no costs and participants receive compensation. Funding is from Shire Pharmaceuticals. PI: Schweitzer.

Identifying Cognitive and Neural Risk Factors for Substance Dependence in ADHD

We are studying behavior and related neural activity in adults with ADHD and adults that have been dependent on methamphetamine in the past to help us understand how to prevent illicit drug dependence in ADHD. The study compares attention and memory brain activity in adults with ADHD and a history of methamphetamine dependence and adults who do not have ADHD and/or a history of methamphetamine use. Participants ages 18 to 50 complete computer tasks and fMRI scans. Funding is from the National Institute on Drug Addition. PI: Fassbender.
The ADHD Program team

The multidisciplinary ADHD Program team includes physicians, psychiatrists, psychologists and other health-care professionals committed to advancing understanding of the environmental, genetic and physiological causes of ADHD and developing novel and enhanced treatment options.

Julie Schweitzer, Ph.D.
ADHD Program Director
Julie Schweitzer, professor in the Department of Psychiatry and Behavioral Sciences, is a licensed clinical psychologist whose research applies translational research methods using a variety of basic behavioral and physiological techniques to develop novel treatment and preventative approaches to addressing attentional problems in ADHD and related disorders. She also conducts research in substance use disorders and has a leadership role in mentoring new UC Davis School of Medicine researchers and faculty.

J. Faye Dixon, Ph.D.
Clinic Director
Faye Dixon is an assistant clinical professor of psychiatry in the Department of Behavioral Sciences and is the director of the UC Davis MIND Institute ADHD Clinic. A licensed clinical psychologist, her clinical and research interests include ADHD, learning differences, and anxiety and mood disorders in children. She also has a long history of educating and training psychology graduate students and interns, medical students and child psychiatry fellows.

Catherine Fassbender, Ph.D.
Assistant Professional Researcher
Catherine Fassbender is a cognitive neuroscientist. She studies cognitive impairments in individuals with ADHD, patterns of brain and behavior in individuals vulnerable to substance dependence and cognitive impairment related to long-term substance dependence.

Murat Pakyurek, M.D.
Medical Director
Murat Pakyurek, associate professor in the Department of Psychiatry and Behavioral Sciences, is a board-certified general and child and adolescent psychiatrist. He is medical director of the UC Davis ADHD Program and of the Department of Psychiatry and Behavioral Sciences outpatient clinic.

Khyati Brahmbhatt, M.D.
ADHD Program Psychiatrist
Khyati Brahmbhatt, assistant clinical professor, Department of Psychiatry and Behavioral Sciences, is a board-certified child psychiatrist. She has a background in pediatric and adult ADHD.

Cynthia Krafft, Ph.D.
Postdoctoral Scholar
Cynthia Krafft is a developmental neuroscientist. She is interested in designing novel treatments that have effects on brain and behavioral functioning. She is also interested in developmental issues and ADHD on neuroimaging and cognitive measures.

Erin Calfee, B.A.
Study Coordinator
Calfee has a degree in history from Brown University and assists with data collection and research recruitment.

Tadeus Hartanto, B.S.
Study Coordinator
Hartanto has a degree in psychobiology from UC Davis and research interests in developmental disorders and clinical psychology.

ADHD Program Volunteers
Sara Baxter, Supria Gill, Tracia Joseph, Cynde Josol, Grant Maciel, Adam Petchers, Alana Russaw and Jazmin Sheppard
Attention-deficit/hyperactivity disorder (ADHD) is the most common childhood behavioral disorder, affecting 3 to 5 percent of school-age children and 4 percent of adults. Individuals with ADHD may act quickly without thinking and interrupt others (impulsivity), fidget, have difficulty sitting still and staying on-task (hyperactivity), or daydream and get easily sidetracked (inattention). ADHD impacts school, work, friendships and daily functioning. It requires lifelong management and can be paired with depression or learning disorders.

The UC Davis MIND Institute ADHD Program is leading the field with research on the causes of ADHD and its impact on the lives of individuals, families and society. We bring hope and help to families experiencing ADHD by identifying accurate diagnostic markers and criteria and by expanding treatment options for ADHD. Our goals are to better understand and treat impulsivity, improve attention and help individuals with ADHD succeed in school and work.

Our mission is to prevent and reduce relapse for substance abuse, given that problems with attention and impulsivity can lead to higher rates of substance abuse. We know that those affected by ADHD have amazing potential, and it is our mission to enable each patient to achieve that potential.

Funding is absolutely crucial to the ADHD Program’s work. With philanthropic support the program can continue providing essential research, clinical, educational and support services. Together with the individuals and families we serve, the program celebrates its successes and faces the challenges ahead with renewed hope and optimism.

Making a gift to the UC Davis MIND Institute ADHD Program makes a difference in the lives of those affected by ADHD now and in the future. Each gift brings hope to the individuals and families that the program serves.

For further information, please contact Robert Stout, UC Davis MIND Institute development officer, at robert.stout@ucdmc.ucdavis.edu.