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Unlocking the Mystery of Stuttering

Dr. Nathan Maxfield and USF Help Lead the Way in Researching, Treating and Better Understanding the Debilitating Speech Disorder

By Dave Scheiber, USF Foundation

Dr. Nathan Maxfield, director of USF's Program for the Advanced Treatment of Stuttering, pours over research in his office inside the College of Behavorial and Community Science; below a participant in the weekly gathering prepares for a challenging speech exercise.

"People who stutter often don't know why they stutter, mechanically, and feel helpless because of this." – Dr. Nathan Maxfield

Inside a second-floor classroom on a recent Monday afternoon, members of a unique group at the University of South Florida watch intently as a young man walks to the front and faces the gathering, silently mustering his courage as if preparing to jump into a cold lake.

He flashes a self-conscious smile, takes a deep breath and begins speaking in a painfully slow, labored cadence – well aware that a blunt review of his effort awaits from his peers.

The participants sitting around a long conference table include a middle schooler, a high-school student, a half-dozen collegians – and even two teens beaming in via Skype from different parts of the state. One by one, they are called upon to talk in a similarly deliberate and awkward fashion. And the more they struggle to get the words out smoothly, the happier that makes the energetic, red-haired man in charge, Dr. Nathan Maxfield.

In this speech exercise, points aren't given for clarity or a steady delivery. In fact, the object of Dr. Maxfield's Program for the Advanced Treatment of Stuttering (PATS) is to consciously undo the stuttering patterns sufferers have struggled with throughout their lives, and gradually replace them with new patterns of clear and comfortable speech.

That requires each attendee to stand up and stutter openly, completely dispensing with all the tricks they have used over the years to mask or minimize their impediment. Then fellow stutterers – as well as Maxfield and a handful of graduate students – weigh in on how the speaker did in making eye contact, abandoning old crutches and utilizing new techniques taught in the sessions.

It is a process that Maxfield likens to raising an iceberg out of the ocean in order to assess the whole obstruction – and an approach he learned as a stutterer himself from the pioneering New York speech therapist who created the system, Pat Sacco.

"You can't correct something you can't fully observe," says Maxfield, an associate professor in the College of Behavioral and Community Sciences, a USF alumnus and a respected speech researcher in his own right.

Today, as director of one of the nation's top programs to treat the disorder, he is carrying on the life's work of the man who helped change his life, and – in so doing – helping change the lives of so many others.

True stuttering isn't simply a matter of stammering over a few words before continuing on with a discussion. It can involve head jerks, eye blinks, flushed faces, and involuntary hand movements, all while the frustrated and often embarrassed speaker gets stuck on a syllable in a repetitive loop – unable to complete a sentence. The complex neurological condition can derail sufferers in school, relationships, jobs and public situations in general.

The method Sacco devised to treat it involves an intricate dissection of words, breaking them down into individual sounds – eventually removing some of the mystery about how stutters can be triggered. And it entails an in-depth study of the physiology of the mouth, providing students with an understanding of how certain movements of their tongue or lips can cause them to get stuck – and learn techniques involving breathing and mouth control that can reduce or eliminate a stutter.

"People who stutter often don't know why they stutter, mechanically, and feel helpless because of this," Maxfield continues. "Our stuttering dissection process involves stuttering on a word, stopping, and then dissecting the stuttered word into 23 different components." The result of such exaggerated one-word utterances is a sound that Maxfield calls "sick-cow" speech, gradually leading to the ability to maintain control in more pressured situations, with more extensive wording and an increasingly normal rate of speed and sound.

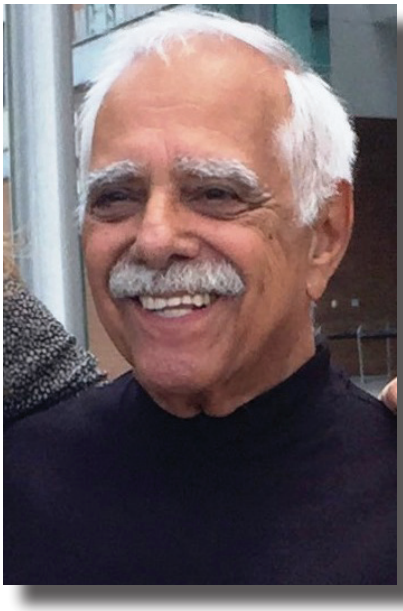
In conjunction with these weekly support classes, Maxfield also runs an intensive, 90-hour interventional program at USF every summer. Clients of all ages and walks of life work six to seven hours a day, five days a week for three weeks. "This is not summer camp – it's more like boot camp for stuttering," he says. "We deconstruct their old speech pattern, and then work with them to build a new speech pattern completely from scratch."

Beyond the hands-on therapy he oversees, Maxfield is immersed in cutting-edge research into correlates and causes of stuttering. For the most part, his research has focused on cognitive control of speech production in people who stutter. Lately, he is also obsessed with evidence that increasingly shows the right hemisphere of the brain may hold a secret of why people who stutter can sometimes achieve spontaneous fluency. Surprisingly one in 100 adults struggle with stuttering.

For USF, the work places the university at the forefront of treatment and discovery, and is entwined by the overlapping stories of a three-time Olympic gold-medal swimmer, a 90-year-old renowned expert in the field who recently emerged as a program donor, a former Bulls track star – and Maxfield, a man who never imagined he would be guiding such a vital mission.

He grew up in New England and just outside of Tampa dealing with a terrible stutter, unable to get it under control with any consistency. When he enrolled at USF as a sophomore, he saw a speech therapist to gauge his communicative level. "In my evaluation, I got hung up very badly on nine of 10 words – for minutes at a time," he recalls.

But Maxfield also received some encouraging news. He was told of a man who came to USF once a year, running a month-and-a-half summer program to help stutterers. Those who attended were expected to work on their speech for eight or nine hours a day, and the results were uniformly positive. The program was taught by Pat Sacco, a non-stutterer whose tough-love approach was known to make the experience particularly uncomfortable for participants – but it was an unexpected ray of hope for Maxfield. "I said, 'Okay, let's do it," he remembers. In the spring of 1993, he raised his own money to pay for enrollment, and went through the program that July.



Program creator Pat Sacco

As grueling as the process was, it made an almost immediate impact on Maxfield's ability to control his stutter. "My life really opened up from there," he says. His only regret was that he hadn't heard of the program earlier, living only an hour away the previous 10 years while enduring so much hardship caused by his stutter.

Sacco proceeded to hire his star pupil to join the staff of the summer program, and Maxfield was happy to oblige as he completed his USF education in speech pathology. "My role was basically to nag the participants to make sure they were utilizing their new skills," he says. "They'd hate us for most of the program, until the final week when they saw results. Then they loved us."

"When Nathan first came to my program at USF, he was having such a hard time with his stutter ... but he became one of my stars."

– Pat Sacco

After graduating, Maxfield headed north for the next seven years, eventually earning his doctorate in the same field from City University of New York, focusing solely on research – with no intervention-related work. After the 9/11 attacks, he was hired on a lab team working for the Centers for the Advanced Studies of Language, funded by the Department of Defense and based at the University of Maryland. The team's job was to help DOD language analysts do their work at a higher level, allowing them to better understand nuances of speech under simulated stress. "We gave them tools to use in high-risk, high-stakes situations," he explains.

Throughout these formative years, Maxfield was motivated by, of all people, basketball superstar Michael Jordan, who was known to go home after hitting a game-winning shot and practice that same shot for hours, creating a motor memory for each movement he used. The same relentless repetition of verbalization techniques helped Maxfield make continued improvement with his speech, suffering fewer stuttering relapses. After earning his PhD, he declined an opportunity to remain with the DOD project and pursued his passion for academics, where he felt he could make a tangible difference in the lives of severe stutterers.

In 2005, that led Maxfield to take a job with USF to teach and continue his research. He moved back to Tampa with wife Alexis, also a speech pathologist, and began building the foundation of a new career. The catalyst was the highly specialized knowledge gained from his mentor, Sacco. At the time, Sacco was very protective of his method and reluctant to let anyone else teach it. "It was dying and not everybody knew about it," Maxfield says. But the USF speech therapist was uniquely qualified to present the program himself, and did just that in 2010 as a three-week prototype – without, he admits, telling Sacco.

"I just wanted to see if I could run it, and I suppose I didn't want to give him the chance to say no," he says. "But everything went extremely well, so that's when I told him what I'd done. And he couldn't have been more gracious about it. He told me that he had wanted to leave some type of legacy, and even encouraged me to adapt his approach in any way I might want."

Maxfield has run the program every summer since, with the exception of 2012 due to a research commitment, and Sacco, retired and living in South Florida, has been a frequent observer.

Unbeknownst to them, a woman who had made international sports headlines three decades earlier was scouring the Internet, trying to get help for her young son's stuttering problem. And this tale of intersecting paths suddenly took a new twist.

The world knew her first as Nancy Hogshead, the American swimmer who won three gold medals and one silver at the 1984 Summer Games in Los Angeles. But before reaching her Olympic heights – and before marrying attorney Scott Makar in 1999 and becoming Nancy Hogshead-Makar – she was a young girl growing up in Jacksonville with a mild stuttering problem.

Her parents made sure she underwent speech therapy as a child, which was well-intentioned but not very helpful. She qualified for the 1980 U.S. Olympic team, but America's boycott of the Moscow Games wiped out her chance to compete in that Olympiad. She accepted a full scholarship to swim for Duke University, becoming an All-American. But during her sophomore year, she suffered serious trauma when she was raped while out for a run on campus. She quit swimming and withdrew from two classes, taking incompletes in her other courses. And the mild stutter she'd known as a child suddenly became a major one – a 10 on a scale of 10, in her estimation.

Nancy Hogshead with her Olympic medals in 1984

Her mother sought help, enrolling her daughter in 1982 in a live-in, eight-week clinic at SUNY-Geneseo in New York – taught by none other than Pat Sacco.

Hogshead-Makar experienced the same difficult program Maxfield would undergo a decade later. Admittedly, she hated it at first. But, like Maxfield, she also benefitted: learning to gain intricate control over the movement of her teeth, lips, tongue and voicebox, and making slow progress – sometimes excruciatingly so – one "sick cow" word at a time.

She describes the sensation that helped her as gaining a "mindfulness," imagining moving her mind into her mouth. She didn't merely practice fluency, either. "I essentially strengthened the neural connections between my brain and mouth," she recollects. "It wasn't that different than what I did to get into a zone and rehearse mentally as a competitive swimmer. The approach helped me 100 percent, and I could never have figured that part out by myself."

Hogshead-Makar returned to Duke after her summer of speech therapy, where the swim coach coaxed her back into the pool – almost a year after the attack – by offering her a scholarship and a place on the team. That helped reignite her competitive fire and launched her on the road to Olympic glory. Hogshead-Makar went on to earn her law degree from Georgetown University, eventually going into private practice representing women on Title IX issues and becoming a gender equity advocate – and frequent public speaker before crowds of hundreds and thousands.

"When you have a stutter, it's hard to get a word into conversations when everyone is talking over each other."

– Teenager Aaron Hogshead-Makar

She also became a busy mom, who noticed that her son Aaron developed a stuttering problem at 2 years of age. She recalls an instance in which her toddler tried four times to say "Mommy," only to give up in frustration. She sought early intervention geared to a young child, and the speech therapist recommended turning the home into speech therapy, by modeling extremely slow speech to Aaron right after he stuttered – not so different from what she'd learned in Geneseo. He would stare at his mother's lip movements and his stutter faded after about a year. But as he neared high school, Aaron's stuttering, while not serious, interfered with his ability to carry on typical, fast-paced conversations with teen pals. That became an increasing source of frustration, and his mother sought assistance from a familiar source.

Unfortunately, Pat Sacco had already left his post at SUNY-Geneseo and closed his clinic. She tried with no success to locate him using the Web. But her searches turned up something else – a reference to the Program for the Advanced Treatment of Stuttering, directed by a Dr. Nathan Maxfield at the University of South Florida. She made contact and was floored to learn that Maxfield had undergone the same treatment program with Pat Sacco, and that he was teaching the same approach, bolstered by new research.

Dr. Maxfield, Aaron and Nancy Hogshead-Makar and Pat Sacco at USF

Hogshead-Makar prepared her son for a difficult, monotonous and occasionally unpleasant three weeks, based on her experience. But she was stunned when Aaron reported on the first day that he'd actually had fun. Just as she had done 30 years earlier, he mastered the visualization and mechanical techniques naturally. And he quickly gained control over his stuttering.

"Dr. Maxfield is just a really good teacher who loves his stutterers," she says. "There's an empathy that can only come from being a stutterer yourself. He is very good at what he does. In addition, he can take what the academic world has to offer on the subject, and blend it with his personal experience as a gifted teacher to make sure the students get the skills they need."

"When you have a stutter, it's hard to get a word into a conversation when everyone is talking over each other," says Aaron, now 15. "So I would always have these brilliant interjections to make, but I could never use them. I'd either look like an idiot, moving my head in all different directions, or I'd just remain silent. But all of that has changed thanks to the program taught by Dr. Maxfield.

"He's a great guy, very thoughtful and caring. And he's excellent at what he does."

Pascal Orelus heartily agrees with Aaron's sentiment.

As a child living in Haiti, he learned to live with his stutter, and he never experienced any teasing from school friends or humiliating moments in public. "I was actually considered one of the cool kids," he reflects. Even after his mother moved the family to Fort Lauderdale in search of a better life, 11-year-old Pascal didn't deal with any particular problems caused by his stutter. He found himself in a program with other students new to the United States, and everyone had to deal with the challenge of learning a new language.

Pascal Orelus

But by high school, his stuttering worsened and began to make him feel embarrassed. To build up his self-confidence, Orelus decided to go out for the high school track team. "Track was my way to feel comfortable again," he says. In fact, he was so comfortable running the 200 and 400 meters that he was

named team captain and MVP at Fort Lauderdale's Northeast High as both a junior and senior, and finished second in the state meet in the 400 in his final season. That was enough to attract plenty of attention from colleges, leading to him accepting a scholarship offer from USF in 2009. But Orelus recalls that it was difficult having conversations with the coaches during the recruiting process.

Pascal Orelus after a 400 meters victory

"I always felt self-conscious, because on the phone I would stutter more," he says. "My friends said, 'Don't worry, they don't care about your stuttering, only your running.' But I still felt bad."

Soon after Orelus arrived at USF, assistant track coach Don Marsh pulled him aside and said he had something to talk to him about. Marsh apologized for bringing up Orelus' stutter without being asked, but he had made some phone calls and learned of the speech therapy program taught by Dr. Maxfield.

"I remember the first time I saw Dr. Maxfield in a support group, he wasn't using any of his techniques and was stuttering – and I thought, 'Wow, he's worse off than *I* am,' " Orelus recalls. "But the next time I saw him, he was speaking with no problems. I couldn't believe it. I said, 'Whatever he knows, I want to learn it.' "

Orelus went through the program and made rapid strides, while doing the same on the track – setting a school record for the 400 meters (46.34 seconds) and winning many races in his four years. He credits Dr. Maxfield for making a huge difference in his life. "When I learned to control my stutter, it was just an amazing feeling," he says. Orelus, now a Texas-based personal and financial advisor, hopes to do what he can to help others who stutter.

"If I want, I can speak with no sign of any stutter, but I choose not to talk perfectly," he says. "The reason is if someone with a stutter hears me, they might ask me a question about it. And that will give me a chance to start a conversation – and tell them where they can go to get help."

His office on the second floor of the College of Behavioral and Community Sciences building is packed with piles of research documentation and notebooks. This is where Maxfield spends a great deal of time studying the latest theories about the possible causes of stuttering. One such medical model, dealing with the hemisphere interaction of the brain, may hold promise.

"People who stutter often have periods of fluency in their speech, even without intervention," he says. "Language and speech are usually controlled by the left half of the brain, but there is mounting evidence that the right hemisphere of the brain increases in activation during these periods of automatic fluency in people who stutter."

That has led Maxfield and researchers elsewhere to examine whether the right hemisphere compensates for problems in left-hemisphere functioning.

"The lights have gone on in my mind that if we can get people who stutter to use the right half of the brain even more, maybe we can harness that to increase their fluency," he says.

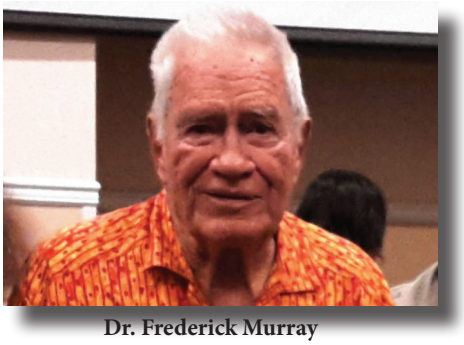
The clues emerged from studies by a Georgia State University researcher, Dr. Bruce Crosson, into anomia, a condition in which stroke victims struggle to find the words for objects they recognize. Those individuals also experience a shift to the right

side for language activity, compensating for issues on the left side caused by the stroke. Crosson has found that if stroke victims make a complex left-handed movement – thus triggering the right side of the brain – they have more success in naming an object that they had previously been unable to identify.

"We're working with that approach to see if it can help people who stutter," Maxfield says. His work in this endeavor includes a new optical brain imaging machine that utilizes lasers, and indicates localized brain activity when the spectrum of light changes. He is currently seeking approval and funding to explore whether right-hemisphere training alone leads to an increase in fluency, or in combination with traditional speech-therapy intervention. Maxfield also has an eye toward investigating more direct brain interventions such as transcranial magnetic stimulation. "The possibility of ameliorating stuttering through direct stimulation of brain regions associated with spontaneous fluency in people who stutter has been on my mind a lot lately."

Meanwhile, two private donors have stepped up to help Maxfield in his work with traditional intervention and his innovative pilot studies. One person is Tampa attorney Sheryl Hunter, whose young son, Logan, was helped in the USF PATS program. Hunter's gift helped create the Prescott and Sandy Seckel & Valerie West Fluency Scholarship, named for Logan's grandparents, and intended to support graduate students doing research in childhood fluency. "As parents of a child who stutters, my husband and I are grateful to Dr. Maxfield and USF for their dedication to providing fluency services, training speech therapists, and conducting research on this complex disorder that impacts over 3 million Americans," says Hunter.

The other donor is heralded former speech pathologist Dr. Frederick Murray, a 90-year-old Largo retiree who overcame a serious childhood stutter. He went on to become one of the leading authorities on the topic, teaching and directing a stuttering therapy program for years at the University of New Hampshire, and authoring a book about his life, *A Stutterer's Story*.



Dr. Frederick Murray

"Dr. Maxfield is top notch," says Murray, who created the Dr. Frederick Murray Endowment for Stuttering, providing financial assistance for individuals who stutter and are in need of therapy services and clinical programs at USF.

"I've been through the mill with the disorder. I suffered very severely earlier in my life, and he did, too. I've known him for 15 years or so, and I'm delighted that he's at USF, doing this important work, and he deserves the best. The way I'd say it is 'Dr. Maxfield has washed the windows of the minds of many people about stuttering.' "

Murray has long believed that stuttering is organically based, definitely not a psychological issue as some once maintained.

"We don't absolutely know what the cause is, however we have enough evidence to show that there are parts of the brain not functioning in the normal range," he explains. "New research – the kind Dr. Maxfield is doing – suggests that the synapses in the brain are out of sync when one stutters. Picture trapeze artists swinging: They have to meet at just the right instant, or one will fall to the pit below. We have found through research that stuttering seems to show a lack of synchrony in that very fine matter of the 'two trapeze artists' meeting. This is what we weigh as being the core of the disorder."

One other stuttering expert has a unique perspective on Maxfield's efforts – his mentor, Pat Sacco.

"When Nathan first came to my program at USF, he was having such a hard time with his stutter," Sacco recalls. "But he wanted to major in speech pathology and absolutely dedicated himself to learning the techniques to control his stutter. He became one of my stars. Today he is doing marvelous work in the field, and it is an extreme joy for me to see him carry on – and build upon – my work with the disorder."

A disorder being treated and better understood in the research labs at USF, by a man determined to smooth the fluency – and the road in life – for his fellow stutterers.

For information about how to support the Program for the Advanced Treatment of Stuttering, contact CBCS Development Officer Lisa Isenbeck at (813) 974-2327 or lisenbeck@usf.edu. For information on how to participate in the program, contact Dr. Nathan Maxfield at (813) 974-6190 or nmaxfield@usf.edu

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