

SPECIAL SECTION

William's Story: A Case Study in Optimal Performance

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Elites in business, academics, and sports, as well as in the performing and visual arts, seek techniques to dissolve barriers while enhancing innate and developing abilities. This case study illustrates a process that weaves together traditional stress-reduction tools, coaching, mental imagery training, psychology, and psycho-physiological technology and that permits individual clients to perform more efficiently at a higher proficiency.

William took the stage with his new \$35,000 cello for what was to be his senior recital. The concert hall was filled with key people in his life, including his mentor and teacher, to whom he had developed a strong attachment over the past 18 months. Also in the audience were 12 family members. His divorced parents, the stepparents, stepsiblings, and three older brothers with their wives sat together in the third row. As William launched into a cello performance, I saw his life story before my eyes. This narrative also includes my role as his therapist, performance coach, and biofeedback professional.

The Practitioner's Story

The desire to help ease human suffering and other people's pain has long informed my pursuits; even when I worked as a theater director and producer, my best skill was as a coach. I attended an elite program at Hofstra University as a theater major with a minor in education. The performing arts will always be an important part of my life. Yet I excelled in a different way in the field of social work. In 1969, I graduated from Columbia University School of Social Work. In the coming years, I worked 16 hours a day, alternating between theater and social work.

Later, my career took me into corporate settings and marketing positions. In 1994, I was in the middle of leaving a telecommunications company and moving to a bigger marketing role. During the transition, I was introduced to the field of neurofeedback.

I made it my mission to learn all I could about this exciting new discipline. I assembled a team of mentors whose seniority and influence in the field provided me with access to the pioneers in biofeedback and neurofeedback,

who gave me support, coaching, and training, in addition to formal coursework.

My private practice in Connecticut began to focus on enhancing people's performance in business, arts, academia, and sports. As a theater person, my best talents came into play as a coach helping my clients achieve outstanding performances. That innate ability translated easily to business, and the practice took off. One of my first clients, a New York show musician, came to me after having read the popular book *Megabrain* (Hutchinson, 1987). He wanted to try alpha neurofeedback training to help him recapture his passion and commitment to jazz. After an intense week of training in my office, he was seeking club gigs in each town, as he played in the touring production of *Cats*. Student musicians, opera singers, film performers, and entrepreneurs came to work with me. As vocal coaches and their students began to work with me, the instructors at the Hartt School Community Division reported that the singers' voices sounded clearer and more resonant. The performers appeared to understand and interpret the selections with better ability to convey the emotional content of the music (Tattenbaum, 2000).

In the summer of 2001, I studied participants enrolled in an intensive training program called *Intermezzo*, offered for aspiring opera singers. Participants in my 6-week study included a targeted intervention group and a control group, both of which completed autobiographies of their vocal careers and questionnaires on flow, mental imagery, and anxiety. The targeted group received 10 to 13 training sessions of neurofeedback on an EEG Spectrum™ system delivered by a trained nurse/technician and the author. Digital recordings of pre- and posttraining vocal performances were made under the direction of an unbiased professional singer and college instructor.

The digital recordings were analyzed by Advanced Brain Technologies™. The analysis indicated that for the male baritone, there was a change both in the spectral analysis of the voice and in the quality of the descending scale. Also, the analysis noted that "harmonics are much clearer and more balanced, which could indicate more focused and controlled vocal productions." The program revealed that

the control group's voices were fatigued and hoarse and did not reveal the improvements in clarity that two of the targeted group members evidenced. These findings were presented in Tattenbaum (2001a, 2002a, 2002b).

At the first professional meetings at which I presented my findings, I focused on the tapestry of tools used for singers and the anecdotal reports we received (Necula, 2004). Frequently, I was able to demonstrate change in a vocalist's voice in the workshop setting. At professional meetings, the workshop participants wanted me to specify the nuts and bolts of the vocalists' programs such as site placements and frequencies. For me, there was a disconnect. I wanted to focus on how neurofeedback appeared—when coupled with other tools or used alone—to release the performer's innate ability. My own concern was never with the technical details, the frequencies and placements. More stunning was the transformation of the voice and instrumental sound and the writer's ability to find the words needed to convey a story.

As time has passed, my focus has moved toward framing questions that would further develop my practice methods. What happened after the opera singer's voice became clearer and more resonant? What happened when the baritone had made his corrections and sang more fully? Would the new sound frighten him further? In a client who was a dancer, might an eating disorder reappear? Or what happened when the Intermezzo project was finished and the young woman's voice, which had demonstrated a shift in clarity, was hit with an external trauma such as 9/11, which in fact affected her and those close to her?¹ Would her improved functionality trigger a greater mood shift? Would she be more resilient? Would she lose her improved vocal control? Would she be better able to process external constraints? Candidly, I am more intrigued by these questions than by sites, frequencies, and communicating placements. As guest editor for three optimal functioning issues of *Biofeedback*, I have had the opportunity to read numerous submissions. I am keenly interested in poststudy behavior and changes.

After a bout of serious illness, I explored Valdeane and Susan Brown's Zengar (now NeurOptimal®) system with Edward O'Malley. I was familiar with Valdeane Brown's work on performance, which had encouraged me to explore the difference between peak and power performance (Brown, 2001). But an earlier article that introduced his clinical approach to treating autoimmune disease resonated with me when I was suffering with Lyme disease of the central nervous system (Brown, 1995). Although my central nervous system was seriously compromised, Edward O'Malley and I believed that this comprehensive

adaptive approach might be the answer to regaining functionality.

I had several magnetic resonance imaging and single-photon emission computed tomography scans and a quantitative electroencephalogram (EEG) performed by Merlyn Hurd of New York prior to, during, and after training with Dr. O'Malley. The Zengar NeurOptimal® program helped unlock my locked, amplitude-asymmetrical brain. The brain function became more normalized, flexible, and connected, as illustrated by decreases in amplitude asymmetry, coherence, and phase lag during my treatment. Those changes occurred despite the fact that they were not the focus of the training during that time. The pre and post findings were presented to the International Society for Neurofeedback and Research (Hurd & O'Malley, 2006).

My personal experience spurred me to migrate to the Zengar platform in my practice. I had experienced such a profound change that I was intrigued to see what might occur in others. I was stunned when three out of four teenagers in my own practice substantially raised their SAT scores after Zengar training (Tattenbaum, 2006).

My clinical approach, a process combining traditional neurofeedback with coaching, breathing, Open Focus™, and imagery, had already begun to be recognized at meetings and by Jim Robbins in his book *A Symphony in the Brain: The Evolution of the New Brain Wave Biofeedback* (Robbins, 2001).

But I had to figure out how to integrate my existing approach, which I employed in my West Hartford, Connecticut, practice under the business name Inner Act, with the Zengar platform. Those tools—rhythmic breathing, Open Focus™ (Fehmi & Robbins, 2007, 2010), journey work, mental imagery, and coaching—are still critical. Marrying them with Zengar, I thought, might produce remarkable results.

The central nervous system (CNS) controls most of our body functioning. Signs of a less than optimally functioning brain can show up in many traits of high performers. Hypersensitivity to correction, excessive internal criticism, an inability to connect to the emotional tone of a selection, and anticipatory thoughts all lead away from a state of flow.

During a session, the sensors read the electrical activity of the client's brain (the brainwaves), and the NeurOptimal® software processes the information. The brain is then given information (via feedback in the sound) about what it has just done. It learns from this information and self-corrects.

This software platform appears to permit the client to move past moments when they might obsess over the

correct answer on the SAT or the high note in the aria they are singing. In its moment-to-moment monitoring, it appears to guide the CNS into a process similar to one used with computer software known as defragmentation.

The information being conveyed by the audio is not a specific interpretation of the EEG as it would be in another technological platform. (e.g., “You’ve got too much alpha right now”). The software presents to the client that turbulence is occurring, and because turbulence precedes a phase state change in every nonlinear, dynamic system, this directly informs the CNS that it is on the cusp of undergoing a phase state change—something the CNS is likely not directly aware of in its usual day-to-day operations. So, with business people, academics, and writers as well as with aspiring and elite performers, the client’s response is triggered by some stimulus in the environment that is reminiscent (for the client) of prior trauma or experience. The client might experience fear, hyperarousal, and anxiety or may begin to worry. And this occurs regardless of whether there is any actual, real, present, current danger. The cascade of physiological shifts that results in the full-blown trauma response (fight, flight, or freeze) occurs through a succession of micro states and transitions, all of which are actively ignored by the CNS. The *NeuroOptimal*® system identifies the pending change in phase state, and the client’s CNS can recognize it earlier in the cascade, and it can then step back, return to the present, and assess accurately how dangerous/safe the current situation is.

Rather than informing the client that to be an outstanding salesperson, he needs to be able to drop into an alpha state, this technology platform bypasses, without criticizing or placing a value on performance, all the dreams, trauma, and messages the client has received from others. By using this platform, I have more freedom to use my training and skill set. I have the freedom to observe the physiological and content releases that occur in my clients. I now use my initial talk time for the client to share their shifts and the barriers they are facing. I am no longer concerned about sites, time, and frequencies. Nor am I concerned about an abreaction. My focus is the releases and small shifts and on tracking anxiety, fears, agitation, and mood stability. My focus is on how the client is transforming his interactions with the acts of learning, rehearsing, practicing—in other words, the act of living his life.

William’s Story

William kept a journal in which he wrote,

I originally came to Rae to find relief from my headaches and migraines. For the month before beginning my work with Rae, I had a

headache every day, most of them debilitating. We are working on myself as a performer, however, and not focusing on the headaches. In resolving many of the issues I have with myself as a musician and managing my stress, the headaches will undoubtedly improve.

William’s words reflect a freedom to not treat the disorder but instead to offer a training program featuring neuro-feedback, and the other tools, in hopes that the client may ultimately find himself improving his functionality.

There are many ways to use the Zengar platform. You can attach the leads and enter your own quiet place so as to “hold the space.” There are other practitioners who engage the client in psychoanalytic talk therapy or actively engage in trauma or cognitive behavior therapy. I have learned to use my own presence in two different ways. Sometimes I will speak and do *Open Focus*™ exercises, guided imagery, or spiritual or journeywork for the first 5 to 7 minutes of a client’s sessions (see Box 1 for an example of a customized *Open Focus* script for a musician). Other times, talking stops when the training begins.

In an early session, William was struggling with a Bach selection. I opted to have him spend a few minutes with guided imagery. William later wrote:

The imagery began with me walking down steps that led to a beach, physically sinking deeper into relaxation with every step. When I reached the bottom of the stairs, however, I found myself in the middle of a field of soft, tall grass. The sun was out, but not too warm or bright, and a few clouds broke up the deep blue of the sky. I could see the wind creating waves in the tall grasses covering the rolling hills around me, and I smelled flowers as the breeze passed over me.

I sat on the bench and a screen appeared before me. As I watched the screen, I felt the energy of music inside it and encircling me. I looked into the screen and asked about the Bach Cello Suite . . . that I am working on. I felt the energy moving and swirling around me, as to suggest excitement. The energy communicated darkness and loneliness.

At a later session, William described his issues with learning the cello. His instructor would tell him to fix a problem.

My teacher explained how to fix it, but I evidently did not understand and so did not fix the problem. We spent 45 minutes on this one issue, until I was sure I understood, which caused me much frustration.

Before the training session, I guided William back to that frustrating experience.

I went back to the lesson in my mind and spoke with a “shadow,” or “guide,” that had been in the room with me. This being

Box 1. Customized Open Focus™ script utilized by Rae Tattenbaum with the cellist William.

Can you imagine feeling the space between your hips?
 Can you imagine visualizing and feeling the space between your hips and knees?
 Can you imagine visualizing and feeling the space between your knees and the bottoms of both feet?
 Can you imagine visualizing and feeling the space between your feet and your left shoulder?
 Can you imagine visualizing and feeling the reality that the region between your shoulders, arms, hands, and feet are composed of particles and space?
 Can you imagine visualizing and feeling the reality that the region between your chin, ears, forehead, sternum, shoulder, arms, hands, and feet are composed of particles and space?
 Can you imagine the particles of space your body occupies in this room?
 Can you imagine visualizing and feeling the space from your hand on the cello's scroll to the cello's tailpiece?
 Can you imagine that the cello is filled with particles of space?
 Can you imagine and visualize the region from your sternum to your heart center to the F hole and Bridge of the cello?
 Can you imagine visualizing the space of the cello and the bow in your hand?
 Can you imagine the space between the tips of your fingers and the cello strings?
 Can you imagine that your body, the chair you are sitting on, your hands, and the cello are simultaneously filled with particles of space?
 Can you imagine at the same time, that the area within your body and the distance between your core and the cello is seamless and filled with space?
 Can you imagine that boundaries between the spaces above, below, to your sides, and between you and the cello are dissolving?
 Can you imagine that the sounds around you and coming from you are permeated by space?
 Can you imagine that the sounds coming from you, the cello, and your colleagues are filling the space simultaneously within and externally around, in front, and behind you? Is it possible to imagine that you are playing in an open focus state?

enabled told me to be less critical of myself and accept that learning is a process, and I cannot expect to master everything immediately. It told me that I need to let my creativity and curiosity flourish and to let those qualities drive me rather than thinking of what I "should" or "should not" do. I have never gone that deep into my mind, but I liked the experience.

During a coaching lesson, or employee evaluation, the strong mind and body connection enables one to experience the present within the framework of the past. The individual being coached experiences a response that on more than one occasion triggered a flight-or-fight state. Invariably, they find they are not able to execute the suggestion.

The Intermezzo pilot study revealed that the group of opera singers receiving the training all appeared better able

to accept the coaching and feedback. Through feedback from the instructors, it became apparent that this group was better able to both hear the correction or suggestion and to execute it.

I drew on this finding when working with William. As he trained, he became more accessible to his teacher. In turn, his teacher became more enthusiastic about training him. Thus, he began taking more lessons and receiving more productive coaching.

Moreover, my use of the Zengar platform in working with William allowed him to develop resilience, or at least to release the resilience he already had. Our sessions moved, in fewer than six trainings, from using imagery as an entry to the training, to Open Focus™, or to my giving him no specific instructions other than to travel to any place that felt safe for him. William listened to recordings of his lessons and his own playing or watched a DVD of a recital.

In September, he made first chair in the conservatory's highly competitive orchestra. About the same time, though, he learned that his teacher's schedule had been cut from 3 days to 1 day per week. That was not enough to meet William's needs, yet it was politically and emotionally unacceptable for him to study with another teacher.

I suggested to William that because he had taken college-level classes in high school, he probably had enough credits to skip his junior year and graduate early. He had to negotiate a political minefield for weeks with a dean who refused to consider that option and an entrenched academic structure that encouraged him to proceed on a traditional course. In the end, though, William prevailed and was able to graduate from college a year ahead of schedule.

That triggered another raft of trouble. As William considered graduate schools, it became obvious that he needed to trade his \$4,000 cello for one that would allow him to produce a different, higher-quality sound. So as he began the senior year, every free moment was occupied by driving 2 hours either to Boston or New York City to play cellos. Each cello came back to Hartford for him to try out before purchasing, and on occasion they ended up in my office.

To help him choose which instrument to buy, I encouraged him to begin his sessions by entering an internal safe place, becoming comfortable, and placing all of his preconceived ideas about the cello into a basket. After he completed that process, I suggested that all he needed to do was to sit, relax, and return to himself. When he felt comfortable, he might connect with the energy of each cello. To my surprise, he ended up selecting a moderately

priced cello after securing a loan he negotiated with his extended family.

The stress of purchasing the right cello had taken its toll, though. William's migraines resurfaced. But a course of physical therapy, dissolving pain, and training sessions with me helped him conquer those crippling headaches, and he returned within 10 days to his full, busy schedule.

As William's senior recital approached, he also had to juggle graduate-school auditions while arranging private lessons with lead faculty in each school. On top of everything else, the relationship with the girl he had imagined marrying ended 2 weeks before his senior recital. Yet he was able to demonstrate resilience and perseverance.

The Zengar approach permitted William to transform himself, from being a highly aroused and narrowly focused individual to becoming more flexible in his state of being. NeurOptimal® work exercises the CNS so that it nonlinearly reestablishes its own flow and function. As William experienced moments of obsessiveness, self-criticism, fear, and anxiety, the training program brought him back to the present.

William, who was labeled at an early age as gifted and talented, found it liberating when the training simply triggered the orienting response. He learned through the experience that he is enough, just by being! At the recital, William was relaxed. He smiled, connected with the audience, and was able to chat about the music he was performing. The final selection was met with a standing ovation from an audience composed of faculty, graduate students, and his extended family. As the final note lingered in the air, the advanced students and the audience, including William's family, rose as one, shouting out "Bravo!"

Note

1. The subject sang for a critical coach on the Sunday preceding the attack. After the attack, she realized she needed more time to process her skills and the new environment in which she was living.

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