A composite case study illustrates how a multidisciplinary approach can be used to improve athletic performance and overall life functioning. The use of heart rate/respiration biofeedback and QEEG-guided neurofeedback are built on a foundation of cognitive therapy. The elements in the article are taken from several successful cases over the course of several years. The athletes represented in this article range from 18 to 24 years old, are from a variety of sports, and are from higher levels of achievement.

The phone rings in my office at the United States Air Force Academy Peak Performance Center, the Academy’s college counseling center. Coach Johnson, head coach of the Track and Field team says, “Hey, Troy, I have this really talented athlete, but her performance is just too unpredictable. If this keeps up, I’ll have to cut her from the team! Can you help her?”

Here at the Academy, I devote a good portion of my efforts offering optimal performance services to individual athletes, teams, and coaches. Applying cognitive and behavioral psychology, biofeedback, and neurofeedback to high-achieving 18–24 year-old athletes from a variety of athletic disciplines not only improves their athletic performance, but also their quality of life. The names used in this article are fictitious. The story I tell is a compilation of many success stories and truthfully represents the progression and improvements athletes realize when using these services. It is based on 3 years of working with about 50 different athletes on various athletic teams, all high achieving in their sport and academics. About two-thirds of these are males, the other third females. The rapidity of improvement illustrated here is also accurate. The average number of sessions required for goal completion for all these athletes was five (a few very complex cases took as many as 25), with an average self-report improvement of 27% (using a verbal scale of 0–10). Many reported significantly reducing race times or increasing scores (as appropriate to their sport), remarkably increasing performance consistency, and/or winning competitions they felt they would not have won without optimal performance services. All of this was also confirmed by coaches and recorded results.

**Case Study: Cadet Amy Rollins**

At her first appointment, Cadet Amy Rollins told me of her impressive high school track record: She consistently achieved winning times and made it to state finals her senior year, at which point she became recognized and was highly recruited for college track. Since choosing to come to the Academy, however, her performance had become inconsistent. Her sport was a big part of her life, and when she performed poorly, she struggled with confidence in other areas of her life. She also felt bad that she was unreliable for her coach and team. Nevertheless, despite trying everything she and her coach could think of, she could not figure out how to gain back the consistency she enjoyed in high school. It was very frustrating to her not to be improving on her high school achievements. “After all,” she concluded, “I’m competing at the collegiate level now!”

I asked her what seems to affect her athletic performance. “I have no clue. I mean, even in high school I got a little distracted by aches and pains or other competitors in the race. I don’t eat as well here in the dorms, I stay up later studying, and occasionally have arguments with my boyfriend, but isn’t that normal college stuff?” “Well,” I responded, “if the reasons for your performance change were obvious, you and Coach Johnson would have figured it out long ago.”

We explored many cognitive and emotional aspects of life that affect optimal performance: social relationships, attitudes about competing, the way she thinks about herself as an athlete and person, her assessment of how others see her, prerace rituals, team dynamics, and other aspects unique to her. Most of these areas seemed to be in good order. There was some negative self-talk and concern for others’ assessment of her, but she reported that these were not any worse than in high school. It was clear there was something new affecting performance. Her family relations were very strong and meaningful to her. As we explored this further, we realized that she felt more distant from
her family, and was not experiencing the same kind of supportive interactions as she did living at home. “It is not logical,” she said, “but it feels like, because I did well in running and that helped me get to college, running takes me away from my family.”

It is funny how the mind works, inventing ridiculous ways to correct bad feelings; unfortunately they work, but usually at a great cost. We began to explore the full spectrum of the feelings her mind was trying to correct. “How does college actually bring you closer to your family?” I asked. Amy discussed how her younger sister idolized her by following her college running, how her parents supported her by attending all her meets, that discussion of college life filled many family interactions, and how they were able to talk, text, and email regularly. She acknowledged that, even though physically separated from her family, the college experience had actually improved her emotional bond with her family. “Yes,” we concluded, “Let’s remember that while you practice and race. Although at first glance it may feel like it takes you away from your family, winning races actually brings you closer together.” This new concept became Amy’s motivation to run her best.

In our next meeting Amy reported, “As long as I remind myself that running actually brings my family and me closer to one another, I don’t feel nervous before races, I enjoy interacting with my friends more, and feel more like myself around my boyfriend. I feel happier overall.” We spent a few more meetings focusing on sleep habits, good nutrition in the college environment, and better interactions with her friends and boyfriend.

“I never knew I could feel so relaxed,” Amy responded as she mastered heart rate/respiration coherence biofeedback. In just a few training sessions with biofeedback, she was able to achieve noticeable benefits. She was able to get to sleep quicker, her overall energy was increased, she was more relaxed during school tests, and her end-of-race surge was more powerful.

“I can’t believe it!” Coach Johnson said when I joined him in his office. “Amy is like a new person: I can completely count on her in events and she keeps cutting her time. I can think of several other athletes that could benefit from this, but I am not sure they will be as willing as Amy,” I said. “I see. They aren’t comfortable with me and don’t understand how I can help them. I have an interactive presentation that outlines basic optimal performance techniques. We could use this to introduce them to me and my services.” We made plans for me to make this presentation at the next team meeting. This allowed the athletes to get basic techniques on board and seek more customized services from me as they needed. As more athletes took advantage of optimal performance training, Coach Johnson was able to spend more time coaching, while I improved the factors that affect performance besides skill, talent, and physical conditioning.

“If I keep this up,” Amy began at our next meeting, “I’ll be able to qualify for the Olympic trials next year! I think the only thing negatively affecting my races now is getting distracted by the normal aches and pains and other competitors, but I think most athletes struggle with these things. Can you help with those?” Staying “in the zone” requires mental flexibility—considering a distraction, resolving it, and getting back to the zone quickly. Neurofeedback improves mental flexibility by directly training the brain. It is a great capstone for optimal performance services. “First, we will do an assessment to determine what areas of your brain are working too hard, or not enough, then we will directly train those parts of your brain to work better for you,” I explained. We began with a quantitative electroencephalograph (QEEG), which maps brain activation levels at 19 sites and shows patterns of coherence and symmetry among those sites. This showed that Amy’s brain was over-activated in the parietal areas (specifically for her, increased 16–28 Hz across an area including P3, Pz, and P4, cortical sites in the International 10–20 system), which may have contributed to her essentially perseverative focus on and worry about common race distractors.

The training protocol that appeared most parsimonious was inhibiting 16–28 Hz at Pz while rewarding 8–10 Hz (Alpha), and controlling for muscle artifact (30+ Hz). After about five sessions with this custom-designed protocol, she noticed an improvement: “I can’t really explain it, but I just don’t seem to get distracted by the other girls on the line. I just think about my race. Sure, I notice the pain in my body, but it is not a big deal: I just feel focused.” We continued neurofeedback for several more sessions, reviewed breathing techniques and occasionally focused on a solution for a problem with her friends or teammates. After just a few months from our first meeting, Amy said, “Running is much more enjoyable now, my mind is clear, my relationships are better, I am doing well in school, and I am making the kind of times I know I am capable of. Thanks for helping me get there.”

**Conclusion**

On my schedule the next week I notice a cadet from the diving team. Our intake paperwork indicated that he was interested in optimal performance services. When we sat down in my office, I asked him how he heard about these services. “I’m good friends with Amy; she said you helped her a lot with her running. Does this stuff work for diving, too?” I smiled and said, “It sure does.”