

Member Q&A: “What I’ve Learned...”

Dr. Debbie Crews, Arizona State University

Interview by Paul Ramee, Jr.



GBN Member Dr. Debbie Crews is Faculty Research Analyst in the Dept. of Kinesiology and Chairs the World Scientific Congress of Golf.

This article continues our series featuring a variety of insights from highly respected GBN members.

Debbie, the golf teaching profession doesn’t have a lot of people in it who hold doctoral degrees and have taught at the university level. How did all this get started for you?

When I was 12 years old my father made us kids play golf with him. I was not very good, but when I turned 14 I started to finally like it. That summer I was playing golf all the time. I lowered my score by something like 40 strokes. When it was time for college I attended the University of Wisconsin and started a golf team, ironically with the help of the tennis coach. After college I moved to Arizona and focused on my graduate studies, I continued to work on my game and try to perfect my swing technique. I taught school and to help pay the bills I coached volleyball, basketball and track.

Sounds like you beat a lot of balls during that time period.

Yes, maybe too many. In my early 20’s I got burned out and stopped playing golf altogether. For the next four years I taught in the Exercise Science Dept. at ASU and finished up my Master’s degree. I then went on and earned a Ph.D in sports psychology.

In your opinion, how has golf research changed in the last 25 years?

Technology is the biggest difference. What used to take months to measure and analyze now takes seconds. We can analyze brain patterns, what the ball is doing on the clubface—really anything you might want to know. We are getting a totally new picture of what happens in a golf swing, versus what we thought was going on—or not going on. For example, we always thought the clubhead accelerated through the ball. That doesn’t happen. An event occurs before impact that we call the “second aim,” with the result that the clubhead actually decelerates.

Why exactly does this “second aim” occur? To ask it another way, why would there be a deceleration?

The subconscious is trying to refine the aim and toward impact it takes over. A golfer feels himself very focused on accelerating through the ball, but a more dominant part of his brain steps in.

To your view, what has been the most significant breakthrough in the research surrounding the action of the swing?

I would say it is the ability to see and help people with the transfer of motion and the ability to define motion more clearly. In general, we now have the capacity to create coherence in the brain so that the conscious and the subconscious are working together. When athletes are performing at their highest level, it’s because they can create that coherence. Under those circumstances the athlete can truly excel. Also, when athletes realize they are in a high-stress situation, they are now able to identify the symptoms and deal with it. In our practice, we set up situations and experiences that allow them to practice high-stress situations and get better at dealing with them.

That raises the question of pre-shot routine. Should we still consider that to be an important performance element for golfers?

Absolutely. The athlete’s routine is critical. It is where all the pieces are put together. I did a study for Dateline NBC several years ago on choking. We learned that the more distracted someone gets—the more stuff is added to the routine—the less successful they will be. The brain-body system knows what is next and if the routine is changed the system goes “on watch” and does not know what is next.

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pre-shot routine?

Every tour player we studied took between 8 and 20 seconds. Everyone is different, although, as a median, we found players take about 12 seconds to complete their pre-shot routine.

Can you explain to me your research on the yips?

Is there an optimal time frame for a



Dr. Debbie Crews is a recognized leader in golf performance-related research and chairs the World Scientific Congress of Golf recently held in Arizona.

The yips are a fascinating disorder, I worked with the Mayo Clinic and we realized there is not one type of yip. Instead, people who are suffering from this problem typically fall into one of three categories. The first are people with neurological impairment.

They would have the yips even if they were putting on the carpet in their living room, with nothing on the line. The second category is a so-called conditional impairment. These are people who at certain times and places suffer a psychological impairment. This type of player is fine on the putting green, but once he gets on the golf course, he will spasm as he tries to putt.

The last type is more of an intermittent impairment. You see this in a player who begins to experience the yips at a certain period of their career.

What is the cure?

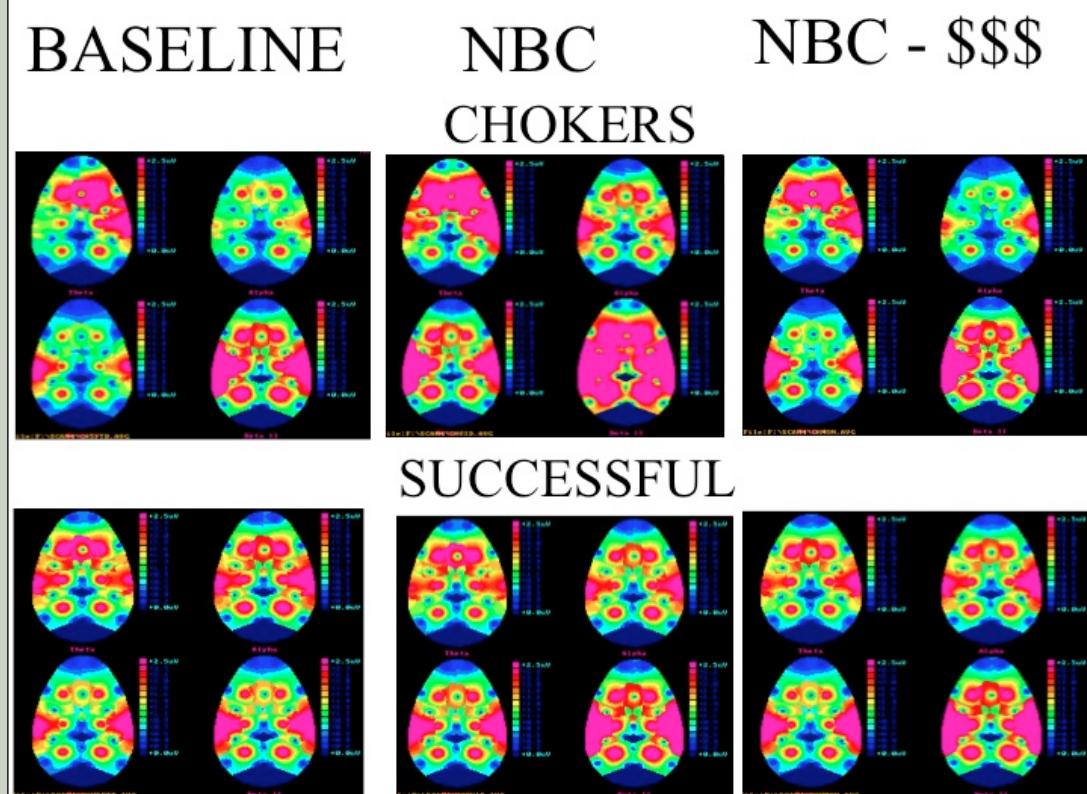
You have to get them out of the mindset that there is only one way to do something. Most likely they have worn out their motor programming. They need you to help them find an alternate pathway. If it is the driver yips, you may ask them to concentrate on shaping the ball, rather than trying to hit it straight. As their instructor, you should focus their attention past the problem, to the finish, not what happens along the way.

What is the relationship between brain activity and cardiac activity?

The brain and heart are highly correlated. Every beat of the heart is controlled by the brain and ultimately the heartbeat has an effect on any athletic motion. With respect to performance and optimal heart rate, we found the dominant pattern for golfers was 75-85 beats per minute. As their heart rate decreased they were in a better condition to perform well. Conversely as their heart rate increased they typically were not in the best place to perform. We also found that in athletes 60 years old or older, their peak performance state heart rate was a little higher. This helped them to get activated.

What can teachers do to better help their students?

Teachers can realize that the better the system actually operates, the better you can operate the system and it is imperative to get the conscious and sub-conscious on the same page. Teachers need to put their students into situations that can test them. Lastly, it is important for players and teachers to realize that the last thing your brain sees or thinks about is what is most likely going to happen.



These EEG brain maps show the amount of electrical energy in the left and right brain hemispheres as they undergo conscious thought. These maps were part of Dr. Crews study of golfers' brains when they are putting with and without perceived pressure. In those who "choked" under pressure there was usually an imbalance between the left and right hemispheres. That wasn't present in those who were successful under pressure. Dr. Crews research is being used to identify improvements in pre-shot routines, imagery training and biofeedback training.