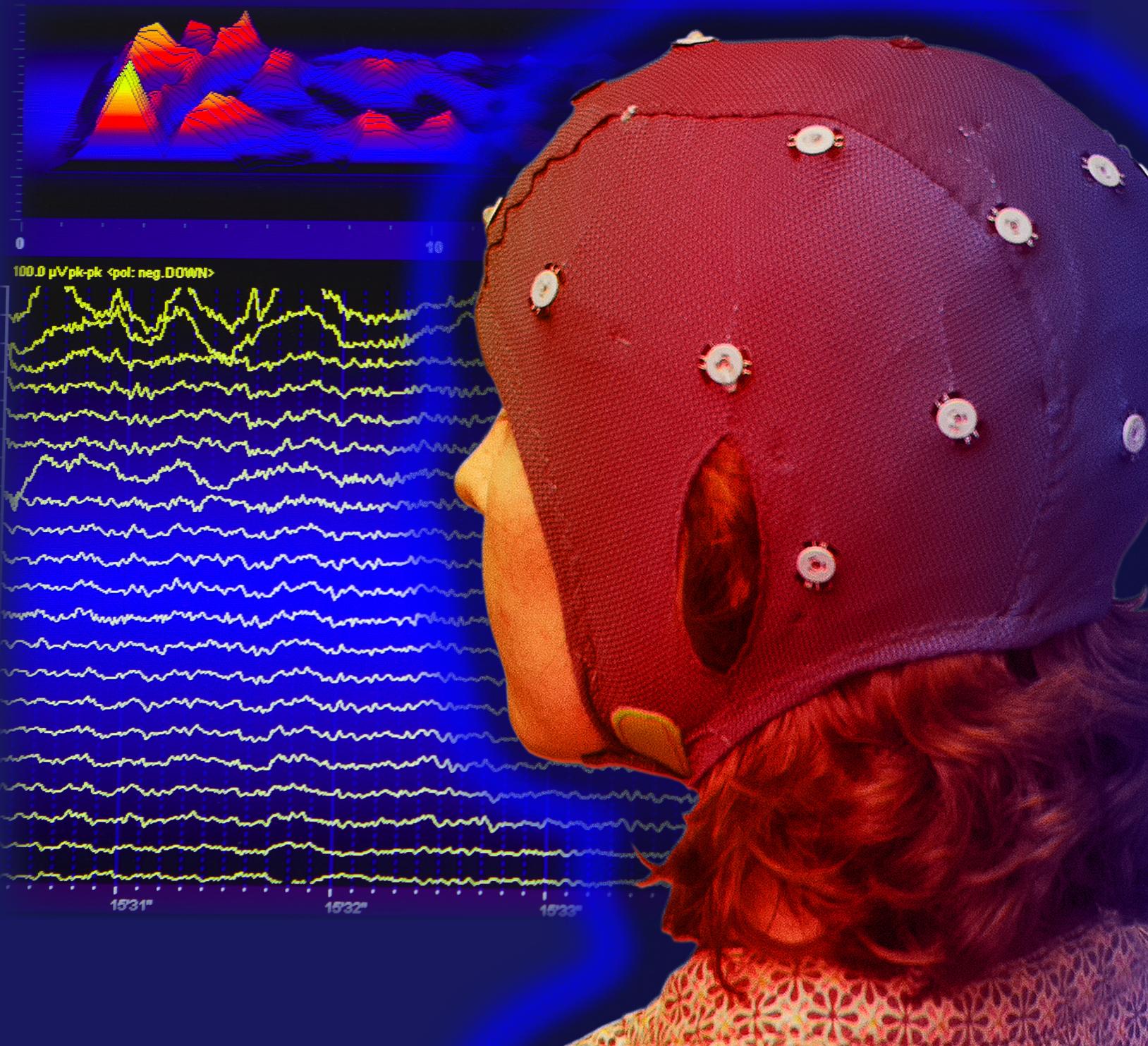


Waves of Communication

by Katie Pratt



Graduate student Claire Kimberly uses a blunt syringe to inject gel into the electrode cap worn by a study participant.

Imagine what it would be like to see into another person's mind. University of Kentucky Family Sciences researchers Ronald Werner-Wilson, Trent Parker, and Nathan Wood aren't mind readers, but individuals and couples come to them, strap on something that looks like a swimmer's cap, and let the professors watch their brainwaves in action.



Ronald Werner-Wilson

"Humans are immensely sophisticated, complicated creatures, which means we need to use more sophisticated ways to collect data about them," said Werner-Wilson, Kathryn Louise Chellgren Endowed Professor for Research in the College of Agriculture's School of Human Environmental Sciences.

In the Family Interaction Research Lab, researchers collect social, neurological, and physiological (heart rate and skin conductance) data from individuals, couples, and families as they communicate.

"The laboratory brings a new research methodology to our faculty," said Ann Vail, director of the School of Human Environmental Sciences. "The entire scientific community is considering the changes of the brain and how they impact human behavior. It is only natural that our faculty would be interested in the impact on relationships and family functions. The potential impacts on individuals and families are numerous."

In the lab, that "swimmer's cap" participants wear is covered with electrodes that measure brainwaves as they travel from neuron to neuron across synapses in particular areas of the brain. Along with the cap, participants are fitted with equipment that measures heart rate and skin conductance, or sweat.

"The areas we're most interested in are the emotion processing areas, which are on the front and right side of the brain," Werner-Wilson said. "For example, people who tend to exercise the right side of their brain more tend to have symptoms of depression and are withdrawn.



People who use the left side of their brain tend to be more relaxed and more engaged in conversation."

The lab allows them to get a more accurate picture of positive and negative factors influencing a relationship. Other forms of research, such as questionnaires, may be clouded by how people picture themselves or want others to perceive them.

"This cuts out the social desirability, so you are able to see what's really going on with people," said Parker, a family sciences assistant professor.

Ashley and Andy, both 24, had been married for only eight months when they decided to participate in one of Parker's studies. He wanted to find out if engaging in a warm interaction before discussing a relationship problem reduces stress. Participants discussed interactions that were warm, such as how they first met, or neutral, like the events of the day. In the study, each couple was alone in the lab while they discussed two problems in their relationship. Researchers recorded the conversations on video and analyzed them later.

"We've had similar conversations in the past at home," Andy said, referring to the problems they discussed. "The whole experience was relaxed and easy. They made it easy."



Doctoral candidate and lab coordinator
Martha Perry
believes the lab provides “a unique graduate school experience” that gives her the opportunity to publish in new areas. (R) Kelly Webber partnered with Nathan Wood in the lab to examine family and couple dynamics.



This is only one of several studies conducted since the lab opened in 2010. Werner-Wilson has conducted research on how military couples are affected by deployment. He particularly focused on couples who have stayed together despite more than one deployment. He's also conducted research about the

impact a traumatic brain injury has on a relationship. Currently, he's collecting data on communication between parents and children and how young people are influenced by video games.

The lab also has games that can help people strengthen a particular area of their brain. In these games, participants move objects on a computer screen by activating a particular part of their brain. The cap captures where the brain is the most active and relays that information to the computer.

“Twenty or 30 years ago, something like this would seem like magic,” Werner-Wilson said. “It’s like being able to play a game without using a joystick. Think of the brain as a muscle. Studies have shown that we can make these muscles stronger and in some cases reduce mental disorders, such as ADHD (attention deficit hyperactivity disorder).”

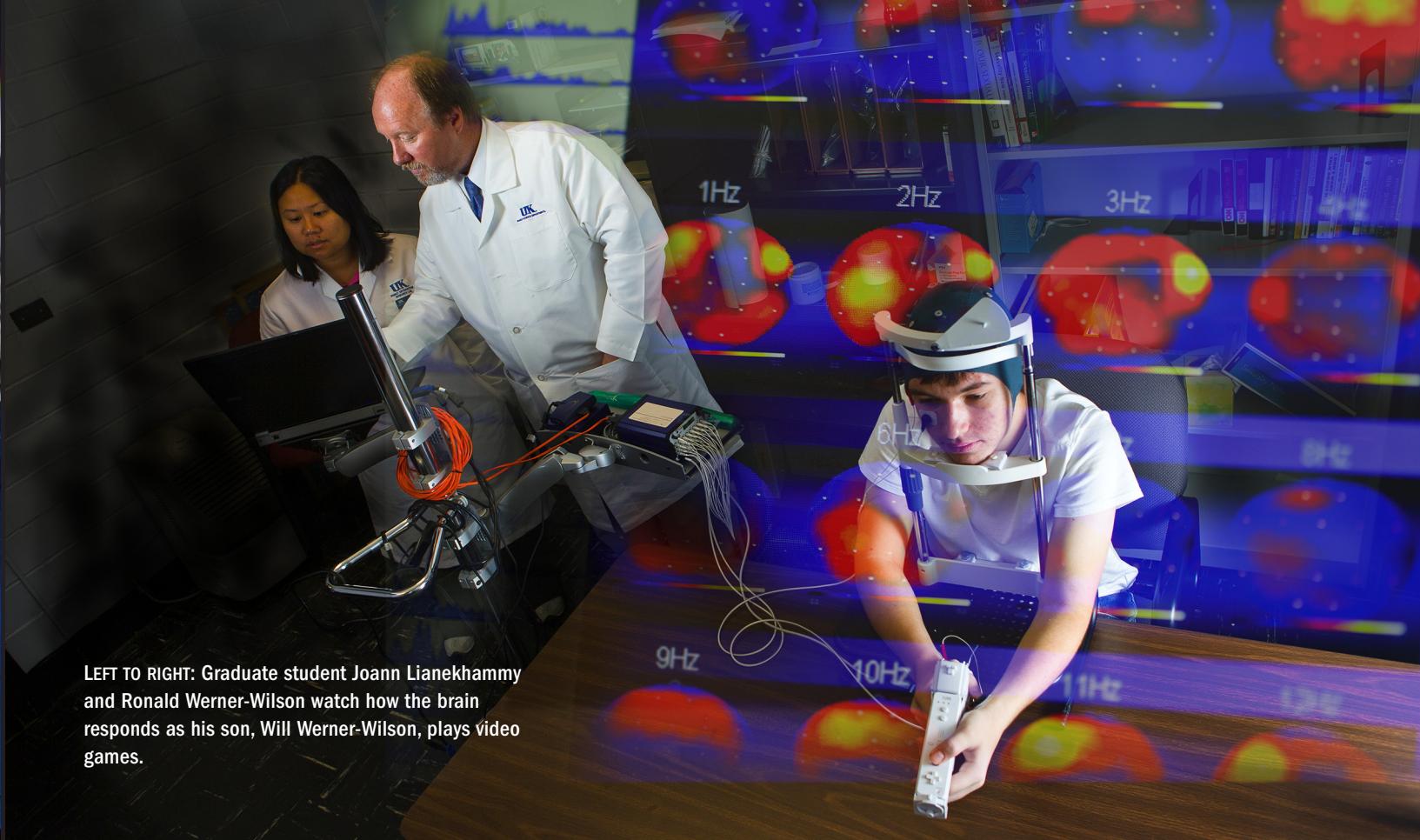
Wood partnered with Kelly Webber, assistant professor in UK’s Department of Nutrition and Food Science, to study how couples affect each other’s eating habits.

“This lab gives us the opportunity for bio-psychosocial research so we can look at inter- and intrapersonal reactions and emotions,” said Wood, an assistant professor in family sciences. “It’s pretty rare to be able to look at families and couple dynamics at this level.”

He’s also conducted a study to determine if a person’s background can help them predict what happens next in a sequence of events. For this intuition study, he solicited graduate students training to become therapists, professional therapists, and people outside the profession. Each research participant was shown a series of photographs of couples interacting. Subjects were asked to predict the intensity level of the next image in the series. They also viewed videos to evaluate different kinds of interactions, like angry or humorous ones.

Parker’s interest in physiological research and its relationship to family communications began in graduate school, and the lab has given him the opportunity to delve further into this area.

In addition to the warm interaction study, he conducted research during actual therapy sessions. It is a common theory among therapists that if a client’s and a therapist’s heart rates increase during a session, the



LEFT TO RIGHT: Graduate student Joann Lianekhammy and Ronald Werner-Wilson watch how the brain responds as his son, Will Werner-Wilson, plays video games.

client sees the therapist as empathetic. In this study, professionals and clients with UK's Family Center volunteered to be research participants. Parker analyzed how clients reacted to the therapist and how the clients rated the therapist after the session.

He presented his findings about clients' self disclosure, and therapist physiology and the empathy theory at the American Association for Marriage and Family Therapy Conference in September in Fort Worth, Texas.

"The lab has opened a whole new world for me," he said. "It's giving me a really unique perspective on therapy."

In addition to the researchers, graduate students in family sciences are using the lab for master's theses and doctoral dissertations.

Martha Perry, a doctoral student who is the lab coordinator, is interested in a career as a family sciences professor. She completed a study comparing face-to-face communication to online communication for her master's thesis in 2010. She discovered that the majority of couples found online chatting as satisfying as face-to-face communication. Some couples preferred to problem solve and resolve conflicts over the computer, as it gave them more time to think about what they wanted to say, resulted in fewer interruptions in the conversation, and lowered the chance of the interaction escalating.

"Having a unique graduate school experience like this one could help me make myself more marketable to potential employers," she said. "It's an opportunity to publish in areas that haven't been published in."

Parker has utilized the lab equipment to demonstrate to some of his undergraduate students the difference between the brainwaves of people with and without ADHD.

"It's been a really valuable teaching tool," he said.

While the lab has only been active for a short period of time, the researchers plan to use it to advance family sciences research and improve family and couple communication.

"UK has a great name in family sciences. The lab just gives us another way to show we're on the cutting edge," Wood said. ♦

Trent Parker

