RATINGS of PERCEIVED EXERTION

BY JESSICA SASSEEN

DR. MATT GREEN HAS DEVOTED HIS PROFESSIONAL CAREER TO RESEARCHING A TOOL THAT MAKES EXERCISE PROGRAMS SAFER AND MORE EFFECTIVE. THIS TOOL ALLOWS INDIVIDUALS TO MAINTAIN THE CORRECT INTENSITY LEVEL WHILE EXERCISING, WITHOUT OVEREXERTING THEIR BODIES.

The focus of his research is called Ratings of Perceived Exertion or RPE. Dr. Green, an assistant professor in the Department of Physical Education and Recreation at Western Kentucky University, describes RPE as "a subjective way of monitoring exercise intensity."

"The big advantage to RPE is it decreases the need to monitor heart rate or any other technical, physiological variables," Dr. Green said. "Many exercisers attempt to closely monitor their heart rate but with varying degrees of accuracy. RPE is so effective that studies suggest if you're using RPE, monitoring heart rate isn't absolutely necessary."

To measure RPE, exercising individuals are asked questions concerning how they feel and asked to answer based on a numerical scale.

"There are various scales we have used like one to ten or six to twenty," Dr. Green said. "While a person is exercising, we show them a scale and say 'How hard is that exercise for you?' and they respond with a number. It has to do with how much fatigue and pain they're feeling, how heavily they're breathing, how hot they feel. Just various things they perceive about their body while they're exercising."

PHOTO BY SHERYL HAGAN-BOOTH

Dr. Matt Green

In one study conducted by the Department of Physical Education and Recreation, participants exercised for more than an hour in an environmental chamber, with a controlled temperature. Dr. Green's research found that, during these periods of exercise, the participants' RPE corresponds with their heart rates in both hot and cool environments.

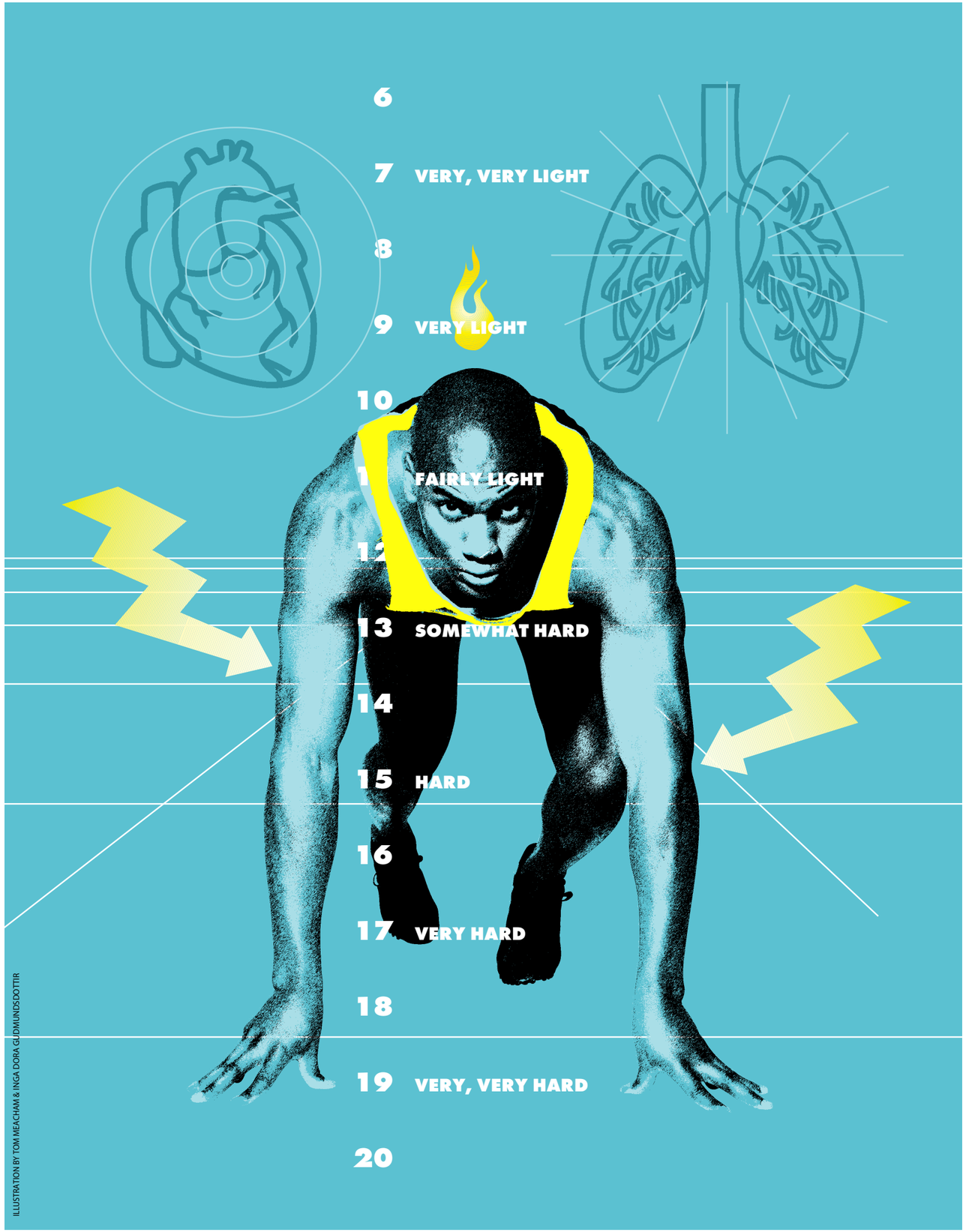
"Basically, as your heart rate goes up, so does your RPE," Dr. Green said.

The RPE scale research is useful to the exercising community by working toward the goals of maximizing the benefits of a fitness program while making workouts time-efficient and safe.

Dr. Green is currently studying blood lactate levels and how RPE corresponds to the lactate threshold. He described blood lactate concentration as a physiological marker of exercise intensity.

"As the exercise gets more intense, the blood lactate concentration goes higher and higher," he said. "As a result, your RPE goes higher and higher."

One RPE application supported by the American College of Sports Medicine (ACSM) is for pregnant individuals, Dr. Green said. According to ACSM, as pregnant women exercise, they should not over exert themselves. When they start to feel like the exercise is too intense, it's time to slow down. They get different feedback mechanisms from their bodies. By using RPE and answering questions like "How hot am I? How heavily am I breathing? How difficult is the work to my legs?" they can gauge their level of intensity.



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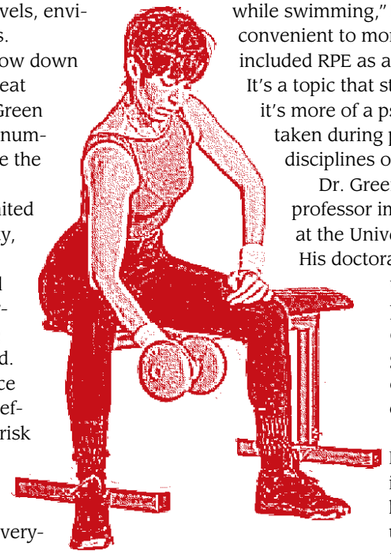
"RPE is based totally on perception, rather than physiological measures," Dr. Green said. "The American College of Sports Medicine suggests that individuals, while exercising, maintain intensity which feels 'somewhat hard' to 'hard' on the RPE scale."

He said advantages to the RPE scale are that it tends to self adjust for varying fitness levels, environmental conditions, and fatigue levels.

"If it's hot outside, you're going to slow down versus if it's cool outside, because the heat makes the exercise more difficult," Dr. Green said. "If you're pregnant and carrying X number of pounds, you'll slow down because the exercise feels a little bit more difficult."

The major killers of people in the United States are chronic conditions like obesity, diabetes, and heart disease. There is a current boom in the fitness industry and an increased interest in fitness and exercise as preventative medicine regarding these life-threatening conditions, he said. RPE is a tool for people to use to enhance their fitness program and make it more effective, he added, thus decreasing their risk of developing these diseases.

"An effective fitness program applies across the student versus the average population spectrum because everybody is, rightfully so, being pushed and encouraged to take better care of themselves," Dr. Green said. "Regular exercise programs enhance the quantity and quality of life."



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He described a practical example of RPE used in a cardiac rehab setting: heart patients taking beta blockers, which prohibits their heart rate going above a certain level. Dr. Green said RPE is an ideal tool to use during this this type of patient's exercise. They can describe how they feel using RPE's numbered scale, including factors such as their chest hurting or a sense of fatigue.

Dr. Green stressed the importance of exercise in everyone's life, no matter what form the exercise may take.

"Exercise is preventative medicine," he said. "Nobody is immune to chronic disease. Everyone should take personal responsibility for his or her health and well-being, and a sound exercise program is a big part of that. For health benefits, simply be non-sedentary. A main part of a healthy lifestyle is to live an active lifestyle."

Dr. Green became interested in the RPE scale during his master's degree thesis work at Middle Tennessee State University where he monitored physical intensity during swimming.

"It's very difficult to monitor your heart rate while swimming and it's difficult to monitor blood lactate while swimming," he said. "Our idea was it might be convenient to monitor RPE instead. Since then, I've included RPE as a variable in every project I've done. It's a topic that stretches across disciplines because it's more of a psychological measure, but it's taken during physical activity. So it crosses the disciplines of psychology as well as physiology."

Dr. Green came to Western as an assistant professor immediately out of his Ph.D. program at the University of Alabama in July of 1999. His doctorate is in human performance studies with a specialization in exercise physiology. He now teaches applied exercise physiology, fitness programming, and various graduate classes in the Department of Physical Education and Recreation.

Through Dr. Green's research of RPE at Western, student involvement in research and scholarly activity has increased significantly at the undergraduate and graduate levels. One of the Physical Education and Recreation departmental action plan goals was to have more student work published and presented. There have been twenty-eight total student authorships and co-authorships on journals and published abstracts from within the department.

Since beginning his research at Western in 1999, Dr. Green estimated there have been a few hundred people tested in the lab. A lot of the volunteers have been fitness enthusiasts who are involved in the exercise science program, he said. Also, some members of the Bowling Green Running Club have participated in Dr. Green's research. Most of the research volunteers want to find their current fitness levels in order to improve their personal exercise programs.

Volunteers in the lab perform some type of exercise on the treadmill or cycling. During the exercise session, heart rate, oxygen consumption, blood lactate, and RPE are monitored. Then, based on the physiological response, participants can monitor their exercise intensity using RPE during everyday exercise.

"Using RPE, you can be pretty sure your heart rate is where it's supposed to be, your blood lactate is where it needs to be, and that you are maintaining the correct physiological intensity," he said.

Interns working in the lab assist with data collection and help develop the research projects. "The research experience requires students to work in the laboratory, which better prepares them for jobs in the fitness and exercise physiology field," Dr. Green said. "Lab skills are an absolute requisite. They have to be able to work in the lab."

Dr. Green has published nineteen articles concerning RPE or thermoregulation during his tenure at Western. Involving students in research and the integration of teaching and research are key concepts to him.

"Western has a perfect combination of emphasis on teaching and research responsibilities for my desire," he said. "I like the combination of research and teaching. There's plenty of opportunity to do research, plenty of support from administration, and plenty of opportunity to involve students. We have really made a push to get as many students as possible involved in what we do. Teaching and research are too often viewed as independent of each other."

By using his research in the classroom, Dr. Green teaches students what happens to the body physiologically, but makes the data come alive in the laboratory. Students are able to see the changes in the heart rate and blood lactate levels, and they are able to see what happens during a maximal exercise test.

"Research really is the creation of new knowledge," Green said, "and to involve students in that is one of the bright spots of being able to be a professor and do research."

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