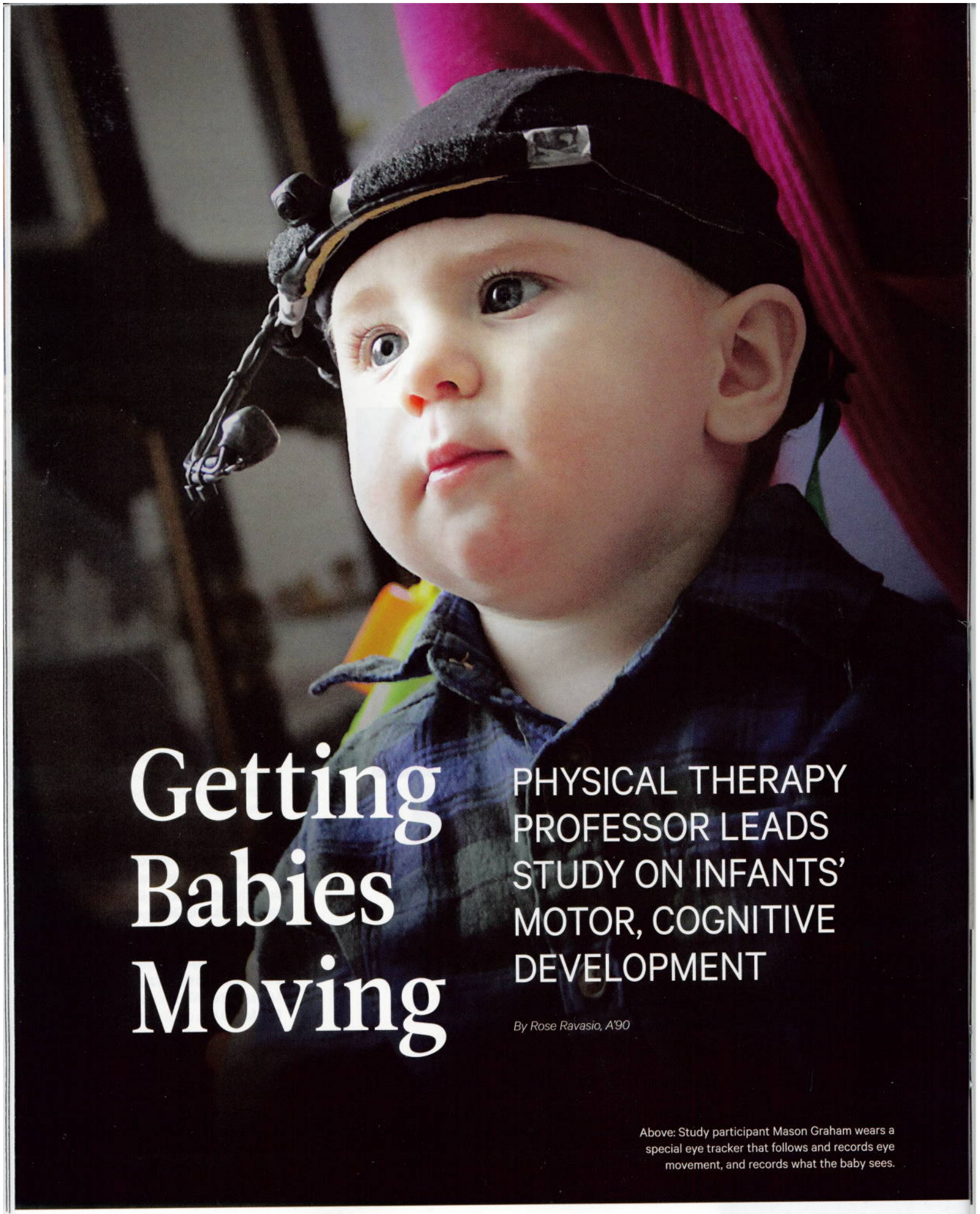

Getting Babies Moving

PHYSICAL THERAPY PROFESSOR LEADS STUDY ON INFANTS' MOTOR, COGNITIVE DEVELOPMENT

By Rose Ravasio, A'90

Above: Study participant Mason Graham wears a special eye tracker that follows and records eye movement, and records what the baby sees.

Many parents look forward to their baby's first smile or first steps. But, another major milestone—sitting—may reveal a lot about a baby's development.

Assistant Professor of Physical Therapy Dr. Regina Harbourne, armed with a $32,778 grant from the Commonwealth Universal Research Enhancement program of the Pennsylvania Department of Health, is conducting research focused on infants with basic neurological disorders that affect their motor development—specifically, learning how to sit up, which is a major benchmark in a baby's development.

"Sitting is a big turning point for babies because they are able to orient in the same way as the adult world, and their hands get freed up so they can manipulate things," says Harbourne. "That is a point where they are really able to start to learn in a whole new way."

In previous similar research, Harbourne found the study's intervention not only improved the infants' motor development (with sitting), it also advanced their cognitive development. Her new study further investigates the effects of physical therapy intervention on the motor and cognitive development of infants with neuromotor disorders, and will also allow her to better understand the interaction between early movement and early thinking skills.

According to Harbourne, infants typically begin to sit up between six and eight months of age.

Below: Dr. Regina Harbourne (right) uses play as a physical therapy intervention to help nine-month-old Mason Graham with motor development as Mason's mom, Debbie, watches.

"Babies with a neuromotor disorder don't sit up easily," explains Harbourne. "When these delays occur, it's important to intervene as early as possible—the earlier we intervene, the faster changes can be made in their progress."

Infants between 7-16 months old that have a diagnosed neuromotor disorder or developmental delays that put them at risk for a disorder, and have not yet learned to sit on their own, are eligible for the study. The infant and family participate for three months of the study, during which a physical therapist works weekly with the child in the home. The study takes place in the home to get more accurate results about their usual behavior.

"It's different for infants that come into a new or unknown environment such as a research lab—babies are very aware of something new, so they end up looking all over the place and all around," says Harbourne.

The babies are randomly split into two groups. One group's intervention includes giving the infants physical help, during which parents and therapists actually lift them up, initiate movement for them and aid them in moving around. The other group's intervention practices movement with a problem-solving focus, such as working with toy stacking cups. This group is given hints, but does not receive as much help with movement.

In addition, each infant wears an eye tracker that includes a camera that follows and records eye movement while another camera shows and records what the baby sees.

"Using the tracker, you can see exactly where the baby's eye is focusing. We look at how quickly the babies move their focus of vision from one thing to another," says Harbourne. "We measure the timing of all of the visual things, how much they look at their hand before they reach for something or do they just look at the object, and we'll compare between the two groups. The information will also help us understand exactly what type of thinking processes are changing for the infants."

The babies are tested just prior to the study, then again each month and one month after they complete the study.

Nine-month-old study participant Mason Graham was born a few weeks early and, after having a seizure at just two months old, was diagnosed with clonus, a disorder in which the baby has involuntary, rhythmic, muscular contractions and relaxations that can indicate neurological issues.

"Physically, he wasn't sitting up when he should have been," says Mason's mom, Debbie. "After he was diagnosed, the tests also showed he had tightness in his legs and back, which may have also contributed to the delay."

Harbourne has been working with Mason since October, and he now sits up on his own, crawls and is learning to walk with assistance.

"Mason has made tremendous progress in both his motor skills and his thinking skills, and his family can be credited with helping him advance in both these areas," says Harbourne. "He has actually made more gains than expected."

Debbie Graham, who is with Mason during each session, says her son's progress seemed to happen quickly. "He caught up all at once in just over a few weeks," she says. "We're so happy he's had the chance to be in this study. It's been very good for him."

Regarding cognitive development, Harbourne found through previous research that the group of infants that received less help with movement did better with problem solving than those who did receive assistance.

"It's always important for children to learn to move, but what we're finding out is that moving helps you get smarter, it helps your cognition, and that's the real importance of this study," she says.

This cognitive finding will be at the center of Harbourne's next research project, a study funded by a $3.5 million grant from the U.S. Department of Education, which will enable her to determine whether pushing or advancing a motor skill like sitting and reaching can also push cognition. She plans to start recruiting participants for this study in February. ◆