

Tulane Researcher Awarded 5-year NIH Grant to Study Infant Motor Coordination

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Using the digital motion-capture technology that made the fabulous worlds of Avatar and Tron Legacy possible, Tulane psychologists are analyzing the early development of coordination skills in infants. "We are studying the development of hand-mouth coordination during the first year--a basic adaptive skill for self-feeding and self-calming," says lead investigator Jeffrey Lockman, professor of psychology. The five-year study is funded by a new \$1.6 million award from the National Institutes of Health.

Approximately 600 babies from 2 months to 18 months of age will be studied at Tulane's Infant and Toddlers Development Project laboratory, where they will be filmed using infrared cameras placed at different vantage points.

"This is a motion analysis system," says Lockman. "We put infrared-reflective markers on the babies' arms, on the objects they hold, and also on their faces, on their cheeks and jaw. We make sure mom or dad are present and affix the markers with hypoallergenic tape so the children don't experience any distress or discomfort."

The cameras, capturing 240 images per second, record motion in high detail. Software blends the images from all the cameras into a moving three-dimensional image of the child's activities.

"The system calculates where each camera is with respect to every other camera, and the composite of all the 2-d camera images is used to compute in three dimensions where each marker actually is," graduate researcher Björn Kahrs says.

"Hand-to-mouth transport is a critical adaptive skill for infants and adults alike, enabling individuals to feed themselves," says Lockman. "Early problems in this skill

can compromise the quality of daily life."

The Tulane project is assessing coordination development in a much more detailed way than has previously been done, according to Lockman. "It will give us milestones for when a baby should be able to do certain things and it also potentially can be used in medical settings, for assessing babies with motor problems, and for looking at the effectiveness of different kinds of interventions."