

APPLIED SCIENCE LABORATORIES:

INFANT RESEARCH SIMPLIFIED WITH INNOVATIVE NEW EYE TRACKER

Focus and vision have brought Applied Science Laboratories of Bedford, Massachusetts, to the forefront of the eye tracking industry. ASL makes eye tracking devices. Its vision is to pursue applications across a broad range of human needs.

ASL systems are used worldwide in eye tracking applications for fields such as human factors and ergonomics, marketing research, psychology and cognition, simulation and training. In the field of infant behavioral studies, eye tracking has given researchers insights unattainable through other methods.

Eye tracking—the use of sensor tracking and optic technology to acquire data about where a subject focuses his or her gaze—opens up a world of information on infant development and human cognition in general. How quickly an infant focuses or refocuses can indicate normal development or possible impairment. Studying an infant's line of sight can show if certain cognitive associations are being made.

As explained by Dr. Alan Leslie, Director of the Rutgers University Cognitive Development Laboratory, "Many fundamental questions about the human mind can be addressed by studying infants. Although babies do not understand language, we can 'ask' them to compare virtually anything. They give us their 'answers' by how long they look."

While an infant views pictures in sequence or watches short films, researchers can take careful measurements of the baby's unbroken gaze. From that record, they can reconstruct how babies remember and compare. To perform these infant studies, ASL's eye tracker is called to the task.

Integrated with Ascension's miniBIRD tracker, the 504 is ideal for infant research. The miniBIRD's 8mm sensor is attached to a cap worn by the infant who can then freely move his or her head because its location in free space is always tracked. The system allows the baby's head to move freely while eye fixation is monitored in real time. Because the head-tracked orientation data controls the pan/tilt of a remote camera, when the infant moves his or her head, reacquisition of the eye is automatic.

The remote pan/tilt optics can be placed up to 4 feet from the infant and will track the eye even during quick or jerky head motions. Calibration requires as little as 2 points, and ASL can provide gaze contingent and event marker software for the system.

Dr. Scott Adler of York University's Department of Psychology is using eye-tracking to study infants' expectations of future visual events in terms of location, time and content as well. "I am also examining the development of infants' ability to selectively attend to singular items in visual arrays of multiple objects, including mechanisms for active inhibition of the irrelevant objects," says Adler.

To provide the technology needed in research as sensitive as infant studies, ASL's level of expertise is unparalleled. Researchers now have the ability to monitor many new aspects of a child's development at stages early enough to address potential problems. They also have the opportunity to discover more of the secrets that lie behind the wonder of human growth. As the Rutgers Cognitive Development Laboratory reports, "Through careful choice of comparison events, we discovered that infants with little experience of the world already have a powerful idea of physical cause and effect."