

Audiovisual Synchrony

People on the autism spectrum live in a synchronized world.

(learn more)

When Ami Klin, Ph.D. was the director of Yale's Child Study Center Autism Program, he and Warren Jones, a CSC neuroscientist, pioneered the use of eye-tracking technology in autism research. They developed an apparatus that allowed them to surreptitiously track eye movements in infants and toddlers.

They discovered that children and adults with autism see the world differently than typically developing subjects, often ignoring important sources of information that could help them build bridges to the social world. Their research demonstrated that infants and toddlers with autism are drawn to patterns, to motion that is synchronized with sound. This may be why young children with autism look at peoples' mouths, instead of the eyes and faces of their caregivers, like typically developing children.

Ami Klin described this preference for audiovisual synchrony (AVS), which might be used to redirect attention to socially relevant stimuli.

Eye-tracking reveals sharp differences between children with ASD and other children in infants as young as two days old. Neurotypical infants show a sensitivity to and preference for viewing biological motion, the movement of living things, as opposed to mechanized objects, which is believed to aid in familial and social bonding. Klin and Jones found that a preference for viewing biological motion is impaired in children with ASD.

Klin and Jones devised point-light animations (in which joints and other important body parts are represented by single dots) of people playing children's games such as peek-a-boo. When two versions of these animations (one upright and the other upside-down and backward) are presented side-by-side on a screen, typically developing children direct their gaze toward the properly presented animations, but children with ASD exhibit no preference.

When the visual images were paired with sound in a synchronous beat, they discovered that as a group, children with ASD showed a strong preference for the conventional, upright version of that animation. This occurred even when most of the sound/ motion correlations were very subtle, almost below the threshold of hearing; showing a strong correlation between ASD and a heightened sensitivity to synchronized sounds and images.

MeMoves is a compelling sensorimotor program that uses AVS to help children on the autism spectrum. Visual patterns, rhythmicity, music, and movement draw each child in as they participate in the pattern themselves, becoming part of a larger social group. In addition to being an effective tool for self-regulation, this patented system has been shown to increase speech and language, imitation, eye contact, and socialization in children with autism spectrum disorder.

