

# Early motor experiences give infants a social jump start

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In a new study published today in the journal *Developmental Science* (Epub ahead of print), researchers from the Kennedy Krieger Institute and Vanderbilt University found that early motor experiences can shape infants' preferences for objects and faces. The study findings demonstrate that providing infants with "sticky mittens" to manipulate toys increases their subsequent interest in faces, suggesting advanced social development.

This study supports a growing body of evidence that early motor [development](#) and self-produced motor experiences contribute to infants' understanding of the social world around them. Conversely, this implies that when motor skills are delayed or impaired – as in autism – future social interactions and development could be negatively impacted.

"Our results provide us with a new way to think about typical, and also atypical, development," said Klaus Libertus, PhD, the study's lead author and a research scientist at Kennedy Krieger Institute's Center for Autism and Related Disorders. "The mind is not independent from the body, especially during development. As motor skills advance, other domains follow suit, indicating strong connections between seemingly unrelated domains. Such connections have exciting implications, suggesting that interventions could target the motor domain to foster social development."

Previous research has found that infants diagnosed with autism spectrum disorders (ASD) show less interest in faces and social orienting. While

the current study was conducted with typically developing infants, it indicates that infants who are at risk for ASD or show signs of abnormal social development may benefit from motor training as early as 3 months of age.

"For parents, this means that early motor development is very important and they should encourage motor experiences and active exploration by their child," said Dr. Libertus. "Fostering motor development doesn't have to be complex or require sticky mittens. Any interactions or games that encourage a child to develop independent motor skills are important."

In the study, the researchers divided 36, typically-developing, 3-month-old infants into two groups – one receiving active motor experiences and the other receiving passive experiences. Infants in the active group were given mittens affixed with strips of Velcro, known as "sticky mittens." The researchers observed as infants in the active group played with the "sticky mittens" for 10 minutes each day for two weeks. While wearing the mittens, a brief swipe of the infants' arm made [toys](#), also covered in Velcro, "stick" as if the infant had successfully grasped the object. Parents first demonstrated this by attaching the toy to the mitten, but then the toy was removed and the infant was encouraged to independently reach for the toy again.

In the passive group, infants were fitted with aesthetically similar mittens and toys, but without Velcro. Passive infants also played with the mittens and toys for 10 minutes each day for two weeks, but were only passive observers as parents provided stimulation by moving the toy and touching it to the inside of the infants' palms.

After two weeks of daily training, the researchers tracked the infants' eye movements while they watched images of faces and toys flash on a computer screen. Infants in the passive and active groups were compared

with each other, as well as to two control groups of untrained infants comprised of non-reaching 3-month-olds and independently-reaching 5-month-olds. Researchers found the following:

- The active group showed more interest in faces rather than objects. In contrast, the passive group showed no preference.
- Infants in the active group focused on faces first, suggesting strengthening of a spontaneous preference for faces.
- When compared to the untrained control groups, the social preferences of the 3-month-old infants who experienced active training were similar to those of the untrained 5-month-olds, indicating advanced development following training.
- Finally, individual differences in motor activity observed between all 3-month-old infants in the study were predictive of their spontaneous orienting to faces. Regardless of training experiences, the more reaching attempts infants made, the stronger was their tendency to look at faces. Thus, motor experiences seem to drive social development.

"The most surprising result of our study is that we see a connection between early motor [experiences](#) and the emergence of orienting towards faces," said Dr. Libertus. "Logically, one would predict exactly the opposite. But in the light of seeing actions as serving a social purpose, it does make sense."

A key question researchers hope to answer next is whether these early changes will translate into future gains for these children. "Our results indicate a new direction for research on social development in [infants](#)," said Dr. Libertus. Dr. Libertus and his colleagues will continue to observe these children to see if the social development benefits achieved during the current study are sustained one year later.

Provided by Kennedy Krieger Institute

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