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For Babies, Copy-Cat Games Provide a Social Compass

Researchers begin to understand infants' imitations

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In 2014 the neuroscientist John O'Keefe won a Nobel Prize for showing that mammals have "place cells" in their brains—an inner mapping system that helps them find their way in the physical world. Now it seems that a particular group of mammals—humans—also have a mapping ability that lets them see themselves in relation to others, thus helping them to navigate in the social world.

It all starts with imitation. In the early 1980s, Andrew Meltzoff, now co-director of the Institute of Learning & Brain Sciences at the University of Washington, found that human babies have an inborn talent for mimicry. Infants just a few days old imitated adults' facial expressions—and even their finger movements—with surprising accuracy. When Dr. Meltzoff stuck out his

tongue or pursed his lips, the newborns did, too.

It's a handy trick to know that your body and someone else's have matching moving parts, especially if you're a newborn who has never looked in a mirror before. But how and why would the human brain be wired to copy what other people do?

Thirty-odd years later, some answers are surfacing. With instruments now available to measure the electrical activity in infants' brains, Dr. Meltzoff and his colleagues have found that babies have interactive neural maps that match their own bodily sensations to their observations of other people's movements.

In a paper in the September issue of Trends in Cognitive Sciences, Dr. Meltzoff and Peter Marshall, a professor of psychology at Temple University, discovered that when a 14-month-old baby's hand was touched, the same region of her brain lighted up as when she saw an adult use his hand to touch something. When the baby watched an adult nudge an object with his foot, there was electrical activity in the region of the brain corresponding to the baby's perception of her own foot being touched. That study tested 44 14-month-olds, but even much younger babies register a similarity between their own bodies and other people's, Dr. Meltzoff told me, adding that this recognition may be one root of empathy.

"I think babies are born socially connected," Dr. Meltzoff said. "They see you moving your hand in the hospital room, and they think 'I have one of those, and I can move it too!' It's an aha! moment. The baby is realizing that he felt that movement in the womb, and this is what it looks like. This starts at birth and flowers as mothers play mutual imitation games with the baby. Parents unconsciously imitate and reflect the babies' behavior back to them because the babies enjoy it so much. And now we know why."

Unwittingly copying someone's gestures, expressions or mannerisms is called "the chameleon effect." Research published in the Journal of Experimental Social Psychology and elsewhere shows that adults who practice such mimicry enjoy bigger tips if they work in the service industry and a larger paycheck if they're engaged in salary negotiations.

Humans clearly have a built-in penchant for synchronizing their actions with those of others. Previous studies by Dr. Meltzoff and colleagues have shown that babies fix their gaze on adults who imitate their actions precisely but are far less interested in adults who react but don't copy them. Using electroencephalogram technology, the researchers have also shown that imitating babies exactly during turn-taking games elicits a distinctive pattern of electrical activity in the babies' brains.

Even if there's no proof yet of "body cells" that orient us toward others the way "place cells" orient us in space, Dr. Meltzoff's work demonstrates that, as he says, "even a young baby recognizes the distinction between his body and yours, but that the pattern of movements is the same. And that's the fundamental way he learns to be 'one of us.'"