

First Evidence Found of Mirror Neuron's Role in Language

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What do we find so gripping about a good book, the kind that makes us stay up later than we should to find out what happens to hero or heroine?

A new brain imaging study from UCLA may provide an answer, and further, shed light on the language problems common to autistic children. In a study published in the Sept. 19 issue of Current Biology, UCLA researchers show that specialized brain cells known as mirror neurons activate both when we observe the actions of others and when we simply read sentences describing the same action. When we read a book, these specialized cells respond as if we are actually doing what the book character was doing.

The researchers — including Marco Iacoboni , director of the Transcranial Magnetic Stimulation Lab at the Ahmanson-Lovelace Brain Mapping Center of UCLA's Semel Institute for Neuroscience and Human Behavior; Lisa Aziz-Zadeh, a former graduate student in Iacoboni's lab and now an assistant professor in the occupational sciences department at USC, and their colleagues — used a brainimaging technique called functional magnetic resonance imaging to investigate how written phrases describing actions performed by the mouth or the hand influenced mirror neurons that are activated by the sight of those same actions.

For example, when individuals read literal phrases such as "biting the peach" or "grasping a pen," certain cortical areas were activated that were also stimulated when the same participants later viewed videos of



fruit being bitten or a pen being grasped. Together, the findings suggest that mirror neurons play a key role in the mental "re-enactment" of actions when linguistic descriptions of those actions are conceptually processed.

Mirror neurons have been hypothesized to contribute to skills such as empathy, socialized behavior and language acquisition. The new data thus suggests that we use mirror neurons not only to understand the actions of other people but also to understand the meaning of sentences describing the same action.

"Our study provides the first empirical evidence in support of the long hypothesized role of mirror neurons in language," said Iacoboni. "Indeed, some scientists think that we humans developed the ability to use language from mirror neurons."

He added that the new findings may also be relevant to understanding language disorders in autism.

"Previously, we showed that autistic children have mirror neuron deficits that make it difficult for them to understand the emotions of other people," he said. "However, autistic children also tend to have language problems. Thus, a deficit in the mirror neuron system may provide a unifying explanation for a variety of disorders associated with autism."

This research was conducted at the UCLA Brain Mapping Center. Other researchers included Giacomo Rizzolatti, Università di Parma in Parma, Italy, and UCLA neuroscience graduate student Stephen M. Wilson.

Source: UCLA



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