New Research From Psychological Science

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Children's Arithmetic Development: It Is Number Knowledge, Not the Approximate Number Sense, That Counts

Silke M. Göbel, Sarah E. Watson, Arne Lervåg, and Charles Hulme

To examine whether approximate number sense and knowledge of the Arabic numeral system influence future arithmetic ability, children were assessed for nonverbal ability, vocabulary, number-identification skill, letter-comparison ability, magnitude-comparison ability, and arithmetic skill at age 6 and again for magnitude-comparison ability and arithmetic skill 11 months later. Although approximate number sense helped children judge magnitude, it did not influence future arithmetic ability. Rather, the ability to match multidigit Arabic numerals to their verbal labels was an important predictor of the growth of arithmetic skill during this time period.

Accurate Metacognition for Visual Sensory Memory Representations

Annelinde R. E. Vandenbroucke, Ilja G. Sligte, Adam B. Barrett, Anil K. Seth, Johannes J. Fahrenfort, and Victor A. F. Lamme

Although people report experiencing a rich integrated visual field, once a scene has disappeared from view, they are able to report only a few items they happened to attend to. The authors of this article examined whether the experience of perceiving more than can be attended to is real or illusory. In the second of two studies, participants completed a change-identification task in which they had to indicate whether an arrow changed position in a counterclockwise or a clockwise movement. Analysis of participants' behavior suggested that subjective impressions of a scene are not an illusion, but instead are accurate reflections from visual perception.

Continuous Theta-Burst Stimulation Demonstrates a Causal Role of Premotor Homunculus in Action Understanding

John Michael, Kristian Sandberg, Joshua Skewes, Thomas Wolf, Jakob Blicher, Morten Overgaard, and Chris D. Frith

Although regions of the premotor cortex (PMC) are active during the observation of actions, there is still controversy over whether they play a role in understanding actions. In two sessions, continuous theta-burst stimulation (cTBS) was applied over the hand or the lip area of a participant's left PMC. The participant then completed a pantomime-recognition task that involved viewing videos of pantomimed hand or mouth actions. cTBS over hand areas impaired participants' ability to interpret pantomimed

hand actions, while cTBS over lip areas impaired participants' ability to interpret pantomimed mouth actions. This double dissociation suggests that the PMC does play a causal role in understanding action.