



### **Monkey 'pay per view' study could help understanding of autism**

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Duke University researchers have found that monkeys will 'pay' to see pictures of female monkey hindquarters or 'high ranking' monkeys. The research techniques offer what the researchers consider to be a rigorous laboratory approach to studying what "social machinery" goes awry in people with autism -- a disease affecting more than a million Americans.

The article, published online in the journal *Current Biology*, was written by neurobiologists Michael Platt, Robert Deaner and Amit Khera. They describe experiments in which male rhesus macaque monkeys were given rewards (juice) for looking at either a neutral picture or a picture of other monkeys. The rewards and images were systematically varied to determine what effect each had on where the monkeys preferred to look. The images used included a gray square, a higher ranking monkey, a lower ranking monkey and female hindquarters.

The researchers found that monkeys had to be paid (given juice) to view a lower ranking monkey, whereas they gave up juice to view the higher ranking monkey and the female hindquarters.

The research, to be published in the March issue of *Current Biology* was funded by the National Institute of Mental Health and the Cure Autism Now Foundation.

According to Platt, the goal of the study was to replicate in a controlled laboratory setting the social judgments that monkeys make in the wild.

"Decades of studies of monkeys in the wild have indicated that they act as if they make judgments about dominance rankings and of the importance of other individuals for their own reproductive success," said Platt. "But there have been no real quantitative experimental demonstrations that monkeys actually process this information and use it in decision-making.

"More broadly, it's important to understand how the brain processes social information and uses it to make decisions," said Platt. "Historically, the problem of understanding social cognition, social evaluation and its neural basis has been a slippery one. And in part that's because scientists haven't been able to bring to bear the methods of experimental psychophysics to understand these phenomena.

"So, our approach, in which we ask the monkeys to, in a sense, put a number on how much juice they'd be willing to 'spend' to see a particular individual gives us an invaluable experimental system to explore the neural wiring that underlies social cognition."

Interestingly, said Platt, the monkeys were not living in a situation where physical

interactions could contribute to establishing dominance or sexual relationships. "So, somehow, they are getting this information by observation -- by seeing other individuals interact," he said.

According to Platt, the findings suggest that these methods could prove fruitful in understanding perception and social relationships and can likely be applied to human social machinery.

"At the moment, it's only a tantalizing possibility, but we believe that similar processes are at work in these monkeys and in people. After all, the same kinds of social conditions have been important in primate evolution for both nonhuman primates and humans. So, in further experiments, we also want to try to establish in the same way how people attribute value to acquiring visual information about other individuals."

If there are indeed similarities to humans, electrophysiological, genetic and molecular studies of monkeys in these types of laboratory situations could result in important insights into the social machinery of the brain, said Platt. The researchers have also begun to investigate the neural basis for decision making with regard to shifting gaze for specific rewards in monkeys.

These studies may be important in understanding what malfunctions are occurring in the brains of individuals with autism, said Platt.

"One of the main problems in people with autism is that they don't find it very motivating to look at other individuals," he said. "And even when they do, they can't seem to assess information about that individual's importance, intentions or expressions."

"So, what we now have with these monkeys is an excellent model for how social motivation for looking is processed in normal individuals. And, it's a model that we can use to explore the neurophysiological mechanisms of those motivations in a way we can't do in humans. For example, we can use drugs that affect specific neural processes to explore whether we can mimic some of the deficits found in autism in these animals."

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