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YERKES RESEARCHERS FIRST TO RECOGNIZE SENSE OF FAIRNESS IN NONHUMAN PRIMATES

Findings Shed Light on the Role of Emotion in Human Economic Interactions

Media contacts: Kelly Duncan, 404-727-9254, kadunca@emory.edu

ATLANTA – In the first experimental demonstration of its kind, researchers led by Sarah Brosnan and Frans de Waal, PhD, at the Yerkes National Primate Research Center of Emory University, and the Living Links Center, have shown nonhuman primates respond negatively to unequal reward distribution, a reaction often seen in humans based on their universal sense of fairness. While researchers have long recognized the sense of fairness within the human species, Brosnan and de Waal are the first to confirm this trait in nonhuman primates. The findings appear in the September 18 issue of *Nature*.

These new findings, coupled with previous scientific data that demonstrate a direct link between nonhuman primate behavior and that of humans, support a new school of thought that economic decision-making is based as much on an emotional sense of fairness as on rational considerations. Identifying similar reactions in nonhuman primates as in humans offers insight into how such emotional reactions developed, providing researchers and economists new perspective on why humans make certain economic decisions in relation to efforts, gains and losses of others.

In this study, researchers made food-related exchanges with brown capuchin monkeys. The subjects refused previously acceptable rewards (cucumbers) if they witnessed their partners receiving higher-value rewards (grapes) for equal or less work.

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This is similar to the negative response humans display when they see other individuals receiving a better deal.

“People often forgo an available reward because it is not what they expect or think is fair,” says Brosnan. “Such irrational behavior has baffled scientists and economists, who traditionally have argued all economic decisions are rational. Our findings in nonhuman primates indicate the emotional sense of fairness plays a key role in such decision-making.”

For this study, Brosnan and de Waal conducted four tests, each including two sessions of 25 trials, on pairs of female capuchins. First, they gave study subjects lower-value rewards of cucumbers if the subjects would exchange tokens. Then, they measured the study subjects’ responses when grapes, a higher-value reward, were given to their partners for exerting varying levels of work.

“We showed the subjects compared their rewards with those of their partners and refused to accept a lower-value reward if their partners received a higher-value reward,” says Brosnan, “This effect is amplified when the partner does not have to work for the reward.”

The researchers recorded a 95 percent completed exchange rate with the subjects during the equity test, in which both subject and partner received cucumber as the reward for the same amount of work. The completed exchange rate fell to 60 percent during the inequity test, in which subjects observed their partners receiving grapes for completing the same amount of work. A further decrease to 20 percent of completed exchanges occurred in the effort-control test, when partners received the higher-value reward for less work. Finally, a 55 percent exchange rate was recorded for the cucumbers in the food-control test.

Brosnan and de Waal are conducting related studies in capuchins to further explain these responses. They also are conducting a similar study with chimpanzees.

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The goal of the Living Links Center at the Yerkes National Primate Research Center is to view great apes as a window to the human past by studying their behavior, cognition, neuroanatomy, genes and reproduction in a noninvasive manner. Another goal is to educate the public about apes and to help guarantee their continued existence in the wild.

The Yerkes National Primate Research Center of Emory University is one of eight National Primate Research Centers funded by the National Institutes of Health. The Yerkes Research Center is a multidisciplinary research institute recognized as a leader in biomedical and behavioral studies with nonhuman primates. Yerkes scientists are on the forefront of developing vaccines for AIDS and malaria, and treatments for cocaine addiction and Parkinson's disease. Other research programs include cognitive development and decline, childhood visual defects, organ transplantation, the behavioral effects of hormone replacement therapy and social behaviors of primates. Leading researchers located worldwide seek to collaborate with Yerkes scientists.

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