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Scientist will apply memory work with orangutans to Great Ape Trust bonobos

Dr. Karyl Swartz's work reveals how orangutans developed 'simple and elegant' response strategy in list-learning study

Des Moines, Iowa – February 27, 2008 – Dr. Karyl Swartz, a psychologist and Great Ape Trust of Iowa scientist who has spent the last 30 years collaborating with non-human primates on memory and self-recognition research, will begin work this year with The Trust's colony of bonobos to determine if language-competent apes respond differently to lists than those who are not.

In *Response Strategies in List Learning by Orangutans*, Swartz and her co-authors, Dr. Sharon A. Himmanen and Dr. Robert Shumaker, shared the memory strategies orangutans developed in a list-learning paradigm modeled after procedures from human cognitive and developmental literatures. In addition to her work at Great Ape Trust, Swartz is professor *emerita* at Lehman College of the City University of New York (CUNY), and also maintains a research associate position at Smithsonian Institution's National Zoological Park. Himmanen is currently a substitute assistant professor at CUNY's Queens College, and Shumaker is director of orangutan research at Great Ape Trust and maintains a professorship at the Krasnow Institute for Advanced Study at George Mason University.

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Swartz, who joined Great Ape Trust in 2004, recently presented her research at one of The Trust's "brown-bag lunch series," ongoing educational and staff development sessions at the world-class scientific research center in southeast Des Moines. She mainly conducted research for the paper at the National Zoo with orangutans Iris and Bonnie, but is continuing it at Great Ape Trust with Knobi. The research was funded with a National Institutes of Health grant.

The purpose of the study was to investigate how orangutans would organize a list of items they were asked to remember. "Humans will find ways to organize lists of items that improve their recall, but we don't know that much about ape memory, particularly orangutans," Swartz said. "I set out to determine if orangutans would devise an organizational strategy to improve their memory."

One question Swartz and her colleagues sought to answer was whether orangutans would demonstrate an ability to subjectively organize a list, a sophisticated strategy of recall that human children adopt by about age 8. "They did not develop an organizational strategy," she said, "but they both developed an unexpected spatial response pattern to solve the problem."

Though the research showed no evidence of subjective organizations, the orangutans moved systematically across the computer, responding from right to left. "The orangutans are showing us something interesting about how to simplify and make elegant the learning of something that is rather complex," she said.

That finding is important because Iris and Bonnie spontaneously developed the strategy, at the same point in each of their training, but about a year apart. One of the orangutans learned quickly and the other more slowly.

In a subsequent study, Swartz and Himmanen set out to determine if serial order information would supersede an already established response pattern. Iris and Bonnie learned eight lists of items in a recognition memory procedure that allowed the list items to be reported in any order.

In this study, one orangutan maintained the established response strategy, while the other showed a gradual weakening of the pattern that appeared as lists were acquired. Neither Iris nor Bonnie demonstrated a serial position effect, although serial order information may have affected the shift in response strategy, Swartz explained.

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She said the differences in how the two individuals responded is striking in light of previous studies that have shown quantitative differences, but no qualitative differences in serial learning by orangutans and rhesus monkeys, the species first studied by Swartz and her colleagues in their inquiry into response strategies and list learning.

In addition to the planned cross-species test with Great Ape Trust's language-competent bonobos, insight may be gained by asking children to do the same tests, according to Swartz.

"Those are the questions that would be fun to answer," she said.

GREAT APE TRUST BACKGROUND

Great Ape Trust of Iowa is a scientific research facility in southeast Des Moines dedicated to understanding the origins and future of culture, language, tools and intelligence. When completed, Great Ape Trust will be the largest great ape facility in North America and one of the first worldwide to include all four types of great ape – bonobos, chimpanzees, gorillas and orangutans – for noninvasive interdisciplinary studies of their cognitive and communicative capabilities.

Great Ape Trust is dedicated to providing sanctuary and an honorable life for great apes, studying the intelligence of great apes, advancing conservation of great apes and providing unique educational experiences about great apes. Great Ape Trust of Iowa is a 501(c) 3 not-for-profit organization and is certified by the Association of Zoos and Aquariums (AZA). To learn more about Great Ape Trust of Iowa, go to www.GreatApeTrust.org.

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Insights Through Collaborations with Apes