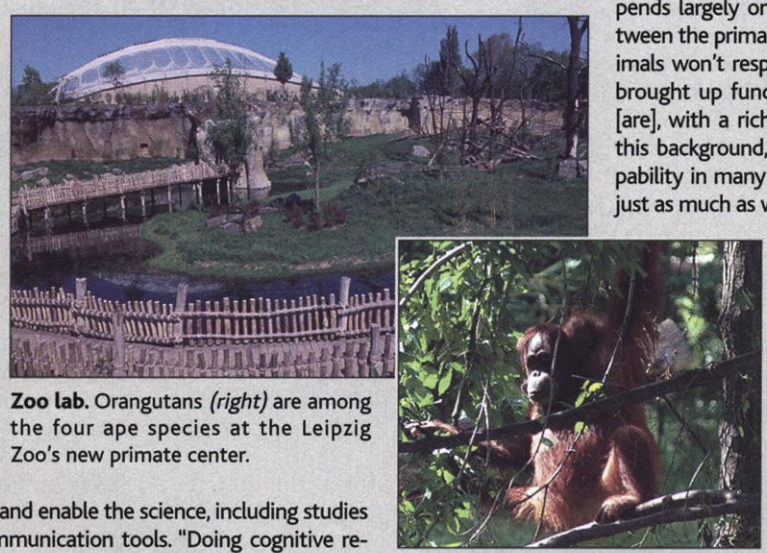
Zoo's New Primate Exhibit to Double as Research Lab

LEIPZIG, GERMANY—Michael Tomasello and Josep Call want to know what it takes to make a mind human. Not only are these two comparative psychologists here at the Max Planck Institute for Evolutionary Anthropology tackling one of biology's fundamental questions, but they expect to conduct their work in full view of thousands of curious onlookers every day.

The researchers are hoping to help bridge the gap between scientists and the public at a sleek new facility at the 120-year-old Leipzig Zoo. Four years in the making, the 13,552-square-meter Wolfgang Köhler Primate Research Center is one of the largest in the world, says Michael Seres, the research coordinator who helped set up the center and now oversees it.

The design does double duty, satisfying educational and research needs. A boardwalk along the outdoor habitat leads into an artificial cave, where zoo patrons can get a closeup view through a glass partition of four primate species—including 15 chimps, a half-dozen gorillas, seven orangutans, and four bonobos—in surroundings resembling their natural habitats. Casual visitors get few hints to the remote platforms, cameras, and the dozen veterinarians and keepers who mind the animals and enable the science, including studies on the role of gestures as communication tools. "Doing cognitive research in a zoo setting is catching on," notes Lisa Stevens, a senior curator at the National Zoo in Washington, D.C.



Zoo lab. Orangutans *(right)* are among the four ape species at the Leipzig Zoo's new primate center.

Crucial to the research is housing the chimps on a 4000-square-meter island, separated from the other primates, such that they form a troop. This hierarchy of males and females will allow the researchers to monitor chimp cognitive development and the use of social skills such as grooming and facial expression. Very few zoos allow chimps to form a full troop, for fear of how the animals might behave in front of people. "Chimps are not as nice as gorillas or orangutans," Seres explains. "They can kill one another and be quite aggressive." Zoo managers are leery of how members of the public may react to chimp violence, or to cantankerous individuals spitting, defecating, or throwing objects at them.

Most exciting to Seres is a now-empty boulder-lined enclosure connected to the island by a tiny doorway blocked with heavy mesh. The enclosure forms the front yard of a nursery, complete with incubators and a kitchen. That's where Seres and Tomasello hope to study how chimps come to understand the world around them, and in particular, how they learn to perceive the behavioral and psychological states of others. In doing so, the researchers will explore the influence of human interactions on a developing chimp mind. The experiment may help resolve a long-standing controversy over just how intelligent our closest cousins are and should dovetail nicely with their work on cognition in other apes.

The controversy ignited in the early 1980s, when Sue Savage-Rumbaugh and her colleagues at Georgia State University in Atlanta reported that chimps demonstrate skills once thought to be the sole province of humans: language and an awareness of what others are thinking. The Georgia group had been trying to teach Matata, an adult female bonobo, to understand human language and to point to symbols to communicate. They didn't have much success with Matata, but to their surprise her adopted 6-month-old son Kanzi seemed to pick up language skills by observing her handlers. By age 2, Kanzi could use symbols to communicate, and he continued to expand his vocabulary by interacting with researchers and their symbol boards.

Since then, the Georgia team and others have succeeded in getting other primates, including chimps, to demonstrate language, math skills, and self-awareness. But their mixed results—individuals often fail to master these skills—have left many experts uncertain of the degree to which primates are capable of humanlike brain power.

Defending the work, psychologist Duane Rumbaugh, Sue's ex-husband and a collaborator at Georgia State, thinks that success depends largely on the degree of interaction between the primate and the researchers. "The animals won't respond," he says, "unless they are brought up fundamentally as human children [are], with a rich, social, interactive life." Given this background, he asserts, "they have the capability in many ways of becoming nonanimals just as much as we are."

Although such interpretations stir academic controversy, the work is combustible for another reason: Some scientists and animal activists contend that the experiments do not respect the animals for what they are and force them to do unnatural tasks.

Now Seres and Tomasello are about to plunge in. Their research subjects are orphans: infant chimps abandoned by captive mothers, a common phenomenon at zoos. These infants "would die if humans didn't raise them," says Tomasello. Once the Leipzig facility was nearly finished last year, he put the word out that the center would raise orphans. Earlier this year, a 3-week-old male arrived on the center's doorstep, even before the nursery was completed. "We had to run out and quickly buy the cribs," Seres says.

Tomasello and his colleagues say they have no intention of raising chimps like children or transforming them into "nonanimals." Their goal is to use the orphanage to explore factors that influence chimp brain development with minimal disruption to the animals' normal upbringing.

Although fed and cared for by human keepers, the young chimps will spend most of their time with their peers. Gradually they will be incorporated into the troop, although at first they will just see, smell, and touch the adult chimps and their young through a mesh. About half the youngsters will experience, with a person, intense parent-child interaction: playing games or being taught symbols. The idea is not to teach the animals how to take part in human activities but to give them the kind of intellectual stimulation generally showered on human infants.

The rest of the animals will receive the care chimps typically get from their keepers. In this way, the researchers can test whether the degree of human-chimp interaction indeed makes a difference in chimp cognitive abilities. The work, Tomasello predicts, in conjunction with studies of the adult chimps and other great ape species, "should be extremely helpful to people trying to reconstruct the evolution of primate, including human, cognition." **–ELIZABETH PENNISI**

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