

# Brian Hare



*As a student, **BRIAN HARE** did experiments in his parents' garage. Working with their dogs, he showed that these animals are more adept than chimpanzees at using humans to solve social problems. Today, at the **MAX PLANCK INSTITUTE FOR EVOLUTIONARY ANTHROPOLOGY**, the American scientist investigates the interplay between intelligence and social behavior – as only the latter of the two helped humans develop their sense (and sensibility).*

The clipping from the German newspaper BILD on Brian Hare's office door is a real eye-catcher. It shows a photograph of the American researcher with a fox, with a short text below – “full of mistakes,” as Hare comments. What was a serious scientist like Hare doing in Germany's most popular daily tabloid? The article's headline reveals the reason: “Foxes are the better dogs,” it says. Brian Hare, born in 1976, investigates the social behavior of dogs, and man's best friend is always a good topic for a wide audience.

But Hare is by no means only a dog researcher. His Ph.D., gained at Harvard University in 2003, identifies him as a biological anthropologist. He studied psychology and anthropology, first at Emory University, then at Harvard. Today, Hare conducts research at the Max Planck Institute for Evolutionary Anthropology in the Department for Comparative and Developmental Psychology. His group calls itself *3chimps* and practices “hominoid psychology.”

Brian Hare has thus defined a new research field: the term hominoid psychology isn't included in any dictionary and, so far, is found only on the Internet in connection with the Leipzig-based researcher. “The goal of our work is to compare the psychology of hominoids, or large and small apes,” says Hare. In particular, he wants to discover how the social-cognitive capabilities of humans have developed since the time when the evolutionary path between humans, chimpanzees and bonobos (the *3chimps*) diverged. At the Leipzig-based Max Planck Institute, Hare has found his ideal research field. It is one of the institutes established in eastern Germany after reunification. The researchers are housed in an impressive new build-

ing that fits in well at its location on Deutscher Platz. Inside, life is international; it is the Max Planck Institute with the largest percentage of researchers from abroad. The five directors alone come from five different countries. No one really notices that Brian Hare speaks only a little German.

## PRACTICAL TRAINING IN THE ECUADORIAN JUNGLE

Hare was at the institute earlier, from 2001 to 2002, to collect data for his Ph.D. In 2004, he returned to Leipzig even though both Harvard and Emory offered him a position. “For what I do, there is no better place than this institute,” he raves. “No other research establishments can compare, not even the best American ones.” Ultimately, the scientist wants to discover things about humans. So how did he end up dealing with dogs? That was “pure chance.” Even as a child, he loved animals, keeping tortoises and catching snakes. When he was nine years old he was enthralled by a film about the primate researcher Jane Goodall: “I sat on our old couch in front of our old TV and thought: Wow, that's what I want to do!” he remembers.

Brian Hare is grateful to his biology teacher, who encouraged his efforts. His teacher helped him arrange an internship at Yerkes Primate Center in Atlanta and a three-week stay in the Ecuadorian jungle. A visit to the Galapagos Islands when he was 14 years old opened his eyes to Darwin's theory of evolution. A biography of this major English researcher lies on his desk today, surrounded by a battery of empty Coke bottles. The bottles are even lined up on the window ledge, together with a flag of the city of Leipzig. “When you come from Atlanta, Coke is part of your daily diet,” explains Hare.

The Max Planck researcher began studying at the psychology department of Emory University in Atlanta and was thrilled. There were “cool lectures” in psychology and anthropology, and the student whose high school grades were “not particularly outstanding” now garnered only the best marks. At Emory he met his most important teacher: Michael (“Mike”) Tomasello, professor of psychology. Tomasello is one of the founding Directors of the institute in Leipzig and, as Director of the Department for Developmental Psychology, now Hare's boss.

“Mike took me under his wing,” Hare recalls. “He gave me, a 19-year-old newcomer, a research project and simply let me get on with it.” The project dealt with the question of how chimpanzees solve specific social problems. “They weren't very good at it, and I was pretty sure that my dog could do better.” Tomasello doubted it, and so Hare became a canine researcher. He performed a simple experiment in the garage with his parents' two dogs: when the animals weren't watching, he hid a dog biscuit underneath one of two plastic cups. He then pointed to the correct cup while looking directly at the dog. The animal headed straight for the cup with the food. This experiment proved that dogs are apparently very good at recognizing human gestures and using them for their own benefit. As later tests showed, they clearly have a better grasp of this than do chimpanzees or wolves. It is now also known that this ability is not learned, but genetically anchored: puppies of various age groups have no problem reading human signals in such experiments – even at only nine weeks old.

Hare's garage experiment from 1995 was the very first experiment of this kind. The new scientific terri-



The search for food can be so simple: With a point of a finger, the puppy finds its way to the cup with the food.

tory that Hare had entered with this experiment helped him achieve his first publication. And the young student learned something else: Michael Tomasello was delighted that he, the professor, was wrong. “A great scientist is pleased when he is not correct. He’s then learned something new,” says Hare. This is one of the most important things he has learned from his professor.

Brian Hare has already traveled widely in his relatively short 10-year career: his list includes stays in Rome and Leipzig, Siberia, Uganda, and the People’s Republic of Congo and the Democratic Republic of the Congo. The reason: “Traditionally, a lab concentrates on one animal species,” says Hare. “But if I want to know how one species evolved, I have to compare as many species as possible.” It also gives him the opportunity to work at different research institutions.

In Akademgorodok near Novosibirsk in Russia, one of the scientific towns established under Stalin, Hare worked at the Institute for Psychology and Genetics. There, a unique experiment has been in progress since 1959: the artificial domestication of the silver fox. The foxes are bred based on a single characteristic: does an individual animal show fear of people? If so, it is not bred further.

**PET FOXES WITH FLOPPY EARS**

The results are incredible. After just several dozen generations, the behavior of the foxes has changed completely. They are not afraid of people. They bark. They whine and even wag their tails when they see someone

they know. In short, they behave like pet dogs. Their appearance has changed, too: they have floppy ears, a short tail and coats with various markings. Their skeleton is weaker and their bones and teeth are smaller. Their stress apparatus and hormone balance is fundamentally different from that of their wild cousins.

The Siberian researchers also keep a control group of foxes that were not selected for their lack of fear of humans, which makes comparisons possible. “What we see with the foxes is evolution at work,” says Hare. “We know the selective mechanism very well and can unambiguously retrace differences between the two groups back to it.” Hare investigated whether social intelligence had changed with the domesticated foxes. It had. The domesticated foxes were clearly better than foxes in the control group when it came to using human gestures and signs. “What is vital in this project is that the foxes were not selected for their intelligence,” says Hare, commenting on the results. Selection focused only on whether the animals showed fear or aggression toward humans or, to put it positively, whether they tolerated people. If an animal loses its fear of, or de-

sire to attack, a potential social partner – in other words, changes its temperament – its social intelligence seems to increase.

What has happened with the Siberian foxes should also be valid for pet dogs. Their domestication over the many years of man and dog cohabitation has so changed their wolf temperament that both now tolerate one another. This process could also be significant for human evolution: “Our hypothesis,” says Hare, “is that a change in human temperament paved the way for human socio-cognitive evolution.” In other words, the evolution of human levels of tolerance allowed our species intelligence to evolve.”

The zoo is Hare’s second office. In cooperation with the Max Planck In-



Bonobo babies in Lola Ya sanctuary are also cause for the primate researcher to celebrate – there are only a few of these animals left.

stitute, this is where “Pongoland” was created. With some 30,000 square meters, it is the world’s largest enclosure for apes outside of Africa.

Its core is a huge tropics hall, with five spacious outdoor areas containing trees, caves and streams grouped around it. Visitors see neither cages nor tiled walls. The primates live in an environment that resembles their natural habitat.

**APES LOVE THE EXPERIMENTS**

What visitors – whose numbers have doubled to a million a year since the ape house was built – call Pongoland, the Max Planck researchers call the Wolfgang Köhler Center for Primate Research. Behind the scenes are work and research rooms where the apes undergo tests – which they really enjoy, as Brian Hare relates: “Ultimately, they are always rewarded with something to eat.” Hare finds the Köhler Center fantastic: “It’s the best around today.” But it still can’t provide the opportunities he finds in chimpanzee and bonobo sanctuaries in Africa.

This is why he has transferred a part of his research to sanctuaries on Ngamba Island (Uganda) and Tchimpounga (Congo), where 40 and 120 chimpanzees live, respectively. He only recently returned from the Lola Ya Sanctuary for bonobos, located near Kinshasa, the capital of the Democratic Republic of Congo. For Hare, these “peace-loving apes,” of which only a small population still exists, are a matter of the heart: “For anthropologists, there is no task more urgent than understanding the psychology of bonobos before they potentially become extinct,” he says.

The Sofja Kovalevskaja Prize, awarded by the Alexander von Humboldt Foundation in 2004, came just at the right time. This award honors successful young scientists from



Just as well that the kids don’t share the quirks of their elders: Chimpanzee orphans suckle together on their bottles in Tchimpounga Sanctuary. Older chimps eat alone.

abroad who are conducting research in Germany. The prize is well endowed: Hare received a generous sum of more than 800,000 euros, which he can invest in his research at his own discretion.

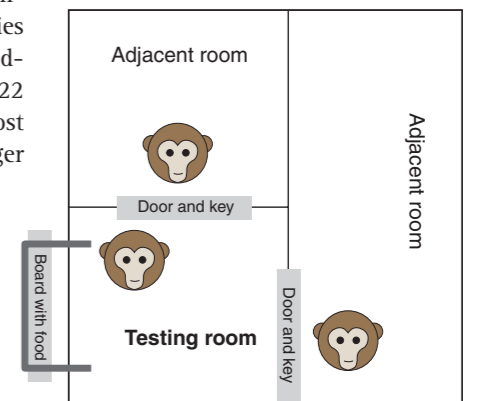
He is using it to finance a simple infrastructure on Ngamba Island, and in Tchimpounga and Lola Ya, which will benefit scientists from all over the world. “This is useful for us as well as the establishments there, which survive more or less on donations and tourism,” he says. “Our research funds are a third source of income.” In return, the sanctuaries provide researchers a range of advantages: “In Leipzig, we have 22 chimpanzees, and in Africa almost 200,” Hare estimates. With a larger number of animals, a set of experiments can naturally be completed faster than at the Köhler Center, where there is a long waiting list.

Chimpanzees can do a lot: they solve problems by reason, understand cause and effect, and use tools. They are probably aware of themselves. They can learn new things from watching their group-mates, identify with others, mislead

others and forge alliances. Chimpanzees raised in captivity have learned hundreds of words. They use symbols and have, according to American anthropologist Christopher Boehm, a “political intelligence” that allows them to gauge complicated power hierarchies.

**NO CANTEEN FOR CHIMPANZEES**

After some thought, chimpanzees have no problem finding food if, say, a board lies flat on the ground



Apes don’t pull together. Only if they can’t grab both rope ends themselves do they go and fetch another from one of the bolted rooms to help pull the board with the food nearer. But then they choose the helper who has already proven itself to be the better one.



Who's studying who? In Tchimpounga Sanctuary, Brian Hare sometimes experiences role-swapping.

and a second board – with the food behind it – is set up. Dogs fail this experiment miserably. What is surprising is that chimpanzees usually fail at the tasks dogs perform so well: finding hidden food with the help of human clues.

According to Brian Hare, chimpanzees lack those socio-communicative abilities of dogs. “It’s their lack of tolerance that makes it so difficult for chimpanzees to solve tasks cooperatively,” explains the researcher. For example, chimpanzees seldom eat together. “A canteen for chimpanzees is unthinkable! A situation where the institute director enjoys a salad while the student sitting opposite him devours a large steak would never be possible with chimpanzees.”

Hare’s research group has impressively proved this social behavior in

a range of experiments: for example, when a feeding bowl is placed at each end of a three-meter-long board. “If both dishes contain food, two chimpanzees will *sometimes* eat together,” says Hare. “But if I, as a chimpanzee, were of a lower rank than the other one, I would take care not to eat out of my dish. I know that I could then expect a beating.”

If only one of the bowls contains food, it is very, very unusual that both animals would eat together. If chimps can eat together, then they can also work together. This is shown in the following experiment: the experimenter places the board with both bowls behind a screen so that the

chimpanzees can’t reach it. However, the ends of a rope with which the board can be pulled nearer lie on the ground in front of each ape. This works only if both animals pull on their end at the same time. If only one of them pulls only on one end, that ape ends up with just the rope in its hands.

The animals quickly grasp the purpose and function of the rope, but often refuse to cooperate. “Only those chimpanzees that can eat together will work together to pull the board nearer,” says Hare. In other words: only the tolerant cooperate. Creating human-like social behavior in chimpanzees would require a good dose of tolerance. “Even if they could be given a human cortex implant, their social behavior would hardly change,” notes Hare. “What has to change is their emotional sys-

tem.” This statement is still a hypothesis, the researcher explains, but he is convinced that the social intelligence of an animal species does not depend on brain size, but on temperament.

### SEX BEFORE DINNER

Hare’s ideas have been reinforced by his research on bonobos at the Lola Ya Sanctuary. Here, there are 45 animals, while at the Köhler Center there are only 6 – in Hare’s opinion, too few to really understand this chimpanzee species, as bonobos live in large groups with 40 to 50 members. “Bonobos are extraordinarily social. Chimpanzees, for the most part, live alone,” says Hare. “They meet up in groups of 4 to 5 for a day and then go their own way for the rest of the week. Bonobos, on the other hand, are *always* together.”

The experiment with the two feeding bowls on the board takes an entirely different course with bonobos than it does with chimpanzees. “As soon as the two animals involved notice that there’s something to eat, they first indulge in sex. Crazy sex,” exclaims Brian Hare: “Two males – they have sex. Two females – they also have sex.” They hug and squeeze each other and rub their genitals together. Sometimes an animal has an orgasm. But mostly sex is a friendly gesture. Then they eat. They empty the bowl together. Every one of them – with no exceptions. If there are two filled bowls, both animals empty one and then the other – together. Owing to their great tolerance, Hare believes that bonobos are very human-like in their cooperative capabilities. Further experiments will show if this supposition is correct.

What do the observations with dogs, foxes and apes tell us about human evolution? “Humans,” as Hare sees it, “began to differ from

their chimpanzee-like ancestors in that they became more tolerant of their fellow species. This change in the human temperament paved the way for further socio-cognitive evolution.” In an article still to be published, Hare and Tomasello put forward the hypothesis that this step was achieved by a kind of self-taming whereby over-aggressive or power-obsessed members of a group were killed or driven out of the group by conspecifics.

Whether this theory is correct will be shown by further comparative research on the *3chimps* – humans, chimpanzees and bonobos. “Man’s best friend” will still remain on Hare’s agenda: dogs have developed special social skills that have much in common with the social behavior of humans. That is why the re-

searchers in Leipzig talk about “convergent evolution.” The dog can help them understand the evolutionary processes that led to human-like cooperation and communication.

“Ultimately,” Brian Hare concludes, “we want to find out what makes the human mind unique.” That may take a while. The scientist was recently married – in Australia, his wife’s home. Having met in Africa, their shared interests strengthened their bond.

The 30-year-old has about two more years at the Max Planck Institute in Leipzig. This foreseeable end, as he says, is the only sad thing about his current activities: “It will be difficult to find a position that is as interesting as the one here.” Although he could stay for an additional four years, that would be dan-



Hare and assistant Susanne Mauritz have much to discuss – and often an audience of curious primates.

gerous for his career. He would then be over-qualified for a junior professorship, and there are very few offers around for better positions.

Brian Hare suspects that he will end up in the US again: Duke and Harvard Universities have already offered him jobs. He is still waiting for the first offer from a German university. Such an offer, he says, could be tempting. HEINZ HOREIS