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Frans de Waal

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Definition

Frans de Waal is a Dutch biologist whose research demonstrates that nonhuman primates show aspects of behaviors previously considered to be exclusively in the domain of humans, such as empathy, reconciliation, and fairness, emphasizing the continuity between humans and other species.

Introduction

Frans B. M. de Waal has studied animals all of his life. As a child, he observed (or collected and then observed) any animal he could near his home in the Netherlands, developing a fascination with the behavior of all species. This ultimately led to a career studying a variety of different topics that, as a whole, demonstrate the substantial cognitive and emotional continuity between humans and other animals. In particular, he has focused on the many ways that animals negotiate with one another to avoid, minimize, ameliorate and, if all else fails, reconcile conflict to maintain their beneficial social relationships. Although his research focuses on nonhuman primates, his work is key to understanding social behavior and cognition across the animal kingdom.

A Life Studying Primates

Shortly after receiving his PhD from the University of Utrecht in 1977, where he studied the social behavior of the chimpanzees at the Royal Burgers' Zoo in Arnhem, the Netherlands under the direction of Jan van Hooff, de Waal rose to prominence with the publication of *Chimpanzee Politics,* which followed the social relationships among the adult males of the Burgers' zoo chimpanzee colony over a 4-year period. This book, which highlighted the ways in which these apes use conflict resolution to maintain their social order, brought primates' social strategizing to the forefront, over the then dominant view that aggression controlled behavior. Moreover, foreshadowing a career that integrated ideas from other disciplines into his scientific thinking, in this book de Waal explicitly compared the chimpanzees' political behavior to the ideas introduced by Machiavelli in his book *The Prince*. While at Burgers' Zoo, de Waal was the first person to recognize consolation and reconciliation in nonhuman primates and established the methodology for their study (postconflict/matched-control; de Waal and van Roosmalen

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1979). In later years, with Filippo Aureli, he further documented that while reconciliation appears to be widespread across the animal kingdom, consolation is more rarely seen, possibly indicating that it requires more advanced cognition.

In 1982, de Waal emigrated to the USA, working first as a research scientist at the University of Wisconsin, Madison, and then, 10 years later, moving to Emory University in Atlanta, Georgia, where he remains the C. H. Candler Professor of Primate Behavior in the Psychology Department and the founder and Director of the Living Links Center of the Yerkes National Primate Research Center. In the USA, de Waal's research became more experimental, with the goal of elucidating underlying behavioral mechanisms for the behaviors he had observed earlier in his career. While exploring the mechanisms underpinning the primates' behavior, however, he maintained his focus on the animals' natural behaviors, and never forgot the importance of the observational approach. Combining experiment and observation has led to important insights. For example, continuing his exploration of mechanisms that animals use to avoid and ameliorate conflict, he and Jessica Flack demonstrated that high ranking individuals in rhesus monkey groups play a control role that helps to maintain stability in the social group (Flack et al. 2006).

De Waal was one of the early researchers to recognize the benefits of studying capuchin monkeys, a large brained neotropical species of primate sometimes referred to as the "New World chimpanzee." This species is highly cooperative in the wild, and in his earliest work with capuchins, he delved into cooperation and related behaviors. He first demonstrated that capuchin monkeys not only shared food reciprocally, but that they understood their partner's role in tasks that required joint action to obtain a reward and adjusted their decisions based upon their partner's behavior (de Waal and Berger 2000). Extending this, he and Josh Plotnick later showed that elephants, too, understood their partner's role in a cooperative task (Plotnik et al. 2011). He and Sarah Brosnan found that both capuchin monkeys and chimpanzees responded negatively to receiving a less preferred reward than a social partner (Brosnan and de Waal 2003). This was the basis for their hypothesis that the evolution of fairness is linked to the need for social partners to be able to evaluate their contribution to a cooperative endeavor relative to their partner's, in order to judge whether or not to maintain the relationship.

Social animals that can recognize themselves and their social partners should have an advantage over those who cannot, and de Waal has also explored the ways in which individuals show this recognition. He and Lisa Parr demonstrated that chimpanzees could recognize familial relationships simply by looking at photographs of unknown chimpanzees (Parr and de Waal 1999). Later, he and Jennifer Pokorny showed that chimpanzees could also recognize females by their swellings (sexual skin in the ano-genital region that becomes bright pink and swollen during the females' estrous phase), but only for known individuals, suggesting whole body knowledge for other individuals in their social group. This work garnered them an Ig Nobel prize in 2012. Finally, he and Pokorny showed that capuchin monkeys recognize other members of their social group and, with Marietta Dindo, de Waal demonstrated that while capuchins do not recognize themselves in the mirror, they do not treat the mirror as a stranger, indicating that a more nuanced approach is needed for our discussions of self-recognition.

One advantage to living in a social group is that individuals can pass information among other members of the group. In order to better understand how these animals decide who and what to copy, with Kristin Bonnie, Victoria Horner, and Andy Whiten, he studied cultural transmission in primates (Bonnie et al. 2006). They demonstrated that, as with humans, subjects chose who to copy based on both the prestige of the demonstrator and what the other members of the group were doing, called conformity. In particular, he argues in his book *The Ape and the Sushi Master* that much social learning occurs as a result of young members of the group absorbing the behavior of older ones, much like the sushi apprentice learns from the master. Of course, animals can also explicitly share information through communication, and he and Amy Pollick explored the role of gesture in the evolution of language, studying the flexibility

of both gestural and vocal signals in bonobos and chimpanzees (Pollick and de Waal 2007).

Finally, de Waal was one of the first scientists to consider whether social behavior in primates is underpinned by empathy, and he and Stephanie Preston developed an influential hypothesis to explain the origins and evolution of empathy (the Perception-Action Model; Preston and de Waal 2002). De Waal has since demonstrated that both capuchins and chimpanzees will give prosocially to other members of their group and that these effects are mediated by factors such as the inequity of the outcome, the degree of relatedness of the partners, and the behavior of the potential recipient. Most recently, he has returned to his roots studying consolation behavior, this time in rodents; he and collaborators Larry Young and James Burkett demonstrated that the consolation behavior in prairie voles is most likely underpinned by empathy.

De Waal has accomplished much; to date, he has been on the editorial board or editorial staff of 15 journals, is currently a Review editor for *Science* and the Editor-in-Chief of *Behaviour*, and has published more than 150 peer-reviewed papers, 100 chapters, and 75 commentaries in multiple languages. He is a member of the US National Academy of Sciences and the Royal Dutch Academy of Sciences, a Fellow of the American Academy of Arts and Sciences and the Japan Society for the Promotion of the Sciences, and the recipient of two *Doctor Honoris Causa* degrees and the American Society of Primatologist's Distinguished Primatologist Award. In 2013 he was appointed as Distinguished Professor at the University of Utrecht.

Aside from his research, in what he describes as a "second career" (de Waal 2009), de Waal has done much to promote scientific interest and literacy in the public. He had written 13 books on primate behavior and edited an additional 10, with the goal of bringing the science of primate social behavior to the public. His most recent book, *Are we smart enough to know how smart animals are?* is representative, challenging people to reconsider what we consider to be "intelligence" in other species by dropping our anthropocentric assumptions and taking into account the environment in which the animal evolved (that is, what sort of intelligence the animal needs in order to survive and thrive). Aside from his books and lectures, his TED talk on the evolutionary roots of morality has become an Internet sensation (http://www.ted.com/talks/frans_de_waal_do_animals_have_morals.html). Outreach such as this has led to him being recognized as one of *Discover* magazine's "47 All-time Great Minds in Science" and *Time* magazine's "100 Most Influential People."

Conclusion

Frans de Waal has done more than perhaps any other primatologist to demonstrate the continuity between humans and other species. He was one of the first scientists to seriously argue for the presence of empathy in other species, and his research in that area has been ground breaking. De Waal has also shared his passion for nonhuman species with the public, writing more than a dozen best-selling science books about primates and other animals and giving innumerable talks and presentations, including a very successful TED talk. As a result, he is one of those rare scientists whose work has influenced both scientists and nonscientists alike.

Cross-References

- ▶ Cooperation
- ▶ Cooperation Among Non-Chimpanzee Non-Human Primates
- ▶ Cooperation Among Non-Human Primates
- ▶ Empathy
- ▶ Evolution of Cooperation
- ▶ Fairness in Primates
- ▶ Food Sharing
- ▶ Food Sharing and Non-Human Reciprocal Altruism
- ▶ Frans de Waal's *Chimpanzee Politics*
- ▶ Great Apes
- ▶ Non-Human Primates
- ▶ Primate Cooperation
- ▶ Prosocial Behaviors
- ▶ Reconciliation

▶ Sarah Brosnan
▶ Social Cognition
▶ Social Learning

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