



## A Special Issue in honor of Sally Boysen: Studying other minds

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It has been a real privilege to edit this special issue of *Learning & Behavior* to celebrate Dr. Sarah (Sally) Boysen's scientific career. Dr. Boysen received the 2022 Comparative Cognition Society Research Award for her outstanding contribution to the study of comparative cognition in animals. Dr. Boysen's Master Lecture was delivered at the conclusion of a symposium organized in her honor at the spring International Conference on Comparative Cognition (CO3) in Melbourne, Florida, and this special issue of *Learning & Behavior* was inspired by that symposium.

Sally Boysen is known around the world for her research on symbolic representation in chimpanzees, starting with the publication of a seminal 1978 paper in *Science* describing symbolic communication between two chimpanzees. Those chimpanzees—and Sally—went on to capture the hearts and minds of people around the world, demonstrating that our closest great ape cousins were cognitively not that different from us. Sally received her initial training from The Ohio State University, completing her undergraduate degree in primate behavior, then moved on to the University of Oklahoma to finish her master's degree in developmental and comparative psychology, before completing her PhD in 1984 at Ohio State. After finishing her doctorate, she set up the Comparative Cognition Project at OSU, which was one of the first such laboratories in the newly emerging field of comparative cognition. Sally's chimpanzee lab at OSU was in operation until 2006 and was a hub for stellar science as well as community outreach. Sally and the chimps starred in a large number of popular television, radio and print media stories, and Sally spent countless hours educating children and adults alike about chimpanzee cognition. The impact that Sally's research and tireless outreach efforts have had on the public was recognized by *Discover* magazine, who named Sally as one of the Top 50 Female Scientists in 2002.

Sally remained as a professor at OSU until retiring in 2014, but she continues to contribute to comparative cognition, through scientific journal editorial work as well as exciting new research studying olfactory discrimination in dogs.

Although Sally is known worldwide for her work on chimpanzee cognition, she has also studied cognitive processes in dogs, pigs, other great apes and lesser apes, and her work has also had a profound influence on human developmental psychology. This special edition of *Learning & Behavior* reflects that diverse comparative impact, and includes articles based on data from a range of species, including pigeons, rats, dogs and, of course, chimpanzees.

Sally's edited book with Capaldi published in 1993 on numerical competence in animals was ground-breaking and influences research to this day. This contribution is beautifully reflected in Beran's article on the reverse-reward contingency task. This task, in which an animal must point at a reward that they do not obtain, was originally designed to test numerical abilities but has proven to be an excellent test of self control and inhibition. Another important focus of Sally's research has been comparative in nature, often studying similar cognitive processes in chimpanzees and human children. Bard and Kishimoto's article comparing early communicative gestures in chimpanzees and 1-year-old human infants shows the developmental overlap between our two species. In the same communicative vein, Kuhlmeier, McCreary and Jones' review on the abilities of nonhuman animals to follow the human point follows directly from Sally's influential 1990 paper with Povinelli and Nelson. Since 1990, more than 120 studies on the topic have been published, which is a tribute to the impact that Sally's work has had. Throughout her career, Sally has always stressed the importance of ecologically valid and species-relevant cognitive processes. This is nicely reflected in the Davila-Ross, Rawlings, and van Leeuwen paper examining intra- and intersexual social relationships in two neighbouring semi-wild chimpanzee groups. The authors used social network analysis to look at male and female social bonds and found in chimps, as in humans, social bonds are influenced by the specific features of the social group in which they live.

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Sally's research on representation across a number of domains is reflected in the next set of papers. Gazes and colleagues report on metacognitive information seeking in another of our great ape cousins, Western Lowland gorillas. Using a standard "tube task," they found that gorillas, like chimpanzees and orangutans, searched more when ignorant, and retrieved more food thanks to information seeking. The selective, adaptive, and appropriate use of information appears to be an ability found in all the great apes. A different type of representation—sequential behavior—is examined in the paper by Cook and colleagues. In three carefully designed experiments, they used a simultaneous color discrimination task to explore the mechanisms underlying sequential behavior in pigeons, which involved both timing and outcome feedback. The final two papers reflect both representation and Sally's current research focus—olfaction. Bruce and colleagues used a non-matching-to-sample

task with 3D objects or olfactory stimuli in rats, and found that rats, as expected, demonstrate excellent olfactory discrimination, and, even more interesting, they found some evidence of cross-modal (visual/olfactory) transfer. Last but certainly not least, Katz and colleagues round out the special issue with a fascinating look at proactive interference in dog working memory using an olfactory matching-to-sample task. Appropriately, they continued the comparative approach championed by Sally and adapted procedures originally designed for pigeons and monkeys.

This Special Issue is a fitting tribute to the impact that Sally has had, and continues to have, on the field of comparative cognition, across a wide range of species and cognitive processes. Enjoy!

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