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KATYAYANI TATIPARTI

ANIMAL BEHAVIOR: An Introduction

Animal Behavior: An Introduction

The study of animal behavior begins with understanding how an animal's physiology and anatomy are integrated with its behavior. Both external and internal stimuli prompt behaviors — external information (e.g., threats from other animals, sounds, smells) or weather and internal information (e.g., hunger, fear). The study of behavior helps us to understand when and why animals, including humans, act. At one extreme, behavior is the link between the nervous system and the world outside an animal. At the other extreme, behavior is the way in which an animal establishes and maintains itself in its ecological niche. Behavior is a key link between an animal and its environment. Animals behavior includes communication, navigation, foraging, mating, parenting, and social cooperation. Each of these topics is a major subject within the study of behavior, and we will deal with each in a separate chapter. These issues all involve action and interaction; they are the externally expressed component of animal behavior. Behavior has internal underpinnings, as well. Motivation, learning, cognition and emotion shape an animal's behavioral decisions and therefore are critical in the study of behavior. Each of these topics has a neurobiological basis, so that their study links externally expressed behavior with the internal state of an animal. Scientists are drawn to the study of animal behavior for varied reasons and the field is extremely broad, ranging from research on feeding behavior and habitat selection to mating behavior and social organizations. Many scientists study animal behavior because it sheds light on human beings. Research on non-human primates, for instance, continues to offer valuable perspectives into the causes and evolution of individual, social, and reproductive human actions. Understanding why some animals help others at the potential cost of their own survival and reproduction, for example, not only gives us insight into their behavior but could also potentially help us to understand the underpinnings of our species' ideas of altruism and sacrifice.

Katyayani Tatiparti has a Master's degree in Pharmaceutical Sciences from JNTU, Hyderabad, India; with the topic of research for thesis being 'Self Micro Emulsifying Drug Delivery System for Carbamazepine (BCS Class II Drug)'. She also has a PG Diploma in Patents Law from NALSAR University, Hyderabad, India. She has been an IPR Professional and an Assistant Professor of Pharmaceutics. She is currently pursuing her second Master's degree in Pharmaceutical Sciences at Wayne State University, USA where she is pursuing research in cancer therapy

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About the Editor

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List of Abbreviations

AFCD	Agriculture, Fisheries and Conservation Department
AHA	American Humane Association
ACO	Ant Colony Optimization
BMPC	Beijing Municipal People's Congress
CNE	Computational Neuroethology
CF	Constant Frequency
ENR	Echo-to-noise ratio
EOD	Electric Organ Discharge
EEG	Electroencephalography
EA	Evolutionary Algorithms
FM	Frequency Modulated
fMRI	functional MRI
MRI	Magnetic Resonance Imaging
PSO	Particle Swarm Optimization
PTSD	Post-traumatic Stress Disorder
SAG	Screen Actors Guild
SPP	Self-propelled Particles
SDS	Stochastic Diffusion Search

Preface

The study of animal behavior begins with understanding how an animal's physiology and anatomy are integrated with its behavior. Both external and internal stimuli prompt behaviors – external information (e.g., threats from other animals, sounds, smells) or weather and internal information (e.g., hunger, fear). The study of behavior helps us to understand when and why animals, including humans, act. At one extreme, behavior is the link between the nervous system and the world outside an animal. At the other extreme, behavior is the way in which an animal establishes and maintains itself in its ecological niche. Behavior is a key link between an animal and its environment. Animals behavior includes communication, navigation, foraging, mating, parenting, and social cooperation. Each of these topics is a major subject within the study of behavior, and we will deal with each in a separate chapter. These issues all involve action and interaction; they are the externally expressed component of animal behavior. Behavior has internal underpinnings, as well. Motivation, learning, cognition and emotion shape an animal's behavioral decisions and therefore are critical in the study of behavior. Each of these topics has a neurobiological basis, so that their study links externally expressed behavior with the internal state of an animal. Scientists are drawn to the study of animal behavior for varied reasons and the field is extremely broad, ranging from research on feeding behavior and habitat selection to mating behavior and social organizations. Many scientists study animal behavior because it sheds light on human beings. Research on non-human primates, for instance, continues to offer valuable perspectives into the causes and evolution of individual, social, and reproductive human actions. Understanding why some animals help others at the potential cost of their own survival and reproduction, for example, not only gives us insight into their behavior but could also potentially help us to understand the underpinnings of our species' ideas of altruism and sacrifice.

Content Coverage

Chapters One and *Two* present an introduction to animal cognition and animal consciousness, respectively. Animal cognition describes the mental capacities of animals and the study of those capacities, animal consciousness is the quality or state of self-awareness within an animal, or of being aware of an external object or something within itself.

Chapters Three and *Four* are intended to focus on animal language and elephant cognition, separately. Animals communicate by using a variety of signs such as sounds or movements. Such signing may be considered complex enough to be

called a form of language. Elephants manifest a wide variety of behaviors, including those associated with grief, learning, mimicry, play, altruism, use of tools, compassion, cooperation, self-awareness, memory, and communication.

Chapters Five and *Six* present a coverage of expression of emotions in animals and neuroethology, correspondingly. Emotions in animals are the subjective feelings and emotions experienced by non-human animals, whereas neuroethology deals with the study of the neural basis of natural behavior in animals.

Chapters Seven and *Eight* clarify about observational learning and pain in animals, separately. In animals, observational learning is often based on classical conditioning, in which an instinctive behavior is elicited by observing the behavior of another. Non-human animals cannot report their feelings to language-using humans in the same manner as human communication, but observation of their behavior provides a reasonable indication as to the extent of their pain.

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