Expanding our Students' Horizons: Incorporating a Comparative Perspective into Psychology Courses

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Psychology is typically defined as the scientific study of behavior and cognitive processes, yet current psychology curricula sometimes limit their focus to human behavior and cognition. A quick (and admittedly non-systematic) review of several popular introductory psychology textbooks appears to support this contention. Some of these books do introduce aspects of nonhuman animal behavior, and discussions of certain topics (e.g., attempts to teach language to nonhumans) are common. However, these treatments are often brief and limited. In-depth discussions are often descriptions of older research, presented in historical context (e.g., Harlow's attachment studies; early studies of learning by Pavlov, Skinner, & Tolman). Furthermore, when research on nonhumans is included in introductory psychology textbooks, it often fails to mention that the research subjects were nonhuman species (Domjan & Purdy, 1995). Similarly, Eaton and Sleigh (2002) surveyed recent developmental psychology textbooks and found that research on nonhuman animals was rarely presented, except in historical context.

Thus, it appears that, in some cases, students may not be exposed to research on nonhumans, or they may not be aware that particular findings are from studies of nonhuman animals. Providing psychology students with a more comprehensive view of behavior, one that encompasses the behavior of more than a single species, has several potential benefits:

1. All species, including humans, confront problems related to survival in their physical and social environments, (e.g., cognitive problems related to obtaining resources, surviving as a member of a social group), and there are diverse ways in which species solve these problems. Learning about how nonhuman species approach and solve these problems demonstrates the breadth and diversity of behavioral strategies that exist in living beings.

2. Students whose primary interest is human behavior can gain insights from examining human behavior in the broader context of behavior across species. An understanding of factors that influence behavior in nonhumans can shed light on how these same factors may be at work in human behavior.

3. It is important for students to learn about the behavior of other species, because, quite simply, it is part of psychology. We deprive students of a full, rich, complete understanding of behavior, and all the factors that influence it, by focusing solely on how humans "do things."

Comparative Research and Psychology's Subfields

Current research in comparative psychology and animal behavior covers a wide range of topics, and many studies provide insights that result in novel ways of looking at human behavior and cognition. Here I provide just a few examples from a sampling of psychology's subfields.

Learning and Cognitive Processes. Many fascinating comparative studies can be found in the animal learning and cognition literature. These studies often start with two basic notions: (a) all species need a "mental toolkit" (Hauser, 2000), or certain cognitive capabilities (i.e., "tools"), to survive; and (b) these cognitive tools are related to the species' physical and social environments and the problems presented by those environments. In some cases, cognitive abilities of nonhuman animals can be directly compared to human cognitive abilities. For example, it is easy for most students to imagine why object permanence—which has been examined in numerous nonhuman species, including orangutans and chimpanzees (Call, 2001), dogs (Gagnon & Dore, 1994), and black-billed magpies (Pollok, Prior, & Guentuerkuen, 2000)—would be a useful tool for nonhuman animals (e.g., What is the adaptive response of a hunting lion when potential prey goes behind a bush or other environmental obstruction?).

Understanding of quantity and number has also been examined in many species. In nonhumans, these abilities are important in assessing quantities of food and determining the size of competing groups (e.g., chimpanzees – Boysen & Berntson, 1995; Boysen, Berntson, & Mukobi, 2001; lions – McComb, Packer, & Pusey, 1994; African grey parrots – Pepperberg, 1994).

Social learning is important in many nonhuman species, as it is in humans. For example, Florida scrub jays learn to forage in a novel food patch from observing family members foraging there (Midford, Hailman, & Woolfenden, 2000), and canaries are more likely to eat novel foods when the adults demonstrating the behavior are familiar to them (Cadieu & Cadieu, 2002). In a recent study, Griffin and Evans (2003) examined social learning of antipredator responses in tammar wallabies. They trained wallabies to demonstrate a fear response to a model fox. (Foxes, which are not native to the wallabies' habitat, are one of the main predators of these animals, and are a significant threat to their survival.) These "demonstrators" were then placed in an enclosure with naïve wallabies while a model fox was presented to the animals. The naïve animals that were exposed to the fox in the presence of a fox-fearful demonstrator later showed vigilance responses to the fox model, whereas animals in a control group (who had a non-fearful demonstrator) did not show these same vigilance responses.

Clearly, an ability to learn from other individuals in one's social group is adaptive for many species, not just humans. This research can broaden student perspectives about the role of social learning across species, as well as the similarities and differences between humans and nonhumans in how social learning takes place.

Sensory and Perceptual Processes. Characteristics and limitations of human sensory capabilities are highlighted when they are compared with the sensory capabilities of nonhumans (Hughes, 1999). Sensory and perceptual capabilities are suited to the social and physical environment of the species, and many nonhuman species provide fascinating examples of specialized sensory systems. For example, bats use high-frequency sound, outside the range of human hearing, to orient and to capture flying prey in total darkness (Altringham, 1996; Kalko & Schnitzler, 1993; Schnitzler & Kalko, 2001). Rats and other rodents communicate using ultrasound (Farrell & Alberts, 2002; Brudzynski & Pniak, 2002), and rats are sensitive to light in the ultraviolet (UV) region of the spectrum (Jacobs, Fenwick, & Williams, 2001). Elephants' use of infrasonic vocalizations enables communication over long distances (Poole, Payne, Langbauer, & Moss,

1988). Almost every species of bird can see UV light, and color signals in these wavelengths often play an important role in mate selection (Smith, Greenwood, & Bennet, 2002; Hunt, Cuthill, Bennett, Church, & Partridge, 2001). Finally, some species of fish can also see UV wavelengths (Losey, 2003).

Personality. Personality is often considered to be uniquely human, but recent studies of nonhumans reveal consistent behavior or "temperament" differences that can be labeled as personality (Gosling & John, 1999; Gosling & Vazire, 2002). What does this tell us about where personality comes from? How does this impact ideas and theories about personality development?

In nonhumans, personality traits have been examined in primates (Capitanio, 2002; Itoh, 2002), horses (Visser et al., 2003), cats (Lowe & Bradshaw, 2001), pigs (Janczek, Pederssen, & Bakken, 2003), and dogs (Svartberg, 2002; Svartberg & Forkman, 2002), among others. In one study, Gosling, Kwan, and John (2003) examined personality in dogs using a modified version of the Five Factor Model often used in the study of human personality. Owners rated their dogs along the dimensions of energy, affection, emotional reactivity, and intelligence. Ratings were also obtained from others familiar with the dog. The obtained ratings showed internal consistency and consensus: Both owners and nonowners rated the dogs similarly. Further, to test for correspondence between the traits identified on the owner surveys and the dogs' actual behavior, trained observers also watched the dogs engage in a variety of tasks. There was significant correspondence between traits as rated on the surveys and traits as rated on the behavioral tests. Gosling et al. (2003) concluded that differences in personality traits do exist in dogs, and that these differences can be accurately measured. They also suggested that taking a comparative approach to the study of personality opens up possibilities for identifying genetic and environmental influences on personality.

Incorporating Research Findings on Nonhuman Animals into Classes

How can you broaden your class by incorporating information on the behavior of nonhumans? As I noted above, texts for psychology classes may not provide much coverage of nonhuman species' behavior or cognitive processes. However, there are useful and readily-available resources for finding information on these topics. Excellent comparative psychology and animal behavior textbooks include Drickamer, Vessey, and Jakob (2002); Goodenough, McGuire, and Wallace (2001); and Papini (2002).

Widely-available journals, such as *Animal Behaviour*, *Behaviour*, and the J*ournal of Comparative Psychology*, are also rich sources of information. In general, the *Journal of Comparative Psychology* focuses more on studies of cognition, sensory processes, and development, while *Behaviour* and *Animal Behaviour* typically publish more studies of communication, social behavior, and ecological factors in behavior. For example, recent issues of the *Journal of Comparative Psychology* included articles on Piagetian liquid conservation in orangutans and chimpanzees (Suda & Call, 2004), social learning in capuchin monkeys (Brosnan & de Waal, 2004), and personality traits in horses (Hausberger, Bruderer, LeScolan, & Pierre, 2004). Recent studies published in *Animal Behaviour* have examined parental care in wattled jacanas (Emlen & Wrege, 2004), and underwater vocal communication in hippos (Barklow,

2004). (Students are often fascinated to learn that in the wattled jacana, a bird that lives on floating river vegetation, males provide virtually all the parental care, while females specialize in defending the nest site—a reversal of what we consider the traditional parental roles for the two sexes.) Research databases, such as PsycInfo, Biological Abstracts, and Cambridge Scientific Abstracts, can point instructors to relevant research on nonhuman species published in these and other journals.

Conclusion

Students should be aware that the discipline of psychology encompasses more than the study of a single species, and that psychological principles, theories, and methods of studying behavior apply more broadly than to the study of humans alone. Incorporating additional information on the behavior of nonhuman species into psychology classes can give students a more comprehensive picture of the richness and diversity of behavior and cognitive processes. Many of us may be reluctant to give up time in our classes or try to fit information on the behavior of nonhumans into an already crowded class schedule. This feeling is understandable given the vast amount of important information we try to impart to our students. However, even a brief foray into the world of nonhuman animal behavior can broaden our students' understanding of the diversity of behavior across living species, and deepen students' appreciation for the wide applicability of psychological principles and ideas.

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