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Revealing Animal Experiments in General Psychology Texts: Opening Pandora's Box

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Domjan and Purdy's (July 1995) article made explicit three facts that teachers of psychology may not know but have long suspected: (a) Authors of general psychology textbooks cite animal experiments without mentioning that animal subjects were used; (b) authors discuss important concepts (e.g., motivation research) without mentioning that the work was based on animal experiments; and (c) authors describe results of animal experiments as if the research had been done with humans (p. 499). Interestingly, being an animal experimenter does not prevent an author from making these attributional errors because at least two of the eight reviewed textbooks were authored by animal experimenters. Three of the remedies that Domjan and Purdy recommended are likely to give rise to important and challenging questions for teachers and students of general psychology.

Remedy 1

Suppose authors do "give credit where credit is due" (Domjan & Purdy, 1995, p. 502), and general psychology teachers discover that "much information" (p. 500; unquantified by Domjan & Purdy) is based on animal experimentation (e.g., "the chemical definition of neurons in the human CNS

is derived largely from animal studies;" DeArmond, Fusco, & Dewey, 1989, p. 173). According to the American Psychological Association (APA; 1995), about 7–8% of psychological research uses animals as subjects and 92–93% uses humans. Does the quantity of information presented in general psychology textbooks reflect APA's percentages, or are animal experiments overrepresented?

Although 90% of the animals used in psychological research are rodents and birds (APA, 1995), the differences among humans, rodents, and birds are great. The rat, for example, is a nocturnally active creature that sleeps 14–15 hours a day, has an average life expectancy of 2–3 years, is completely colorblind and physiologically unable to vomit, has a nonconvoluted cortex and a liver that regenerates but no gall bladder or tonsils, has a metabolism and heart rate more than twice that of humans, produces 8–10 litters annually, and walks on four legs. Are such biorhythmic, genetic, physiological, anatomical, immunological, metabolic, reproductive, and behavioral differences inconsequential?

If the validity of a model depends on how closely it resembles the original in key respects, then at what point do systemic differences between species become significant enough to make the animal-to-human analogy break down and become disanalogous (LaFollette & Shanks, 1993)? How well can any animal model recreate human psychological capacity for perceptiveness, for imaginative projects, for memory, or for skillful movement, when so many psychosocial and spiritual factors that govern human behavior fall outside of the animal model altogether? Perhaps animals are poor models for humans for the same reason that humans are poor models for animals: species variation.

Remedy 2

If authors must present a "detailed discussion of the rationale and contributions of animal research" (Domjan & Purdy, 1995, p. 502), then, on balance and in the interest of developing critical thinking, teachers and stu-

dents also must be informed about the scientific problems with animal experimentation (Shapiro & Bowd, 1993). Perhaps a primer could be developed that would guide teachers and students to critically evaluate common animal experiments mentioned in general psychology textbooks. Questions might include: Are animal species selected on non-scientific grounds (e.g., cost, ease of handling)? Are artificially induced independent variables used that only superficially correspond to the naturally occurring human condition (e.g., injecting neurotoxins to damage cholinergic systems to simulate Alzheimer's disease)? Are dependent-variable animal tasks used that have no apparent correspondence to human behavior (e.g., using the Porsolt swim test to assess the effects of antidepressant drugs)? Are uncontrolled variables in the experimental setting (e.g., laboratory conditions, stress, and pain) confounding interpretation of animal data?

An especially crucial question is: How powerful is the animal modeling approach? Even though the animal is treated in an experimental paradigm, the human being enters the picture only analogically. Humans may be the population to which results are intended to be generalized, but humans are not the population from which subjects are selected. Animal models are like statistical correlations: They have heuristic value for animal science, but are generally unreliable predictors of human response (Sharpe, 1994). Is it good science to study the human brain by manipulating and then destroying the brains of animals, when such experiments provide only analogical knowledge and can never prove cause and effect or correlation in humans (LaFollette & Shanks, 1992)?

Although animal experimentation and dissection for scientific purposes "can significantly inform theories of human behavior" (Domjan & Purdy, 1995, p. 502), it also (a) can lead researchers astray (e.g., promote the belief that mind is brain and body is machine, reducible to elemental fragments that can be understood independent of psychosocial factors); (b) can impede important scientific advances (e.g., delayed the

cognitive revolution); and (c) can divert research funds from more relevant sources of information, that is, people (e.g., 31% of National Institutes of Health extramural research funds in 1991 went for human research, whereas 69% supported animal research; U.S. Department of Health and Human Services, Public Health Service, & National Institutes of Health, 1992). To what degree can educators trust the knowledge contained in general psychology textbooks to provide an accurate representation and understanding of human psychology, biology, or behavior when much of that information is derived from experiments on nonhuman animals? Have Domjan and Purdy revealed contemporary general psychology to be largely a psychology of animals masquerading as a psychology of people?

Remedy 3

If examples of animal experiments are to be explicitly described (Domjan & Purdy, 1995), then it will no longer be possible to sanitize the details of experimental procedures and apparatus (Birke & Smith, 1995). Difficult ethical questions will arise in classroom discussions: Why take a healthy being from a species not our own; cage the animal under stressful laboratory conditions; give the animal deadly diseases, painful surgery, addictive drugs, or experimental pathologies; and then sacrifice the animal's life to humanitarian ends in experiments that would be unethical if conducted on human beings? Why is it ethical to do this with animals? At what point does the value of life become less in animals? Does protecting the sacredness of human life and obtaining knowledge about the human mind, brain, and consciousness require killing animals? Must we kill in pursuit of that ideal? Does the end justify the means? Have all nonanimal alternatives been considered?

I am in favor of following the recommendations of Domjan and Purdy (1995) to correct the inadequate portrayal of animal experiments in general psychology textbooks. Correcting the inadequacies, however, may not so much "free a crazy aunt from the attic" (p. 502) as open up a Pandora's box of extremely important questions.

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Right, but for the Wrong Reasons

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Domjan and Purdy (July 1995) assembled a long list of unsung animal heroes in psychological research. They pointed out that despite the vital role played by animals in psychological research, animals do not get their fair share of credit—indeed, research on animals is sometimes presented as though it was performed on humans. These crimes of credit have been perpetrated by the authors of the most widely used introductory textbooks in psychology, influencing at least 350,000 unsuspecting students each year. Domjan and Purdy claimed that this neglect in not only unjust, but also unwise. They argued that by underemphasizing the prevalence of animal research, this valuable source of psychological inquiry may be unfairly represented in the public arena and that this "is especially important given contemporary concerns about animal rights and animal welfare" (p. 496). Domjan and Purdy concluded from their advocacy of animal re-

search that it is time to acknowledge the contributions of such research more explicitly. I believe they are right, but for the wrong reasons.

According to Domjan and Purdy (1995), the mere fact that animals are necessary for so much psychological research, and that this research is under threat, justifies more explicit inclusion of animal research in psychology textbooks. But if we were to adopt this logic, introductory psychology textbooks should include other forms of vital, yet rarely mentioned, aspects of psychological research. For example, research funding is a component of psychology that is surely just as necessary to the well-being of the discipline as research on animals and is similarly under threat. However, one would not ordinarily suggest that the funding agency or grant supporting a particular research project be mentioned every time findings from such a project are cited in an introductory textbook. Domjan and Purdy claimed that "these errors of omission and commission obscure the role of animal research in psychology and promote the misrepresentation that major advances in knowledge concerning the biological bases of behavior can be obtained without animal experimentation" (p. 501). They do no such thing: no more than omitting reference to the National Science Foundation promotes the misrepresentation that major advances in knowledge concerning the biological bases of behavior can be obtained without funding!

My objections to the reasoning pursued by Domjan and Purdy (1995) should not be taken to suggest that I object to their conclusions—far from it—I agree that there are strong grounds to suggest that animal research should enjoy a far higher profile in introductory psychology textbooks. I believe there should be more discussion of animals in textbooks, but only when relevant to the pedagogical goals of such texts. To achieve a full understanding of a psychological finding, it is sometimes necessary to consider the type of subjects used in the research. For example, when generalizing from one species to another, philosophical and conceptual issues may arise. In such cases, it is essential that the students are instructed about the complexities associated with these issues.

There are no hard rules governing the appropriateness of cross-species generalizations. Comparisons should be judged on biological, phylogenetic and social grounds, and the importance of these criteria should be weighed according to what one is studying. In 1946, Hebb noted "The true objection to anthropomorphism is . . . inventing similarities that do not exist" (p. 88). Many