Animal Research in Psychology

More Than Meets the Eye of the General Psychology Student

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The general psychology course provides a unique opportunity to present the science of psychology to a wide audience. Informing the general public about the importance of animal research in psychology is especially important given contemporary concerns about animal rights and animal welfare. A study of 8 leading introductory psychology textbooks indicated that with the exception of principles of conditioning and learning, the contributions of animal research to psychology were often not explicitly acknowledged. In addition, major findings from animal research were frequently presented as if they had been obtained with humans. In obscuring the contributions of animal research, introductory psychology textbooks miss the opportunity to ensure that public policy is based on accurate information about the significance of this research to many areas of psychological science.

Public support of psychological research requires that the major findings and contributions of various aspects of psychology be successfully communicated to the general public (Bevan, 1982). One aspect of psychological research that has come under public scrutiny is research with animal subjects.[1] Public scrutiny of animal research is now common and may be desirable. However, such scrutiny will be counterproductive if it is based on poor information. Psychology is a biological science of behavior that draws on data from a wide range of species. Articles have appeared on occasion in professional journals extolling the value of animal research in psychology (e.g., Miller, 1985), and much has been written about the ethical treatment of animals in psychological laboratories (e.g., Baird & Rosenbaum, 1991). However, these publications have ignored perhaps the largest audience for psychological science, students in general introductory psychology courses. A recent survey indicated that 97% of two- and four-year colleges offer an introductory psychology course, and in 94% of those schools the course primarily has a general audience (Cooney & Griffith, 1994). Because of this, the way psychological science is presented to introductory psychology students no doubt influences public attitudes and opinions about psychological research in general and about psychological experiments with animal subjects in particular.

In an effort to determine what information about psychological research with animals is available to students in general psychology courses, we examined how the contributions of animal research are presented in eight of the most widely used introductory psychology textbooks. The textbooks were chosen on the basis of their resale value and rating in the *MBS Textbook Buying Guide* (February 1993 edition). The books were written by Atkinson, Atkinson, Smith, and Bem (1990); Baron (1992); Carlson (1993); Coon (1992); Gleitman (1992); Kalat (1993); Morris (1993); and Wortman and Loftus (1992). All of the books were rated 9, the highest rating a book could receive, in the *Buying Guide*. A reasonable estimate is that these eight books account for nearly 30% of the general psychology textbook market and directly reach about 350,000 students per year. However, because widely used textbooks also serve as models for other texts, the eight books we selected probably reflect how animal research is presented to far more than 350,000 students per year.

Remarks About Animal Research in Opening Chapters

With the exception of Atkinson et al. (1990) and Gleitman (1992), all of the authors included some discussion of the importance and ethics of animal research. The information was included in opening chapters on approaches and methods in psychology. This had the disadvantage of challenging students to think about animal research issues before they were informed about the specific contributions of animal research to psychology. In addition, the total attention devoted to animal research issues was a trivial proportion of most of the texts. Baron (1992), Carlson (1993), and Kalat (1993) provided lengthier treatments than the other authors. However, even they devoted little more than one page to the topic, out of more than 600 pages of text.

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[1] The animal kingdom includes both human and nonhuman subjects. However, in discussions of animal research, the term *animal* typically has been used only in reference to nonhuman subjects. This usage is followed in the present article.

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Importance of Animal Research

Only one of the authors, Coon (1992), explicitly mentioned the importance of animal research in psychology in an opening chapter. Coon wrote that psychology "is the scientific study of human and animal behavior" (p. 2) and discussed that "as a group psychologists are interested in natural laws governing the behavior of any living creature—from flatworms to humans" (p. 5). In addition, he noted that "most of what is known about the brain is based on animal research" (p. 6) and that "a government panel (which included animal welfare advocates) concluded that in psychology there is often no substitute for ethically done animal research" (p. 6). In a less forceful endorsement of animal research, Morris (1993) commented that "Some psychologists believe that since psychology is, at least in part, the science of behavior, animal behavior is just as interesting and important as human behavior" (p. 22).

Ethical Issues in Animal Research

Ethical issues in animal research were discussed in six of the eight textbooks. Most authors discussed the animal rights movement and presented arguments for and against the use of animals in research (e.g., Coon, 1992, p. 49). In addition, most authors pointed out that guidelines have been developed by various organizations, including the American Psychological Association, the Society for Neuroscience, and the National Institutes of Health, for the conduct of research with animals. Only Morris (1993), however, wrote anything about the nature of these guidelines, and he provided only one sentence on the matter (p. 22).

Carlson (1993) argued that "any time we use another species of animals for our own purposes, we should be sure that what we are doing is both humane and worthwhile. I believe that a good case can be made that psychological research with animals qualifies on both counts" (pp. 38–39). Baron (1992) commented that "most projects conducted with animals involve absolutely no harm or discomfort to the animals" (p. 30). Wortman and Loftus (1992) wrote that any pain or harm research animals might experience has to be justified. However, they did not indicate what reasons might be acceptable.

Justification of Animal Research

Five of the eight books (Baron, 1992; Carlson, 1993; Coon, 1992; Kalat, 1993; Morris, 1993) included points of justification for animal research in their opening chapters. For example, Morris (p. 22) noted a number of methodological advantages of animal research. Kalat (pp. 58–59) summarized Johnson's (1990) four main arguments in defense of animal research. Atkinson et al. (1990) justified animal research on the basis of a justification for basic research in general but devoted only one sentence to the topic (p. 258). Coon wrote that research psychologists use animals to discover principles that help solve human problems in such diverse areas as obesity, memory, stress, psychosis, therapy, and aging. In addition, Coon pointed out that animals sometimes serve as models that provide important information. Finally, Coon mentioned that psychology also benefits animals. The key arguments appeared in one text or another. However, most of the books presented incomplete arguments. Only by reading all eight books would a student obtain a reasonable introduction to the ethical issues and reasons for conducting animal research in psychology.

Presentation of Results From Animal Research

Biological Bases of Behavior

Perhaps the most obvious area to which animal research has made prominent contributions concerns the biological bases of behavior. All of the books included chapters on the physiological or biological bases of behavior. These chapters typically included information about the structure and function of the neuron, the action potential, mechanisms of neurotransmission, the central and peripheral divisions of the nervous system, parts of the brain, lateralization of function, effects of brain damage on behavior, recovery from brain damage, and endocrine influences on behavior. Although animal research has been critical to all of these areas of knowledge, this was not evident in the presentation of the information. For example, discussions of the structure of the neuron, neural action potentials, and neural transmission made it clear that such information is fundamental to understanding the physiological bases of behavior. However, the discussions did not explicitly acknowledge that this information was derived from animal experimentation.

Presentations of the biological foundations of behavior encouraged students to marvel about the extent and sophistication of the available knowledge, without

challenging them to consider how this information was obtained. None of the chapters pointed out that experimental brain stimulation and brain lesion research cannot be done with humans or that studies of neuroanatomy, neurophysiology, and neurotransmitter function require the use of invasive techniques that are unethical to carry out with humans. Only one author (Carlson, 1993, p. 59) mentioned (in a summary section) that physiological psychologists usually study animals. Only two of the eight books included a section explicitly discussing methodological issues in physiological psychology (Carlson, pp. 53–54; Wortman & Loftus, 1992, pp. 77–80). However, the necessity of using animals in physiological research was not pointed out in either of these sections. Wortman and Loftus, for example, described brain stimulation and lesion techniques in a section titled "Methods of Brain Research" without pointing out why such work invariably is done with animal subjects (p. 77).

Some authors described animal research in a way that left the impression that the research had been done with human research participants. For example, in a section titled "Major Regions of the Human Brain," Wortman and Loftus (1992, p. 81) cited research on the role of the cerebellum in learning and memory (Thompson et al., 1983), without pointing out that this research was done with rabbits. They also included descriptions of the functions of the thalamus, hypothalamus, and the limbic system, without noting that much of the evidence came from animal subjects. Kalat (1993) wrote in connection with recovery from brain damage that "long after people have recovered more or less normal behavior following brain damage, they may suffer a relapse in old age. An older person's behavior may deteriorate, eventually ending up about the same as it was just after the damage" (p. 113) The evidence cited for this conclusion was a study conducted with laboratory rats (Schallert, 1983), but there was no mention of the species used in the research, giving the misimpression that the conclusions were based on human data. Some authors (e.g., Atkinson et al., 1990) described the results of electrical stimulation research—"Mild electrical stimulation of certain areas of the hypothalamus produces feelings of pleasure, while stimulation of adjacent regions produces sensations that are unpleasant or painful" (p. 42)—without noting that the findings were obtained with animal subjects.

Several books included photographs or drawings of rats or monkeys fitted with skull cap electrodes to illustrate research on the reinforcing effects of brain stimulation (Baron, 1992; Carlson,1993; Gleitman, 1992) and brain stimulation induced aggression (Morris, 1993). Such illustrations are often featured in anti-animal research literature in an effort to elicit reactions of pity and revulsion. The pictures are presented without the explanation that the electrodes were implanted while the subjects were anesthetized and that the animals quickly became habituated to the skull caps. These mitigating factors were also omitted in all but one (Carlson) of the introductory psychology books. In addition, presentation of the illustrations in the textbooks was not accompanied by a discussion of the importance of the findings obtained from such preparations or why the use of animals was necessary for the research.

All of the books included some examples of research in which the use of animals was explicitly stated. However, the necessity of using animals in the research was not explained. Gleitman (1992), for example, described research with dogs, cats, and monkeys on the physiology of reflexive behavior (p. 16) without explaining why such information could not have been obtained with humans and why such animal research provides information that is fundamental to understanding the organization of neural action. Later in the same chapter (pp. 38–39), Gleitman described the results of animal research on recovery from brain damage, again without pointing out why such research could not have been conducted with humans.

Sensation and Perception

Animal research has also contributed significantly to the acquisition of knowledge about sensation and perception. Much of what is known about the anatomy and physiology of vision, hearing, taste, touch, and smell has come from animal research. Many of the major researchers in sensation and perception, including Hubel, Weisel, Lettvin, Jacobs, Newsome, Sperry, Bekesy, DeValois, and Melzack, used animal subjects in their research. These contributions of animal research were not made evident in the general psychology books. In many instances the reader was not informed that animals served as subjects. We found more than 25 instances in which an animal

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study was cited as evidence without acknowledgment that the study involved the use of animal subjects.

One area of sensation and perception in which animal research has been criticized is the study of pain and pain relief systems. Experiments in which animals are subjected to painful stimuli are often singled out by opponents of animal research. Therefore, it is critical that introductory psychology books discuss in detail why animal research is required for the study of pain. Although all eight books included discussions of pain, very little information about the role of animal research was provided. Morris devoted two sentences to the use of animals in this type of research (1993, p. 108). Atkinson et al. (1990, pp. 151–153), Gleitman (1992, p. 23), and Kalat (1993, pp. 140–141) each devoted a single sentence to the role of animals in such research. The other four books (Baron, 1992; Carlson, 1993; Coon, 1992; Wortman & Loftus, 1992) did not mention the use of animals in pain research.

Motivation and Emotion

Knowledge concerning homeostasis and drive reduction, intrinsic and extrinsic reward, primary and secondary reinforcement, and intermittent reinforcement and its effects on persistence all derive significantly from animal research. In addition, much of what is known about the physiological and neurophysiological bases of hunger, thirst, and sexual motivation comes from animal experimentation.

The specific contributions of animal research to knowledge about motivation was not explicitly pointed out in the textbooks. Indeed, we found many of the same kinds of omissions that we observed in other chapters. Authors cited examples of animal research without mentioning that animal subjects were used, they discussed important concepts in motivation research without mentioning that the work was grounded in animal research, and sometimes they described the results of animal research as if the research had been done with humans (e.g., Kalat, 1993, pp. 456, 459, 460).

Studies with animals have also explored the physiological and neural bases of emotion and have tested competing theories of emotion. Animal research has also been instrumental in guiding research on the opponent process theory of emotion, aggression, and the relation between frustration and aggression. These contributions of animal research were largely ignored by the authors of the introductory texts. Four of the eight textbooks (Baron, 1992; Gleitman, 1992; Kalat, 1993; Morris, 1993) included no mention of the role of animal research in the study of emotion, and Atkinson et al. (1990, p. 402) and Wortman and Loftus (1992, p. 319) included sections on the physiological bases of emotion with no mention of animal research.

Conditioning and Learning

Experiments with animals have greatly increased our understanding of the basic principles of learning. In contrast to their treatment of other research areas, the authors did a good job of acknowledging that animal research has been the source of much of our knowledge of conditioning and learning. All of the authors cited numerous animal studies and explicitly described examples of animal research. Indeed, given the paucity of animal research described in the other chapters, an introductory psychology student could easily get the impression that the use of animals in psychological research is confined to the investigation of conditioning and learning.

Memory and Forgetting

As with other areas, the contributions of animal research to a variety of aspects of knowledge concerning the physiological bases of memory and forgetting was described without acknowledging the source of the knowledge. Examples include the effects of stimulants, glucose, and the enzyme calpain on memory (Coon, 1992, p. 259; Kalat, 1993, p. 330; Wortman & Loftus, 1992, p. 211), the phenomena of retrograde amnesia (Baron, 1992, p. 240) and long-term potentiation (Baron, p. 240; Morris, 1993, p. 245), and the role of calcium channels (Wortman & Loftus, p. 211) and various brain areas in encoding and storage of memories (Morris, p. 261; Wortman & Loftus, p. 212).

Developmental Psychology

Much of the knowledge about psychological development that appeared in the introductory textbooks involved studies of human participants. However, there were a few striking exceptions. For example, all of the books included descriptions of the work of Harlow and his associates on emotional development in rhesus monkeys. The next most frequently described example of animal research was research on imprinting using avian species (Coon, 1992, p. 392; Gleitman, 1992, pp. 381–382; Morris, 1993, p. 373). Other examples of animal research were more idiosyncratic. These included studies of the effects of daily handling of infant rats on the release of stress hormones (Wortman & Loftus, 1992, p. 256) and the effects of raising rats in enriched environments (Coon, p. 405).

The books also included various examples of procedures that are based on animal research and used to test human infants. However, the source of these procedures was not acknowledged (Atkinson et al., 1990, p. 77; Baron, 1992, p. 290; Gleitman, 1992, p. 367; Kalat, 1993, p. 223; Morris, 1993, p. 357; Wortman & Loftus, 1992, p. 257).

Finally, we found instances in which animal research was critical but was not mentioned. For example, Baron (1992) described the effects of stimulants, narcotics, and alcohol ingested during pregnancy without mentioning that experimental investigations of teratology require animal research (pp. 288–289). Elsewhere, Baron noted that cellular changes in neurons that occur with Alzheimer's disease hold out hope that drugs that will arrest these changes can be developed. However, he did not mention that such drug development research will have to be done with animal subjects (p. 342).

Psychoactive Drugs and Drug Abuse

Six of the books (Atkinson et al., 1990; Baron, 1992; Carlson, 1993; Kalat, 1993; Morris, 1993; Wortman & Loftus, 1992) included descriptions of psychoactive drugs and their mechanisms of action, usually in a chapter on consciousness or altered states of consciousness. The drugs discussed included alcohol, barbiturates, amphetamines, cocaine, opiates, and hallucinogens. These drugs are of considerable interest and importance because of their use in society. Few would contest that understanding problems of drug use and drug abuse requires understanding the neurochemical and neurophysiological mechanisms of drug action. In recognition of the importance of this information, all of the books discussed how psychoactive drugs influence neurotransmitter systems. However, none of them stated that much of this information was obtained through animal research.

Psychopathology

Biological factors have been implicated in several forms of psychopathology, including depression and schizophrenia, and principles of conditioning developed in animal research have been implicated in the acquisition of fears and phobias. In addition, animal models have been developed for a number of behavioral disorders.

Although all of the books included information about the role of neurotransmitters in mood disorders, the contribution of animal research to this knowledge was rarely explicitly acknowledged. Wortman and Loftus (1992), for example, described the effects of tricyclics and monoamine oxidase (MAO) inhibitors on serotonin and epinephrine and discussed research on whether antidepressants cause synaptic changes in the brain, without mentioning the use of animal subjects in such research (p. 507). Atkinson et al. (1990) noted that animal research has shown that reserpine causes a decrease in brain levels of serotonin and norepinephrine (p. 643). However, they did not mention the use of animals in subsequent descriptions of the effects of tricyclics and MAO inhibitors.

Neurotransmitter systems also have been implicated in schizophrenia. All of the books reviewed evidence of the role of dopamine, serotonin, and other neurotransmitters in schizophrenia. However, none of them acknowledged the use of animals in research on these transmitter systems.

Carlson (1993) described animal models that have been used to study a variety of problems related to psychopathology, including obesity, the genetics of the preference for alcohol, the development of drugs to reduce alcohol intake, the suppression of the reuptake of serotonin as a cause of depression, and anxiety caused by teratological effects of Valium (pp. 531–532). None of the other authors explicitly discussed the use of animal models in the study of psychopathology. However, isolated mention of particular animal models appeared in various texts. Every author, except Baron (1992), noted that learned helplessness, a prominent concept in explanations of depression, was first investigated in animal subjects. Kalat (1993) described the research of Mineka and her colleagues with rhesus monkeys on observational learning of phobias (pp. 590–591). Morris (1993) also cited this research (p. 191). However, Morris did not mention that the research was done with monkeys, and his reference to the work after a description of Freudian interpretation of phobias left the impression that the data on observational learning of fear had been obtained with human research participants.

Other examples in which the contributions of animal research were not acknowledged include a description by Atkinson et al. (1990) that alcohol intake stimulates endorphin receptors and may compensate for a drop in endorphin levels (p. 521).

Treatment

A number of important treatments for psychological disorders are derived from animal research. Behavior therapies are well grounded in basic behavioral research with animals. Included among these are aversion therapy (used in the treatment of substance abuse), desensitization, flooding, implosion, and extinction therapies (used in the treatment of phobias); token economies; systematic reinforcement; and time-out (used to reduce behavior problems). These procedures draw heavily on information obtained from the animal laboratories in the tradition of Hull, Pavlov, Skinner, and Thorndike.

Biological or medical treatments of psychological dysfunction are also based on animal research. The development and clinical use of electroconvulsive shock and psychosurgery, as well as the development and use of antipsychotic, antidepressant, and antianxiety drugs could not have been possible without research with animals. In addition, the safe use of these drugs as determined through parametric studies of dose response curves is based in large part on animal research.

The contribution of animal research to the treatment of psychological disorders was rarely acknowledged in the textbooks. Morris (1993) devoted two sentences to the topic. He noted that electroconvulsive shock produces brain damage in animals (p. 608), and he suggested that research with animals shows that certain antipsychotic drugs act by inhibiting hypothalamic arousal (p. 609). Kalat (1993) discussed how various drugs affect behavior by facilitating or inhibiting neurotransmitters within the central nervous system without mentioning that animal research underlies much that is known about the efficacy of medical psychological treatments.

Coon (1992) offered a single sentence affirming that the principles of operant conditioning were developed through laboratory research with animals by B. F. Skinner and other psychologists (p. 604). Atkinson et al. (1990, p. 646), Baron (1992, pp. 572, 574), Gleitman (1992, p. 544), and Wortman and Loftus (1992, pp. 532–535) acknowledged that the various techniques used by behavior therapists were adapted from principles of learning and conditioning discovered in the laboratories of Pavlov, Thorndike, and Skinner. However, none of the authors mentioned the role of animal work in the development

of these therapies. Carlson pointed out that the use of time-out as a technique of behavior modification was based on animal research (p. 547) but did not note the role of animal research in any of the other behavior therapies. Carlson (1993) also discussed drug therapies without mentioning their basis in animal research. Likewise, Baron described various drugs and their actions on neurotransmitter systems in a section on "The Pharmacological Revolution" (pp. 592–595) with no mention of the importance of animal work. Neither Atkinson et al. nor Wortman and Loftus discussed the importance of animal work in the development and use of various biological therapies.

Health, Stress, and Coping

Much of what is known about health, stress, and coping is founded on animal research. This was not explicitly pointed out in any of the books. And, as was true with other areas of research, the findings of animal research were often reported without proper attribution. For example, both Carlson (1993) and Wortman and Loftus (1992) described the basic concepts of immunology without noting that these concepts were developed during the course of animal research. Carlson also described in some detail two studies of opioid effects on immune responses without noting that the research was done with animals (Shavit, Depaulis, et al., 1986; Shavit, Lewis, Terman, Gale, & Liebeskind, 1984). Atkinson et al. (1990), Baron (1992), Coon (1992), Kalat (1993), and Wortman and Loftus (1992) all described the basic concepts of the physiology of stress without pointing out that this knowledge is based on animal research. Baron described environmental carcinogens (p. 461) and anticarcinogenic properties of vitamin A (p. 463) without noting the bases of these claims in animal research.

The stressful effects of aversive stimuli are significantly influenced by the extent to which the subject has control over the aversive events. Animal research was responsible for identifying this phenomenon and has contributed to its analysis. The contributions of animal research to the understanding of control were noted by Atkinson et al. (1990), Carson (1993), and Coon (1992). In contrast, Kalat (1993) and Wortman and Loftus (1992) did not cite any animal research in their discussion of controllable versus uncontrollable stress.

Discussion

Psychological research with animal subjects has been central in addressing many of the issues that are fundamental to psychology—issues ranging from the anatomy and functional mechanisms of neurons to sensation and perception; motivation and emotion; learning, memory, and forgetting; development; psychopharmacology; psychopathology; therapy; and the relation of stress and disease. In a study of eight leading introductory psychology textbooks, we found that with the exception of chapters on conditioning and learning, the contributions of animal research often were not acknowledged explicitly. In addition, major findings from animal research were presented as if they had been obtained with human participants. These errors of omission and commission obscure the role of animal research in psychology and promote the misimpression that major advances in knowledge concerning the biological bases of behavior can be obtained without animal experimentation.

Most of the books discussed some reasons for conducting experiments with animals and mentioned ethical issues. However, these discussions were incomplete. In addition, information about ethical and methodological issues was presented in the opening chapters of the books, before the readers were familiarized with any of the results and benefits of animal research. Therefore, contrary to recent suggestions (e.g., Rosenthal, 1994), ethical judgments about animal research were discussed in the absence of knowledge of the importance of such research to fundamental issues in psychology.

In obscuring the contributions of animal research, major general psychology textbooks miss the opportunity to educate the general public about the importance of psychological experiments with animals. These texts also miss the opportunity to educate current and future psychologists. Graduate students and professionals in the field use general psychology texts to familiarize themselves with areas of psychology outside their specialized expertise. Thirty years ago, exercises with laboratory rats or pigeons were a standard part of courses in experimental psychology. Psychologists who specialized in work with human clients encountered experimentation with animals first-hand during their undergraduate or graduate training. That is no longer the case. Most current doctoral students in psychology do not receive first-hand experience with animal research. This makes it especially important to portray the contributions of animal research accurately in texts that provide a general summary of psychology.

Authors may have obscured the contributions of animal research for several reasons. One possibility is that they wanted to focus on the results and conclusions of research rather than on methodological considerations. Perhaps they considered animal research a "dry" methodological issue irrelevant to communicating important research findings. Unfortunately, de-emphasizing issues related to animal research does not make the issues go away. For many people animal research is not a dry methodological issue. It is close to a moral issue. In addition, students are likely to enter a general psychology course with some opinions about the use of animals in research, whereas they are not likely to have preexisting opinions about other methodological issues, such as the use of control groups, counterbalanced experimental designs, or double-blind treatment procedures. Current societal sensibilities require that the use of animals in psychological research be treated differently from other methodological issues.

Another interpretation is that lack of acknowledgment of the contributions of animal research is the result of market forces that shape the content of introductory psychology books. Authors are encouraged to update their

books frequently. One might suggest that lack of citation of animal work may reflect a shift away from animal research in contemporary psychology. However, this cannot explain our findings. The problem was not the absence of important animal research in the textbooks; the problem was lack of acknowledgment of the use of animals in the research that was reported.

Another possible interpretation of our findings is that the textbooks did not identify what type of subjects served in the experiments that were described, whether those subjects were human or animal. This interpretation is inconsistent with our finding that animal research was often presented as if it had been done with humans. In addition, the authors often identified various human populations (babies, college students, men or women, etc.) that provided the data that they described.

Our findings probably resulted from the extreme efforts of the authors to captivate their readership. In their eagerness to make the material interesting, the authors tended to emphasize the relevance of research that had been done with animals to human behavior. This eagerness to highlight human relevance may have even led authors to misrepresent some animal experiments as if they had been conducted with humans.

Emphasis on possible human relevance is unfortunate not only because it may cause distortions of exposition but also because it encourages an overly simplistic view of animal research. Animal research can significantly inform theories of human behavior not only in cases where similarities are found but also in cases where the mechanisms of behavior in an animal species are found to be different from the mechanisms of corresponding forms of human behavior.

Pedagogical considerations also may have contributed to our findings. Animal research issues are often divisive and therefore can distract students from focusing on the psychological principles that should be the core of a general psychology course. We are sympathetic to this argument. However, obscuring the contributions of animal research is not a satisfactory solution to the problem. Pedagogical considerations cannot justify the misrepresentation of animal research as research conducted with human participants. Such considerations also cannot justify obscuring the contributions of animal research and thereby creating the misimpression that the use of animals is only marginally important to most areas of psychology.

Several levels of response to the inadequacies that we have identified are possible. At a minimum, we would like to encourage authors to give credit where credit is due. If animal subjects had to be used to develop an important research finding, that finding should not be described as if it had been derived from research with human participants.

A more proactive response would involve detailed discussions of the rationale and contributions of animal research to various areas of psychology. For example, in addition to pointing out the importance of investigating the biological bases of behavior, authors might discuss in some detail why animal subjects have to be used in this area of psychology. Authors might also point out how animal research was instrumental in opening up certain important areas of research. They might discuss in greater detail the rationale for using animal models to study certain forms of psychological dysfunction (Levis, 1991; Overmier & Burke, 1992). They might discuss the advantages of using a comparative method that can reveal both similarities and differences among species. Finally, authors might revisit ethical issues involved in animal research after readers have become familiar with the contributions of such research.

Given intense public scrutiny of animal research and given the importance of animal research to fundamental issues in many areas of psychology, it is time to stop treating animal research as if it were our crazy aunt in the attic. If researchers do not acknowledge the contributions of animal research more explicitly and do not take the opportunity to educate the general public more directly about the ethical issues involved, we risk further erosion of public support for animal research. The deleterious consequences will not be limited to a few isolated investigators but will affect our success in addressing fundamental issues in many areas of psychology.

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