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# Attitudes Toward the Use of Animals in Psychological Research and Education

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## *Results From a National Survey of Psychologists*

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S. Plous  
Wesleyan University

*Animal research has played a central role in psychology, yet its clinical value and ethical propriety have recently come under attack. In an effort to assess current thinking on this controversial subject, a mail survey was sent to 5,000 randomly selected members of the American Psychological Association. Responses were received from 3,982 individuals, and the results showed (a) majority support for animal studies involving observation or confinement, but disapproval of studies involving pain or death; (b) majority support for mandatory pain assessments and the federal protection of rats, mice, pigeons, and reptiles; and (c) majority support for the use of animals in teaching, but opposition to an animal laboratory requirement for the psychology major. Additional findings and policy implications are discussed.*

The use of animals has been and continues to be essential . . . in applied research with direct clinical applications in humans and animals.

—American Association for the Advancement of Science (1990)

The quotation above, taken from a joint resolution endorsed by the American Psychological Association (APA) in 1990, represents the feelings of many psychologists. As Miller (1985) pointed out in a trenchant defense of animal research in psychology, behavioral research on animals has laid the foundation for breakthroughs in the treatment of drug addiction, anxiety disorders, phobias, urinary incontinence, and ruminative vomiting. Animal models have also been used to study the neural bases of schizophrenia, depression, retrograde amnesia, and a range of other psychological phenomena (Domjan & Purdy, 1995). Indeed, research on animals has played a central role in psychology throughout most of the 20th century.

In recent years, however, some psychologists have questioned the clinical value of laboratory research on animals. For example, Kelly (1986) examined 3,293 citations in the 1984 volume of the *Journal of Consulting and Clinical Psychology* (the leading APA journal devoted to treatment breakthroughs) and found that 99.7% did not refer to laboratory animal research. He also examined the 1984 volume of *Behavior Therapy*, a journal that spe-

cializes in behavioral intervention research and would therefore be expected to rely heavily on the results of animal studies. Here again, though, animal research was rarely cited. Of 1,132 citations in *Behavior Therapy*, only 2.0% referred to animal studies. Giannelli (1986) likewise found that only 7 of the 118 studies cited by Miller (1985) appeared in the five-volume reference lists of the Association for Advanced Training in the Behavioral Sciences (a comprehensive course for the national licensure examination in psychology). Thus, it is unclear how often clinical investigators actually use the results of animal research (at least, as reflected by the results of citation analysis).

In addition, several psychologists have criticized animal research on ethical grounds (Bowd & Shapiro, 1993; Robinson, 1990; Ulrich, 1991). A recent article by two board members of Psychologists for the Ethical Treatment of Animals, Alan Bowd and Kenneth Shapiro, illustrates this line of criticism. In their article, Bowd and Shapiro (1993) argued that

Interests and rights are not the sole preserve of the human species, and should be evaluated consistently and with due consideration to an animal's capacity to suffer. Our ethical obligations extend to individuals who are intellectually unable to reciprocate them, within and beyond our own species. Those who would accord rights to human beings but deny them to all other species

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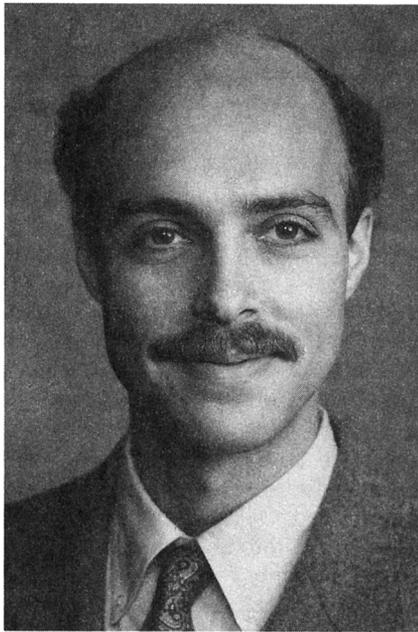
A parallel survey was distributed to a national sample of psychology majors, and the results are being published simultaneously in S. Plous (1996), Attitudes toward the use of animals in psychological research and education: Results from a national survey of psychology majors. *Psychological Science*, 7, 352-358.

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Correspondence concerning this article should be addressed to S. Plous, Department of Psychology, Wesleyan University, 207 High Street, Middletown, CT 06459-0408. Electronic mail may be sent via Internet to splous@wesleyan.edu.



**S. Plous**

must make the case that there is a morally relevant difference separating *Homo sapiens* from other creatures. We do not believe such a difference exists. . . . To base ethical decisions on species membership alone . . . is as arbitrary as relying on skin color or gender in hiring decisions. (p. 136)

Not long ago, such views would have been dismissed by many psychologists. Yet during the past 20 years, there has been an unprecedented growth in concern over animal rights and animal welfare. In an analysis of the scientific literature, Phillips and Sechzer (1989) found that articles on animal welfare quadrupled following passage of the 1966 Animal Welfare Act. According to Jasper and Nelkin (1992), 10–15 million Americans now belong to at least one animal welfare group, and one in five Americans claims to have donated money to an animal protection organization. In fact, by the end of the 1980s, Congress was receiving more letters about animal welfare than any other topic (Fox, 1990). Between 1987 and 1995, approximately one fourth of state legislatures introduced bills to stop the use of animals in education, and several additional state and federal bills were introduced to restrict animal research (Rowan & Loew, 1995).

It is hard to assess the impact of this shift in concern for animals. Nevertheless, whether for reasons of cost, increased regulation, animal rights, or other factors, animal research does seem to be on the decline. During the past 20 years, the number of animals used in research worldwide has fallen by an estimated 30–50% (Rowan & Loew, 1995). This decline in animal use includes a 38% reduction in Canada between 1977 and 1989, a 46% reduction in the Netherlands between 1978 and 1991, a 30% reduction in Great Britain between 1980 and 1990, a 55% reduction in Italy between 1978 and 1989, and a 50% reduction in Switzerland between 1980 and 1990 (Orlans, 1994; Rowan, 1994). In the United States, the

number of animals used in research has fallen by as much as 50% since the mid-1970s (although it should be noted that this estimate is somewhat speculative, because rats, mice, and birds are not tabulated under the U.S. Animal Welfare Act; Rowan, 1994).

A downward trend in animal use is also apparent within psychology. In a survey of more than 200 psychology graduate departments in the United States, Gallup and Eddy (1990) found that 15% of the departments had closed their animal facilities, and another 19% had held serious discussions about doing so. Benedict and Stoloff (1991) conducted a similar survey of “America’s best colleges” (137 top-rated schools without doctoral programs) and found comparable results: 21% of the psychology departments had closed their animal facilities, and an additional 18% of departments had seriously discussed closing them. And a parallel decline is taking place in Great Britain. In a comprehensive survey of British psychology departments, Thomas and Blackman (1992) found a 25% decrease since 1977 in the number of departments that maintained animal facilities, a 35% drop in psychology faculty conducting animal research, a 62% reduction of graduate students engaged in animal research, and a 70% decline in the number of animals used in research.

Has there been a concomitant loss of public support for animal research? To date, no nationwide surveys have specifically examined attitudes toward the use of animals in psychology, but public opinion polls on biomedical research have shown a modest decline in support for animal experimentation. Surveys by Gallup and the National Opinion Research Center suggest that support for animal research in medicine has fallen by approximately 20% since the late 1940s (American Medical Association, 1989; Rowan & Loew, 1995). Additional evidence of a decline in support for animal research has come from a series of four opinion polls conducted for the National Science Board (1991; Pifer, Shimizu, & Pifer, 1994). In these polls, respondents were asked whether they agreed or disagreed with the following statement: “Scientists should be allowed to do research that causes pain and injury to animals like dogs and chimpanzees if it produces new information about human health problems.” Between 1985 and 1993, the percentage of respondents agreeing with this statement fell from 63% to 53%.

Relative to 50 years ago, the public today is also less confident that laboratory animals are treated humanely. In 1948, 75% of the public believed that medical schools treated laboratory animals as well as individual owners would (National Opinion Research Center, 1948). Back then, trust in the biomedical research community was so high that nearly half of the public (49%) felt research rules and regulations were unnecessary. By 1989, however, only 33% of the public thought that “animals used in medical and pharmaceutical research [are] treated humanely” (compared with 49% who thought veal calves are treated humanely; Animal Industry Foundation, 1989). A similar survey conducted in 1985 found that only 40% of respondents thought animals used in medical

research are treated "fairly" or "very" considerably (Foundation for Biomedical Research, 1985).

This skepticism toward animal research is not limited to the United States. A 1989 national survey in Great Britain found that 50% of respondents thought scientific experiments on animals were morally wrong—more than the percentage who disapproved of pornography, abortion, or capital punishment (Jacobs & Worcester, 1990). According to a 1990 Gallup poll, 50% of the British public and 70% of British 16- to 24-year-olds thought animal experiments should be banned or further restricted ("Man's Mirror," 1991). Indeed, a recent cross-cultural study of 15 nations found that Canada and most European countries exceed the United States in opposition to animal research (Pifer et al., 1994).

Although this level of opposition may appear to threaten the future of animal research, at least three pieces of survey evidence run counter to such a conclusion. First, support for research on rats and mice—which comprise the majority of animal research subjects—is substantially higher than support for research on dogs, cats, and primates (Driscoll, 1992). For example, a public opinion poll by the Associated Press (1985) found 88% approval for the use of rats in medical experiments, compared with only 55% for dogs. Second, according to several polls sponsored by the American Medical Association, more than three quarters of the public believe "the use of animals in medical research is necessary for progress in medicine" (e.g., American Medical Association, 1989). In other words, most members of the public reject the animal rights argument that animal research is unnecessary. Third, support for animal research increases when the outcome of research is specifically tied to human health. For instance, 78% of respondents in one survey said they would support animal research if it were the only way to find a cure for AIDS (Groller, 1990).

Of course, *psychological* research on animals is not directed at curing diseases such as AIDS, so it is unclear whether public support for animal research in psychology ever reaches this level. One thing is definite, however—if animal research is to continue in psychology, it will require the support of the professional community. Given this basic fact, it is surprising that no large-scale surveys have looked at psychologists' attitudes toward the use of animals in psychology. The only survey published on this topic is a brief report of a student project, and, unfortunately, the results of this study were limited by a return rate of less than 50% and no information on the representativeness of the sample (Huskey, 1991).

The present article reports the results of a nationwide survey on psychologists' attitudes toward the use of animals in psychological research and teaching. A mail survey on this topic was sent to a random sample of 5,000 APA members in the fall of 1994, and approximately 80% of those contacted took part in the study. The focus of the survey was on three main topics: (a) the use of animals in psychological research, (b) research regulations and the humane care of animals, and (c) the use of animals in undergraduate psychology classes. A parallel survey

was also distributed to a national sample of psychology majors; interested readers should see Plous (1996) for a report of that study.

## Method

### Participants

The sample frame for this study consisted of all APA members, fellows, and associates residing in the United States. From this frame, a simple random sample of 5,000 individuals was drawn by the APA Office of Demographic, Employment, and Educational Research. Forty-eight of these APA members proved to be unreachable for various reasons, leaving a pool of 4,952 potential respondents. Of these individuals, 3,982 (80.4%) completed a survey in time for inclusion in the study. As Table 1 shows, the profile of these respondents was similar to a demographic and occupational breakdown of APA members in general. For example, 43.1% of respondents were female, compared with 41.8% of APA as a whole; the mean age of respondents was 49.7 years, compared with 50.3 years for APA as a whole; and the percentage of respondents from universities or four-year colleges was 23.2%, compared with 21.5% of APA as a whole. These figures suggest that the respondents were highly representative of APA members in general.

**Table 1**  
Demographic Comparison of Survey Respondents and General American Psychological Association (APA) Membership

Characteristic	Respondents	APA
Gender		
% women	43.1	41.8
% men	56.9	58.2
Mean age (in years)	49.7	50.3
Primary employment (% of full-time employed)		
Independent practice	38.9	32.3
Hospital-clinic-medical school	18.8	20.8
University or four-year college	23.2	21.5
Other academic-educational setting	7.1	6.2
Other	12.0	19.1
Primary activity (% of full-time employed)		
Mental health services	62.3	54.6
Research	8.5	9.3
Research and education	0.7	0.2
Education-teaching-educational services	15.0	18.9
Management-administration	7.0	10.6
Other	6.6	6.4
APA division membership (in %)		
Clinical related (Division 12, 17, 29, 39, 42, or 43)	28.6	26.8
Clinical neuropsychology (Division 40)	5.3	4.7
Animal research related (Division 6, 25, or 28)	2.9	2.9

Note. APA figures are from the 1993 APA Directory Survey, compiled by the Office of Demographic, Employment, and Educational Research, APA Education Directorate.

## Survey Instrument

In most respects, the survey format and procedure followed the total design method outlined by Dillman (1978). The survey appeared as a four-page booklet with the title "Animals & Science: A Survey of Psychologists," and the cover stated that the project was sponsored by the National Science Foundation and constituted "the first large-scale survey of psychologists' opinions concerning the use of animals in research and teaching."

On the first inside page of the survey booklet, respondents were instructed as follows:

This survey concerns the use of animals in psychological research and education. For present purposes, "animal research" refers only to *psychological* research on animals—not biomedical research or toxicology testing. Although the lines are sometimes fuzzy, psychological research should be taken to include areas such as behavioral neuroscience, psychopharmacology, and psychophysiology, as well as studies of animal behavior, perception, and cognition.

After these instructions, respondents were asked a series of questions on their support for animal research, their use of findings from animal research, their attitudes and knowledge concerning various animal welfare regulations, and their attitudes about the use of animals in undergraduate education (for the wording of these questions, see the Appendix). Next, an empty table was presented with four columns labeled *Primates*, *Dogs*, *Rats*, and *Pigeons* and three rows labeled *Observational studies in naturalistic settings*; *Research involving caging or confinement, but no physical pain or death*; and *Research involving physical pain or death*. Respondents were instructed to

place a "+" in a cell when you think that psychological research is usually *justified*, a "-" in a cell when you think that psychological research is usually *unjustified*, and leave the cell blank if you do not have a strong opinion one way or the other. For present purposes, assume all research has been institutionally approved and deemed of scientific merit.

Following this question, respondents were asked several demographic and occupational questions, and they were invited to submit additional comments.

## Independent Ratings

Because the survey covered a controversial topic, particular care was taken to minimize experimenter bias and social demand characteristics. As part of this effort, draft and final versions of the survey were independently rated for clarity, balance, and neutrality in tone. Independent raters were asked to provide a general evaluation of the survey and to answer three fixed-format questions: (a) "In general, how clear are the survey questions?" *Very clear/Fairly clear/Not too clear/Not clear at all*; (b) "In your opinion, is the survey biased in favor of using animals in psychological research and teaching, against using animals in research and teaching, or is it fairly balanced?" *Biased in favor/Biased against/Fairly balanced*; and (c) "Using a numbered scale, how would you rate the *tone* of the survey when it comes to using animals in psychological research and teaching?" from 1 (*Against using animals*) to 9 (*In favor of using animals*).

In the first round of independent ratings, an early draft of the survey was evaluated by 16 professors of psychology, 2 practicing clinical psychologists, and 2 professors specializing in public policy issues relating to animal research. The results showed that 18 raters thought the survey was "very

clear" or "fairly clear" and 2 thought the survey was "not too clear"; 13 raters thought the survey was "fairly balanced," 3 thought it favored animal research, 2 thought it opposed animal research, and 2 did not answer; and the mean 9-point rating of tone was 4.6 (not significantly different from the neutral point of 5.0).

On the basis of this feedback, I designed a final version of the survey and sent it out for additional independent ratings. This time, to minimize rater selection biases, I asked the earlier independent raters to select 1–3 colleagues on their own and have these individuals return the rating form directly to me on an anonymous basis. In this phase of evaluation, 24 individuals provided independent ratings. Half of these raters had conducted animal research, 11 were female and 13 were male, 14 were APA members, 11 were American Psychological Society members, 5 were Society for Neuroscience members, and their median year of receiving a PhD was 1980. The results from this round of evaluation were that 23 raters felt the survey was "very clear" or "fairly clear" and 1 thought the survey was "not too clear"; 17 raters thought the survey was "fairly balanced," 2 thought it favored animal research, and 5 thought it opposed animal research; and the mean 9-point rating of tone was 5.0. These ratings indicate that the survey was generally perceived as clear, balanced, and neutral in tone.

## Procedure

In October 1994, each respondent was sent a survey along with a personalized, hand-signed cover letter on university letterhead; a postage-paid, self-addressed return envelope; and a business-reply postcard with a respondent identification number. The cover letter introduced the topic of the survey, explained that respondents had been chosen randomly as part of a sample of psychologists from around the country, and stressed that the survey was strictly anonymous. The cover letter also instructed respondents to mail back the numbered postcard separately "so that we may remove your name from our mailing list," and it told respondents that by returning the postcard they would "be entered into a drawing for a \$500 cash prize—our way of thanking you for your time."

One week later, respondents were sent a hand-signed reminder postcard, encouraging them to respond and asking them to call collect for a replacement survey if the first one had not arrived or had been misplaced. Two weeks after this, a second survey booklet was sent to all respondents who had not yet returned a numbered postcard (approximately half of the original sample). Each survey was again accompanied by a personalized, hand-signed cover letter on university letterhead; a postage-paid, self-addressed return envelope; and a business-reply postcard with a respondent identification number. The cover letter stressed the importance of each response, and it reminded respondents of the \$500 cash incentive and the fact that the survey would take very little time to complete. To heighten the persuasive impact of this second appeal, a blue felt marker was used to highlight the line about the survey taking very little time, and a handwritten yellow self-stick note was attached to each letter. The self-stick note was personalized and said, "Please help—I really need your response."

Survey responses were included in the study if they were received by March 1, 1995. As of that date, 3,783 numbered postcards had been returned (95.0% of the total number of completed surveys). A random drawing was then held for the \$500 cash prize, and payment was sent to the respondent whose postcard contained the winning number.

**Table 2**  
Items on General Support for Animal Research

Survey item	n	%
Level of general support for animal research		
Support strongly	1,243	31.4
Support	1,924	48.6
Oppose	361	9.1
Oppose strongly	199	5.0
Not sure	230	5.8
See animal research as necessary for progress in psychology		
Yes	2,736	68.9
No	534	13.4
Not sure	703	17.7
Position on funding for animal research		
Should be increased	231	6.1
Should be maintained	2,439	64.5
Should be decreased	1,112	29.4

## Results

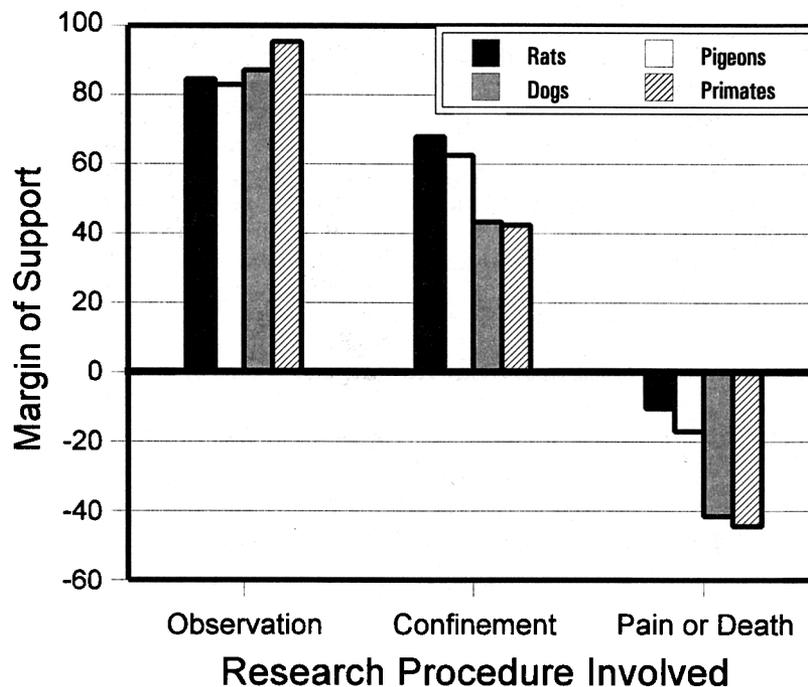
### Main Analyses

When respondents were asked whether they generally supported or opposed animal research in psychology, four

out of every five respondents expressed some level of support (see Table 2). Overall, 31.4% of respondents said they strongly supported the use of animals in psychological research, 48.6% said they supported it, 9.1% said they opposed it, 5.0% said they strongly opposed it, and 5.8% said they were not sure. In addition, 68.9% of respondents said animal research was necessary for progress in psychology (compared with only 13.4% who said it was not), and 70.6% of respondents said funding for animal research should be maintained or increased (compared with 29.4% who said it should be reduced). These results suggest a good deal of support for animal research in psychology.

As shown in Figure 1, however, this support did not extend to experiments involving pain or death. Even though the research was described as "institutionally approved and deemed of scientific merit," only 17.7% of respondents felt that painful or terminal experiments on primates were justified, and only 18.8% approved of such research with dogs (compared with 62.1% and 60.3% of respondents opposed, respectively, and the remainder having no strong opinion one way or the other). The same trend was apparent with research on pigeons and rats, although to a lesser extent: 29.6% of respondents approved of painful or terminal experiments on pigeons, compared with 46.7% who disapproved of them, and 34.0% of respondents approved of painful or terminal experiments

**Figure 1**  
Margin of Support for Various Types of Research



Note. Respondents were given an empty table with four columns labeled *Primates*, *Dogs*, *Rats*, and *Pigeons* and three rows labeled *Observational studies in naturalistic settings*; *Research involving caging or confinement, but no physical pain or death*; and *Research involving physical pain or death*. They were told to assume that the research was "institutionally approved and deemed of scientific merit," and they were asked to indicate whether each type of research was usually justified or unjustified (see the Survey Instrument section of the text). Margin of support equals the percentage of respondents saying "justified" minus the percentage of respondents saying "unjustified."

**Table 3**  
Support for Specific Types of Animal Research

Type of research	Usually justified		Usually unjustified		No strong opinion	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Observational studies						
Primates	3,810	96.0	23	0.6	134	3.4
Dogs	3,545	89.4	92	2.3	329	8.3
Pigeons	3,414	86.1	128	3.2	424	10.7
Rats	3,460	87.3	111	2.8	394	9.9
Research involving caging or confinement						
Primates	2,496	63.0	824	20.8	641	16.2
Dogs	2,510	63.4	796	20.1	654	16.5
Pigeons	2,922	73.8	444	11.2	595	15.0
Rats	3,059	77.2	368	9.3	534	13.5
Research involving pain or death						
Primates	694	17.7	2,434	62.1	792	20.2
Dogs	739	18.8	2,364	60.3	818	20.9
Pigeons	1,161	29.6	1,829	46.7	926	23.6
Rats	1,331	34.0	1,741	44.4	845	21.6

on rats, compared with 44.4% who disapproved of them (see Table 3). Even among respondents who had indicated support for animal research in psychology, the majority disapproved of painful or terminal experiments on primates (54.5%) and dogs (52.2%), and a sizable minority disapproved of them on pigeons (36.6%) and rats (34.2%).

As for clinical applications of animal research, relatively few mental health workers reported using findings from animal research on a frequent basis (see Table 4). Of the respondents whose primary professional activity focused on mental health services, 7.8% said they used findings from animal research "frequently" (compared with 14.7% of other respondents), and 5.7% said their work would be seriously hampered by a ban on psychological research with animals (compared with 9.9% of other respondents). These numbers are surprisingly low in light of the fact that 77.2% of mental health workers

supported animal research and 64.8% saw it as necessary for progress in psychology, and they suggest that many mental health workers were basing their support for animal research on factors other than its applied value in their own clinical work (a point that is examined further in the Discussion section of this article).

In an effort to capture the range and intensity of opinions expressed by supporters and opponents of animal use, Table 5 presents differing views on four controversial issues: the legitimacy of animal rights, the value of animal research, the need for regulation, and the value of using animals in education. As can be seen, supporters of animal use tended to feel that research animals are treated humanely and/or that animal welfare should be secondary to human benefit, whereas opponents of animal use tended to believe that research animals are subjected to unnecessary harm. This division of opinion was also

**Table 4**  
Reported Use of Animal Research Findings by Mental Health Workers and Other Respondents

Survey item	Mental health workers		Other respondents		Combined	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Use findings from animal research						
Frequently	189	7.8	217	14.7	406	10.4
Occasionally	744	30.5	415	28.1	1,159	29.6
Rarely	978	40.1	459	31.0	1,437	36.7
Never	527	21.6	388	26.2	915	23.4
Effect of a ban on animal research						
Would seriously hamper work	139	5.7	146	9.9	285	7.3
Would have a minor effect	1,128	46.5	601	40.8	1,729	44.3
Would have no effect whatsoever	1,160	47.8	726	49.3	1,886	48.4

**Table 5**  
*Respondent Comments on the Use of Animals*

Topic	Attitude toward the use of animals	
	In favor	Against
Animal rights	<p>"Animal rights is a silly bourgeois cause at a time when we have enough trouble defining humane treatment of our own species."</p> <p>"If animals are treated humanely, I see no problem with research or death if necessary. I think the people opposed are generally self-righteous dogooders."</p> <p>"I do not believe that animals have rights—guidelines should suggest appropriate research parameters, these should not be mandated."</p> <p>"Existentially, we have a right to do whatever we decide we have a right to do."</p> <p>"Our priorities are screwed up when we worry more about treatment of animals, women's rights, boycotting businesses who do not think in a Politically Correct manner—than we do about hurting people in a society falling apart!"</p>	<p>"I think how we treat animals has an influence on how we treat one another. Much of this research with animals seems superfluous."</p> <p>"The same attitude that leads to war and homicide leads one species to impose its will over another."</p> <p>"To sacrifice in any respect one species such that another species may 'prosper' will be found to be a faulty approach to coexistence. In fact it may set the seeds for dominant's demise."</p> <p>"We have no more right to hurt or control animals than animals would have to hurt or control us. Oppression is oppression."</p> <p>"I observed the unjustifiable cruelty that is inflicted on research animals while a graduate student. . . . This is also a 'women's' issue because more women than men object to the abuse of animals."</p>
Value of animal research	<p>"I think animal research is very important in understanding the brain-behavior link/interaction and is important in helping us understand problems such as anxiety, depression and violence."</p> <p>"Neuropsychological work with animals is important to learn about neural functioning, even though animals and humans 'think' differently."</p> <p>"Animal research is essential for physiological, comparative, and developmental research in particular."</p> <p>"Animal research is extremely important, particularly in areas such as head injury."</p> <p>"[There was] a study with rat subjects on conditioned drug tolerance in which it was demonstrated that 50% of an experimental group perished when administration of their typical drug dose was conducted in a novel environment. The implications of this finding for the notion of 'overdose' are striking, and in my view justify the sacrifice of those experimental animals."</p>	<p>"I have been doing research in brain-behavior relations for 30 years and my conclusion is that we can learn more about the brain from studying one brain patient . . . than from any number of animal studies."</p> <p>"I'm a neuropsychologist and have worked in rat and monkey labs. However, I'm increasingly convinced about differences between animal and human brains and behavior and think we should usually study humans."</p> <p>"I used to conduct research with animals. I believe that much of the pain I inflicted on animals was <i>not</i> justified by the value of the data."</p> <p>"Pain and death may still be necessary in biomedical research, but not psychological. You want to study pain? Ask for human volunteers, they're capable of informed consent."</p> <p>"There seem to be numerous pressures for experimentalists to overvalue their results and undervalue life."</p>
Need for regulation of animal research	<p>"Most psychologists/researchers hold themselves to strict standards, and do not unnecessarily harm animals."</p> <p>"You have to trust science to be its own watchdog—or you make an even bigger mess."</p> <p>"Restricting research on animals to the detriment of humans is unconscionable. It harkens back to the times when autopsies were banned and grave robbers flourished."</p>	<p>"Most people do not know how to treat each other . . . How can you expect them to treat animals well without very strict monitoring?"</p> <p>"As a graduate student, I witnessed atrocities and was threatened to be quiet."</p> <p>"In my experience at NIH [National Institutes of Health] I found that the large scale use of animals, over time creates a callousness among those involved. This is, in my opinion, a defense mechanism much like that of prison guards."</p>
Value of using animals in education	<p>"In teaching experimental psychology courses, animal work is vital."</p> <p>"Animal research and animal training . . . should be required for <i>all</i> clinicians!"</p> <p>"Worked with mice as graduate student during experimental psychology course. Found it to be very interesting."</p> <p>"I had a wonderful undergrad experience working with rats, cats, and pigeons. . . . That experience enabled me to have a thorough understanding of graduate level research in behavior, cognition, motivation, and social dynamics."</p> <p>"I did an animal study in graduate school (rats) and found it very instructive."</p>	<p>"The principles could be taught without using rats. I was a physio psych major and I did not need to kill rats to learn about the brain!"</p> <p>"I still feel bad about a drug research project I participated on as an undergraduate."</p> <p>"My first graduate assistantship was mostly cleaning cages and feeding Albino rats. I thought both the rats and me were exploited."</p> <p>"As a student I observed Nazi-like behaviors directed at animals."</p> <p>"In my undergraduate education . . . I saw rats and gerbils horribly mistreated."</p> <p>"In grad school I did research using rats—I'm sorry I did. As 'humane' as we were, it was still brutal."</p>

Note. All statements were either unsolicited comments in response to fixed-format questions or replies to an open-ended survey item asking for "additional comments."

evident in answers to a survey question on whether animals used in psychological research are treated humanely: 42.8% of respondents answered affirmatively, 10.7% of respondents answered negatively, and 46.6% of respondents expressed uncertainty. Although the figure of 42.8% is somewhat higher than the percentage of citizens who believe that animals are treated humanely in biomedical research (Animal Industry Foundation, 1989), it is striking that so many psychologists were unsure about the humane treatment of animals in psychology.

Perhaps as a result of this uncertainty, support for research regulations was generally high. On balance, 61.2% of respondents felt that the current regulations governing animal research should be maintained, 32.3% felt the regulations should be strengthened, and 6.5% felt the regulations should be reduced (see Table 6). In addition, 85.9% of respondents supported the idea of protecting the psychological well-being of primates, compared with 3.9% who opposed it and 10.2% who were not sure. This high level of support for the protection of primates is especially noteworthy given the original controversy surrounding this regulation (Novak & Petto, 1991).

When asked whether APA funds should be used to defend researchers who are charged with violating animal welfare guidelines or anticruelty laws (as APA did in the case of Edward Taub), most respondents were opposed. Several respondents wrote that this would be equivalent to defending a clinician against charges of unethical behavior toward a client. Others felt that researchers should carry something similar to malpractice insurance, as clinicians often do. In all, 52.7% of respondents were opposed to this use of APA funds, 15.6% were in favor of it, and 31.7% were unsure.

The majority of respondents also favored two important extensions of animal research regulations. First, 81.2% of respondents felt that prior to being granted approval to run an experiment, investigators in the United States should be required to assess the degree of pain animals may experience (at present, such an assessment is not mandatory in the United States). Only 7.2% of respondents said they would oppose this requirement, and 11.6% said they were not sure of their position. Second, most respondents felt that rats, mice, pigeons, and reptiles should receive federal protection when used for research

**Table 6**

*Attitudes Toward Research Regulations and the Treatment of Animals: A Comparison of Supporters and Opponents of Animal Research*

Survey item	Supporters		Opponents		All respondents <sup>a</sup>	
	n	%	n	%	N	%
Legal regulations governing animal research						
Should be tougher	568	19.5	481	90.1	1,176	32.3
Should be maintained	2,108	72.5	50	9.4	2,227	61.2
Should be reduced	230	7.9	3	0.6	238	6.5
Protecting the psychological well-being of primates						
Support	2,620	82.9	553	98.9	3,413	85.9
Oppose	155	4.9	0	0.0	155	3.9
Not sure	385	12.2	6	1.1	404	10.2
Mandatory assessments of animal pain						
Support	2,436	77.1	545	97.7	3,223	81.2
Oppose	286	9.1	1	0.2	287	7.2
Not sure	436	13.8	12	2.2	459	11.6
Are research animals treated humanely?						
Yes	1,631	52.0	26	4.7	1,685	42.8
No	112	3.6	277	50.3	421	10.7
Not sure	1,396	44.5	248	45.0	1,835	46.6
Should APA use funds to defend animal researchers?						
Yes	561	18.0	36	6.5	612	15.6
No	1,450	46.5	445	80.0	2,068	52.7
Not sure	1,106	35.5	75	13.5	1,243	31.7
The Animal Welfare Act should cover						
Primates	2,882	95.5	545	99.1	3,664	96.1
Dogs	2,791	92.5	545	99.1	3,574	93.8
Cats	2,757	91.4	546	99.3	3,539	92.9
Pigeons	2,126	70.5	517	94.0	2,847	74.7
Rats and mice	2,106	69.8	500	90.9	2,805	73.6
Reptiles	1,797	59.6	494	89.8	2,480	65.1

Note. APA = American Psychological Association.

<sup>a</sup> Includes respondents who did not identify themselves as supporters or opponents of animal research.

(all of these animals are currently excluded from coverage under the U.S. Animal Welfare Act). As shown in Figure 2, 73.6% of respondents felt that rats and mice should be covered, 74.7% felt that pigeons should be covered, and 65.1% felt that reptiles should be covered. Furthermore, both of these regulatory reforms—mandatory pain assessments and federal protection for rats, mice, pigeons, and reptiles—were favored by the majority of animal research supporters as well as most animal research opponents (see Table 6). Among animal research supporters, 77.1% favored mandatory pain assessments, 69.8% favored federal protection for rats and mice, 70.5% favored federal protection for pigeons, and 59.6% favored federal protection for reptiles (with corresponding figures of 97.7%, 90.9%, 94.0%, and 89.8%, respectively, among opponents of animal research). Thus, support for these measures constitutes a rare instance of agreement between advocates and opponents of animal research.

Figure 2 also shows that knowledge concerning the U.S. Animal Welfare Act was rather low. Most respondents thought that rats and mice were already covered under the act, and nearly half thought that pigeons were included. Several hundred respondents simply left this question blank or scribbled comments such as “I have no idea,” and of the 3,102 individuals who attempted a response, only 28.8% answered correctly (i.e., *yes* to pri-

mates, dogs, and cats, and *no* to rats and mice, pigeons, and reptiles). Supporters and opponents of animal research did not differ significantly in the overall percentage who got this item correct (29.1% vs. 27.5%, respectively), but they did show an interesting mirror-image bias: Supporters thought more excluded animals were covered ( $M = 1.21$ ) than did opponents ( $M = 0.95$ ), and opponents thought more covered species were excluded ( $M = 0.58$ ) than did supporters ( $M = 0.26$ ). Both of these differences were highly significant,  $t(2529) = 4.33$  and  $t(2529) = 8.19$ , respectively,  $ps < .001$ .

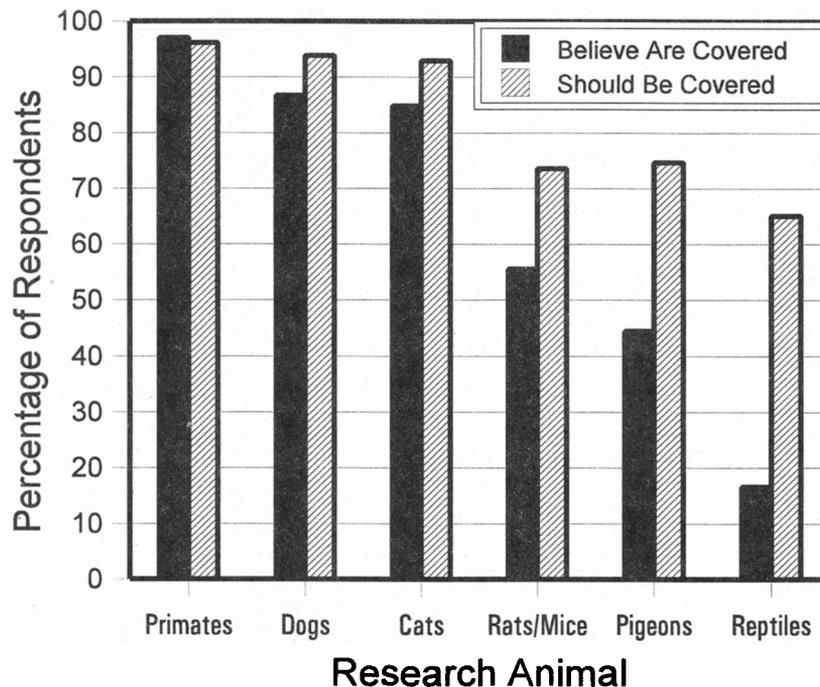
The remaining two attitude items dealt with the use of animals in education. Most respondents were in favor of using animals in undergraduate psychology courses: 57.8% supported this use of animals, 26.2% opposed it, and 16.0% were unsure. At the same time, 53.9% of respondents felt that laboratory work with animals should not be a *required* part of the undergraduate psychology major, compared with 31.1% in favor and 15.0% unsure. Taken together, these results suggest there is majority support for the use of animals in teaching, provided such course work is offered on an optional basis.

### Additional Analyses

From a disciplinary perspective, one of the most important questions about animal research is whether it will

**Figure 2**

Comparison of Respondents Believing Various Animals Are Federally Protected and Respondents Feeling Animals Should Be Federally Protected



Note. A comparison of the percentage of respondents who believe various animals are covered under the U.S. Animal Welfare Act and the percentage of respondents who feel the animals should be covered under federal protection. At the present time, primates, dogs, and cats are covered under the act, but rats, mice, birds, and reptiles are not.

**Table 7**  
Generational Differences in Attitudes Toward the Use of Animals

Attitude	Decade PhD was obtained			
	Before 1970	1970s	1980s	1990s
Strongly support the use of animals in research				
%	47.7	32.0	26.5	20.0
<i>n</i>	322	383	390	56
See animal research as necessary for progress				
%	78.4	72.0	65.9	56.4
<i>n</i>	535	863	970	159
Frequently use findings from animal research				
%	15.4	11.1	8.6	7.1
<i>n</i>	105	133	127	20
Would be seriously hampered by ban on animal research				
%	11.9	7.0	6.6	3.6
<i>n</i>	80	84	97	10
Support the use of animals in undergraduate education				
%	63.9	60.9	55.5	50.0
<i>n</i>	434	728	815	141
Feel that animal labs should be required for majors				
%	37.4	32.2	29.4	22.5
<i>n</i>	254	386	433	63
Believe that research animals are treated humanely				
%	49.0	44.5	41.2	36.4
<i>n</i>	331	531	601	102
Feel that research regulations should be tougher				
%	22.7	27.6	36.7	47.3
<i>n</i>	143	304	491	124
Feel that funding for animal research should be cut				
%	20.7	27.0	32.2	39.4
<i>n</i>	135	308	449	106

Note. All generational differences are significant by  $\chi^2(3)$  at  $p < .001$ .

continue to play a prominent role in psychological experimentation. Although the present survey measured attitudes at only one point in time and cannot, therefore, provide trend information, it can furnish a comparison of opinions across different generations of psychologists. As seen in Table 7, the results of this comparison are quite clear: Recent PhD recipients are considerably less enthusiastic about the use of animals than are older respondents. For example, compared with respondents who

earned a PhD before 1970, respondents earning a PhD during the 1990s were less than half as likely to express strong support for animal research. Of respondents in the latter group, 96.1% said that a ban on animal research would have little or no effect on their work, and only 7.1% said they used findings from animal research on a frequent basis.

The reasons for this trend are hard to gauge, but one key contributor may be the growing number of women in psychology (Pion et al., 1996). In the current sample, 21.0% of the respondents with a pre-1970 PhD were female, 35.2% with a 1970s PhD were female, 53.8% with a 1980s PhD were female, and 64.1% with a 1990s PhD were female. Several studies have found that fewer women than men support animal research (Driscoll, 1992; Foundation for Biomedical Research, 1985; Pifer et al., 1994), and the present results are consistent with this conclusion. As shown in Table 8, female respondents were significantly less supportive of animal research and significantly more supportive of research regulations than were male respondents.

These findings raise the question of whether generational differences persist once gender is taken into account. To assess the independent effects of gender and PhD year, both factors were regressed on unweighted composite measures of support for animal research and support for research regulations. The animal research composite measure was based on z-score transformations of three items (support for animal research, support for animal research funding, and the perceived necessity of

**Table 8**  
Gender Differences in Attitudes Toward the Use of Animals

Attitude	Men		Women	
	<i>n</i>	%	<i>n</i>	%
Strongly support the use of animals in research	881	39.2	360	21.2
See animal research as necessary for progress	1,743	77.2	988	58.0
Frequently use findings from animal research	249	11.0	158	9.3
Would be seriously hampered by ban on animal research	187	8.3	95	5.6
Support the use of animals in undergraduate education	1,483	65.8	798	47.1
Feel that animal labs should be required for majors	834	37.0	397	23.3
Believe that research animals are treated humanely	1,104	49.3	578	34.2
Feel that research regulations should be tougher	514	24.2	658	43.7
Feel that funding for animal research should be cut	521	23.9	586	36.8

Note. Except for the item on frequency of usage, all gender differences are significant by  $\chi^2(1)$  at  $p < .002$ .

animal research), and the research regulations composite measure was based on z-score transformations of four items (support for research regulations, support for protecting the psychological well-being of primates, support for mandatory pain assessments, and the number of animals that respondents thought should be covered under federal protection). The results of these regression analyses showed that gender was a stronger predictor than PhD year, but after controlling for effects of gender, PhD year was still significantly related to support for animal research and support for research regulations. In other words, even apart from the increasing number of women in psychology, recent PhD recipients expressed less support for animal research and more support for research regulations than did older psychologists.

## Discussion

The picture that emerges from this study is one of qualified support for the use of animals in psychology. Approximately 80% of respondents expressed general support for psychological research on animals, and nearly 60% endorsed the use of animals in undergraduate psychology courses. At the same time, respondents tended to disapprove of experiments involving pain or death, and most felt that laboratory work with animals should not be a required part of the psychology major. These results are consistent with the findings of Huskey (1991), who reported that "most psychologists do not see the issues related to the use of animals in biomedical or psychological research as representing a simple, 'all animal research is good' or 'all animal research is bad' issue" (p. 262).

The present results are also consistent with the observations of Giannelli (1986) and Kelly (1986), who found that animal research was seldom cited in the clinical psychology literature. Most mental health workers who responded to the survey said they did not make frequent use of findings from animal research, and nearly 95% felt that a ban on animal research would have little or no effect on their work. Of course, these results do not mean that animal research is without clinical value; it may be that clinical applications of animal research are relatively rare but extremely important in those cases when they do occur. Or it may be that clinically valuable studies take place primarily at the level of basic science, far removed from the daily concerns of most mental health workers (e.g., classical-conditioning research that lays the foundation for phobia treatments). Regardless of the reason, however, it is clear that most clinicians viewed animal research as peripheral to their work.

A large number of respondents also expressed doubts about whether animals used in psychological research and education are treated humanely. Part of the difficulty here may be that animal care guidelines sometimes use the word *humane* when referring to procedures that would be considered aversive in a human context (e.g., confinement in a small space, deprivation of food or water). Consider, for example, the relatively stringent "Guidelines for the Use of Animals in School Science Behavior Projects"

issued by the APA Committee on Animal Research and Experimentation (1981). According to these guidelines, school science projects using animals must be "conducted with humane considerations and respect for animal life" (p. 686). At the same time, however, these guidelines state that if students are appropriately supervised and have adequate animal facilities, they may "inflict pain, severe deprivation, or high stress levels or use invasive procedures such as surgery, the administration of drugs, ionizing radiation, or toxic agents" (p. 686). As one survey respondent put it, "What seems like normal humane treatment of animal[s] to people who live all day in psych labs, often does not seem humane to people on the outside."

This concern about humane treatment was equally evident from the strong support respondents expressed for mandatory pain assessments. More than 80% of respondents felt that researchers seeking approval for an experiment should be required to assess the degree of pain animals may experience. Such an assessment is required in Canada and some European nations but not in the United States (in 1987 the U.S. Department of Agriculture proposed the use of a pain scale similar to the one shown in Figure 3, but the proposal was not adopted; Orleans, 1993). Although pain scales involve a good deal of subjective judgment and are certainly not a panacea, they serve a number of important purposes and should probably be considered more seriously than they have been in the past (for a useful discussion of this issue, see Orleans, 1993).

Another policy change favored by most respondents was the extension of federal animal welfare protection to rats, mice, pigeons, and reptiles. This change would apply to the majority of animal researchers in psychology, because rats, mice, and birds comprise roughly 95% of all animals used in psychological research (Gallup & Suarez, 1985). At the present time, institutions using only these animals are not subject to inspection by the U.S. Department of Agriculture, and investigators using these animals are not required to follow U.S. Public Health Service guidelines on animal care unless their institution receives federal funds for biomedical or behavior research on animals.<sup>1</sup> Exclusion under the U.S. Animal Welfare Act also means that these animals are not counted by the U.S. Department of Agriculture in its annual report on animal research.

The survey results discussed above raise several questions that merit further research. For example, future surveys might explore why the majority of mental health

<sup>1</sup> This should not be interpreted as meaning that experiments on rats, mice, pigeons, and reptiles are currently unregulated. For one thing, many institutions do receive federal funds for animal research, and these institutions are required to follow the National Research Council's (1996) *Guide for the Care and Use of Laboratory Animals*. Although rodent and pigeon laboratories at these institutions are not typically inspected by the government, these guidelines state that each institution should establish its own "animal care and use committee" to ensure that research animals are treated humanely. In addition, APA (1992) maintains a set of guidelines recommending that animal researchers comply with all applicable federal, state, and local laws.

**Figure 3**  
A Pain Scale for Psychological Research on Animals

Degree of Pain or Stress	Examples
<b>Category A:</b> Experiments involving either no living materials, live isolates, simple invertebrate species, or unobtrusive observations	Use of tissue cultures or tissues obtained at necropsy; use of eggs or single-celled organisms; use of invertebrate species with a simple nervous system; unobtrusive observational studies of animals in natural settings
<b>Category B:</b> Experiments that involve complex invertebrates or vertebrates but cause little or no pain or stress	Use of invertebrates with complex nervous systems; vertebrate studies involving short-term restraint for physical examination; food or water deprivation equal to periods found in nature; acute terminal studies in which animals are anesthetized and do not regain consciousness
<b>Category C:</b> Experiments that cause minor pain or stress to vertebrate species	Minor surgical procedures under anesthesia, such as biopsies; short periods of restraint beyond that for physical examination; short periods of food or water deprivation exceeding deprivation in nature; use of noxious stimuli from which escape is possible
<b>Category D:</b> Experiments that involve significant pain or stress to vertebrate species	Major surgery under anesthesia with recovery, such as brain lesioning or electrode implantation; prolonged restraint; major stressors such as maternal deprivation or conspecific aggression; inescapable noxious stimuli; severe, persistent, or irreversible sensorimotor disruption
<b>Category E:</b> Experiments that involve intolerable pain or stress to vertebrate species	Use of muscle relaxants or paralytics for surgical restraint without anesthesia; attempts to induce psychotic-like behavior; inescapable severe stress leading to death [Note: many Category E experiments are prohibited by national policies, regardless of human benefit]

Note. Scales such as this pain scale are sometimes referred to as invasiveness scales or harm scales because more than physical pain is taken into account. From *In the Name of Science: Issues in Responsible Animal Experimentation* (pp. 87–88), by F. B. Orlans, 1993, New York: Oxford University Press. Copyright 1993 by Oxford University Press. Adapted with permission.

workers supported animal research and saw it as necessary for progress in psychology even while stating that they themselves rarely or never used animal-based findings. One explanation for this apparent discrepancy may be that mental health workers viewed animal research as more valuable at the level of basic science than at the level of clinical application. Another possibility is that respondents interpreted the word *use* in only the strictest sense, excluding animal studies that have laid the foundation for clinical treatments (much as people who depend on computers do not think of themselves as “using” the results of electrical engineering). Still another possibility is that mental health workers overestimated how often other practitioners use animal-based findings, believing that these findings are used more often than they really are. Future surveys might examine these and other possible explanations by asking respondents to separately evaluate the basic and applied value of animal research or by asking respondents about the value of basic research in developing clinical treatments.

Future surveys might also ask respondents to evaluate the usefulness of specific types of animal research (e.g., studies of learned helplessness in dogs, aggression in rats, language ability in primates). In the present survey, respondents were asked only about general categories of animal research. One consequence of this limitation can be found in the survey item asking whether experiments

involving pain or death are justified; because pain and death appeared together as a single category, it is unclear whether respondents were objecting to pain, death, or a combination of the two. Future research should disentangle these two factors.

Finally, the survey contained two other limitations that might be addressed through further research. First, the sample frame was restricted to APA members, fellows, and associates. This sample frame was chosen because APA is the largest organization of professional psychologists in the country and because a central purpose of the study was to see whether clinicians report using the results of animal research. Nonetheless, it is quite possible that members of less clinically oriented professional associations (e.g., the American Psychological Society) would have answered differently than APA members. Second, the survey measured opinions at only one point in time, thereby limiting its ability to provide information on changes in attitude. Although the results showed a decline in support for animal research among recent generations of psychologists, it remains an open question as to what effect, if any, these generational differences will have on the future of animal research in psychology.

#### REFERENCES

American Association for the Advancement of Science. (1990, February 19). *Resolution on the use of animals in research, testing, and education*. Washington, DC: Author.

- American Medical Association. (1989, April). *AMA surveys of physician and public opinion on health care issues: 1989*. Chicago: Author.
- American Psychological Association. (1992). *Guidelines for ethical conduct in the care and use of animals*. Washington, DC: Author.
- American Psychological Association, Office of Demographic, Employment, and Educational Research. (1993). [Demographic characteristics of APA members by membership status]. Unpublished raw data.
- Animal Industry Foundation. (1989, April). *Survey results on how Americans view modern livestock farming* (Report No. CR 2765). Arlington, VA: Author.
- Associated Press. (1985). [Data available from POLL computer database]. Storrs, CT: Roper Center for Public Opinion.
- Benedict, J., & Stoloff, M. (1991). Animal laboratory facilities at "America's best" undergraduate colleges. *American Psychologist, 46*, 535-536.
- Bowd, A. D., & Shapiro, K. J. (1993). The case against laboratory animal research in psychology. *Journal of Social Issues, 49*, 133-142.
- Committee on Animal Research and Experimentation. (1981). Guidelines for the use of animals in school science behavior projects. *American Psychologist, 36*, 686.
- Dillman, D. A. (1978). *Mail and telephone surveys: The total design method*. New York: Wiley.
- Domjan, M., & Purdy, J. E. (1995). Animal research in psychology: More than meets the eye of the general psychology student. *American Psychologist, 50*, 496-503.
- Driscoll, J. W. (1992). Attitudes toward animal use. *Anthrozoös, 5*, 32-39.
- Foundation for Biomedical Research. (1985). *Members of the American public comment on the use of animals in medical research and testing*. (Available from the Foundation for Biomedical Research, 818 Connecticut Avenue, NW, Suite 303, Washington, DC 20006)
- Fox, M. W. (1990). *Inhumane society: The American way of exploiting animals*. New York: St. Martin's Press.
- Gallup, G. G., Jr., & Eddy, T. J. (1990). Animal facilities survey. *American Psychologist, 45*, 400-401.
- Gallup, G. G., Jr., & Suarez, S. D. (1985). Alternatives to the use of animals in psychological research. *American Psychologist, 40*, 1104-1111.
- Giannelli, M. A. (1986). Three blind mice, see how they run: A critique of behavioral research with animals. In M. W. Fox & L. D. Mickley (Eds.), *Advances in animal welfare science 1985* (pp. 109-163). Boston: Martinus Nijhoff.
- Groller, I. (1990, May). Do animals have rights? *Parents, 33*.
- Huskey, C. A. (1991). Attitudes toward animal research among contemporary psychologists. *Humane Innovations and Alternatives, 5*, 258-262.
- Jacobs, E., & Worcester, R. (1990). *We British: Britain under the MORIscope*. London: Weidenfeld and Nicolson.
- Jasper, J. M., & Nelkin, D. (1992). *The animal rights crusade: The growth of a moral protest*. New York: Free Press.
- Kelly, J. A. (1986). Psychological research and the rights of animals: Disagreement with Miller. *American Psychologist, 41*, 839-841.
- Man's mirror. (1991, November 16). *The Economist, 21-22*, 24.
- Miller, N. E. (1985). The value of behavioral research on animals. *American Psychologist, 40*, 423-440.
- National Opinion Research Center. (1948). [Data available from POLL computer database]. Storrs, CT: Roper Center for Public Opinion.
- National Research Council. (1996). *Guide for the care and use of laboratory animals*. Washington, DC: National Academy Press.
- National Science Board. (1991). *Science & engineering indicators* (10th ed.). Washington, DC: U.S. Government Printing Office.
- Novak, M. A., & Petto, A. J. (Eds.). (1991). *Through the looking glass: Issues of psychological well-being in captive nonhuman primates*. Washington, DC: American Psychological Association.
- Orlans, F. B. (1993). *In the name of science: Issues in responsible animal experimentation*. New York: Oxford University Press.
- Orlans, F. B. (1994). Data on animal experimentation in the United States: What they do and do not show. *Perspectives in Biology and Medicine, 37*, 217-231.
- Phillips, M. T., & Sechzer, J. A. (1989). *Animal research and ethical conflict: An analysis of the scientific literature: 1966-1986*. New York: Springer-Verlag.
- Pifer, L., Shimizu, K., & Pifer, R. (1994). Public attitudes toward animal research: Some international comparisons. *Society and Animals, 2*, 95-113.
- Pion, G. M., Mednick, M. T., Astin, H. S., Hall, C. C. I., Kenkel, M. B., Keita, G. P., Kohout, J. L., & Kelleher, J. C. (1996). The shifting gender composition of psychology: Trends and implications for the discipline. *American Psychologist, 51*, 509-528.
- Plous, S. (1996). Attitudes toward the use of animals in psychological research and education: Results from a national survey of psychology majors. *Psychological Science, 7*, 352-358.
- Robinson, D. N. (1990). Comment on animal research labs. *American Psychologist, 45*, 1269.
- Rowan, A. N. (1994, March). Laboratory animal numbers: Trends and problems. *Animal Policy Report, 8*, 1-3.
- Rowan, A. N., & Loew, F. M. (1995). *The animal research controversy: Protest, process & public policy*. North Grafton, MA: Tufts University, Center for Animals and Public Policy.
- Thomas, G. V., & Blackman, D. (1992). The future of animal studies in psychology. *American Psychologist, 47*, 1679.
- Ulrich, R. E. (1991). Animal rights, animal wrongs and the question of balance. *Psychological Science, 2*, 197-201.
- U.S. Animal Welfare Act, 7 U.S.C. §§ 2131-2157 (1966).

## APPENDIX

### Survey Questions on the Use of Animals

- In general, do you *support* or *oppose* the use of animals in psychological research?  
*Support strongly/Support/Oppose/Oppose strongly/Not sure*
- How often do you use findings from animal research in your professional work?  
*Frequently/Occasionally/Rarely/Never*
- Do you believe that the use of animals in psychological research is necessary for progress in psychology, or not?  
*Yes/No/Not sure*
- Some people say that funds for animal research would be better spent studying humans. Others feel that funding for animal research should be maintained or increased. What is *your* opinion?  
*Decrease/Maintain/Increase*
- If psychological research on animals were banned in the future, how would this affect your work?  
*Seriously hamper/Have a minor effect/Have no effect whatsoever*
- In general, how do you feel about the legal regulations governing animal research?  
*Should be tougher and/or more inclusive/Are adequate and should be maintained/Are excessive and should be reduced*

7. Federal regulations protect the “psychological well-being” of primates used in research. Do you *support* or *oppose* the idea of protecting the psychological well-being of primates?  
*Support/Oppose/Not sure*
8. Before being granted approval to run an experiment, investigators in Great Britain, Canada, and the Netherlands are required to assess the degree of pain animals may experience. Would you *support* or *oppose* a similar requirement in the United States?  
*Support/Oppose/Not sure*
9. As far as you know, are the animals used in psychological research treated humanely, or not?  
*Yes/No/Not sure*
10. If an animal researcher is charged with violating animal welfare guidelines or anticruelty laws, should the American Psychological Association contribute money toward that person’s legal defense?  
*Yes/No/Not sure*
11. The Animal Welfare Act is a federal law that governs the use of animals in research. As far as you know, which of the following animals are presently covered under this law? (check all that apply)  
*Primates/Dogs/Cats/Pigeons/Rats and mice/  
Farm animals/Reptiles/None of these animals*
12. Regardless of the species now covered under the Animal Welfare Act, which of the following animals should, in *your* opinion, receive federal protection when used for research? (check all that apply)  
*Primates/Dogs/Cats/Pigeons/Rats and mice/  
Farm animals/Reptiles/None of these animals*
13. In general, do you *support* or *oppose* the use of animals in undergraduate psychology courses?  
*Support/Oppose/Not sure*
14. Do you feel that laboratory work with animals should be a required part of the undergraduate psychology major?  
*Yes/No/Not sure*