

We examined the possibility that opinions on the animal rights debate reflect differences in personality. Our survey of 1055 college students compared scores on the Myers-Briggs Type Inventory and other personality measures with scores on the Animal Research Survey. We found people supportive of animal experimentation more likely to be male, masculine, conservative and less empathic than those opposed to it. Animal rights advocates were more likely to support vegetarianism and to be more ecologically concerned. They also indicated less faith in science. Students likely to encounter animal experimentation in their studies (psychology, biology majors) tended to oppose animal experimentation more than others. Intuitive and feeling types were more opposed to animal experimentation than were sensate and thinking types. Extraverted-sensate and extraverted-thinking types were more likely to favor animal experimentation than were extraverted-intuitive and extraverted-feeling types. Implications of these results are discussed. The debate between those opposed to animal experimentation and those who support it has focused primarily on philosophical questions (do animals feel pain the way humans do, is invasive animal experimentation necessary and/or useful?) (Singer, 1975; Regan, 1983; Kuker-Reines, 1984; Rowan, 1984; Smith and Hendee, 1988; Blakemore, 1989; Horton, 1989; Rose and Adams, 1989; Sharpe, 1988; 1989; Johnson, 1990; Mastromarino and Tomasovic, 1990; Rollin, 1990; Bray, 1991). However, there have also been allusions to personality characteristics of those involved in the dialogue (Bullington, 1987; Collard and Contrucci, 1988; Bartlett, 1989; Adams, 1990; Richards, 1991). The few attempts to explore personality characteristics supposed to be associated with these images and the personalities behind the different positions have been introspective and subjective. These explorations on the mind set of those on one side of the issue or the other (Bullington, 1987; Gullie, 1991) apparently reflect attempts to justify the ethical prejudices of the authors. Thus, it is not clear if the arguments made by both sides and the images that they hold of each other are reflections of something more than philosophy (Takooshian, 1988).

Opposition to animal experimentation has been linked to femininity (Richards, 1991), perhaps because women are perceived as more empathic than men (Collard and Contrucci, 1988; Rose and Adams, 1989; Adams, 1990), and to vegetarianism (Bartlett, 1989).

Antivivisectionists/animal rights advocates are seen as anti progress (Horton, 1989; 1990; Keeling and Yielding, 1990), antiscience (Takooshian, 1988; Clark, 1990) and anti life (Denver, et al., 1988; Nicoll and Russell, 1988; Smith and Hendee, 1988; Blakemore, 1989; Horton, 1990; Johnson, 1990). They have been depicted as aggressively attempting to compel others to accept their ideas (Horton, 1989; Johnson, 1990; Bray, 1991). In contrast, provivisectionists have been portrayed as conservative (Gendin, 1986; Sharp, 1988; Kimball, 1989), conforming (Singer, 1975; Rollin, 1981; Rowan, 1984; Collard and Contrucci, 1988) and belligerent (Ruesch, 1978; Regan, 1983). Those who use animals in their research are perceived to be unconcerned about or unaware of the pain and death that they are inflicting on their animal subjects (Singer, 1975; Rollin, 1981; Kuker-Reines, 1984; Collard and Contrucci, 1988; Rose and Adams, 1989; Stoller, 1989).

Following the Myers-Briggs Type Inventory (Myers, 1980) which measures the four Jungian polarities (extraversion-introversion, thinking-feeling, sensate-intuitive and perceiving-judging), Keirsey and Bates (1984) describe four temperaments. Two of these seem to reflect descriptions of individuals involved in the animal rights debate. The sensate-judging type is characterized as a person with a sense of duty, who wants to establish, preserve and maintain established institutions. In contrast the intuitive-feeling type is seen as more focused on the search for self, devoted to people and relationships and concerned with self actualization and ethics. On the surface it would appear that intuitive-feeling types might be more likely to oppose animal experimentation, because of their concern with ethics, whereas sensate-judging types are more likely to favor it, because of their concern for maintaining established institutions.

The present study was conducted to examine stereotypes associated with the different positions. We examined relationships between attitudes toward invasive animal experimentation, temperament, personality and vegetarianism, gender and sex role orientation, empathy, aggression, conservatism and respect for scientific investigation.

Method

Subjects

Students in general psychology classes at 7 universities (Southern Maine, East Stroudsburg, Georgetown, Brown, Missouri at Rolla, Northeastern and Western Michigan) were asked to complete a survey designed to "determine if attitudes toward social issues is a reflection of personality." Vivisection, or animal rights, was not mentioned as a focus of the survey. Students received the questionnaires at the end of class and were asked to return the completed form at the start of the next class period for course credit.

Apparatus

A questionnaire was developed to assess personality and attitudes about a number of different social issues. The short form of the Myers-Briggs Type Inventory was placed at the beginning of the form, followed by the Bem Sex Role Inventory (Bem, 1974). The Myers-Briggs test was used as a measure of personality because it is a reliable measure of personality and it provides a basis for measuring temperament (Keirsey and Bates, 1984). The Bem Sex Role Inventory was included because of the supposed relation between empathy and other feminine traits with opposition to animal experimentation (Takooshian, 1988; Horton, 1990; Tanis, 1991).

Additional scales as described below were randomly interspersed so as to confuse subjects about which attitudes were being assessed. The Animal Research Survey (Takooshian, 1988) was used as our index of attitudes toward the use of animals as subjects in experiments. This scale also provided an index of empathy for animals, and faith in science. McClosky's (1969) conservatism scale was used as an index of political conservatism. We also included measures of fundamentalist morality (Bardis, 1972) and religious conservatism (Bardis, 1961). In addition, questions about military service, ecological responsibility and vegetarianism, developed by us, were included to further explore the conservatism-liberal dimension. Scales of argumentativeness (Infante and Rancer, 1982) and assertiveness (Hertzberger, Chan and Katz, 1984) were also included. Because the vivisection debate is often discussed in terms related to life and death, we also included measures of concern about death (Dickstein, 1972) and a measure of attitudes toward abortion (Koslowsky, Pratt and Wintrobb, 1976).

Two forms were used in this study; one consisting of 399 items, the other having 295. The difference between the forms was that the shorter version did not include questions about concerns about death, attitudes about abortion and fundamentalist morality or religious conservatism. We created the shorter version of the survey when it became clear that many students were not willing to answer all 399 items.

Procedure

Subjects received the forms and were asked to answer the questions on an attached computer scorable answer sheet. They also were asked to indicate their gender, class and academic major.

Results

1055 students returned completed questionnaires; 556 from The University of Southern Maine, 139 from East Stroudsburg University, 105 from Northeastern University, 104 from Western Michigan University, 78 from the University of Missouri at Rolla, 55 from Georgetown University and 18 from Brown University. The 399 item survey was completed by 619 of these subjects, from the University of Southern Maine and East Stroudsburg University. Most subjects were freshmen (50.4%), female (60.4%) and under age 20 (50.1%).

Table 1 shows the breakdown by personality type as defined by the Myers-Briggs Type Inventory of subjects in our sample. As indicated, 93% of the subjects were extraverted, 51% were sensate, 30% were thinking and 68% were judging types. These values are consistent with the reported norms for college students (Myers, 1980).

Table 1. The frequency (percent) of personality type described by the Myers-Briggs Type Inventory in our sample					
		Extraverted		Introverted	
		Thinking	Feeling	Thinking	Feeling
Sensate	Judging	124 (16)	173 (22)	20 (2)	23 (3)
	Perceiving	17 (2)	50 (6)	3 (<1)	1 (<1)
Intuitive	Judging	38 (5)	142 (18)	8 (<1)	10 (1)
	Perceiving	21 (3)	153 (19)	3 (<1)	10 (1)

We found significant Pearson Product Moment correlations (two tailed test, $p < .01$) between attitudes about vivisection and political conservatism ($r(960) = -.1532$ $p < .001$), religious conservatism ($r(960) = -.1527$ $p < .001$), attitudes about the military ($r(556) = .3094$ $p < .001$), ecological responsibility ($r(968) = .1861$, $p < .001$), empathy for animals ($r(972) = .5370$ $p < .001$) and vegetarianism ($r(944) = .3076$ $p < .001$). Generally, those opposed to animal experimentation, (having high scores on our measure of antivivisection) were more liberal, ecologically concerned and empathic than those in favor of such experimentation.

Attitudes toward vivisection were found to correlate significantly with argumentativeness ($r(958) = -.1109$ $p < .01$) but not assertiveness. Those who favor animal experimentation were more likely to be argumentative, though not more or less assertive than those opposed to it.

We did not find significant correlations between attitudes about animal experimentation and subject age, attitudes about abortion, concerns about death or fundamentalist morality. Thus, differences of opinion on this issue apparently do not reflect differences in concerns about life and death.

Consistent with the image held by those who favor animal experimentation, faith in science was negatively correlated with attitudes about vivisection ($r(979) = -.4268, p < .001$). Animal rights advocates tended to be more skeptical of scientific investigation than people who supported animal experimentation.

Factor analysis, (shown in table 2), indicated that 4 factors (moral conservatism, behavioral activism, anger and life and death) accounted for 55.5% of the variance. Stepwise multiple regression indicated that only one of these, activism, was a significant ($F(1,482) = 51.2, p < .001$) predictor of attitudes toward vivisection, accounting for 9.5% of the variance. As indicated in table 2, the activism factor was comprised in part by two variables from the Animal Research Survey (Takooshian, 1988) (empathy for animals and faith in science), the instrument used to assess attitudes toward animal use in science. The other elements of this factor (antimilitarism, vegetarianism, and ecological concern) would perhaps be characteristic of a liberal activist lifestyle.

Table 2. Rotated Factor Matrix Showing Relationships among various Social Attitudes

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
	MORAL CONSERVATISM	BEHAVIORAL ACTIVISM	ANGER	LIFE AND DEATH
EMPATHY	-.09167	.63132*	.10609	.13269
FAITH/SCIENCE	-.23548	-.46207*	.16729	.22432
ABORTION	.76427*	.12417	.00840	-.03270
MILITARY	-.17692	.68516*	-.08299	-.00164
ARGUMENTATIVE	-.13424	-.11344	.79573*	.02253
ASSERTIVE	-.02891	-.04564	.79174*	-.21128
POLITICAL CONS	.13348	-.07250	-.27234	.64747*
DEATH CONCERN	.01012	.24997	.13660	.72653*
ECOLOGY	.00949	.35666*	.16090	-.52933*
FUNDAMENTAL MOR	.78451*	-.14102	-.13610	.06399
RELIGIOUS CONS	.84176*	-.02183	-.08272	.10031
VEGETARIAN	.12842	.67398*	-.13020	-.05343

* indicates that this measure is a significant component of factor

We found a significant sex difference in attitudes toward vivisection ($t(902) = 4.96, p < .001$). Males tended to be less opposed to animal research (mean = 4.2) than were females (mean = 5.5). One-way ANOVA indicated that sex role orientation also significantly predicted attitudes toward vivisection ($F(3,986) = 4.40, p < .01$). Post-hoc comparisons (Tukey B, $p < .05$) indicated that masculine types were more likely to favor animal experimentation (mean = 4.3) than were feminine types (mean = 5.0). Thus males and masculine types tended to be less sympathetic to the position held by animal rights advocates.

We also found that academic major (undeclared, social science, natural science, applied science, health and helping professions, the arts, business and the humanities) significantly predicted attitudes about animal experimentation ($F(7,754) = 2.44, p < .05$). Post-hoc comparison indicated that social science majors (psychology, sociology, political science, anthropology, etc.) were more likely to oppose vivisection (mean = 5.1) than were those majoring in applied science (computer science, engineering, mathematics, etc.) (mean = 4.0). Other categories of majors did not differ significantly from either of these two groups. We did not find a main effect of class on attitudes toward invasive animal experimentation, nor was this variable found to interact significantly with category of college major.

In a separate one-way ANOVA we compared those students most likely to be exposed to animal research (psychology, biology, pre-medicine and pre-veterinary majors) with other majors and those who indicated that they were undecided or undeclared. We found significant differences between these groups ($F(2,759) = 3.85, p < .05$). Post-hoc comparison (Tukey B, $p < .05$) indicated that students most likely to be exposed to animal research were more antivivisectionist ($n = 83$, mean = 5.4) than other majors ($n = 520$, mean = 4.6) and undecided-undeclared students ($n = 159$, mean = 4.6).

Attitudes toward vivisection were found to reflect Keirsey and Bates' (1984) classification of temperament ($F(3,740) = 5.45, p < .001$). Post-hoc comparisons indicated that the intuitive-feeling type was significantly more opposed to animal experimentation (mean = 5.3) than either the sensate-perceptive (mean = 4.3) or the sensate-judging (mean = 4.6) types. Intuitive-thinking types (mean = 4.6) were not reliably different from any of the other temperaments. The other temperaments did not differ reliably from either of these groups. Thus, intuitive-feeling types are more opposed to animal experimentation than are sensate-judging types.

Because temperament is believed to reflect empathy (Keirsey and Bates, 1984), we examined the relationship between these variables. One-way ANOVA indicated a significant relationship ($F(3,884) = 9.56, p < .001$) between temperament and empathy. As predicted by Keirsey and Bates (1984) and Myers (1980), post-hoc comparisons indicated that intuitive-feeling types had more empathy for animals (mean = 5.2) than any of the other temperaments (mean = 4.5 for sensate-perceiving and sensate-judging types and 4.6 for intuitive thinking types).

Keirsey and Bates (1984) also suggest that there is a relationship between temperament and acceptance of institutions. Specifically, they predict that the sensate-judging temperament is most likely to support institutional hierarchies. A one-way ANOVA indicated, as predicted, a significant difference among the temperaments in trust of scientific institutions ($F(3,859) = 6.89, p < .001$). Post-hoc comparisons indicated a significant difference between the intuitive-feeling

(mean = 5.0) and sensate- judging (mean = 5.7) types. Consistent with the hypothesized differences in temperament, the sensate-judging type was found to be more likely to support the institution of science.

Using the polarities of the Myers-Briggs personality scale, a 2 X 2 X 2 X 2 ANOVA showed significant differences in attitudes toward vivisection between thinking and feeling types ($F(1,687) = 6.22, p < .05$) and between sensate and intuitive types ($F(1,687) = 8.83, p < .005$). Those scoring as thinking types had a mean antivivisection score of 4.27, whereas those scoring as feeling types had a mean score of 5.02. Sensate types had a mean score of 4.52, whereas intuitive types had a mean of 5.14. Thus, feeling and intuitive types are most likely to be opposed to the use of animals as subjects.

Interestingly, the extraversion/introversion polarity was found to interact significantly with both the thinking/feeling and the sensate/intuitive dimensions ($F(1,687) = 4.91$ and 6.63 respectively, $p < .05$). Post hoc comparisons indicated that extraverted sensate types (mean = 4.54) were significantly more in favor of animal experimentation than extraverted-intuitive types (mean = 5.08). Also, extraverted-thinking types (mean = 4.11) were more likely to favor animal experimentation than extraverted-feeling types (mean = 5.05). None of the other interactions were found to be significant.

Discussion

Our results support at least some stereotypes of people on both sides of the animal rights debate. Specifically, provivisectionism was found to correlate with political conservatism (Gendin, 1986; Kimball, 1989), religious fundamentalism (Bowker, 1986; Johnson, 1990), and less empathy for animals (Rollin, 1981; Regan, 1983; Bullington, 1987; Bartlett, 1989). Animal rights advocates were more likely to espouse more liberal causes, including vegetarianism and opposition to the military (Horton, 1989; Phillips and Sechzer, 1989; Johnson, 1990; Bray, 1991). It should be noted, however, that while these correlations were significant, the magnitude of these correlations was relatively small. Even when scores on several scales were combined, less than 10% of the variability of scores on the animal rights questionnaire could be accounted for. This suggests that attitudes about vivisection are not easily predictable from other attitudes.

As expected, we found a significant sex difference and difference between sex types in attitudes toward vivisection. Generally, females and feminine types expressed more concern about vivisection/animal rights than did males and masculine types (Bem, 1976; 1981). Thus our results support the observations by those on both sides of this issue that women are more likely than men to oppose animal experimentation (Fox, 1986; Adams, 1990). While these differences may reflect a male typical interest in science and lack of empathy (Collard and Contrucci, 1988), they might be interpreted as a reflection of male typical dominance: males demonstrating their strength by subjugating other living creatures (Adams, 1990).

We found that subjects who supported animal experimentation tended to be more argumentative, but not more or less assertive than those who believe in animal rights. Supporters of animal experimentation may be more willing to defend their position than those opposed to it (Blakemore, 1989; Bray, 1991), but not more or less willing to espouse it when unchallenged. This may reflect the conservatism associated with support of animal research. It may also reflect

the temperaments and personality of those who support animal experimentation. Because sensate and thinking types tend to focus on the process, they may not be concerned with long term consequences of their actions. Similarly, because intuitive and feeling types are more focused on relationships, they may be less willing to argue their point of view (Keirse and Bates, 1988).

The obtained correlation between argumentativeness and attitudes toward animal experimentation is consistent with claims that provivisectionists are aggressive individuals who hold considerable hostility toward others (Singer, 1975; Ruesch, 1978; Rollin, 1981; Regan, 1983; Kuker-Reines, 1984; Rose and Adams, 1989; Stoller, 1989). Supporters of animal research may be perceived as aggressive because of their masculinity. In addition to being seen as less empathic, males are frequently assumed to be more independent, domineering and argumentative than females (Bem 1974; 1981). As suggested by Collard and Contrucci (1988) and Adams (1990), aggressiveness may be a reflection of masculinity and adoption of the masculine role (Bem, 1974).

Our results are inconsistent with claims by animal research supporters that animal rights advocates are aggressive (Goodwin, 1986; Denver et al., 1988; Horton, 1989; Clark, 1990). Supporters of animal rights tended to be more feminine and less argumentative. However, it should be noted that we did not sample activists. The perception of aggressiveness by animal rights advocates may reflect differences between our sample and those more actively involved in the debate.

We found that activism but not anger predicted attitudes toward vivisection. Aggressiveness and assertiveness, the primary elements of our anger factor, did not significantly predict attitudes toward vivisection. This suggests that neither side is more or less angry than the other. Animal rights advocates may be more willing to "take on the establishment," to defend the helpless or abused, or to attempt to correct perceived social wrongs, as shown by our activism scale. Conversely, supporters of animal experimentation may be more willing to dominate other living creatures, and to stay the course, as shown by our finding that these people tend to be more conservative than animal rights advocates.

Attitudes toward Science

We found that the best predictor of attitudes about vivisection was faith in science; those opposed to animal experimentation also tended to be more critical of science than those who support animal experimentation. This result at least partially supports provivisectionist claims that animal rights advocates are anti-science (Takooshian, 1988; Clark, 1990; Johnson, 1990; Mastromarino and Tomasovic, 1990). This finding is inconsistent with the claim by animal rights advocates (Singer, 1975; Ruesch, 1978; Sharpe, 1989; Stephens, 1989; Rollin, 1990) that they are not anti-science. There are several possible explanations for our result.

Animal rights activists may be more willing to explore alternatives to Western, reductionist, scientific understanding (Ruesch, 1978; Rowan, 1984; Stephens, 1989; Rollin, 1990), perhaps because of their temperament (Keirse and Bates, 1984). They may be more comfortable developing associations between variables (naturalistic observation) than they are in controlling them (experimentation). Intuitive-feeling types are creative, innovative (Myers, 1980; Keirse and Bates, 1984) and, we found, less likely to favor invasive animal research than are other

temperaments. They are also less accepting of reductionist science (Mishlove, 1975; Goldberg, 1983) and more empathic than those with other temperaments. Animal rights advocates may not be rejecting science as much as they are accepting of other ways of learning about the world. This hypothesis is supported by our finding that opposition to animal experimentation is associated with "activism" and less conservative political and moral views.

Alternatively, people who oppose animal experimentation may express little faith in institutional science (Harmon and Rheingold, 1984), perhaps in part because of the perceived importance of animal experimentation in some of the sciences; notably medicine, biology and psychology (Davenport and Davenport, 1990). Animal rights advocates may view science with more suspicion or less awe because some of the methods used by scientists in these areas are "unconscionable" (Singer, 1975; Ruesch, 1978; Kuker-Reines, 1984; Rowan, 1984; Bartlett, 1989). If this were the case, students who oppose animal experimentation might be expected to avoid majors where animal research has traditionally been important. However, we found that students majoring in sciences where exposure to animal experimentation is most likely were more opposed to vivisection than other declared and undeclared majors.

To the extent that science is an attempt to dominate and control rather than communicate experience (Harmon and Rheingold, 1984), empathic and feminine types (Bem, 1974; 1981) may be less interested in pursuing scientific investigation (Collard and Contrucci, 1988). Thus aversion to animal experimentation may reflect interest in helping rather than manipulating others (Collard and Contrucci, 1988). This might explain why majors most likely to be exposed to animal research were found more likely to oppose it than majors in other areas and those who were undeclared.

Another possible explanation of the correlation between faith in science and attitudes toward animal experimentation is methodological. Our measures of faith in science and empathy for animals were developed by the same individual (Takooshian, 1988) and came from the same scale. This may explain why these scales were highly correlated with attitudes toward vivisection and were a significant component of the "activism" factor, the only factor to significantly predict attitudes toward vivisection. Also, given the relationship between temperament and attitudes toward vivisection, it is not clear if attitudes about science can be entirely separated from attitudes about animal experimentation (Takooshian, 1988). A third possibility is that the scale measures attitudes toward traditional American, Western, reductionist science. Emphasis on control and utility rather than observation (Harmon and Rheingold, 1984), may be rejected by those who oppose animal experimentation. The measure we used does not reflect attitudes toward holistic, associationist scientific practices, which are less concerned with control and more focused on description of associations between events (Mishlove, 1975; Goldberg, 1983; Harmon and Rheingold, 1984).

Correlations with Major

We also found that those most likely to encounter animal experiments in their major course of study (majoring in psychology, biology, pre-medicine, and pre-veterinary science) were more opposed to animal experimentation than students declaring other majors and those who have not yet chosen a specific area of study. These results are perhaps not what would be expected; opposition to animal experimentation might be expected to steer people away from majors where

they are likely to encounter it. On the other hand, this result may reflect our sample, which consisted primarily of freshmen. Relatively naive, they may change their view of animal experimentation or their major as they become increasingly familiar with the role of animal experimentation in their area of interest. It is also possible that the presence of animal rights advocates in these sciences will result in a change in these disciplines. As people opposed to animal experimentation enter these areas of study, they may develop alternatives and/or change the way science is conducted because of their opposition to present practices.

Another possible explanation for why social science and animal experimentation intensive majors were more opposed to invasive animal research is that they are more exposed to it. Perhaps study of this type of science and exposure to animal experimentation makes them more likely to oppose it. This is unlikely however, again because subjects in this study were relatively naive. All were taking a first class in introductory psychology and most were first year students. Also, our findings that age and class did not reflect attitudes toward vivisection suggest that exposure alone is probably not sufficient to change opinions of such research. If experience with animal experimentation were to influence attitudes about it, then older and more advanced students might be expected to have different opinions about it than the majority of our sample.

Correlations with Personality Types

We found that intuitive and feeling types were more likely to oppose animal experimentation than sensate and thinking types. Intuitive types seek general impressions of possibilities and are less patient with routine, structured and mechanical approaches. Similarly, feeling types are concerned about ethical applications of knowledge and are more concerned with individuals than the knowledge itself. In comparison, sensate types have been described as emphasizing the concrete aspects of the here and now, focusing on the details rather than the global significance, and thinking types are concerned with how knowledge is obtained (Myers, 1980; Jensen, 1987). Animal rights advocates tended to be intuitive and feeling types. Thus they might be expected to be less interested in the process of reductionist scientific exploration, more concerned with how the results are used and future possibilities. In contrast the sensate and thinking types, characteristic of provivisectionists, would tend to focus on the mechanisms and process of obtaining new information. It is striking that this difference in personality parallels the disagreement between these two groups on the value of animal experimentation; provivisectionists focus on the process of scientific investigation while those opposed to animal experimentation focus on its effects and ethical implications (Rollin, 1981; Regan, 1983; Blakemore, 1989; Clark, 1990; Keeling and Yielding, 1990).

The most surprising findings of this study were the significant interactions between the extraversion-introversion dimension and the sensate-intuitive and thinking-feeling dimensions with respect to attitudes about animal experimentation. We found that extraverted-sensate and extraverted-thinking types are more supportive of animal experimentation than, respectively, extraverted-intuitive and extraverted-feeling types. We did not find similar differences between introverted types. One explanation of our failure to find significant differences among introverts may be the relatively small number of this type in our sample (65, versus 638 extraverts). Only about 1 in 10 college students is introverted (Keirsey and Bates, 1984). Another possibility is that introversion is an integral component of the personalities of antivivisectionists who are thinking or intuitive types. Because they are less dependent on and influenced by the attitudes

and beliefs of others, these individuals may be more likely to think differently about a number of social issues.

The present correlational study cannot establish if personality is a reflection of views on vivisection or vice versa. Also, because it was a survey of college students, most of whom are not active participants in the animal rights debate, it is not clear that we have provided an accurate picture of those more actively involved. Furthermore, this study does not directly examine other issues related to the animal rights debate: notably animal use in product development, factory farming, animals in entertainment and animals and animal tissue as marketable commodities. However, it does provide a basis for future investigations, perhaps using other models of personality and assessing attitudes about other issues.

Perhaps the most heartening element of this research does not come from the results but from the process. This paper is authored by two people who strongly favor animal research (Broida and Miele), and two who strongly oppose it (Tingley and Kimball). That we were able to work together on this project suggests that it may be possible to find a common ground from which to build a consensus.

Note

1. Address all correspondence to John P. Broida, Ph. D., Psychology Department, University of Southern Maine, 96 Falmouth Street, Portland, ME 04103, (207) 780-4255.

References

Adams, C. J. (1990). *The sexual politics of meat: A feminist vegetarian critical theory*. New York, NY: Continuum Press.

Bardis, P. D. (1961). A religion scale. *Social Science*, 36, 120-123.

Bardis, P. D. (1972). Counseling and the evolution of the concept of sin. In Silverman, H. (Ed.) *Marital therapy* (pp. 178-209) . Springfield IL: Thomas.

Bartlett, K. (1989). Survey shows movement promise. *Animals' Agenda* 9, 2.

Bem, S. L. (1974). The measurement of psychology androgyny. *Journal of Personality and Social Psychology*. 42, 155-162.

Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88, 354-364.

Blakemore, C. (1989). Misguided thinking on animals. *Nature*, 339, 414.

Bowker, J. (1986). Religions and the rights of animals. In Regan, T. (Ed) *Animal Sacrifices: Religious perspectives on the use of animals in science*. Philadelphia PA: Temple University Press.

Bray, A. (1991). The wrongs of animal rights. *Campus: America's student newspaper*, 26, 16-19.

Bullington, A. (1987). Probing the mind of the vivisector. *The Animals' Agenda*, 7, 4-57.

Clark, L. C. (1990). The animal rights movement threatens to make scientists an endangered species. *The Scientist*, September 3.

Collard, A., and Contrucci, J. (1988). *Rape of the wild*. Bloomington IN: Indiana University Press.

Davenport, L. D., and Davenport, J. A. (1990). The laboratory animal dilemma: A solution in our own backyards. *Psychological Science*, 1, 215-216.

Denver, R. J., Nicoll, C. S., and Russell, S. M. (1988). Direct action for animal research. *Science*, 241, 11.

Dickstein, L. S. (1972). Death concern: Measurement and correlation. *Psychological Reports*, 30, 563-571.

Fox, M. A. (1986). *The case for animal experimentation: An evolutionary and ethical perspective*. Berkeley, CA: University of California Press.

Gendin, S. (1986). The use of animals in science. In Regan, T. (Ed) *Animal sacrifices: Religious perspectives on the use of animals in science*. Philadelphia PA, Temple University Press.

Goodwin, F. K. (1990). Animal experiments are vital to continued medical progress. *Washington Post*, May 29.

Goldberg, P. (1983). *The intuitive edge*. Los Angeles, CA: Tarcher.

Gullie, G. (1991). Use Scientific Arguments. *SUPRESS: voice of the new anti-vivisectionist movement*, spring, 12.

Harmon, W. and Rheingold, H. (1984). *Higher creativity: Liberating the unconscious for breakthrough insights*. Los Angeles, CA: Tarcher.

Hertzberger, S. D., Chan, E., and Katz, J. (1984). The development of an assertiveness self report inventory. *Journal of Personality Assessment*, 48, 317-323.

Horton, L. (1989). The enduring animal issue. *Journal of the National Cancer Institute*, 81, 736-743.

Horton, L. (1990). Physicians and the politics of animal research in the 1990s. *The Cancer Bulletin*, 42, 211-219.

Infante, D. A. and Rancer, A. S. (1982). A conceptualization and measurement of assertiveness. *Journal of Personality Assessment*, 46, 72-80.

Johnson, David (1990). Animal rights and human lives: Time for scientists to right the balance. *Psychological Science*, 1, 213-214.

Keeling, M. E., and Yielding, K. L. (1990). Impact of animal research policies, regulations and social attitudes on cancer research. *The Cancer Bulletin*, 42, 224-230.

Kimball, R. (1989). Liberal/conservative voting records compared to interest in animal protection bills. *PsyETA Bulletin*, 9, 7-9.

Keirsey, D. and Bates, M. (1984). *Please understand me: Character and temperament types*. Delmar, CA: Prometheus Nemesis Press.

Koslowsky, M., Pratt, G. L., and Wintrobo, R. M. (1976). The application of Guttman scale analysis to physicians' attitudes regarding abortion. *Journal of Applied Psychology*, 61, 301-304.

Kuker-Reines, B. (1984). *Environmental experiments on animals: A critique of animal models of hypoxemia, heat injury and cold injury*. Boston, MA: New England Anti-Vivisection Society.

Mastromarino, A. J., and Tomasovic, S. P. (1990). Animal research: Contributions, controversies and responsibilities. *The Cancer Bulletin*, 42, 209-210.

McClosky, H. (1969). *Political inquiry*. New York, NY: McMillan.

Myers, I. B. (1980). *Gifts differing*. Consulting Psychology Press.

Mishlove, J. (1975). *The roots of consciousness*. Berkeley, CA: Random House.

Phillips, M. T., and Sechzer, J. A. (1989). *Animal research and ethical conflict: An analysis of the scientific literature 1966-1986*. New York, NY: Springer-Verlag.

Regan, T. (1983). *The case for animal rights*. Berkeley, CA: U. California Press.

Richards, R. (1991). A sociologic study of people in the animal protection movement. Talk presented at Tufts University Veterinary School.

Rollin, B. E. (1981). *Animal rights and human mortality*. Buffalo, NY: Prometheus.

Rollin, B. E. (1990). *The unheeded cry: Animal consciousness, animal pain and science*. Oxford: Oxford University Press.

Rose, M. and Adams, D. (1989). Evidence for pain and suffering in other animals. In Langley, G. (Ed.) *Animal experimentation: The consensus changes* (pp. 42-71). New York: Chapman and Hall.

Rowan, A. N. (1984). *Of mice, models and men: A critical evaluation of animal research*. Albany University Press.

Ruesch, H. (1978). *Slaughter of the innocents*. New York, NY: Bantam Press.

Sharpe, R. (1988). *The cruel deception*. Wellingborough: Thorsons.

Sharpe, R. (1989). Animal experiments, a failed technology. In Langley, G. (Ed.) *Animal experimentation: The consensus changes* (pp. 88-117). New York: Chapman and Hall.

Singer, P. (1975). *Animal liberation: A new ethics for our treatment of animals*. New York, NY: Random House.

Smith, S. J., and Hendee, W. R. (1988). Animals in research. *Journal of the American Medical Association*, 259, 2007-2008.

Stoller, K. (1989). Hunt for grants creates needless animal research. *Atlanta Constitution and Journal*, October 16, A8.

Stephens, M. (1989). Replacing animal experiments. In Langley, G. (Ed.) *Animal experimentation: The consensus changes* (pp 144-168). New York: Chapman and Hall.

Takooshian, H. (1988). Opinions on animal research: Scientists versus the public. *PsyETA Bulletin*, 7, 5-7.

Tanis, J. (1991). A brief outline of scientific antivivisectionism. *SUPRESS: Voice of the new anti-vivisectionist movement*, spring, 3-6.