

Personality, empathy and attitudes to animal welfare

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Abstract

A total of 833 students completed a four-part questionnaire which measured demographic factors (sex, education, vegetarianism, religiousness), attitudes to animal experimentation, personality (Big Five) and empathy. Attitudes to animal experimentation factored into five interpretable factors, and multiple regression analyses were used to examine the extent to which demographic factors, personality and empathy predicted these. Sex, vegetarianism, Agreeableness, Openness, Extraversion and empathy were significant predictors of all these factors. Results showed an interpretable set of correlates that were similar to previous studies in the area. As with previous research findings, the measures used predicted only a small amount of variance with respect to attitudes to animals. © 2003 International Society for Anthrozoology

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No doubt in part due to the various animal rights campaigns, there has been an increase in interest in attitudes to research on animals (Coilee and Miller 1984; Gallup and Suarez 1985; Miller 1985; Archer 1986; Feeney 1987; Gray 1987; Devenport and Devenport 1990; Furnham and Pinder 1990; Plous 1991, 1996; Hills 1993, 1995; Hutchins and Armstrong 1994; Armstrong and Hutchins 1996; Vigorito 1996; Martasian and Goldstein 1997). Various studies have focused on psychology students' attitudes, paying particular attention to the structure and demographic correlates of specific attitudes. Furnham and Pinder (1990) looked at the attitudes of 250 Britons and found them strongly against animal testing and in favor of stricter controls on laboratories using animals. They also found that females more than males, left-wing more than right-wing people, and vegetarians more than non-vegetarians were more strongly against animal experimentation.

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Furnham and Heyes (1993) looked at numerous demographic correlates of attitudes to animal experimentation, particularly vegetarianism, but also sex, religion and politics. Females were found to be less in favor of experimentation than males. In addition, left-wing political sympathizers, less religious people and cat and dog lovers tended to be less pro- and more anti-animal experimentation, while non-vegetarians and graduates held the opposite views. However, they did note that participants' knowledge of actual experimentation was poor.

Vigorito (1996) administered 46 statements related to animal rights to 112 students. They found junior psychology students had a more negative attitude than senior undergraduates to animal rights issues. More recently, Martasian and Goldstein (1997) showed that students' beliefs about animals are influenced by their research areas, particularly if they are involved in animal research.

Rather than have relatively few participants answer many questions on the topic, Plous (1996) mailed questionnaires (14 questions) to 5000 randomly selected members of the American Psychological Association. He received responses from 3,982 individuals, of which the majority showed support for animal studies involving observation and confinement, but disapproval for studies involving pain or death. There was also support for mandatory pain assessments and the federal protection of rats, mice, pigeons and reptiles and the use of animals in teaching, but not as an undergraduate course requirement.

Various studies have looked specifically at personality factors and attitudes towards animals. Broida et al. (1993) looked at Myers-Briggs Type Inventory personality dimensions and attitudes to animal research. They found, as predicted, that those in favor of experimentation tended to be extraverted, thinking types who were also male, masculine, conservative and less empathic. Equally, those who were anti-vivisectionists and animal rights advocates, tended to be intuitive and feeling types, vegetarians, more ecologically concerned and those more likely to encounter animal experimentation in their studies. They noted: "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 pro-vivisectionists, would tend to focus on the mechanisms and process of obtaining new information" (p. 142).

More recently, Mathews and Herzog (1997) used the 16 Personality Factor inventory to explore personality and attitudes towards the treatment of animals in 99 American college students. They found only weak associations with two of the 16 factors relating to attitudes: tender-minded,

imaginative rather than tough-minded, practical students tended to be more sympathetic to animals.

In a series of studies, Hills (Hills 1993, 1995; Hills and Lalich 1998) has explored attitudes to animals, showing that specific factors like empathy and beliefs about the mental experience of animals are directly related to attitudes towards them (Hills 1995). Indeed, Hills (1993) developed and tested a model designed to show the motivational bases of attitudes towards animals. The model has three factors or processes, namely instrumental self-interest, empathy and belief/values about the nature of animals.

The present study was particularly concerned with three correlates/determinants of attitudes to animal research. The first looked at empathy and attitudes to animals using a shortened measure of Davis' (1983) multidimensional scale. Davis (1983) showed his multidimensional measure was systematically related to social functioning, self-esteem, emotionality and sensitivity to others. There are four sub-scales: Perspective Taking (anticipating the behavior and reactions of others), Fantasy (the tendency to transpose oneself imaginatively into the feelings and actions of fictitious characters in books, movies and plays), Empathic Concern ("other-oriented" feelings of sympathy and concern for unfortunate others) and Personal Distress ("Self-oriented" feelings of personal anxiety and unease in tense interpersonal settings). It was predicted that all four empathy measures would be correlated with attitudes towards animals, particularly the Fantasy and Empathic Concern scales, perhaps with different scales being related to different aspects of animal experimentation.

The second issue investigated concerned the relationship between personality and attitudes to animals. There is abundant evidence on the relationship between personality and such things as health, ideology, close relationships and consumption (Furnham and Heaven 1999), and there have also been studies that have demonstrated the relationship between personality and animal ownership (Gunter 1999). It was predicted that Neuroticism and Agreeableness would be related to attitudes to animal research.

The third determinant of attitudes to animal research investigated was demographic variables. From past research it was predicted that many of these variables: gender, science education, vegetarianism and religiousness, would be related to attitudes to animals (Broida et al. 1993).

Methods

Participants and Questionnaire Design

There were 833 participants (university students) of which 416 were male and 417 were female ($M=20$ years, $SD=1.9$, Range=17–32). To start, they

were asked to what level they had studied science and biology subjects. In all, 59.5% said they had studied science subjects at school and 40.4% had studied them at university; 81.2% said they studied biology at school and 18.6% had studied it at university. The students were then asked to rate on a seven-point scale (ranging from never to every day) how often they ate four items: fish ($M=3.4$, $SD=1.3$), red meat ($M=3.4$, $SD=1.6$), white meat ($M=4.0$, $SD=1.5$), and eggs, cheese, dairy products ($M=5.5$, $SD=1.5$). On a four-point scale (ranging from not at all important to extremely important), participants rated how important religion was to them in their daily lives ($M=1.7$, $SD=0.9$) and in their upbringing ($M=1.9$, $SD=0.9$).

The questionnaire was then divided into three parts:

1. *Attitudes to the use of animals in medical and psychological research.* This was a 32-item questionnaire; respondents gave their answers on a four-point scale (definitely/probably/yes/no). Items were derived from the process described below.
2. *Personality: Big Five.* A total of 15 questions drawn from the sixty-item version of the questionnaire (NEO-FFI), with three items on each of the five scales (Costa and McCrae 1989), was used. This is perhaps the most widely used personality questionnaire in empirical research at present. Our questionnaire provided brief measures of Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness. Inevitably, the internal reliabilities of our three-item scales were lower than for the full, 12-item scales, but were marginally satisfactory: Agreeableness 0.57, Neuroticism 0.69, Openness 0.59, Extraversion 0.67 and Conscientiousness 0.59.
3. *Empathy.* A total of 16 items drawn from the original 42-item measure (Davis 1983), with four items on each of the four scales, was used. This is one of the most widely used questionnaires on empathy. Alphas on the four scales were calculated to be: Fantasy 0.74, Perspective Taking 0.70, Empathic Concern 0.69 and Personal Distress 0.63.

Procedure

The study was carried out as part of a first- and second-year laboratory class in social psychology; second-year students designed the questionnaire, while the first-year students collected the data and did some simple analyses. In the first part of the study, the second-year students used a traditional approach to questionnaire item generation. The class of about 90 students was divided into eight different groups, each of which delegated two members independently to interview two subjects in a semi-structured format—each group deciding on its own format. In total, 16 subjects were

interviewed, resulting in sixteen interviews, all of which were transcribed and were available during the stage of question generation by *all* of the eight groups. Each of the eight groups was asked to generate a total of four questions, which were produced by creating a larger number of questions (by members working in pairs) which were then composited into the four questions included in the final questionnaire. It was emphasized to the class that although the principle interest was in understanding attitudes to the use of animals in experimentation, they should also be willing to consider aspects of other relationships between people and animals in society, and some of the questions reflect these issues. The final version of the questionnaire included some background demographic measures, the 32 attitude questions on the use of animals in experimentation and otherwise, and abbreviated versions of the empathy and personality measures, as detailed above.

The first-year laboratory class used the questionnaire developed by the second-year class. For various reasons, a particular thrust of the first class was on sex differences, and the class was divided into forty-two pairs of students, each of which was asked to distribute the questionnaire to a total of ten male and ten female students in the university. One pair did not manage to collect an entire set of data, but the result is that the proportion of male and female students in the final sample is almost exactly equal.

Results

Factor analysis

Table 1 (pp. 140–141) shows the mean responses (and standard deviations) to each question, as well as the main output values of the factor analysis (VARIMAX rotated). Most concerns with factor analysis are about the robustness of the factor solution, given the ratio of participants to questions; in this study the ratio was satisfactory. This study used exploratory rather than confirmatory factor analysis because the structure of the scale was unknown. Items that showed highest disagreement were 13, 27 and 11, while those that were most strongly endorsed were 12, 28, 16 and 37. As many factors were extracted as there were eigenvalues greater than 1.00.

The first factor, which accounted for a fifth of the variance, contained items that tapped *attitudes concerning animals in research*; high scores indicate participants believed in the importance of animal research. The second factor, accounting for over 7% of the variance, was about *feelings*; high scores indicate that participants like animals who they believe have feelings. The third factor contained items about *animal-tested, non-medical products*; high scores indicate that people would be prepared to use and purchase non-essential products tested on animals. The fourth factor

Table 1. Factor analytic results showing item means and standard deviations (attitude statements 7-38).

	M	SD	Loading	Eigenvalue	Variance
Factor 1: Attitudes concerning animals in research					
9. Is it acceptable to use animals for any kind of medical research even if it causes the animal pain?	2.5	1.0	0.8	6.8	21.1%
33. Do advances in medical research justify the suffering animals may endure during experimentation?	2.7	0.9	0.7		
22. Would you prohibit animal research if you had the power to do so?	2.3	1.0	-0.7		
35. Is it justifiable to kill animals for research that makes non-life saving medical advances?	2.3	1.8	0.7		
11. Does the fact that we have the opportunity to use animals in research give us the right to do so?	2.0	0.9	0.7		
7. A new brand of eye drops has come on to the market, the side effects of which are unknown, would you want it to be tested on animals to save yourself possible pain?	2.4	1.0	0.6		
27. Would you be willing to assist with invasive animal experimentation?	1.8	0.9	0.6		
31. Is it right to buy products derived from animals reared using intensive techniques?	2.2	0.8	0.6		
21. Do you think animal dissection should be carried out in schools?	2.4	1.0	0.6		
18. Is it more acceptable to test on a rat than an ape?	2.4	1.0	0.5	2.3	7.1%
Factor 2: Feelings					
30. Is it more acceptable to test on animals for scientific purposes if the effects on the animals are temporary?	2.8	0.9	0.5		
37. Do you think animals have feelings?	3.3	0.8	0.7		
38. Do you think that humans can know what animals are feeling?	2.6	1.9	0.6		
16. Do you believe that animals have the ability to anticipate pain?	3.3	0.8	0.6		
34. Do you think animals should have rights protected by law?	3.1	0.9	0.6		
28. Do you like being in the company of animals?	3.3	0.9	0.4	1.9	5.8%
Factor 3: Animal-tested non-medical products					
13. Have bad childhood experiences with animals influenced your feelings towards animal experimentation?	1.5	0.9	0.7		
25. Would you be prepared to use cosmetics containing ingredients tested on animals?	2.3	1.0	0.6		

20. Would you buy a non-medical product you knew was tested on animals?	2.2	0.9	0.6	1.4	4.5%
Factor 4: Vegetarian sentiments					
29. Should animal rights activists be vegetarians?	2.6	1.0	0.7		
36. Is eating meat cruel to animals?	2.2	1.0	0.6		
26. Do you believe using animals for food is a necessity?	2.6	1.1	-0.6		
24. Do you agree with this statement "Using animals for science is more important than using animals for food"?	2.1	0.9	0.5		
Factor 5: Animal testing					
23. Would you be prepared to try a product which had not previously been tested on animals?	2.8	0.8	0.8	1.2	3.7%
8. If a person volunteers to be used for research purposes, would it be acceptable to use them in place of an animal?	3.0	0.9	0.7	1.1	3.4%
Factor 6 (no clear theme)					
14. Has your opinion towards animals welfare been influenced by the media?	2.4	0.9	0.7		
19. Can results of animal experiments be generalized to humans?	2.5	0.8	0.4		
Factor 7 (no clear theme)					
17. Do you believe that experimenters become less aware of animal distress over time?	3.1	0.7	0.7		
15. Do you believe that humans have a greater potential for further experience and development than animals?	3.2	0.8	0.6		
12. Should information about animal testing be included on all product labels?	3.5	0.7	0.5		
Factor 8 (no clear theme)					
32. Do you think the use of animals in sport is made more acceptable by tradition?	2.3	1.1	0.7		
10. Do you think the government should fund continual assessment of peoples' uses of animals in the practice of science research?	3.1	1.1	-0.5		

contained four items all concerned with meat eating; high scores indicate *vegetarian sentiments*. The fifth factor contained two items specifically to do with *animal testing*; high scores indicate a preference for human over animal testing of products. The remaining three factors contained items for which there were no clear themes.

The personality dimensions were then correlated with the empathy factors. The correlation between Neuroticism and the four scales were significant and positive, with the largest being for Personal Distress ($r=0.27$, $p<0.001$). Extraversion and Openness were both significantly correlated with Empathic Concern ($r=0.21$, $p<.001$). Agreeableness was significantly correlated with Fantasy ($r=0.15$, $p<0.01$), Perspective Taking ($r=0.09$; $p<0.01$), Empathic Concern ($r=0.40$, $p<0.001$) and Personal Distress ($r=0.08$, $p<0.01$). There were no significant correlations with Conscientiousness.

Regression analyses

Following the factor analysis, multiple regressions were computed. There were three sets of independent variables: four demographic variables (gender, science education, vegetarianism and religion), the Big Five personality variables; and the four empathy variables. Scores for the two questions on science education and the two questions on religion were averaged and these scores were used in the regression. Vegetarianism was based on the answers to the frequency of eating red and white meat and fish/seafood (three questions). Those were averaged.

Regressions were run on the five interpretable factors reported (see Table 2). All were significant, accounting for between 4 and 18% of the variance. The first regression showed that introverted, agreeable, vegetarian females with high scores on Empathic Concern and Personal Distress tended to be against the use of animals in research. Results from the second regression showed that empathic, open participants who had had a science education tended to like animals who they believed had feelings.

The third regression showed that open, agreeable, empathic, but non-religious, people tended to be against the use of animals for testing non-medical products, like cosmetics. The fourth regression showed that neurotic vegetarians with high scores on Personal Distress believed meat eating is cruel and unnecessary. Finally, the fifth regression indicated that extraverted, agreeable, non-religious participants with low Personal Distress scores would be prepared to take non-animal tested products and would replace animals in experiments.

Table 2. Results of the five multiple regression analyses conducted: influence of demographic, personality and empathy variables on the five attitudinal factors.

Variables	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5	
	Beta	t	Beta	t	Beta	t	Beta	t	Beta	t
Sex	-0.15	3.88***	0.03	0.71	0.01	0.27	-0.03	-0.70	-0.01	-0.50
Science Education	0.06	1.57	0.08	2.18*	0.01	0.15	-0.02	-0.45	-0.05	-1.11
Vegetarianism	0.18	4.73***	-0.06	-1.66	0.02	0.37	-0.30	-7.50***	-0.02	-0.46
Religion	0.04	1.01	0.05	-1.32	0.20	5.26***	0.02	0.45	-0.11	2.90**
Neuroticism	0.03	0.85	0.04	0.86	0.04	1.07	0.13	3.34***	0.03	0.82
Extraversion	0.13	3.54***	0.02	0.57	0.03	0.69	-0.04	-0.91	0.10	2.58**
Openness	-0.05	-1.39	0.13	3.44***	-0.08	-2.15*	-0.07	-1.82	0.04	1.11
Agreeableness	-0.11	-2.73**	0.02	0.67	-0.13	-3.11**	-0.07	-1.68	0.12	2.72**
Conscientiousness	0.00	0.22	-0.04	-1.00	-0.02	-0.57	0.04	1.15	-0.05	-1.29
Fantasy	-0.03	-0.68	0.04	0.97	-0.02	-0.56	0.07	1.68	0.04	0.85
Perspective Taking	0.01	0.23	-0.04	-1.11	0.06	1.64	-0.02	-0.54	0.05	1.20
Empathic Concern	-0.16	-3.72***	0.22	4.77***	-0.17	-3.73**	-0.07	-1.47	-0.04	-0.81
Personal Distress	-0.09	-2.36*	-0.05	-1.18	-0.00	-0.13	0.09	2.37***	-0.08	-0.91*
F (13, 648)	12.27***		7.06***		6.91***		9.07***		3.31**	
Adj R. Sq	0.18		0.11		0.10		0.14		0.04	

Factor 1=Attitudes concerning animals in research, Factor 2=Feelings, Factor 3=Animal-tested, non-medical products, Factor 4=Vegetarian sentiments, Factor 5=Animal testing.

Note: degrees of freedom dropped from >800 to 648, due to missing data. *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Discussion

These results extend the small but growing literature on attitudes to animal experimentation. The study showed first that attitudes towards animal experimentation factor into definable areas such as the use of animals in research, the use of animals for food, the extent to which animals have feelings, and the use of animals in non-medical research. Nearly all other studies which have devised their own attitudes-to-animals questionnaires have shown similar results (Furnham and Pinder 1990; Broida et al. 1993). Whilst these different items are logically related, what this study showed was that they are predicted by different individual difference factors.

This study took the literature forward by studying three different groups of factors: demography, personality and empathy. It concentrated on four demographic factors, as each has been shown to be related to attitudes to animal experimentation. Various studies have shown females to be more "tender-minded" and sensitive to the use of animals in research (Furnham and Pinder 1990; Broida et al. 1993; Furnham and Heyes 1993; Hills 1993). This study, however, showed that sex was a significant predictor of only one of the attitude factors, though it did show that females were more anti-animal research than males.

Education in science played little role in attitudes to animal research, contrary to the work of Broida et al. (1993). However, vegetarianism and religious beliefs did. People are vegetarian for many reasons, one of which is concern for animals. On two of the attitude factors, vegetarianism was the strongest predictor of attitudes. Religion was also a significant predictor on two factors. The fact that a person holds religious beliefs, means they have an integrated belief system and one that is perhaps more prescriptive and proscriptive.

Personality traits were consistently and logically related to attitude factors. From the regressions it was apparent that Agreeableness was the most consistent predictor (3 out of 5), followed by Extraversion and Openness (2 out of 5 each), then Neuroticism (1 out of 5). Conscientiousness was not a significant predictor. It makes perfect sense that Agreeableness was the strongest predictor of these attitudes. Agreeableness is about being compassionate, altruistic and tender-minded; agreeable people are sensitive to pain in others, be they non-human animals or people. Openness is also relevant and reflects curiosity.

The results from the empathy scale showed that only two of the four sub-scales were predictors of the attitude factors. The stronger predictor, based on the beta weights, was Empathic Concern, which is the extent to

which the emotional problems of others are things which concern and worry one. The other predictor was Personal Distress, which is the extent to which one suffers oneself when others are themselves distressed. Whilst these scales were devised to measure *human* empathy, it is clearly apparent that they are equally relevant to the plight of animals. It is interesting to note that neither of the other two sub-scales were at all predictive of these attitudes.

The personality traits were predictably correlated with some of the empathy scales. Results indicate, as one may expect, that agreeable individuals with Empathic Concern are more sensitive to issues concerning experimentation with animals. However, it should be noted that even when combining personality, demographic and empathy factors, very little of the variance was explained (between 4 and 18%). This is indeed a consistent finding across the literature, which shows that while personality traits and belief factors are logically related to attitudes to animals, they rarely account for more than one tenth of the variance. Whilst part of the variance may be due to error measurement, it seems likely that other factors must play a bigger part in determining these attitudes. Precisely what variables/factors are the most important in predicting attitudes to animals have yet to be discovered.

References

- Archer, J. 1986. Ethical issues in psychobiological research on animals. *Bulletin of the British Psychological Society* 39: 361–364.
- Armstrong, J. and Hutchins, L. 1996. Development of an attitude scale to measure attitudes toward humans' use of non-human animals. *Perceptual and Motor Skills* 82: 1003–1010.
- Broida, L., Tingley, L., Kimball, R. and Miele, R. 1993. Personality differences between pro- and anti-vivisectionists. *Society and Animals* 1: 129–144.
- Coilee, D. and Miller, N. 1984. How radical animal activists try to mislead humane people. *American Psychologist* 39: 700–701.
- Costa, P. and McCrae, R. 1989. *The NEO-PI/NEO-FFI Manual Supplement*. Odessa, FL: PAR.
- Davis, M. 1983. Measuring individual differences in empathy. *Journal of Personality and Social Psychology* 44: 113–126.
- Devenport, L. and Devenport, J. 1990. The laboratory animal dilemma. *Psychological Science* 1: 215–216.
- Feeney, D. 1987. Human rights and animal welfare. *American Psychologist* 42: 593–599.
- Furnham, A. and Heaven, P. 1999. *Personality and Social Behaviour*. London: Arnold.
- Furnham, A. and Heyes, C. 1993. Psychology students' beliefs about animals and animal experimentation. *Personality and Individual Differences* 15: 1–10.

- Furnham, A. and Pinder, A. 1990. Young people's attitudes to experimentation of animals. *Psychologist* 10: 444–446.
- Gallup, G. and Suarez, S. 1985. Alternatives to the use of animals in psychological research. *American Psychologist* 40: 1104–1111.
- Gray, J. 1987. The ethics and politics of animal experimentation. In *Psychology Survey*, 6, 241–260. eds. H. Beloff and A. Colman. Leicester: BPS.
- Gunter, B. 1999. *Pets and People: The Psychology of Pet Ownership*. London: Whurr.
- Hills, A. 1993. The motivational bases of attitudes towards animals. *Society and Animals* 1: 111–128.
- Hills, A. 1995. Empathy and belief in the mental experience of animals. *Anthrozoös* 8: 132–142.
- Hills, A. and Lalich, N. 1998. Judgements of cruelty towards animals: sex differences and effect of awareness of suffering. *Anthrozoös* 11: 142–147.
- Hutchins, M. and Armstrong, J. 1994. College students' attitudes toward animal use. *The College Student Journal* 28: 258–266.
- Martasian, P. and Goldstein, S. 1997. Students' beliefs about animal researchers as a function of researchers' sex. *Psychological Reports* 81: 803–811.
- Mathews, S. and Herzog, H. 1997. Personality and attitudes toward the treatment of animals. *Society and Animals* 5: 169–175.
- Miller, N. 1985. The value of behavioural research on animals. *American Psychologist* 40: 423–440.
- Plous, S. 1991. An attitude survey of animal rights activists. *Psychological Science* 2: 194–199.
- Plous, S. 1996. Attitudes toward the use of animals in psychological research and education. *American Psychologist* 51: 1169–1180.
- Vigorito, M. 1996. An animal rights attitudes survey of undergraduate psychology students. *Psychological Reports* 79: 131–147.