

The effects of level of support for animal protection organisations on attitudes to the use of animals and other social issues

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Abstract

Animal protection issues are being advanced increasingly by Non-Government Organisations, yet the views of their supporters are little understood. We surveyed attitudes towards animals and other social issues in 3,462 university students from over 103 universities in eleven European and Asian countries. The extent to which those respondents that supported animal protection organisations had more concern for animals than those who did not support such organisations was investigated, and whether this concern was generalised to other world social issues. Of the respondents, 36% sometimes and 6% very often supported animal protection organisations and 2% identified themselves as key members. Supporters and key members had increased scores on indices that measured their concerns for animal welfare (+ 6%), animals in experimentation (+ 7%), and other major social issues (+ 5%), compared with non-supporters. Supporters were also likely to have lived with pets for longer, suggesting that this was one of the drivers for their increased concern for animals. Key members of the organisations rated the sentience of humans lower (−9%) than other students rated them, and nearer to that of animals. The level of support for the organisations was directly related to avoidance of poultry, pork and beef meat. It is concluded that support for animal protection organisations is an indicator of attitudes towards animals and other social issues, and food consumption habits.

Keywords: animal ethics, animal protection organisations, animal welfare, Non-Government Organisations, social issues, student attitudes

Introduction

Many surveys have been conducted to elucidate society's perceptions of animals. These have usually concentrated on demographic correlates of attitudes to animal use and issues, particularly gender (Driscoll 1992; Eldridge & Gluck 1996; Peek *et al* 1996; Wells & Hepper 1997; Hagelin *et al* 1999; Paul & Podberscek 2000; Hagelin *et al* 2003; Heleski *et al* 2004; Phillips & McCulloch 2005; Serpell 2005; Herzog 2007; Phillips *et al* 2011; Izmirlı & Phillips 2012), experience with keeping animals (Paul & Serpell 1993; Wells & Hepper 1997; Izmirlı & Phillips 2012), education level and vegetarianism (Izmirlı & Phillips 2011). However, only a few studies (eg Plou 1991; Einwohner 1999) have been conducted to examine the relationship between being a membership of animal protection organisations (APOs) and attitudes to the use of animals. These APOs are increasingly driving the improvement of welfare standards and the attitudes of those supporting them are therefore influential. Whilst it is known, and to be expected, that supporters have greater concern for animals than those in the general community (Signal & Taylor 2006), the generalisation of these attitudes to other social issues has not been investigated.

Animal protection organisations generally follow one of two paths towards improving animal welfare and rights issues. First, they may attempt to activate the public on issues that they believe are capable of being changed by guardians of the issues (Hallahan 2001). This Issues Processes Model involves identifying four main public groups: 1) active members of the public, those with a high level of knowledge and direct involvement in an animal welfare agency; 2) aroused members of the public, with a low level of knowledge but significant involvement and therefore likely to be core followers of a social movement; 3) aware members of the public, with a high level of knowledge but low involvement, who are not likely to effect change but may join initiatives; and 4) inactive members of the public with a low level of both knowledge and involvement and unlikely to engage or effect change. Second, animal protection organisations may envisage that there is a struggle between the advocates and guardians of the issues for the minds and support of the public. This Movement Action Plan recognises and utilises trigger events to activate public sentiment, such as the Australian footage of live export cattle being slaughtered in Indonesia in 2011 (Tiplady *et al* 2012).

APOs have grown rapidly in number, size and influence, in common with other Non-Government Organisations (NGOs), over the last few decades in both developing and developed countries. Few attempts have been made to characterise the supporters of such organisations, even though they have been accused of valuing animal welfare above human welfare, extremism and eschewing animal products (Plous 1991). A survey of American animal rights attendants at a rally against medical research that used animals indicated that most animal activists actually valued non-human life at the same level as human life, whereas a non-activist sample mostly valued human life more than non-human life (Plous 1991). In Plous' survey more animal research activists (89%) claimed to value non-human life at or above human life than animal activists focused on other uses of animals (75%).

The research described in this paper was part of a cross-cultural study into attitudes towards animals in Eurasian students (Izmirli & Phillips 2011; Phillips *et al* 2011, 2012). The objective of this part of the study was to determine the extent to which students supporting animal protection organisations had increased concern for animals, and whether this related to more, or less, concern for other social issues.

Materials and methods

The survey method was approved by the Human Ethics Committee of the University of Queensland and has been described in full previously (Phillips *et al* 2012). A call was distributed through relevant organisations, eg International Society for Applied Ethology, for volunteer academic collaborators to organise a survey of students' attitudes to social issues, in particular animal management, in their country. Suitable collaborators volunteered in 21 countries worldwide, but those in nine countries dropped out over the course of the project, leaving 12 countries as a convenience sample. Subsequently, one country, Portugal, was also excluded because of low response rates. Those remaining represented a broad spectrum of cultures and geographical regions of Europe and Asia (China, Czech Republic, Great Britain, Iran, Ireland, South Korea, Macedonia, Norway, Serbia, Spain and Sweden). In all cases, except Norway and Sweden, where access by email to the entire student populations in the selected universities was possible, collaborators organised a team of student volunteers to recruit respondents in a sample of universities in their country. The universities were selected at random if possible, but in some countries a convenience sample was used. Student volunteers approached students at a central location in the university (not related to any subject area) and asked them if they would take part in a social survey. This phraseology was anticipated to avoid the potential bias of students interested in animals being more likely to complete a survey on animals if asked to do so. A pilot survey informed the development of the survey (Phillips *et al* 2012). The majority of responses were received from students in 103 universities in the main survey, providing a broad spread of the tertiary education sector. The target number of respondents in each country was related to the population.

If they agreed, students were asked to give their email address to the volunteer, in order that a weblink to the survey could be sent at a later date.

The survey format and content was discussed and agreed by all collaborators, and the survey was then translated by the collaborators into the native language, since these people were most familiar with the animal welfare terminology used. Where possible, the translated versions were translated back into English and changes made in the case of discrepancies, and in all cases the survey meaning and translation were checked by a third party for accuracy and consistency of meaning, in conjunction with the collaborator. Weblinks to the survey were distributed by email with an accompanying password.

Students were asked questions relating to demographics, food-consumption preferences and about the acceptability of forty-three animal issues and the importance of thirteen World issues. In this paper we report only the influence of support for animal protection organisations. The effects of gender and country on attitudes towards animal use and world social issues, and on food consumption have been reported elsewhere (Izmirli & Phillips 2011; Phillips *et al* 2011, 2012). Students were asked whether they had ever supported animal protection organisations (with two examples of support given: by being a member and donating money). The options were: 1) never; 2) sometimes; 3) very often; and 4) I am a key member of an animal protection organisation. Students were also asked their gender and whether their living place was rural, urban or metropolitan.

The 43 Animal issues were based on the major human concerns about our use of animals, with approximately five questions for each (Table 1) (for further details, see Phillips *et al* 2012). Students were asked to rate the acceptability of each of the issues on a five-point Likert scale from 1, extremely unacceptable to 5, extremely acceptable, with an alternative option of indicating that they were not familiar enough with the issue described to decide.

Thirteen questions were asked concerning major world social issues (Table 2). Students were asked to give their opinion about how important each was to them, on a scale of 1, not important, to 7, extremely important (Meng 2009), and an alternative option was provided, indicating that they were not familiar enough with the issue to decide.

Students were also asked to rank a list of animals so that in their opinion it was in order of their capacity for feeling (hereafter termed sentience) from 1 to 12, with 1 having the greatest capacity and 12 the least. The animals offered were cat, cattle, chicken, chimpanzee, dog, dolphin, fish, horse, human infant, octopus, pig and rat (Herzog *et al* 1991). Finally, they were asked how many years they had lived with pets, which was divided by their age for analysis.

Statistical analysis

Data were initially cleaned and examined for potential sources of bias (Meng 2009). We found no evidence of bias, for example in the willingness of Asian country

Table 1 The forty-three animal issues, A1–A43, listed by the eight major concerns identified.

| Major concerns | Animal issues |
|--------------------------------------|---|
| 1 Use of animals | A1 Keeping animals for the production of food or clothing A2 Keeping animals as pets A3 Keeping animals for the education of the public in zoos, wildlife parks etc A4 Using animals for work A5 Using animals for entertainment or sports |
| 2 Animal integrity | A6 Operations on animals to improve their health A7 Decoration of animals, such as dying or cutting their hair for aesthetic reasons A8 Desexing by hormone implants A9 Removal of a body part, such as tail docking or de-clawing A10 Marking animals by branding or ear notching A11 Removal of dead tissue, such as hair/wool removal or foot trimming |
| 3 Killing animals | A12 Killing young animals that are dependent on their parents A13 Allowing animals to experience pain during slaughter A14 Using animals for products after their natural death A15 Killing animals when they are seriously injured or ill A16 Euthanising healthy and unwanted pets because of overpopulation |
| 4 Animal welfare | A17 Depriving animals of their needs for food and water A18 Depriving animals of an appropriate environment to rest, including shelter A19 Inflicting pain, injury or disease on animals A20 Not providing sufficient space, proper facilities and company needed for animals A21 Subjecting animals to conditions and treatment which cause mental suffering |
| 5 Experimentation on animals | A22 Observing animal behaviour in an experiment A23 Experiments to improve animal welfare or health A24 Medical experiments using animals to improve human health A25 Testing cosmetics or household products on animals A26 Operating on living animals for the benefits of human medicine research |
| 6 Changes in animals' genotypes | A27 Increasing animals' reproductive or productive capabilities by genetic changes, eg cows producing more milk A28 Increasing animals' health or disease resistance by genetic changes A29 Creating farm animals that feel happy with little stimulation and have little desire to be active A30 Genetic selection of pet animals, such as dogs and cats, to increase their rarity, potential for showing or pedigree value A31 Genetic modification of crops grown for animal foods |
| 7 Animals and the environment | A32 Killing animals because they are not native to the area in which they live A33 Killing wild animals to stop the spread of diseases that could affect humans A34 Controlling wildlife populations by killing A35 Controlling animal populations by sterilisation A36 Destroying the habitat of endangered animal species A37 Destroying the habitat of non-endangered animal species to develop and promote urbanisation or crops to feed humans |
| 8 Societal attitudes towards animals | A38 Sacrific of animals in religious rites A39 Considering some animal species as sacred or good luck symbols or totems A40 Considering some animal species as evil or bad luck A41 Parents displaying cruel treatment of animals in front of their children A42 Inflicting pain or injury on animals as part of cultural tradition A43 Cloning animals for human benefit |

Table 2 Short descriptions of major world social issues included in the survey.

| |
|--|
| W1 Animal protection |
| W2 Professional ethics |
| W3 Capital punishment |
| W4 Environmental protection |
| W5 Racial equality |
| W6 Genetic engineering |
| W7 Equality for lesbian, gay, bisexual and transgender |
| W8 Human cloning |
| W9 Human euthanasia |
| W10 Reducing poverty |
| W11 Sustainable development |
| W12 Womens' rights |
| W13 Peace and security |

respondents to use extreme scores, compared to respondents from European countries. One source of error was detected from a graph of Euclid distance of sentience levels of different animal species to the mean (Meng 2009). Some respondents clearly rated animals in reverse order for sentience levels by mistake, and responses were reversed. The removal of respondents that had insufficient time to complete the questionnaire adequately was rejected after careful scrutiny of the data.

The differences in the number of respondents from the various countries, of each gender, meat consumption or reasons for meat avoidance category that indicated each level of support for APOs were tested by Chi-squared test. Contributions to the Chi-squared statistic are provided for individual cells specifying meat consumption category and the reasons for meat avoidance. Consumption of meat types was compared with APO support level by binary logistic regression, with a logit-link function and APO support level as a covariate. A Mood median test compared monthly expenditure (US\$) for the four levels of APO support, after residuals from linear models proved to be not normally distributed.

Responses to the 43 Animal issues were subjected to a Principal Component Analysis with Varimax rotation that weighted sample size for each country and included all variables with loadings ≥ 0.20 (Meng 2009). This identified seven indices that represented views on Animal welfare, Animal rights, Unnatural practices on animals, Killing animals, Animals in experimentation, Wildlife and Animals as spiritual symbols (indices are adopted from Meng [2009], but renamed for greater clarity). The formulae for creating the index scores from the 1–5 rating by each respondent for the acceptability of each issue (see Table 1 for text) are presented in Table 3 (listing the issues in declining order of importance for each index).

For negative variables included in the indices, a high index score meant a low level of acceptability of the issue, whereas for positive variables, which are in a minority, a high index score meant a high level of acceptability. A similar factor analysis was conducted for the World issues that summarised attitudes to these issues in one value, containing the issues listed in Table 3, in order of declining importance. The association between support for APOs and individual World issues was tested using ordinal logistic regression, with a logit-link function and world issues as covariates.

Binary logistic regression, ANOVA, and Chi-squared analyses were compared in terms of their effectiveness for modelling the index scores, which comprised the dependent variables. Both binary logistic regression and ANOVA gave similar and more discriminating results than Chi-squared and the data either approximated a normal distribution or could be manipulated to a normal distribution, hence ANOVA was selected for its flexibility for modelling the data.

Following an initial analysis, the residual data distribution was examined and where necessary transformed to approximate a normal distribution. This was only required for one variable, the Animal welfare index, and a squared function gave the necessary approximately normal distribution. The dependent variables entered into the model included level of support for animal protection organisations, nation, ethnic group (nested within nation), gender, level of education, area of study, place of residence, religious affiliation, food avoidance and reasons why food was avoided. *Post hoc* pair-wise comparisons were conducted using uncorrected Student's *t*-test statistic. Tukey's correction and Fisher Least Significant Difference test were evaluated and found to be inappropriate because of being insufficiently robust for different-sized groups and insufficiently stringent, respectively.

Responses to ranking of sentience were examined for distribution of residuals following an analysis of variance using the model described above, and this followed an approximately normal distribution. All analyses were conducted using the statistical packages Minitab 15 and SPSS 15.

Results

Demographics

A total of 3,433 of the 3,462 respondents answered the question about APO support. Of these, 43% ($n = 1,531$) said that they had supported APOs. Of the 3,433, 36% ($n = 1,233$) said that they supported APOs sometimes and 6% ($n = 214$) said very often, and a further 2% ($n = 84$) self-identified themselves as key members. The highest level of support existed in Great Britain, then Sweden and then Norway, with approximately two-thirds of students supporting APOs at some level (Table 4); Iran had a relatively large number of key members, whereas South Korea had the smallest number ($P < 0.001$).

Female students were more likely at all levels to offer support than males (Table 5). Respondents that identified themselves as key members of APOs had greater expenditure than the other respondents (monthly expenditure, US\$, No support 404, Sometimes 423, Very often 495 and Key members 770; Chi-squared 24.7, $P < 0.001$).

Table 3 Animal indices and the corresponding Animal issues from which they were formulated, and the World issues index, with the corresponding world issues from which it was formulated.

| Index title | Equation | R ² |
|--------------------------------|--|----------------|
| Animal rights | 104 – 2.6 A8 – 2.4 A1 – 1.9 A12 – 1.8 A3 – 1.6 A13 – 1.6 A10 – 1.6 A5 – 1.5 A4 – 1.2 A9 – 1.1 A7 – 0.8 A2 | 16.9 |
| Animal welfare | 98.8 – 6.2 A18 – 5.2 A13 – 4.3 A17 – 2.7 A12 + 2.5 A2 – 1.6 A9 – 0.5 A5 | 15.9 |
| Unnatural practices on animals | 116 – 4.0 A28 – 3.9 A30 – 3.4 A27 – 3.0 A31 – 2.5 A3 – 2.2 A7 – 2.3 A36 – 1.9 A8 + 1.9 A12 + 1.9 A10 – 1.7 A2 | 10.1 |
| Killing animals | 107 – 3.6 A14 – 3.4 A22 – 3.1 A11 – 3.1 A4 – 2.8 A15 + 2.6 A36 – 2.3 A32 – 2.2 A8 – 2.0 A1 – 2.0 A12 + 2.0 A20 | 9.3 |
| Animals in experimentation | 115 – 5.2 A24 – 4.0 A26 – 3.5 A23 + 3.3 A36 + 2.2 A8 + 2.2 A30 + 1.9 A37 – 1.9 A43 – 1.8 A33 – 1.8 A1 + 1.7 A18 | 6.7 |
| Wildlife | 92 – 4.9 A37 – 4.4 A33 – 4.1 A36 – 3.2 A34 + 2.7 A22 – 2.6 A16 + 2.2 A14 – 2.0 A20 + 1.9 A25 – 1.8 A2 – 1.8 A9 | 6.2 |
| Animals as spiritual symbols | 108 – 6.5 A39 – 5.6 A40 – 4.9 A2 – 3.1 A6 – 2.3 A42 – 2.2 A9 – 1.8 A23 + 1.8 A23 + 1.8 A29 – 1.8 A38 + 1.5 A35 – 1.3 A28 | 4.0 |
| World issues | 0.17 W4 + 0.16 W10 + 0.16 W11 + 0.16 W12 + 0.16 W5 + 0.15 W13 + 0.15 W1 + 0.15 W2 + 0.1 W7 + 0.09 W3 + 0.09 W6 + 0.08 W9 + 0.04 W8 | 7.9 |

Table 4 Percentage of respondents in the eleven nations that indicated the different levels of support for animal protection organisations.

| Nation | Never (%) | Sometimes (%) | Very often (%) | I am a key member (%) | Number of total responses |
|----------------|-----------|---------------|----------------|-----------------------|---------------------------|
| China | 55.4 | 37.1 | 5.5 | 1.9 | 1,018 |
| Czech Republic | 48.6 | 46.6 | 4.1 | 0.5 | 939 |
| Great Britain | 33.3 | 38.8 | 24.0 | 3.7 | 54 |
| Iran | 51.8 | 27.8 | 12.7 | 7.5 | 133 |
| Ireland | 46.6 | 46.6 | 2.2 | 2.2 | 45 |
| Macedonia | 63.3 | 27.7 | 8.9 | 0.0 | 101 |
| Norway | 36.0 | 50.5 | 9.1 | 4.2 | 261 |
| Serbia | 71.9 | 21.7 | 4.8 | 1.4 | 207 |
| South Korea | 88.0 | 10.6 | 0.9 | 0.3 | 309 |
| Spain | 76.7 | 15.9 | 4.2 | 3.0 | 163 |
| Sweden | 33.9 | 36.4 | 17.2 | 12.3 | 203 |

Chi-squared *P*-value < 0.001.

Animal and World indices

Students that said that they very often supported APOs or that they were key members had higher scores on the Animal welfare index than those that never or only sometimes supported APOs, indicating greater concern (Table 6). In relation to the Animals in experimentation index there was a progressive increase in score, and therefore concern, with increasing level of support for APO. The World issues score was greater, indicating more concern, for students offering support for APOs than students that had never supported them, but there was no effect of level of support on the score (Table 6). The World issues that significantly related to APO support level were animal protection, Odds ratio (OR) 0.70, *P* < 0.001; environmental protection OR 0.87, *P* = 0.01;

Table 5 The percentage of male and female respondents that indicated different levels of support for animal protection organisations.

| Supporting level of the animal protection organisation | Female (%) | Male (%) |
|--|------------|----------|
| Never | 50 | 62 |
| Sometimes | 39 | 32 |
| Very often | 7 | 5 |
| I am a key member | 3 | 2 |
| Total number of responses | 1,902 | 1,530 |

Chi-squared *P*-value < 0.001.

Table 6 The effects of level of support for animal protection organisations on mean unacceptable values for indices relating to Animal welfare, Animal rights, Unnatural practices on animals, Killing animals, Animals in experiments, Wildlife, Using animals as spiritual symbols and World issues. High index values indicate low levels of acceptance.

| | Animal (Animal welfare welfare)* | Animal rights | Unnatural animal practices | Killing animals | Animals in experimentation | Wildlife | Animals as spiritual symbols | World issues | |
|-------------------|----------------------------------|--------------------|----------------------------|-----------------|----------------------------|-------------------|------------------------------|--------------|------------------|
| Never | 79.9 | 6,492 ^b | 62.1 | 67.5 | 50.7 | 67.3 ^d | 57.4 | 52.6 | 8.9 ^b |
| Sometimes | 80.5 | 6,564 ^b | 62.4 | 66.9 | 50.2 | 69.6 ^c | 58.1 | 53.0 | 9.3 ^a |
| Very often | 83.3 | 7,021 ^a | 64.0 | 66.5 | 51.9 | 71.8 ^b | 58.2 | 52.9 | 9.4 ^a |
| I am a key member | 83.9 | 7,065 ^a | 64.7 | 67.4 | 48.5 | 74.8 ^a | 59.6 | 53.4 | 9.3 ^a |
| SED | | 70.8 | 0.45 | 0.81 | 0.65 | 0.68 | 0.63 | 0.70 | 0.06 |
| P-value | | 0.002 | 0.16 | 0.92 | 0.46 | 0.001 | 0.70 | 0.98 | < 0.001 |

Means with different superscripts differ significantly by $P < 0.05$ by uncorrected Student's *t*-test.

* Squared values of scores on the Animal welfare index, to provide normally distributed residuals.

Table 7 Perceptions of relative sentience in specified animals by students with different levels of support for animal protection organisations. High values indicate high levels of attributed sentience.

| | Human infant | Chimp | Dog | Dolphin | Cat | Horse | Cattle | Pig | Rat | Chicken | Octopus | Fish |
|-------------------|-------------------|-------|------|---------|------|-------|--------|------|------|---------|---------|------|
| Never | 10.5 ^a | 9.7 | 9.3 | 8.7 | 8.9 | 7.7 | 4.7 | 5.4 | 4.9 | 3.7 | 2.5 | 2.1 |
| Sometimes | 10.1 ^a | 9.3 | 9.4 | 8.8 | 9.0 | 7.6 | 4.7 | 5.4 | 5.0 | 3.9 | 2.5 | 2.4 |
| Very often | 10.3 ^a | 9.4 | 9.4 | 8.8 | 9.0 | 7.7 | 4.6 | 5.5 | 5.1 | 3.7 | 2.2 | 2.3 |
| I am a key member | 9.4 ^b | 9.6 | 9.0 | 9.0 | 8.5 | 7.6 | 5.0 | 5.9 | 4.5 | 4.1 | 3.3 | 2.1 |
| SED | 0.13 | 0.12 | 0.09 | 0.13 | 0.10 | 0.10 | 0.10 | 0.11 | 0.12 | 0.10 | 0.11 | 0.11 |
| P-value | 0.03 | 0.10 | 0.70 | 0.90 | 0.63 | 0.92 | 0.75 | 0.62 | 0.51 | 0.29 | 0.08 | 0.13 |

Means with different superscripts differ significantly by $P < 0.05$ by uncorrected Student's *t*-test.

genetic engineering OR 1.12, $P < 0.001$; equality for lesbian, gay, bisexual and transvestites OR 0.95, $P = 0.04$; womens' rights OR 0.93, $P = 0.05$; and peace and security OR 0.83, $P < 0.001$. Odds ratios below 1 indicate that increased support for APOs was associated with increased concern and those more than one were associated with reduced concern, so the greatest increase in concern with level of support for APO was for animal protection, then peace and security and environmental protection. Attitudes towards professional ethics, capital punishment, racial equality, human cloning and euthanasia, reducing poverty and sustainable development were not significantly related to APO support level ($P > 0.05$).

Animal sentience and keeping pet animals

Students that identified themselves as key members of APOs had a lower perception of the sentience level of human infants than respondents less closely involved in APOs or not involved with them ($P = 0.03$) (Table 7). Students that had never supported APOs had the shortest proportion of their life with pets; those that supported APOs very often or were key members had the highest proportion and those that sometimes

supported APOs were intermediate (means Never 0.33^c, Sometimes 0.40^b, Very often 0.47^a and Key member 0.50^a proportion of life spent with pets; P -value < 0.001 , different superscripts are significantly different by Student's *t*-test, Standard Error of the difference between two means = 0.0054, $P < 0.05$).

Avoidance and consumption of animal products

Students that identified themselves as key members of APOs were more likely to be vegans, with the second largest contribution to the overall χ^2 value, than those offering less or no support to APOs (Table 8). Vegetarianism increased in direct proportion to level of support for APOs. Those that had never supported APOs were most likely to indicate that they had no avoidance of meat. In addition, those who identified themselves as regular supporters of APOs or key members were less likely to say that their health was the reason for meat avoidance and more likely to say that it was because of animal suffering (Table 9). As level of APO support increased respondents consumed less pork and poultry, and to a lesser extent, less beef/veal (Table 10).

Table 8 The effects of level of support for animal protection organisations on the number and percentage of respondents indicating meat avoidance, or that they were vegetarian or vegan. Within each cell, the left and right values represent the number and percentage of respondents, respectively, and the contribution to the χ^2 value is below.

| | No meat avoided (No/%) χ^2 | Some meats avoided (No/%) χ^2 | Vegetarian (No/%) χ^2 | Vegan (No/%) χ^2 | Total |
|-------------------|------------------------------------|---------------------------------------|-------------------------------|--------------------------|-------|
| Never | 1,037/54.2 15.2 | 848/44.3 4.1 | 27/1.4 33.8 | 3/0.2 3.4 | 1,915 |
| Sometimes | 542/43.6 4.9 | 634/51.1 3.3 | 62/5.0 2.4 | 4/0.3 0.4 | 1,242 |
| Very often | 62/28.3 17.7 | 118/53.9 1.9 | 36/16.9 87.4 | 2/0.9 1.0 | 218 |
| I am a key member | 20/23.3 11.0 | 44/51.2 0.3 | 16/18.6 44.1 | 6/7.0 85.0 | 86 |

Pearson $\chi^2 = 315.9$, $df = 9$; $P < 0.001$.**Table 9** The effects of level of support for animal protection organisations on the number and proportion of respondents that indicated the reason for avoiding animal products. Within each cell, the left and right values represent the number and row percentage of respondents, respectively, and the contribution to the χ^2 value is below.

| | Animal suffering(No/%) χ^2 | Environment (No/%) χ^2 | Religious instruction (No/%) χ^2 | My health(No/%) χ^2 | Total |
|-------------------|------------------------------------|--------------------------------|--|-----------------------------|-------|
| Never | 195/33.4 6.7 | 90/15.4 0.3 | 34/5.8 0.5 | 265/45.4 7.8 | 584 |
| Sometimes | 216/41.9 0.4 | 92/17.9 0.7 | 23/4.5 0.5 | 184/35.7 0.9 | 515 |
| Very often | 75/57.3 9.4 | 21/16.0 0.01 | 6/4.6 0.1 | 29/22.1 8.9 | 131 |
| I am a key member | 27/58.7 3.9 | 6/13.0 0.3 | 3/6.5 0.2 | 10/21.7 3.3 | 46 |

Pearson $\chi^2 = 43.9$, $df = 9$; $P < 0.001$.**Table 10** The relationship between consumption of animal products (ratio of those consuming the product: those avoiding the product) and the level of support for animal protection organisations.

| | Beef/veal | Lamb | Pork | Poultry meat | Eggs | Milk | Seafood |
|---------------------------|-----------|-------|---------|--------------|-------|-------|---------|
| Never | 1.08 | 0.28 | 2.17 | 3.35 | 4.35 | 2.83 | 0.75 |
| Sometimes | 0.75 | 0.24 | 1.44 | 2.03 | 3.89 | 3.04 | 0.72 |
| Very often | 0.53 | 0.21 | 0.67 | 1.32 | 3.85 | 3.62 | 0.76 |
| Key member | 0.67 | 0.29 | 0.47 | 1.17 | 3.41 | 4.33 | 0.56 |
| Total number of responses | 1,869 | 2,020 | 2,020 | 1,869 | 2,020 | 2,020 | 2,020 |
| Odds ratio | 0.77 | 0.93 | 0.59 | 0.65 | 0.94 | 1.11 | 0.95 |
| P-value | < 0.001 | 0.32 | < 0.001 | < 0.001 | 0.42 | 0.14 | 0.37 |

Discussion

In the present study, almost 9% of the students identified themselves as 'a key member of the APOs' or supported APOs 'very often'. However, there were considerable differences between countries. Strong support for APOs in Sweden has also been identified by Hagelin *et al* (2000), who found that 40% of Swedish veterinary students identified themselves as animal rights activists. In Great Britain the animal rights movement was pioneered in the 19th and 20th centuries (Ryder 1989), and therefore the strong support for APOs by British students was expected. In Iran there was less general support for APOs but a greater number of key members than most countries, a symptom perhaps of the active reformist movement in that country (Katiri 2005). South Korean students had one of the lowest levels of concern for animal welfare and rights in this international survey (Phillips *et al* 2012), hence the low APO participation was expected.

Historically, various studies have showed that females display a more zoocentric attitude than males to the use of animals and are more likely than males to oppose the use of animals in research, experiments, sport and as food (Plous 1991; Herzog 1993; Jasper & Poulsen 1995; Galvin & Herzog 1998; Einwohner 1999; Lowe & Ginsberg 2002). It is for this reason that females were more likely to identify as supporters of APOs, as found in the study of American activists by Plous (1991). One of the other key influences is likely to be students' experiences of keeping animals, which has been identified as affecting attitudes to animals in previous studies (Furnham & Pinder 1990; Driscoll 1992; Furnham & Heyes 1993; Paul & Serpell 1993; Wells & Hepper 1997; Izmirlı & Phillips 2012). Supporting our results, Paul and Serpell (1993) found that membership of animal welfare organisations was associated with pet keeping during childhood. We chose to use years of pet keeping, corrected for the respondents' age, as the predictive variable, allowing for a more quantitative assessment than just whether the students had grown up with pets or not. Paul and Serpell (1993) also reported that pet keeping during childhood increased the likelihood of membership of organisations that were concerned with conservation and the environment. Furthermore, they describe how the development of concerns for animal and human welfare have been postulated to be related by humane educationalists writing over at least the last few hundred years, although in their own study they only found a weak link, and only in males. Our finding that supporters of APOs avoided certain animal products primarily because of their concern for animal suffering, rather than their own health, supports their greater affiliation with animals relative to humans than those who did not support APOs. The fact that pork, and to a lesser extent poultry meat, were the meats most likely to be avoided by APO supporters is probably due to the intensive nature of production systems for these animals, compared with those for sheep, for example.

According to a study of 27 women animal rights activists, more than 90% identified themselves as vegan/vegetarian (Gaarder 2008). In our study, we found that 26% of students

that self-identified as key members of APOs were vegan/vegetarian; a percentage that is less than other studies (63%: Plous 1991; 66%: Lowe & Ginsberg 2002). This may be due to the interpretation of APO by respondents, which could be anything from conservation-focused or animal care groups to militant animal rights organisations. However, in our study as a whole, only 4% of the university students were either vegan or vegetarian (Izmirlı & Phillips 2011).

The increased level of concern for world social issues in respondents that were supporters of APOs suggests that they are generally highly empathetic people. This link between APO support level and World issues was stronger than for some animal indices, demonstrating that the concern of supporters for animals was focused on animal welfare and animals in experiments, and that there are strong and widespread principles in those supporting APOs. The specific World issues that were of concern confirm that animal protection was the primary interest, but the environment, peace and security were also major issues. Reduced concern for genetic engineering in APO supporters suggests supporters are progressive and open to new technology.

We acknowledge that interpretation of the term 'animal protection organisation' may have differed between individual respondents. However, we believe that this was unlikely to introduce a systematic bias as varied interpretations, if they existed, were likely to have been across the factors and covariates tested for association. We acknowledge that our inability to effectively model the effect of dependent variables on monthly expenditure means that the non-parametric relationship tested may have been influenced by other variables than level of APO support. Nevertheless, if key members of APOs really do have increased disposable income, this further supports the evidence for a relationship between concern for animals and level of disposable income that we have suggested previously (Phillips *et al* 2012).

Animal welfare implications

Understanding the characteristics of the people that support animal protection organisations is important because they have a major role in shaping the organisations themselves, which do much to influence both government policy towards animals and public attitudes towards animals. Our research demonstrates that such people have significant concerns, not just about animals, but about similar world justice issues such as peace, security, and the environment. They were not afraid of development, having less or the same concern about scientific advances, including cloning and genetic engineering. However, their concerns influenced their meat-eating habits, in particular reducing consumption of intensively produced meat, which has become a focus for many APOs.

Conclusion

Students in Eurasian universities that self-identified as supporters of APOs had more concern for both animal and World social issues than those that did not support APOs. This was associated with a reluctance to consume animal

products from pigs and poultry, the most intensively kept animals. Probable drivers of their attitudes included gender and pet keeping. Support for animal protection organisations was therefore an indicator of concern for animals and other social issues, as well as animal product consumption habits.

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