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Cox, Laura; Montrose, V. Tamara

Published in:
Journal of Animal Ethics

Publication date:
2016

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[10.5406/janimalethics.6.1.0044](https://doi.org/10.5406/janimalethics.6.1.0044)

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Citation for published version (APA):
Cox, L., & Montrose, V. T. (2016). How Do Human-Animal Emotional Relationships Influence Public Perceptions of Animal Use? *Journal of Animal Ethics*, 44-53. <https://doi.org/10.5406/janimalethics.6.1.0044>

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The original publication is available at <http://dx.doi.org/10.5406/janimaethics.6.1.0044>

How do Human-Animal Emotional Relationships Influence Public Perceptions of Animal
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Laura Cox and V. Tamara Montrose

Hartpury College

The final version of this article was published in the Journal of Animal Ethics and can be
accessed at <http://dx.doi.org/10.5406/janimaethics.6.1.0044>

Author Note

Corresponding author: Laura Cox. *E-mail address:* Laura.Cox@hartpury.ac.uk.

Abstract

Human-animal emotional relationships have a complicated interplay with public perceptions of the morality of animal use. Humans may build emotional relationships with companion species. These species are not usually intensively farmed in the United Kingdom, but may be utilised during animal experimentation. From a relational ethical standpoint, the public may therefore perceive animal experimentation as being less acceptable than intensive farming. This study aimed to determine whether human-animal emotional relationships affect public attitudes regarding use of animals in intensive farming and research. Responding to an online questionnaire, British citizens (N = 85) rated their agreement with 20 statements relating to their acceptance of intensive farming and animal experimentation; scientific research involving a given species (e.g. an animal which either is or is not typically associated with the companion context); killing free-living animals; and consuming animals existing within companion and farming contexts. Positive correlations were found between public acceptance of intensive farming and animal experimentation, such that acceptance of animal experimentation corresponded with acceptance of intensive farming practices. This finding disproved our theory that the British public may perceive animal experimentation as less acceptable than intensive farming due to the use of companion species in scientific research. Public acceptance of animal experimentation also did not significantly differ between that involving companion or non-companion species. However, respondents were more accepting of the consumption of a typical farmed animal raised for meat purposes than consuming the animal if it had been raised in a companion context, or consuming a typical companion species raised in either a farmed or companion context. These findings illustrate that the

human-animal relationship can influence (but only to a degree) public perceptions of the morality of animal use.

Keywords: relational ethics, human-animal interactions, public attitudes, animal use

How do Human-Animal Emotional Relationships Influence Public Perceptions of Animal Use?

Perceptions regarding acceptable treatment of animals vary and affect an individual's tolerance of practices such as animal experimentation and agriculture (Regan, 2001). Factors influencing these perceptions include human-animal relationships (Engster, 2006; Gheaus, 2012; Palmer, 2010); perceptions of the animal's ability to suffer (Dawkins, 2008); and the individual's utilitarian principles (Morris, 2000). Basing acceptable animal treatment on these factors may cause a disconnect between perceived animal sentience and how the animal is actually treated; for example rats are capable of suffering (Balcombe, 2010), possess metacognition (Foote & Crystal, 2007), and demonstrate episodic-memory (Babb and Crystal, 2006; Naqshbandi, Feeney, McKenzie & Roberts. 2007). These abilities suggest that rats possess sentience and cognitive abilities (Jones, 2013; Kirkwood & Hubrecht, 2001; Kornell, 2009), yet elimination of free-living rats is widely accepted (Bell, 2011; Kanai et al., 2012; Lock, 2006).

In care ethics, an attitude within the relational ethical standpoint, morality is considered according to human-animal affective relationships (Palmer, 2010) and necessitates the protection of companion animals as these animals depend on humans and satisfy human emotional needs (Gheaus, 2012). For instance, canine welfare may be prioritised over the welfare of rodents and farmed animals due to dogs being more commonly kept as companions in comparison to rodents and typical farmed animals such as swine (Pet Food Manufacturers' Association [PFMA], 2013; Trower, 2013). Considering that public attitudes regarding animal wellbeing can elicit animal protection laws (María, 2006), basing

acceptable animal treatment on human-animal emotional relationships may interfere with some species achieving optimal welfare. The UK Animals (Scientific Procedures) Act, (1986) for instance prohibits experimentation utilising dogs if alternative animals such as swine or rodents may be utilised. However, both pigs and dogs demonstrate positive and negatively valenced emotional states (Burman et al., 2011; Douglas, Bateson, Walsh, Bédoué, & Edwards, 2012; Mendl et al., 2010; Reimert, Bolhuis, Kemp & Rodenburg, 2013). Thus, both animals are capable of experiencing subjective affective states and can be perceived as displaying sentience despite the disparity in the above legislation (Burman et al., 2011; Kirkwood & Hubrecht, 2001; Reimert, Bolhuis, Kemp & Rodenburg 2013).

Animal experimentation commonly encounters controversy (Festing & Wilkinson, 2007) while farm animal practices traditionally encounter less disapproval (Fraser, 2005). This may be due to the affective connections that humans build with companion but not farmed animals. Typically, companion animals including dogs can be involved in animal experimentation (Cooke, 2011; Fraser, 2005; Wolfensohn & Lloyd, 2013). Similarly whilst consuming a dog would elicit distress in Western individuals this disgust is not commonly evident when food is derived from an animal perceived as a farmed creature such as a cow (Joy, 2010; Rakhyun, 2008; Trower, 2013). Thus, there is a need to investigate how humans emotionally relate to animals to identify situations where relationships may influence animal treatment and use, such as within the fields of scientific research and agriculture.

The project aimed to establish if human-animal emotional relationships affect public attitudes regarding use of animals in intensive farming and research. Its objectives were (a) to investigate if there is a relationship between the perceived morality of intensive farming and the use of animals within research, (b) to determine if attitudes towards intensive farming and animal experimentation are affected by perceptions regarding benefits for humankind, animal suffering or human-animal emotional relationships and (c) to identify if acceptance of animal

experimentation changes depending whether the species involved is a typical companion animal.

Method

Participant Recruitment

Eighty-Five British individuals (mean age 34.8; range 18-70) participated in this quantitative study which was conducted via online questionnaire. Of these respondents seventy-four individuals provided information upon companion animal keeping. 90.5% (n = 67) kept at least one companion animal. Amongst these participants, 51% (n = 38) kept rabbits, 43% (n = 32) kept dogs, 41% (n = 30) kept cats, 12% (n = 9) kept hamsters, 9% (n = 7) kept rats and 27% (n = 20) kept other companion animals.

The project was questionnaire based, the questionnaire designed using the online tool *SurveyMonkey*®, enabling it to be distributed online via hyperlink. Public engagement with questionnaires can be problematic (Vollum, Buffington-Vollum & Longmire, 2004) and offering monetary rewards can encourage replies (Bryman & Bell, 2011). Thus, respondents wishing to be included were entered into a random prize draw to win a £20 Amazon.co.uk voucher.

The questionnaire hyperlink was posted on social networking websites *Facebook*® and *Twitter*®, and respondents were recruited via convenience sampling and snowball sampling (Bryman & Bell, 2011; Sarantakos, 2005). Participants were required to be over the age of 18 and no identifying personal data were collected. Participants were reassured that all responses were voluntary, data remained anonymous, and all information collected was held securely. Participants provided informed consent (Data Protection Act, 1998). The study was approved by the Institutional Research Ethics Committee.

Questionnaire Design

The questionnaire contained three sections. Part one investigated respondents' views on animal experimentation and intensive farming. Participants ranked their acceptance of intensive farming and animal experimentation; their perception of how essential each practice is for humans; and their perception of farm and research animal welfare (Table 1). Questions were adapted from previous research regarding public perception of animal use in zoo, research and farm contexts (Henry & Pulcino, 2009; Vanhocker et al., 2010). For all statements participants were asked to rate their agreement on a 10-point Likert-type scale ranging from 1 (indicating they did not feel the practice was acceptable or essential to mankind, or that welfare could not be worse) to 10 (indicating that the practice was viewed as entirely acceptable or essential for mankind or that welfare could not be better).

Part two determined the influence of human-animal relationships on perceived morality of animal use and treatment. Respondents ranked on a 10-point Likert-type scale their acceptance of scientific experimentation involving dogs, cats, rabbits, mice, rats, pigs and nonhuman primates, their tolerance of the killing of free-living rats, mice and rabbits (modified from Austin, Deary, Edward-Jones, & Arey, 2005), and their acceptance of consuming a companion dog, a dog bred and raised for meat purposes, a companion pig and a pig bred and raised for meat purposes (Table 1). For all these statements a 10-point Likert-type scale was used ranging from 1 (indicating entire disagreement with the practice) to 10 (indicating entire agreement).

Part three gathered demographic details. Information on companion animal keeping habits, age and region of respondents were collected.

Statistical Analysis

For part one of the questionnaire, relationships between respondents' views towards animal experimentation and intensive farming were analysed using Spearman's rank

correlation tests. For part two, the Kruskal-Wallis test was used to identify if acceptance of animal use differed between the given species. Where significant results were found, post hoc Mann-Whitney U tests compared responses between questions to identify which groups varied. A Bonferroni correction with a significance level set at .003 was used to minimize likelihood of type I errors. Finally, Spearman's rank correlation tests were performed to identify if perceptions of acceptable animal treatment and use differed according to the animal's perceived context for instance either as a companion, free-living or farmed animal. All analyses were carried out in SPSS (version 21.0, SPSS Inc., 2012).

Results

Part 1: Attitudes Regarding Intensive Farming and Animal Experimentation

There were significant positive correlations found between acceptance of animal experimentation and intensive farming ($r_s = 0.408$, $N = 85$, $p < .001$), acceptance of intensive farming and the belief that intensive farming is beneficial for mankind ($r_s = 0.866$, $N = 85$, $p < .001$), acceptance of intensive farming and the belief that intensively farmed animals have high welfare ($r_s = 0.687$, $N = 85$, $p < .001$), acceptance of animal experimentation and the belief that the use of animals in research is beneficial for mankind ($r_s = 0.859$, $N = 85$, $p < .001$), and acceptance of animal experimentation and the belief that research animals have high welfare ($r_s = 0.781$, $N = 85$, $p < .001$).

Median ranks for the acceptance of intensive farming was 3, acceptance of animal experimentation was 4, perception of benefits of intensive farming for mankind was 3, perception of benefits of animal research for mankind was 5, perception that intensive farmed animals have high welfare was 2, and perception that research animals have high welfare was 3.

Part 2: Acceptance of Animal Use and Treatment

Acceptance of the Use of Specific Species for Scientific Research and Food Consumption

No significant difference between acceptance of experimentation utilising dogs, cats, rabbits, mice, rats, pigs and nonhuman primates was found ($X^2_2 = 4.404$, $n_1 = 79$, $n_2 = 79$, $n_3 = 79$, $n_4 = 79$, $n_5 = 79$, $n_6 = 79$, $n_7 = 79$, $p = .622$).

There was a significant difference between acceptance of the use of specific species in different contexts for consumption and in research ($X^2_2 = 44.171$, $n_1 = 79$, $n_2 = 79$, $n_3 = 79$, $n_4 = 79$, $n_5 = 79$, $n_6 = 79$, $p < .001$). Post hoc Mann-Whitney U tests with a Bonferroni correction found significant differences between acceptance of eating pigs bred and raised for meat (Median=8) and eating dogs bred and raised for meat (Median=2) ($U = 1692.000$, $n_1 = 79$, $n_2 = 79$, $p < .001$); acceptance of eating pigs bred and raised for meat (Median=8) and eating companion dogs which had died naturally (Median=1) ($U = 1589.000$, $n_1 = 79$, $n_2 = 79$, $p < .001$); acceptance of eating pigs bred and raised for meat (Median=8) and eating companion pigs which had died naturally (Median=3) ($U = 2069.500$, $n_1 = 79$, $n_2 = 79$, $p < .001$); acceptance of eating pigs bred and raised for meat (Median=8) and using dogs in research (Median=3) ($U = 1725.000$, $n_1 = 79$, $n_2 = 79$, $p < .001$) and acceptance of eating pigs bred and raised for meat (Median=8) and using pigs in research (Median= 4) ($U = 1907.000$, $n_1 = 79$, $n_2 = 79$, $p < .001$).

Acceptance of Animal Use or Treatment According to Human-Animal Interaction

Significant positive correlations were found between acceptance of poisoning free-living rats and use of rats in research ($r_s = 0.669$, $N = 79$, $p < .001$), acceptance of eating a companion dog and companion pig, both of which have died naturally ($r_s = 0.793$, $N = 79$, $p <$

.001), acceptance of eating a companion dog which has died naturally and eating a dog bred and raised for meat purposes ($r_s = 0.640$, $N = 79$, $p < .001$), acceptance of eating a dog and pig bred and raised for meat purposes ($r_s = 0.463$, $N = 79$, $p < .001$), acceptance of controlling free-living rabbit populations using snare traps and using rabbits in research ($r_s = 0.536$, $N = 79$, $p < .001$), acceptance of using mice in research and poisoning free-living mice ($r_s = 0.634$, $N = 79$, $p < .001$) and acceptance of eating a companion pig which has died naturally and a pig bred and raised for meat purposes ($r_s = 0.304$, $N = 79$, $p = .007$).

Median ranks for acceptance of use of dogs in research was 3; acceptance of rabbits in research was 3, acceptance of mice in research was 4, acceptance of rats in research was 4, acceptance of pigs in research was 4, acceptance of poisoning free-living rats was 5, acceptance of poisoning free-living mice was 5, acceptance of eating companion dogs which had died naturally was 1, acceptance of eating dogs bred and raised for meat was 2, acceptance to eat a companion pig which had died naturally was 3, acceptance of eating pigs bred and raised for meat was 8 and acceptance of controlling free-living rabbit populations using snare traps was 1.

Discussion

Part 1: Attitudes Regarding Intensive Farming and Animal Experimentation

This study aimed to determine if public attitudes towards intensive farming and animal experimentation are influenced by human-animal emotional relationships. Surprisingly animal experimentation was not perceived as less moral than intensive farming with acceptance of animal experimentation corresponding with acceptance of intensive farming practices. This suggests human-animal emotional relationships did not influence attitudes towards either practice. If relational ethics stances were influencing public attitudes we would have expected animal experimentation to have been considered less moral than

intensive farming due to the emotive links built among humans and animals such as dogs, cats and rabbits which can be utilised in both research and companion contexts (Gheaus, 2012; Palmer, 2010; Wolfensohn & Lloyd, 2013). Instead respondents' acceptance of intensive farming and animal experimentation corresponded with how they rated animal welfare and how essential they perceived the practices to be for humankind. This finding corresponds to other research which has highlighted how prioritising animal welfare can shape perceptions of animal use in agriculture and animal research (Frewer, Kole, Van De Kroon & De Lauwere, 2005; Knight, Vrij, Bard & Brandon, 2009; María, 2006).

For both animal experimentation and intensive farming, perceived benefits for humankind had a stronger positive relationship with acceptance than the perceived levels of animal welfare. Henry & Pulcino (2009) similarly identified respondents' tolerance of animal experimentation was highest for situations where humans were perceived to receive a substantial health gain and whilst tolerance reduced when levels of adversity inflicted on animals increased, tolerance was higher in situations where human gain was substantial. This finding, alongside that from the current study, suggests that the public may often adopt utilitarian stances regarding their acceptance of animal use (Morris, 2000).

Part 2: Acceptance of Animal Use and Treatment

No difference was found between the acceptance of research using animals commonly or not commonly kept as companions. Considering principles regarding the care ethical standpoint (Gheaus, 2012; Palmer, 2010), this suggests that human-animal emotional relationships did not influence acceptance of research involving each group of species. This suggests that acceptance of animal experimentation would be unlikely to change following greater use of pigs in experimental procedures as opposed to dogs (Swindle, Makin, Herron, Club Jr & Frazier, 2012). Henry & Pulcino (2009) identified that experimentation utilising

dogs and primates was only better tolerated than experimentation utilising mice if the study involving mice researched a mild human pathology and caused mortality to the animal and the study utilising dogs or primates caused no animal adversity irrespective of the pathology researched. Thus, animal welfare and gains obtained from the research influence acceptance of animal experimentation potentially more than species involved. This may account for why respondents in the current study accepted the use of each species in research similarly.

Whilst it can be suggested that under a relationship-oriented care ethical standpoint, the context of the animal (e.g. companion versus free-living, research or farmed animal) would influence perceived acceptable animal use and treatment (Cooke, 2011), this was not found to be the case. Acceptable animal use or treatment in one context (e.g. research, consumption etc) was found to positively correlate with accepted use or treatment of the animal in a different context. Experimentation involving rabbits and killing free-living rabbits was poorly accepted, as was experimentation involving mice and rats and killing free-living mice and rats. Potentially animal welfare and perceived human benefits, which influenced acceptance of animal experimentation and intensive farming, also influenced perceptions regarding animals in alternative situations.

Consuming a farmed pig was perceived as more acceptable than consuming a companion pig, farmed or companion dog or experimentation involving these animals. Within the relationship-oriented care ethical standpoint (Palmer, 2010), harming companion animals including dogs is immoral (Gheaus, 2012), hence this finding indicates that human-animal emotional relationships can influence what is perceived as acceptable animal utilisation. Acceptance did not differ between consuming farmed or companion dogs or using dogs in research, all practices were poorly accepted. Historically dogs are very strongly associated with humans (Galibert, Quignon, Hitte & André, 2011), and are a species with which we tend to have a strong relational bond (Walsh, 2009).

There are limitations to the current study such as the modest sample size and that we did not assess gender, personality or vocation, all of which can impact upon tolerance of animal use and exploitation (Austin, Deary, Edward-Jones & Arey, 2005; Furnham, McManus & Scott, 2003; Henry & Pulcino, 2009; Knight, Vrij, Bard & Brandon, 2009; Phillips et al., 2011). In addition 90.5% of the current study's sample kept companion animals. Personal exposure to companion animals can reduce acceptance of animal agriculture (Boogaard, Oosting & Bock, 2006), experimentation (Yerlikaya et al., 2004) and general interference with animal livelihoods (Ozen et al., 2004) so this may have contributed to their low tolerance of intensive farming and animal experimentation. Nonetheless this study demonstrates that human-animal emotional relationships have a complicated interplay with public attitudes towards animal use. Whilst attitudes towards intensive farming or animal experimentation were more greatly influenced by the perceived benefit for humankind and the welfare of the animals, consumption of a typical farmed animal within a farm context was more accepted than consuming companion animals, or farmed animals in a companion context. These findings serve to illustrate that whilst human-animal emotional relationships may not be promoting discord between the public and the scientific community or increasing tolerance towards intensive farming, the human-animal relationship can influence perceptions of the morality of animal use. Further research into the complexities of human animal emotional relationships and the interaction between factors shaping acceptance of animal use is warranted.

Acknowledgements

The authors wish to thank Alison Wills for her helpful comments upon the manuscript.

Author Biographies

Laura Cox holds a BSc (Hons) in Animal Management from the University of the West of England (Hartpury College), Gloucestershire. Research interests include: animal ethics, animal cognition and animal welfare. Laura.Cox@hartpury.ac.uk.

Dr V. Tamara Montrose is a senior lecturer at Hartpury College. Research interests include: animal ethics, behavioural ecology and animal welfare. Tamara.Montrose@Hartpury.ac.uk.

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Table 1

Statements Relating to Attitudes Regarding Intensive Farming and Animal Experimentation, and Acceptance of Animal Use and Treatment

Part 1: Attitudes Regarding Intensive Farming and Animal Experimentation	
1. How acceptable do you feel it is to intensively farm animals	4. Please indicate your view on how beneficial the use of animals in research is for humankind
2. How acceptable do you feel it is to use animals in scientific research regarding medicine	5. Please indicate your view on the welfare of intensively farmed animals
3. Do you feel intensive farming is beneficial for mankind	6. Please indicate your view on the welfare of animals used in scientific research
Part 2: Acceptance of Animal Use and Treatment	
7. It is acceptable to use dogs in scientific research	14. It is acceptable to kill wild rats using poison
8. It is acceptable to use cats in scientific research	15. It is acceptable to kill wild mice using poison

9. It is acceptable to use rabbits in scientific research	16. It is acceptable to eat a pet dog which died naturally
10. It is acceptable to use mice in scientific research	17. It is acceptable to eat a dog bred and raised specifically for meat purposes
11. It is acceptable to use rats in scientific research	18. It is acceptable to eat a pig kept as a companion which died naturally
12. It is acceptable to use pigs in scientific research	19. It is acceptable to eat a pig bred and raised specifically for meat purposes
13. It is acceptable to use non-human primates in scientific research	20. It is acceptable to control wild rabbit populations using snare traps