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# Exposure to Animal Welfare Regulations Does Not Influence Attitudes Toward Animal Research Procedures

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This study explored whether exposure to facts about the Animal Welfare Act and Animal Welfare Regulations (AWA/AWR) would impact participant's perceptions of a fictitious research scenario using either rats or dogs as subjects. Participants read AWA/AWR facts or generic research facts and then read a research scenario. After, they completed a questionnaire that measured the value of the research proposal and their concern for animal subjects. Participants responded significantly more favorably to the research scenario when rats were used, but exposure to AWA/AWR regulations did not have an impact on their favorability ratings. This finding is contrary to Metzger (2015) who reported knowledge of regulations protecting the welfare of animals in research settings favorably impacted perception toward animal research.

Keywords: animal research, Animal Welfare Act, attitudes

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The fact that some individuals show great concern for the welfare of animals is no recent phenomenon, and perhaps one of the strongest held beliefs of animal welfare advocates is that animals should not be subjected to biomedical and behavioral testing. As with other moral issues, public sentiment ebbs and flows over time, and views on this issue are no different. When Americans were asked about medical testing on animals in 2001, 65% of those responding believed it to be acceptable while only 26% believed it to be morally wrong. The most recent version of the *Moral Issues Poll* shows, however, that a majority of Americans (53%) still believe it acceptable to perform medical testing on animals, but the number of respondents believing it to be morally wrong has climbed to 41% (Gallup, 2016). While those in favor of animal testing still hold the majority, the historical data from this poll indicates that the tide has been, indeed, turning on this issue.

There are likely a multitude of factors, both dispositional and situational, that determine an individual's attitude toward the use of animals in research settings. A voluminous amount of data suggests that females are more sympathetic to animal welfare issues than are males (Eldridge, & Gluck, 1996; Hagelin, Carlsson, & Hau, 2003; Herzog, 2007; Wuensch & Poteat, 1998). Additionally, there is a divide among younger and older respondents on this issue, in that participants aged 18 – 34 years old were much less accepting of medical testing on animals (47%) compared to those 35 – 54 (60%) or 55 and older (61%) (Wilke & Saad, 2013). Other variables that relate to differences in the amount of concern toward animals are the individual's level of empathy (Eckardt Erlanger & Tsytsarev, 2012), political orientation (Furnham & Pinder, 1990), pet ownership (Hagelin, Johansson, Hau, & Carlsson, 2002), and education level (Jerolmack, 2003), among others. Apart from characteristics of the individual who is judging the ethicality of animal research, the respondent's attitude toward the use of animals in research settings is heavily influenced by the type of species used. Henry and Pulcino (2009) reported a 'species effect' in their study, in that their participants responded more favorably to animal research with mice than to animal research using chimps and dogs as research subjects. This result was also reported by Hagelin et al. (2003) in their review of a number of studies that examined similar issues. Thus, it appears that one's attitudes toward animals is multifaceted and is not likely derived from any one single variable. In fact, Takooshian (1988) suggested that one's attitudes toward the use of animals are opinions formed early in life.

Given the many variables that are involved in animal research attitudes, several researchers have suggested the use of debate and discussion of this issue to educate and inform the public on issues surrounding animal research. In an effort to increase participant favorability toward animal research, Gallup and Beckstead (1988) stated "it would seem prudent for us in discussions with students and others to detail the existence of many federal, state, local, and professional codes and regulations that have been enacted to ensure the humane care and treatment of animals used in research" (p. 476). Additionally, Festing (2005) called for researchers to explain their research and the reasons for using animals, as well as the benefits that are derived from such studies in an effort to boost public support for these procedures. Interestingly, Hagelin et al. (2001) reported that students were more accepting of animal research when they had experience with animal research procedures through their college and university coursework. The exact nature of this association was not addressed by Hagelin and colleagues, however. The relationship between education and acceptance of animal research practices could be the result of a greater knowledge of the regulations in place for the protection of research animals, or it could be because of some other unknown factor(s). That is, perhaps those already in favor of animal research

are drawn to university courses in which this type of research is a central component. Related is a study by Saucier and Cain (2006) who reported that people who were supportive of animal research believed, among other factors, that research procedures were well-regulated. Collectively, it appears that participants with greater exposure to animal research procedures, which may increase their knowledge and education regarding these practices, have a greater favorability toward the use of animals in research procedures.

Recently, an empirical test of whether education on animal research issues could be used to sway participant's opinions toward a more favorable view of animal research was reported (Metzger, 2015). The results from study 1 suggested that the general public had very little knowledge of the regulations currently in place that are designed to protect animals in research settings, a finding which confirmed earlier research by Plous (1996). Study 2 then assessed individual's attitudes toward the use of animals in research before exposing participants to either 'generic' research facts or facts related to the Animal Research Act and Animal Research Regulations (AWA/AWR), federal regulations intended to protect the welfare of animals used in a variety of settings including research laboratories. The results of this manipulation revealed that participant attitudes toward animals used in research were significantly more favorable after exposure to the AWA/AWR facts, suggesting that educating people about federal regulations that protect animal research subjects, at least temporarily, reduced their concerns about those practices.

In part based on these findings, the present experiment was conducted to determine if exposure to AWA/AWR facts influenced participant perception of a fictitious research scenario. Whereas Metzger (2015) reported that exposure to AWA/AWR facts lead to higher favorability of animals used in research, the present experiment explored whether educating participants about these federal regulations would influence ratings of a research scenario that described specific details of the procedure. That is, would education about laws protecting animals in research settings translate into more favorability for more specific instances of animal research? It was hypothesized that those participants exposed to AWA/AWR facts would respond more favorably to the research scenario than those participants exposed to generic research facts. Additionally, two research scenarios were created that were identical apart from the animal species used (rats vs. dogs). Given that the species used in research has shown to be important, it was further hypothesized that participants would respond more favorably to the rat scenario than the dog scenario.

## Method

### *Participants*

One hundred ninety seven individuals were recruited to participate in this study through Amazon's Mechanical Turk (MTurk), provided the participants (1) had completed a minimum of 50 successful HITs (Human Intelligence Task), (2) had a HIT approval rate of at least 95%, and (3) were located in the United States. The sample consisted of 102 females and 95 males, and participants had a mean age of 34.03 years ( $SD = 10.65$ ). Every region of the United States was represented with individuals located in 40 different states and the District of Columbia. Thirty-one participants indicated that they had completed high school, 70 had taken some college coursework, and 96 had graduated from a college or university. Participants who completed the study were paid \$0.25 in exchange for their participation. It has been widely reported that samples gathered with MTurk are as reliable

as those gathered in traditional, laboratory settings (Johnson & Borden, 2012; Mason & Suri, 2012).

### *Materials*

The materials used in this study consisted of two sets of research facts: One set of facts consisted of eight statements extracted from the Animal Welfare Act and Animal Welfare Regulations (AWA/AWR) (United States Department of Agriculture, 2013), and one set of facts consisted of generic animal research facts (see Appendix A). Additionally, two research scenarios were created that described a fictitious animal research procedure proposed by a researcher named Dr. Jones. Specifically, the scenario read as follows:

Dr. Jones has proposed an experiment to see if a new drug will improve memory, and it is hoped that this drug will eventually be used in human clinical trials to treat people with Alzheimer's Disease. For her experiment, Dr. Jones will need to use 30 rats. One-half of the rats will receive a daily injection of the drug, while the other one-half of the rats will receive a daily injection of saline. Ten minutes after each injection, the rats will undergo a battery of memory tests. By comparing the results from the first day of drug administration to the last day of drug administration, Dr. Jones hopes to determine if any improvement in memory will occur. There is the possibility that this new drug will produce toxic effects. Therefore, after the last day of the experiment each rat will be euthanized and the liver, kidneys, brain, lungs, and heart will be removed and microscopically examined to determine if any tissue damage is present.

A second scenario was identical, apart from listing "dog" as the research subject as opposed to "rat". Finally, a seven-item questionnaire was created to assess participant's attitude toward the research procedure, with participants rating each item on a 9-point scale with the endpoints being 1 = *strongly disagree* and 9 = *strongly agree* (see Appendix B).

### *Procedure*

Once participants accepted the HIT in MTurk they were directed to a Survey Monkey® page where they read consent documentation before moving on to the study. This was a 2 × 2 between subjects design with one factor the type of research facts participants were exposed to (AWA/AWR vs. Generic) and the other factor the species identified in the research scenario (rat vs. dog). There were an approximately equal number of participants in each of the four cells, ranging from 48 to 52 individuals in each.

Participants were first directed to a demographic page where they provided answers to questions about their gender, age, geographic location, and educational experiences. Then, they were directed to either the AWA/AWR or generic research facts, where they were allowed to read through the facts at their own pace. After, an instruction page told participants that they were going to read a short description of a proposed experiment by Dr. Jones, and that they should read it carefully as they would be asked their opinion of

the proposal after they had finished. As with the research facts, participants were not timed on their reading of the research proposal and could complete this task at their own pace. Finally, participants were given a series of questions that measured their opinion/attitudes toward the proposal. Upon successful completion of this last step, participants were given monetary credit in their MTurk account in exchange for their participation.

## Results

The data for five participants were removed from the analysis as they failed to respond correctly to the last item in the questionnaire. This item was included to check if participants were carefully reading the statements and simply not responding randomly to complete the HIT and be paid. The remaining participant scores on the survey were tabulated, with the scores ranging from a possible low score of 6 (responding ‘strongly disagree’ on each item) to a possible high score of 54 (responding ‘strongly agree’ on each item). An inspection of Appendix B shows that the fifth item on the questionnaire was reverse-coded for the analysis, as ‘strongly agreeing’ to that item indicated more concern for the animals in the research scenario. High scores on the questionnaire were reflective of greater favorability of the research scenario, where low scores reflected less favorable ratings of the scenario.

As the questionnaire was developed for this study, an analysis was first conducted to determine if each of the items measured the same construct. Cronbach’s Alpha was  $\alpha = .89$ , suggesting that the items on the questionnaire did, in fact, measure the same construct. Values between .80 and .90 for this statistic are considered adequate/good (Nolan & Heinzen, 2008).

A  $2 \times 2$  between subjects Analysis of Variance was calculated, which indicated the participants responded significantly more favorably to the research scenario with rats as opposed to dogs ( $F(1,193) = 29.01, p < .01, \eta = .13$ ). There were, however, no significant effects of the type of research facts (AWA/AWR vs. Generic) participants read prior to the scenario ( $F(1,93) = .22, p > .05, \eta = .01$ ) nor an interaction between the two factors ( $F(1,193) = .54, p > .05, \eta = .01$ ). (See Table 1 for means and standard deviations for each of the four cells in this study.) Regardless of whether participants heard the AWA/AWR facts or generic facts, their scores on the research scenario rating were nearly identical.

## Discussion

An examination of the data suggests that participant’s views of the research scenario were not more favorable after reading AWA/AWR facts which provided information about

**Table 1.** Means and standard deviations (in parentheses) for the four conditions in this experiment

	AWA/AWR	Generic
Species		
Rat	20.66 (4.97)	21.52 (4.66)
Dog	17.38 (5.01)	17.18 (5.22)

the federal protection of animals used in research procedures. These findings are contrary to Metzger (2015) who reported that participant attitudes toward animal research were more favorable after exposure to AWA/AWR facts. One important difference between that study and the present findings may be that Metzger reported a shifting in overall attitudes toward animal research, whereas the current study measured participant views on experiment-specific material. The research scenario read by participants in the current study made reference to giving injections of drugs, euthanizing the animals after the experiment, and examining the tissues microscopically. Specific references to practices that are not uncommon in animal research studies but may be uncomfortable for some people to think about may have thwarted any “bump” in favorability ratings by exposing participants to the AWA/AWR facts.

These data do show that participants rated the ‘rat’ research scenario more favorably than the ‘dog’ research scenario, a result that is in line with data reported by Henry and Pulcino (2009). In that study, participants were more favorable to research involving mice than to procedures that involved dogs or chimps (which, incidentally, did not significantly differ from each other). Additionally, Hagelin et al. (2003) reported an overview of research on perception of animal use and stated that, generally, the use of dogs, cats, and nonhuman primates is met with less support than the use of rats, mice, and other rodents. Thus, the species difference reported in the present study is consistent with these findings. The research facts that participant’s read in the present experiment did mention the use of ‘dogs’ and did not mention the use of ‘rats.’ While it is possible that this may have influenced how participants responded to the research scenario, their greater concern with the dog research scenario is likely attributed to the ‘species effect’ that was reported by Hagelin et al. (2009) and Henry and Pulcino (2009).

This experiment sought to demonstrate that educating the general public about federal regulations that protect animals in research settings would create more favorable ratings toward a fictitious research scenario. Research by Petty and Cacioppo (1986) suggest that central routes of persuasion (e.g., presenting the facts of the argument) are more effective than peripheral routes of persuasion (e.g., the characteristics of the source) only when the target is motivated to pay attention. While the last item on the questionnaire was included to make sure the participants were carefully reading the questions related to the research scenario, whether the respondents in this study were truly attending to the research facts presented to them cannot be determined by the procedure used in the current study. Likewise, Petty, Cacioppo, and Goldman (1981) reported that participants were more likely to be swayed by facts and logic if the topic was personally relevant to them. If the topic was of low relevance, participants were more likely to be persuaded by peripheral routes such as the trustworthiness of the source of the message. When participants are, for whatever reason, unable to pay attention to the facts of the message, the peripheral route, rather than the central route, becomes the dominant factor in the persuasive message (Petty & Brock, 1981). Quite clearly, the procedure described in the present study used a factual argument (e.g., presentation of AWA/AWR facts) in an attempt to sway participant’s attitudes to be more favorable toward a fictitious research scenario. It is quite possible that this had no impact on participant attitudes because they (1) found it difficult to pay attention and focus on the message or (2) did not find the argument to be personally relevant. Adding additional questions that measured comprehension of the materials would have been advantageous to determine if participants were, indeed, reading and carefully processing the materials that

were presented to them. Furthermore, it would be interesting to see how the procedure used in the present study would compare to one in which participant attitudes were measured after exposure to an emotional message on the benefit of animal research. That is, might it be more effective to appeal to individual's emotional processes, rather than appeal to participant's rational processes by presenting facts and logical arguments?

One concern with recruiting participants via MTurk is the possibility of recruiting the same individuals for multiple studies. While Amazon boasts that there are 500,000 MTurk 'workers', a recent study by Stewart et al. (2015) reported that, for the average laboratory, the effective size of the MTurk population is approximately 7,300 potential participants. Thus, as Metzger (2015) also recruited participants on MTurk, it is unlikely that many of the current participants also completed that previous study, which could have influenced their performance on the current study. Additionally, Stewart et al. reported an MTurk worker 'half-life' of 7 months. In other words, during each 7 month period one-half of the workers in MTurk have left the MTurk marketplace. As the Metzger (2015) data were collected in the spring of 2014 and the data presented in the current study were collected in the spring of 2016, it is unlikely that these data were compromised by participants taking part in earlier studies that measured similar constructs. Furthermore, each MTurk worker is given an identification number that is can be downloaded when payments are made for completing the HIT. These identification numbers were examined to ensure that the same worker did not participate in the present study more than once.

Outside the context of intentionally attempting to alter people's attitudes toward animal research (as was the case in the present study), there is evidence that world and current events can have a significant impact on individual's attitude toward animal research. Between late 2014 and early 2015 there was a 12 point jump in the attitudes of Americans for the humane use of animals in biomedical research. According to Paul McKellips, executive vice president for the Foundation for Biomedical Research, this "...rise in public opinion support seems to coincide with the arrival of Ebola to American shores and the emergence of a measles outbreak" (Public Support, 2015). Might this increase in animal research support be because those respondents found the health issues (Ebola and measles) personally relevant (Petty et al., 1981)? Does this suggest that fear is a powerful motivator for inducing attitude change? While one may never know the precise reasons why this surge in animal research support occurred, it remains the case that public opinion on this important matter is malleable. Given the recent trend for less public support for animal research (Gallup, 2016), those researchers who conduct experiments with animals might consider ways to increase public support for this enterprise.

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**Appendix A.****AWA/AWR Facts:**

- The Animal Welfare Act and Regulations (AWAR) is legislation enforced by the United States Department of Agriculture to protect research animals from inhumane treatment and neglect. The AWA has been in effect for almost 50 years.
- Species protected by the AWAR include, but is not limited to, monkeys, dogs, cats, and guinea pigs.
- The AWAR requires that an Institutional Animal Care and Use Committee (IACUC) review and approve all proposals for animal use activities.
- The AWAR states that IACUC must include a veterinarian.
- The AWAR requires that procedures avoid or minimize pain and distress to the animal.
- The AWAR states that animals experiencing unrelieved pain or distress be painlessly euthanized.
- The AWAR prohibits research facilities from using stolen animals for research experiments.
- The AWAR allows the IACUC to suspend a research procedure if it the research is not being done in accordance with what was approved.

**Generic Animal Research Facts:**

- Researchers using animals in experiments must follow certain laws and guidelines.
- Species used in research include, but is not limited to, monkeys, dogs, cats, and guinea pigs.
- Animal researchers have a plan (protocol) for the procedures they will do in an experiment.
- Veterinarians work in clinics, private practice, and in industry.
- Animals sometimes experience pain and distress in research experiments.
- The job of a veterinarian is to care for and treat a wide variety of animal species.
- Research facilities purchase animals for experiments from facilities that breed animals specifically for research purposes.
- Animal research facilities are located in medical centers, universities, and for-profit research centers.

**Appendix B.**

Dr. Jones' experiment should be approved:

Dr. Jones' proposed experiment is scientifically justified:

Dr. Jones' experiment will produce important scientific knowledge:

The results of Dr. Jones' experiment will have a direct benefit to humans:

I am concerned about the welfare of the animals in this experiment:

Dr. Jones' proposed experiment is ethical:

Please respond to this question by answering "neutral".

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