

# Cognitive Dissonance in Laboratory Animal Medicine and Implications for Animal Welfare

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People experience cognitive dissonance when they entertain 2 conflicting ideas at the same time. Cognitive dissonance may cause a negative emotional state, which can lead to engagement of compensation mechanisms to resolve the conflict. Here we describe a survey that explores cognitive dissonance in laboratory animal veterinarians and veterinary technicians and various ways in which veterinary staff manage dissonance associated with research animal use. Respondents—164 veterinarians and 145 veterinary technicians—were asked to rate their opinions of various statements on a sliding scale of ‘strongly disagree’ to ‘strongly agree’ or ‘never’ to ‘always.’ Statements assessed negative emotions (discomfort, powerlessness, frustration) and compensation mechanisms (devaluing, emotional distancing, shifting responsibility) as bases for inferring effects on welfare states of animals. Responses were evaluated overall and were compared according to level of training (veterinarian compared with veterinary technician), years of work experience (0 to 5, 6 to 10, greater than 10), and species tended (large, mixed, small species). Respondents strongly agreed that animal wellbeing and animal use in research were important. Respondents reported feelings of discomfort, powerlessness, and frustration associated with work. In addition, respondents reported feeling empowered to initiate changes affecting animal welfare. The most frequent compensation mechanism noted was shifting responsibility onto the IACUC and institutional rules. Devaluing the animals was another reported compensation mechanism. Responses to emotional distancing statements were divided. Survey responses supported the existence of cognitive dissonance associated with laboratory animal medicine. Potential negative and positive effects on animal welfare are discussed.

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Laboratory animal veterinary technicians and veterinarians are a highly trained community of animal care providers. Most veterinary technicians and veterinarians choose veterinary medicine as a career because they care about animals and want to prevent or mitigate pain and suffering in animals.<sup>1,27,28</sup> In addition to their concern for good animal welfare, laboratory animal medicine veterinary workers generally support the use of animals for research.<sup>1</sup> Consequently, highly skilled and compassionate people choose a career caring for research animals, realizing that certain studies may cause animal distress, disease, or pain. This conflict between the primary purpose of veterinary care and the requirements of select research protocols can become significantly distressful to veterinary workers and can affect—either favorably or adversely—animal welfare.

The idea that veterinary professionals experience internal conflict associated with their work is not new.<sup>1,6,8,13,26,27,29,31</sup> Compassion fatigue and emotional burn-out are commonly discussed in the veterinary literature.<sup>5,8,24,26,31</sup> Veterinary workers in all subdomains of the profession may experience emotional exhaustion from continuous caregiving. Veterinary professionals working with research animals occasionally face an ethical quandary in addition to caregiving exhaustion: how should a compassionate person react when they must become party to animal distress, disease, or pain as a necessary component of research use?<sup>1,8,28,31</sup> We propose that the mental strain experienced by veterinarians and veterinary technicians working with

research animals is a manifestation of cognitive dissonance. In simplest terms, cognitive dissonance describes the internal conflict that arises from a person saying or doing something that the person doesn’t completely agree with or may feel is wrong.<sup>7,10,12</sup> The depth of internal conflict can vary widely depending on the person and situation. However, the dissonance is amplified when the contrary action has negative consequences or when the individual feels personally responsible for the outcome.<sup>7,11,12,32</sup>

The practice of laboratory animal medicine may predispose veterinarians and veterinary technicians to cognitive dissonance. First, laboratory animal veterinary professionals are continually challenged to create conditions supportive of good welfare yet assure IACUC-approved requirements of the research project. For some projects, it may be impossible to fulfill one of these goals without detracting from the other. Second, laboratory animal professionals commonly assume responsibility for the welfare of their patients, either by assignment or by feelings of personal ethical obligation.<sup>4,14,26</sup> Feelings of personal responsibility are considered a prerequisite to cognitive dissonance.<sup>7,11,32</sup> Last, veterinary professionals may feel stigmatized by members of the public, even family members, who do not approve of animal use for research. Stigmatization can validate and intensify any dissonant feelings that the veterinary professional may already have.<sup>1,28,32</sup>

We designed a survey to explore perceptions of veterinarians and veterinary technicians working with laboratory animals. The goal of this exercise was to identify whether these communities experienced cognitive dissonance, to what level dissonance had occurred, what negative emotions had been experienced, and what compensation mechanisms had been used to relieve dissonant emotions.

Cognitive dissonance can arouse feelings of discomfort, powerlessness, and frustration.<sup>7,12</sup> For veterinary professionals

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working with laboratory animals, the conflict generating these emotions may be impossible to eliminate. Individuals must somehow reconcile their thoughts and actions if they are to compensate for workplace dissonance. We focused on 3 possible compensatory mechanisms in our survey: shifting responsibility, devaluation, and emotional distancing.

Cognitive dissonance may result in shifting responsibility for negative outcomes away from oneself by attributing the situation to institutional bureaucracy.<sup>21,25</sup> In laboratory animal medicine, this mechanism may mean shifting responsibility for perceived deficiencies in animal welfare to the IACUC, an institutional policy, a technical plan, or a standard operating procedure.

Some people may respond to dissonance through devaluation. For example, self-professed ‘animal lovers’ who eat meat have been shown to attribute less emotional depth to animals used for food than to those species that are not normally eaten. Devaluing the emotional depth of food animals is thought to make people more comfortable killing and eating them.<sup>2,9,17,30</sup> A second devaluation strategy may be to categorize research animals differently in one’s mind than animals used for other purposes. If one agrees that laboratory animals are purposed for research that may benefit people and potentially other animals, then certain adverse conditions which would not be tolerated under other circumstances where animals are purposed as a pet, companion, or food source may become acceptable.<sup>6,22</sup>

The last compensation mechanism assessed in our survey was emotional distancing. In clinical medicine, practitioners are taught by example and experience to maintain a modicum of professional (emotional) distance between themselves and their patients. Professional distancing encourages objective, rational clinical decisions in the best interest of the patient. However, professional distancing may also become a self-preservation mechanism, allowing practitioners to distance themselves from emotionally difficult situations.<sup>1,26,28</sup> Professional (emotional) distancing can become problematic when it interferes with the clinician’s ability to empathize with the patient.<sup>5,16,23,33</sup>

In laboratory animal medicine, cognitive dissonance can have a significant effect on staff retention and veterinary advocacy for welfare improvement. Unresolved internal conflict may cause skilled care providers to leave the field.<sup>34</sup> Shifting responsibility for animal distress may lead to reduced efforts toward welfare improvement. Devaluing animals and emotional distancing may foster insensitivity to welfare concerns and further decreased advocacy for patients. Dissonance may be compounded when the veterinary professional perceives a lack of institutional support for innovations leading to improved animal welfare.<sup>4,8,19</sup>

However, veterinary professionals who can focus their dissonance may find a powerful driver for animal welfare improvement and more reliable research outcomes. An animal experiencing good welfare is more likely to serve as a normal physiologic model, providing the most accurate research data, and creating more repeatable conclusions.<sup>4,6,35</sup> When the institutional culture accommodates cageside concerns, veterinary professionals and the IACUC can partner to leverage dissonant feelings into advocacy for refinement.

## Materials and Methods

A survey entitled *Caring for Research Animals* was distributed through a weblink, which was open from 13 October 2017 until 27 October 2017, to persons who self-identified as veterinarians or veterinary technicians who worked with laboratory animals. The designation ‘veterinary technician’ involved a personal assessment of role, rather than any particular level

of certification or degreed status. No information was given to participants regarding the specific purpose of the survey. The weblink was distributed at one session during the 2017 American Association of Laboratory Animal Science annual meeting (Best Practices: Disaster Preparedness) and by using the CompMed ListServ. Distribution of the survey instrument was approved by the Management Analysis and Review Branch and the Project Clearance Branch of the Office of Extramural Research, NIH. Responses were voluntary and anonymous. No personally identifiable information was collected.

SurveyMonkey was used to construct the survey and collect responses.<sup>36</sup> The survey comprised 16 questions designed to gather generalized background information, assess emotions associated with cognitive dissonance and to assess welfare-effective compensatory mechanisms. Sets of responses from people who did not self-identify as either veterinarians or veterinary technicians were excluded from the results, because this data point was critical to survey assessment and conclusions. Respondents could answer questions on a sliding scale from ‘strongly disagree’ to ‘strongly agree’ or from ‘never’ to ‘always,’ depending on the question. The survey platform assigned numerical values to the responses from 0 (strongly disagree or never) to 100 (strongly agree or always) according to the sliding scale response. For ease of data analysis, numerical responses were defined as follows: strongly disagree or never, 0 to 12.5; disagree or rarely, 12.6 to 37.5; neutral or sometimes, 37.6 to 62.5; agree or often, 62.6 to 87.5; and strongly agree or always, 87.6 to 100.

Prism 8 (GraphPad Software, San Diego, CA) was used for statistical analysis. Differences in response according to training level (veterinarian compared with veterinary technician) were assessed using a 2-tailed unpaired *t* test. Responses then were evaluated according to the respondent’s years of experience in the field of laboratory animal medicine (0 to 5 y, 6 to 10 y, or more than 10 y). One-way ANOVA followed by the Tukey test to compare each mean with every other mean was used to assess differences depending on time on the job; these data also were tested for linear trend. One-way ANOVA followed by the Tukey test to compare each mean with every other mean was used to assess differences according to the primary species tended. Respondents were asked to place themselves in one of the following categories: spend more time working with large animals compared with small animals; spend equal time with small and large animals; or spend more time working with small animals compared with large animals. The term ‘large animal’ was defined as species similar in size to dogs, pigs, and NHP. The term ‘small animal’ was defined as species similar in size to rabbits, rodents, and fish.

## Results

A total of 332 people responded to the survey. We analyzed 309 sets of responses; 3 sets of responses were not analyzed because the respondents did not self-identify as either a veterinarian or veterinary technician. An additional 20 sets of responses were not included in the analysis, because the respondents answered only demographic questions, leaving all remaining questions blank. Some respondents chose not to answer certain questions, so the number of responses for each question varied slightly. Overall, 164 respondents identified as veterinarians and 145 as veterinary technicians; 184 respondents had more than 10 y of experience working with lab animals, 67 respondents had 6 to 10 y of experience, and 58 respondents had 0 to 5 y of experience. Whereas 67 respondents reported spending an equal amount of time with large and small animals, 88 spent more time with

large animal species, and 154 spent more time working with small animal species. The overall response rate could not be calculated because the total number of people who were aware of the weblink is unknown.

**Overall response.** Three statements were designed to establish whether respondents had the potential to experience dissonance by measuring the assumptions that people working with laboratory animals care about the welfare of their patients, feel responsible for the wellbeing of those patients, and support the research for which they are used. These statements were the only ones that had mean scores of greater than 87.6, indicating strong agreement. Data discussed in this section are summarized in Table 1

Four statements were written to assess emotional responses indicative of cognitive dissonance, specifically feelings of discomfort, powerlessness, and frustration. The mean response to the statement "In conversation with people who are not involved with laboratory animal research (acquaintances, friends, family, and neighbors), I openly discuss what I do for a living and advocate for the use of animals in research" was 'often.' Professing to advocate for animal research more often was equated with less dissonant feelings. We postulate that people who feel more comfortable with their work and the public's view of it would be more likely to freely discuss it.

The mean response to the statement "I have supported research procedures in which the degree of pain or distress experienced by the animal(s) made me uncomfortable" was 'sometimes.' Interestingly, the 'rarely' to 'never' and 'sometimes' ranges received a relatively even number of responses, with approximately 41% of respondents falling into each of these categories. The remaining respondents, roughly 17%, reported feelings of discomfort due to animal pain and distress in the range of 'often' to 'always.'

Responses to statements indicating powerlessness and frustration were dependent on the specific situation that respondents were asked to assess. Respondents agreed with the statement "I feel frustrated when I cannot help an animal because the needed treatment is not allowed under the protocol or because the disease or injury is part of the model." Agreement with this statement indicates feelings of both frustration and powerlessness when dealing with protocol restrictions. However, respondents indicated feeling empowered to affect change in animal care practices. There was overall agreement with the statement "When it comes to animal care and use, I feel empowered to initiate change at my institution."

The remaining 6 statements assessed the use of compensatory mechanisms that may be used to address dissonant thoughts. Respondents agreed most with statements indicating shifting responsibility. Responses to statements indicating devaluation varied. Respondents did not deny emotional depth to the animals under their care. However, respondents did agree with the idea that the welfare of laboratory animals may have to be compromised to accomplish research goals. Respondents agreed the least with statements indicating emotional distancing. However, the 'neutral' mean response to the statement "I maintain some professional distance between myself and the animals I work with. I think it is best not to become too emotionally involved" is misleading. Approximately 26% of the responses to this statement fell into the 'neutral' range. The remaining respondents were divided between the 'strongly disagree-disagree' range (approximately 34%) and the 'agree-strongly agree' range (approximately 39%). In this case, the 'neutral' mean represents even division among respondents rather than a bell-curve distribution.

**Comparison of answers from veterinarians and veterinary technicians.** Veterinarians and veterinary technicians did not disagree on any of the statements to the point that their responses were rated in different categories such as 'strongly agree' compared with 'agree.' However, veterinary technicians agreed more strongly than veterinarians with some statements (Table 2)

**Comparison of answers according to time on the job.** Responses were compared according to how long the respondents reported working with laboratory animals: 0 to 5 y, 6 to 10 y, or greater than 10 y. Again, these groups did not disagree on any of the statements to the point that their responses were rated in different categories, such as 'strongly agree' compared with 'agree.' However, using one-way ANOVA followed by the Tukey multiple-comparisons test revealed some significant differences among groups (Table 3)

The following statements showed a linear trend of stronger agreement with increasing time on the job. However, Tukey multiple-comparisons testing after one-way ANOVA did not disclose any significant difference.

- "It is up to the IACUC to decide if the value of the research project justifies animal use. Once a protocol is approved, I will support it."

- "In conversation with people who are not involved with laboratory animal research (acquaintances, friends, family, and neighbors), I openly discuss what I do for a living and advocate for the use of animals in research."

- "I feel personally responsible for the animals I work with."

The following statements showed a linear trend of less agreement with longer employment.

- "I feel frustrated when I cannot help an animal because the needed treatment is not allowed under the protocol, or because the disease/injury is part of the model."

- "The animals I work with are capable of a full range of emotions, from depression and fear to joy and anticipation."

**Comparison of answers according to primary species.** Very few differences emerged between responses compared according to the primary species the respondents worked with. Responses were compared for 3 groups: participants who worked primarily or mostly with small animals; those who worked equally with small and large animals; and those who worked primarily or mostly with large animals. The groups did not disagree on any of the statements to the point that their responses were rated in different categories, such as 'strongly agree' compared with 'agree.' Significant differences found by using one-way ANOVA followed by the Tukey multiple-comparisons test are noted in Table 3.

## Discussion

The premise that veterinarians and veterinary technicians working with research animals are uniquely prone to cognitive dissonance was based on 3 assumptions: first, that these caregivers are emotionally committed to the wellbeing of their patients; second, that they feel responsible for the animals under their care; and third, that they support the use of animals for research, which results in a greater good. Respondents strongly agreed with each of these suppositions, indicating that laboratory animal veterinary professionals have the potential for work-associated dissonance (Table 1).

Two of the survey statements were meant to assess feelings of discomfort related to working with research animals. The first statement, "I have supported research procedures in which the

**Table 1.** Survey statements and overall response

Assessment	Statement	N	Mean $\pm$ SEM	Mean response
Primary hypothesis	I care about the physical and mental wellbeing of the research animals I work with.	309	97.2 $\pm$ 0.57	strongly agree
	The use of animals for research is necessary and important.	309	91.9 $\pm$ 0.89	strongly agree
	I feel personally responsible for the animals I work with.	309	93.2 $\pm$ 0.73	strongly agree
Feelings of discomfort	In conversation with people who are not involved in animal research (acquaintances, friends, family, and neighbors), I openly discuss what I do for a living and advocate for the use of animals in research.	309	72.9 $\pm$ 1.44	often
	I have supported research procedures in which the degree of pain or distress experienced by the animal(s) made me uncomfortable.	304	40.8 $\pm$ 1.51	sometimes
Feelings of powerlessness or frustration	When it comes to animal care and use, I feel empowered to initiate change at my institution.	309	72.9 $\pm$ 1.47	agree
	I feel frustrated when I cannot help an animal because the needed treatment is not allowed under the protocol, or because disease or injury is part of the model.	306	65.5 $\pm$ 1.55	agree
Devaluing	The animals I work with are capable of a full range of emotions, from depression and fear to joy and anticipation.	308	82.2 $\pm$ 1.31	agree
	I work with animals used for research. I accept that their quality of life may have to be compromised to accomplish research goals.	307	67.4 $\pm$ 1.52	agree
Shifting responsibility	It is up to the IACUC to decide whether the value of the research project justifies animal use. Once a protocol is approved, I will support it.	306	71.1 $\pm$ 1.30	agree
	I think the rules and regulations my institution follows are enough to ensure the research animals have an acceptable quality of life.	309	76.6 $\pm$ 1.38	agree
Emotional distancing	When I began working with research animals, their pain and distress had a stronger effect on me than it does now.	305	33.3 $\pm$ 1.75	disagree
	I maintain some professional distance between myself and the animals I work with. I think it is best not to become too emotionally involved.	307	50.4 $\pm$ 1.72	neutral

N indicates the number of respondents for each statement. The numerical means presented equate to worded responses as follows: 0-12.5, strongly disagree or never; 12.6-37.5, disagree or rarely; 37.6-62.5, neutral or sometimes; 62.6-87.5, agree or often; and 87.6-100, strongly agree or always.

**Table 2.** Comparison of responses from veterinarians and veterinary technicians

Statement	t	df	P
The use of animals for research is necessary and important.	2.125	307	< 0.05
The animals I work with are capable of a full range of emotions, from depression and fear to joy and anticipation.	2.871	306	< 0.005
It is up to the IACUC to decide if the value of the research project justifies animal use. Once a protocol is approved, I will support it.	3.902	304	< 0.0005
I think the rules and regulations my institution follows are enough to ensure the research animals have an acceptable quality of life.	3.633	307	< 0.0005
When I began working with research animals, their pain and distress had a stronger effect on me than it does now.	2.403	303	< 0.05

df, degrees of freedom; P, P value reported ( $\alpha$ , 0.05)

Veterinary technicians agreed with these statements more strongly than veterinarians; only significant differences are listed.

degree of pain or distress experienced by the animal(s) made me uncomfortable," received an overall response of 'sometimes' (Table 1). However, roughly 17% of respondents reported feelings of discomfort due to animal pain and distress in the 'often' to 'always' categories. These findings support the hypothesis that veterinary professionals working with lab animals are experiencing emotional discomfort associated with their work.

The second statement meant to assess feelings of discomfort asked how often respondents advocate for animal research in conversation with people outside of the laboratory animal medicine

community. The overall response was 'often,' indicating respondents do advocate for the profession in conversation outside of the field (Table 1). There was a positive linear trend regarding discussing animal research with increasing time on the job. However, agreement or disagreement with this statement only expressed how willing a person was to discuss animal research in private conversation. The reluctance of lab animal caregivers to discuss their profession may indicate some level of discomfort but also may show uneasiness with discussing controversial issues or possibly deference to the feelings of others.<sup>1,28</sup> For the past few

**Table 3.** Comparison of responses according to time on the job and primary species tended

Statement	Variable	ANOVA	Tukey multiple-comparisons test			
			Groups compared	Mean difference	SE of difference	P
I feel frustrated when I cannot help an animal because the needed treatment is not allowed under the protocol, or because disease or injury is part of the model.	Time on job	$F_{2,303} = 5.618$ $P < 0.005$	0–5 vs 6–10	3.494	4.807	ns
			<b>0–5 vs &gt;10</b>	12.04	4.027	< 0.05
			6–10 vs >10	8.542	3.838	ns
The animals I work with are capable of a full range of emotions, from depression and fear to joy and anticipation.	Time on job	$F_{2,305} = 3.502$ $P < 0.05$	0–5 vs 6–10	4.386	4.137	ns
			<b>0–5 vs &gt;10</b>	8.808	3.466	< 0.05
			6–10 vs >10	4.422	3.280	ns
	Species	$F_{2,305} = 3.494$ $P < 0.05$	Mixed vs large	–4.895	3.710	ns
			Mixed vs small	3.193	3.352	ns
			<b>Large vs small</b>	8.088	3.061	< 0.05
It is up to the IACUC to decide if the value of the research project justifies animal use. Once a protocol is approved, I will support it.	Species	$F_{2,303} = 5.241$ $P < 0.05$	Mixed vs large	–1.454	3.645	ns
			Mixed vs <b>small</b>	–9.059	3.288	< 0.05
			Large vs <b>small</b>	–7.605	3.015	< 0.05
I maintain some professional distance between myself and the animals I work with. I think it is best not to become too emotionally involved.	Species	$F_{2,304} = 5.949$ $P < 0.005$	Mixed vs <b>large</b>	–11.50	4.845	< 0.05
			Mixed vs <b>small</b>	–15.02	4.367	< 0.005
			Large vs small	–3.519	3.981	ns

ns, not significant

Groups regarding time on the job: 0–5 y, 6–10 y, and >10 y. Groups regarding primary species: large, majority large animals; mixed, equal large and small animals; and small, majority small animals. Groups in boldface agreed more strongly in the listed comparison. Only significant ANOVA results and their post hoc comparisons are reported. Degrees of freedom are reported as a subscript to the F statistic;  $\alpha = 0.05$ .

decades, public opinion has been divided regarding support for the use of animals in research.<sup>15,18,20</sup> Perceived stigma surrounding the profession may make some workers more reluctant to discuss animal research, and this reservation may be unrelated to individual cognitive dissonance. In addition, public stigmatization may feed feelings of dissonance by reinforcing negative thoughts already held by the laboratory animal worker.<sup>1,26,34</sup>

There was an overall agreement with the statement “I feel frustrated when I cannot help an animal because the needed treatment is not allowed under the protocol or because disease or injury is part of the model” (Table 1). People who have been working with laboratory animals for 0 to 5 y agreed more strongly with this statement than those who have been in the profession for more than 10 y, thus suggesting that frustrations are generally greater for more junior staff (Table 3). The data do not allow us to discern why longer-term employees were less affected. Perhaps staff who experience strong frustration early in their career leave the profession prematurely, leaving in the long-term group persons who were already less inclined to frustration. However, the results also may indicate that staff had managed to resolve dissonance by becoming more adept at engaging compensatory mechanisms, by working to improve animal welfare, or by resigning to scientific justifications for the animals’ observed condition. A combination of several methods of dissonance management likely are involved. This area deserves further investigation in a follow-up study.

Respondents indicated feeling empowered to initiate change in animal care and use practices at their institutions (Table 1). This response is a favorable indicator suggesting that institutions are accepting of input from professional staff and are open to considering practical changes for improved welfare and staff satisfaction. Advocacy for refinement of animal care and

use practices is potentially the most powerful tool to address cognitive dissonance.<sup>28</sup>

The remainder of the survey statements were designed to assess compensatory mechanisms that might be used to alleviate cognitive dissonance. There was an overall agreement with statements assessing shifting responsibility for animal welfare concerns to the IACUC or institutional rules and regulations, with veterinary technicians agreeing more strongly than veterinarians (Tables 1 and 2). Laboratory animal veterinary professionals must work within the framework provided by the IACUC and any applicable rules and regulations. However, laboratory animal veterinary professionals also have an indispensable role in the oversight of research in progress and advocacy for continued improvements in animal care and use practices. If caregivers excessively use shifting responsibility as a compensation mechanism, they will be less effective patient advocates. Shifting responsibility allows caregivers to disregard any reservations they may have concerning animal welfare because the situation has been deemed acceptable by a higher authority.<sup>11,21</sup>

The perceptual differences between veterinarians and veterinary technicians may be related to their expected roles within the laboratory animal community. The role of the veterinary technician is commonly one of support for the animals, the veterinarians’ clinical decisions, and the policies of the research institution. Veterinary technicians generally have minimal direct interaction with the IACUC. In contrast, veterinarians often participate in IACUC decisions and are required for discussions of protocol endpoints when there is the potential for pain or distress. Although bounded by federal and institutional guidelines, veterinarians have authority over patient care and may use veterinary discretion to mitigate animal distress, even during protocol performance. Having more control over animal

care and use decisions can be a double-edged sword for veterinarians. Increased control in the workplace can decrease feelings of powerlessness and frustration<sup>19,21</sup> but may increase cognitive dissonance when an animal is in a poor welfare state.<sup>32</sup>

Small-animal caregivers agreed more strongly with the statement regarding IACUC primacy than did large-animal workers, who tended to believe that the IACUC was important but that other factors (presumably ethical conditions) should also be considered (Table 3). This stance could be tied to a general sense of decreased ethical or emotional attachment to rodents and other smaller species and should be explored in a future study.

The survey results supported a position that devaluing animals is sometimes used as a compensation mechanism. There was overall agreement with the statement “I work with animals used for research. I accept that their quality of life may have to be compromised to accomplish research goals” (Table 1). Acceptance of this statement by the surveyed community appeared to reflect a utilitarian approach to the use of animals for research.<sup>3,22</sup> One interpretation is that respondents would agree that it is acceptable for a few animals to experience poor welfare if their experience contributed to the greater good.<sup>1</sup> This understanding does not imply that most laboratory animal care providers hold a strictly utilitarian viewpoint, but it does reveal a tendency to accept suboptimal welfare when required for research.

Survey respondents attributed emotional depth to the research animals under their care (Table 1). Veterinary technicians and junior staff tended to agree more strongly than did veterinarians and more experienced workers that their patients experience a full range of emotions (Table 2, Table 3). Veterinary caregivers have historically been taught to refrain from anthropomorphizing animal patients to avoid misinterpreting behavioral responses unique to each species. In some cases, avoiding anthropomorphization may allay feelings of dissonance by placing more weight on the differences between humans and animals than on the similarities between species. The survey suggests that, compared with senior staff, junior personnel may anthropomorphize more, consequently tending toward greater dissonance during adverse welfare conditions. Frequency or extent of direct patient contact may also play a role in dissonance intensity. Veterinary technicians spend more time interacting with the animals than veterinarians in general and may become attuned to patient personalities and expressions.<sup>13</sup> An enhanced sense of patient connection can be beneficial to the animals, the caregivers,<sup>4,6,13,24,35</sup> and research outcomes.<sup>6,35</sup> However, it can also exacerbate dissonant emotions when animals experience poor welfare.<sup>1,8,27,28,31</sup>

Compared with personnel working with small animal species, staff working primarily with large animals agreed more strongly that their patients had a full range of emotions (Table 3). As part of the 3 Rs, society classifies species into different levels of sentience on the basis of their perceived level of complexity and intrinsic value to humans.<sup>3,14</sup> The ‘R’ of replacement can mean replacing a higher taxonomic order species with a lesser taxonomic order subject.<sup>3</sup> Less sentient species, such as rodents and amphibians, are generally less relatable for humans than more charismatic species.<sup>1</sup> Smaller species have shorter life spans and generally receive less intensive wellness assessment by veterinary professionals. Therefore, the veterinary staff typically spends less time with these species and has less opportunity to build emotional bonds.

The last compensatory mechanism that we sought to assess was professional (emotional) distancing. The survey results

indicated that professional (emotional) distancing was the least used compensation mechanism. The first statement was designed to assess the idea that people may become more indifferent to welfare concerns over time, in an unconscious effort to shield themselves from dissonant feelings. Respondents disagreed overall that the strength of their reaction to animal pain and suffering had decreased over time (Table 1). Veterinarians disagreed with this statement more strongly than did veterinary technicians (Table 2). Veterinary professionals’ disagreement with this idea suggests conscious recognition of the criticality and continuance of pain management and support for ongoing sensitivity to good animal welfare.

Responses were divided when participants were asked specifically about professional distancing. Although the mean response was ‘neutral,’ with approximately 26% of the responses falling within that range (Table 1), the remainder of the respondents were divided between the ‘strongly disagree–disagree’ range and the ‘agree–strongly agree’ range. Although professional (emotional) distancing can encourage objectivity with logical clinical decisions, focused reliance on distancing may engender apathy toward patient welfare.<sup>16,23</sup>

Persons overwhelmed by dissonant emotions may use compensation mechanisms to shield themselves from noticing deficiencies in animal welfare. Excessive dedication to rules or devaluing animals can precipitate a slide into apathy, where the suboptimal welfare status quo becomes acceptable. This possibility may be especially true for veterinary technicians, who may not have the opportunity to voice their concerns yet shoulder substantial emotional attachment to the animals under their care, and for large-animal care providers, who are more likely to develop bonds with individual patients.

The responses to this survey do not support the idea that laboratory animal medicine professionals are apathetic. The respondents strongly agreed that they care about and feel responsible for the animals under their care. Most respondents did not indicate feeling emotionally distant from their patients, nor did they deny their patients’ emotional depth. Despite dissonant feelings regarding the nature of animal use in research and overall trust in the efficacy of rules and regulations, laboratory animal technicians and veterinarians remain engaged in patient advocacy. This conclusion is supported by the abundance of papers involving refinements to laboratory animal care and use continually published by members of the laboratory animal medicine community. Strong advocacy is pivotal in the ongoing improvement of welfare for laboratory animals, and dissonant emotions—when focused—may drive workers to find areas of refinement.

With institutional commitment, alleviation of substantial levels of workplace dissonance is possible. Institutions can support both research projects and veterinary staff. The first step is acknowledging dissonant reactions and communicating that dissonant perceptions are not contrary to the overall goals of research or laboratory animal medicine.<sup>14</sup> Cognitive dissonance can lead to refined care paradigms, resulting in improved animal welfare, which in turn produces more reliable research data.<sup>6,35</sup>

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