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Perpetration-induced Traumatic Stress in Persons Who Euthanize Nonhuman Animals in Surgeries, Animal Shelters, and Laboratories

ABSTRACT

This study explored possible identification of Perpetration-induced Traumatic Stress (PITS) in workers whose occupations required euthanizing nonhuman animals and determining whether event or person-related factors influenced symptoms. The sample included 148 animal workers: veterinarians, veterinary nurses, and research and animal shelter staff. The Impact of Event Scale-Revised (IES-R) assessed traumatic stress. Experimenters constructed additional scales measuring satisfaction with social support, participation in various types of training, and concern over animal death. More than 70% of participants reported affinity toward animals had strongly influenced their occupation selection. Half the sample perceived animal death—particularly euthanasia—as one of the least desirable jobs. Of the sample, 11% reported experiencing moderate levels of traumatic symptoms. The study found lower levels of euthanasia-related stress were associated with increased satisfaction with social support and length of time working with animals. Those who reported high levels of concern about animal death reported higher levels of euthanasia-related stress. The study found occupational context was not associated with different levels of euthanasia-related stress symptoms—even though reasons for administering euthanasia differed significantly between occupations.

Many individuals enter particular occupations because of their love of non-human animals. Few, however, are adequately prepared for the fact that one of their duties may be to kill these animals. Arluke (1994) calls this the "caring-killing paradox." On the one hand, many people who work with nonhuman animals care deeply for them. On the other, they may be required to kill those same animals on a regular basis (Arkow, 1985; Arluke, 1991, 1992; Chang & Hart, 2002; Rollin, 1986; White & Shawhan, 1996). Those who work with animals perceive killing animals for the purpose of euthanasia (relief of suffering) or human convenience (unwanted companion animals, animals on the farm, or in the laboratory) one of the primary causes of occupational stress (American Association for Laboratory Animal Science, n.d.; American Veterinary Medical Association, 1995; Arluke; Chang & Hart; Frommer & Arluke, 1999; White & Shawhan). According to Rollin, such people may experience a particular type of stress known as moral stress.

This form of stress arises when people are required to perform actions they have difficulty justifying on moral grounds. Veterinary staff and animal shelter workers, who enter these occupations specifically to save or care for animals, may experience moral stress. In addition, Arluke (1992) reported that some interviewees drawn from research laboratories—including graduate students—experienced guilt and uneasiness over the euthanasia or convenience killing of laboratory animals. In such contexts, it is possible that moral stress is influenced by an individual's level of involvement with animals (Herzog, 2002) or with their level of concern about animal death—particularly if those persons are required to participate actively in performing euthanasia as part of their occupational duties.

Very little quantitative research has been conducted in this area. However, preliminary evidence suggests that people who look after animals and, as part of their occupation, are required to euthanize them should be regarded as an at-risk population for post-traumatic stress (PTS). A variety of physical and psychological difficulties have been reported in such workers: unresolved grief, high blood pressure, depression, and substance abuse (Arluke, 1991; 1992; 1994; Fogle & Abrahamson, 1990; Frommer & Arluke, 1999; Hart & Mader, 1995; Owens, Davis & Smith, 1981; White & Shawhan, 1996).

Many of the psychological symptoms reported are associated with post-traumatic stress in other contexts. Previous studies also have reported ani-

mal workers describing various other PTS symptoms including nightmares, emotional numbing, and recurrent, distressing recollections of the event. Sleep disturbances, an increased startle response, difficulty concentrating, and irritability also have been reported (Arluke, 1992; White & Shawhan).

In other contexts, people who experience PTS, as a result of actively participating in traumatic events, are said to have perpetration-induced traumatic stress (PITS) (MacNair, 2002). PITS has been identified in war veterans who have killed people in combat (MacNair) and in police officers who have shot criminals in the line of duty (Loo, 1986). PITS is similar to PTS, in that persisting emotional distress is caused by either an isolated traumatic event or a cluster of traumatic events (American Psychiatric Association, 1995). It differs from PTS, however, in that individuals with PITS are exposed to traumatic events and actively participate in them.

Description of Risk Factors

There appear to be several factors that influence whether persons participating in traumatic events develop PITS. Research has categorized these risk factors broadly into event-related risk factors, such as the context in which the killing occurs, the duration and number of events, the nature of exposure, and person-related risk factors such as persons' attitudes and the social support available to them (MacNair, 2002). Establishing whether these risk factors influence the stress experienced by those who work with animals may provide a means by which the mental and physical well being of these workers could be improved.

Event-related Factors

Animals may be killed in a variety of workplace contexts, ranging from slaughter houses to veterinary practices. The contexts most likely to result in traumatic stress are those in which employees enter the profession because of a perceived affinity with animals. In addition, traumatic stress may be likely in contexts in which employees may develop an attachment toward an animal who later is killed (Arluke, 1994) and also, perhaps, in those contexts in which euthanasia is performed for human convenience rather than because the animal is sick or suffering.

The former may occur (a) when an owner asks veterinary staff to euthanize an old or sick animal whom the staff have treated for many years (Fogle & Abrahamson, 1990; Herzog, Vore & New, 1989; Tannenbaum, 1993) or (b) in scientific laboratories, where an animal carer may be asked to euthanize an animal suffering because of a scientific procedure. The latter also may occur in veterinary practice: Clients may ask a veterinarian to kill a healthy animal they no longer wish to keep. It also is common in animal welfare shelters where, in Australia, it is reported that up to 70% of the animals killed are healthy but unwanted (RSPCA, personal communication, 1995). Although many people feel welfare concerns justify this high rate of euthanasia, employees report experiencing ethical concerns as well as emotional distress during these procedures (Arluke, 1994; Frommer & Arluke, 1999; Hart & Mader, 1995; Owens, et al., 1981; Reeve, et al., 2004; White & Shawhan, 1996).

In Australia, animal laboratories use up to six million animals each year for research purposes (Edwards, 2001). Strict codes of practice govern the treatment of these animals; those animals not killed as part of a scientific procedure typically are euthanized following completion of the project. Although senior researchers are trained to view their animals as data (Arluke, 1992), more junior research staff often are encouraged to handle and form mutual attachments with research animals, because this has been shown to alleviate stress and maintain normal behavioral repertoires in the animals (American Association for Laboratory Animal Science, n.d.). They might, therefore, be expected to experience PITS when otherwise healthy animals, to whom they have become attached, are euthanized.

Some research suggests that traumatic stress is cumulative (MacNair, 2002). However, specific training in areas such as stress management and the availability of appropriate debriefing may moderate this effect (Pulley, n.d.). Also, Epstein (1983) argues that experience with a stressor may promote resilience in some people by facilitating the development of coping mechanisms (the stress inoculation hypothesis). This possibility is supported by evidence that veterinary students develop the ability to detach themselves and desensitize to distressing events as they progress through their formal training (O'Farrell, 1990; Blackshaw & Blackshaw, 1993). It is not known if this desensitization extends to the performance of euthanasia. Thus, it is not known whether cumulative exposure to euthanasia in animal workers is likely to reduce or increase stress symptoms.

Person-related Factors

Person-related factors that influence individual experiences of euthanasia-related traumatic stress may include personal concerns about animal death and satisfaction with social support. Social support has been noted to protect against the effects of stress in many contexts (Cohen & Wills, 1985; Leavy, 1983), although it is established that it is the source of such support and the perception of the existence of such support, rather than its actual existence, that determine how effective social support is in buffering the effects of stress (Leavy). In this context, three potential types of social support have been identified: (a) peer support among animal workers (White & Shawhan, 1996); (b) affiliation with animals (especially companion animals) (Arluke, 1992; White & Shawhan); and (c) an animal worker's relationship with management (Reeve et al., 2004).

Although qualitative research suggests that individual animal workers required to euthanize animals may be susceptible to PITS (Arluke, 1991; White & Shawhan, 1996), there has been no standardized measure used to quantify how widespread this phenomenon may be. To begin to address this issue, this study investigated the incidence of PITS among a sample of animal workers drawn from veterinary clinics, research laboratories, and welfare shelters. Potential relationships between various event-related and person-related factors and PITS also were explored.

Method

Participants

One hundred and fifty participants were recruited from various veterinary clinics, animal welfare shelters, and university laboratories within metropolitan Melbourne. Only individuals who had actively participated in the euthanasia of animals were recruited. Participants included veterinary nurses, veterinarians, animal shelter co-ordinators, students, animal technicians and attendants, research assistants, lecturers, research fellows, and laboratory technicians. For statistical purposes, these occupations were reclassified as veterinarians in private practice (25.7%), veterinary nurses in private practice (31.8%), animal shelter workers (25.0%), and research staff (17.6%). The mean age of the participants was 30.6 years ($sd = 8.976$) with both full-time and part-time

employees being represented. Of participants, 80% were female ($n = 120$); females were more prevalent in all occupational contexts. The majority of males represented in the sample were veterinarians ($n = 18$). The demographic characteristics were similar to those described in previous research (Arluke, 1991; 1992; Chang & Hart, 2002; White & Shwhan, 1996). Hence, it is believed that the sample was representative of the population of interest.

Measures

Characteristics of animal workers. To characterize the sample more fully, participants responded to three open-ended questions probing their reasons for entering their chosen profession and identifying the best and worst aspects of their current job.

IES-R. The IES-R (Weiss & Marmar, 1997) is a 22-item self-report measure of current traumatic stress that can be directed toward a specific event. The IES-R assesses three broad domains of traumatic stress: (a) intrusive phenomena (recollections of the event, nightmares); (b) avoidance phenomena (staying away from reminders of the event, trying not to think about it) and; (c) hyper-arousal phenomena (exaggerated startle response, sleep disturbance). Participants were directed to consider each item in relation to their experiences with the euthanasia of animals. A 5-point Likert scale was used (0 = not at all, 4 = extremely) to indicate the level of distress associated with each difficulty during the last seven days.

The IES-R is a relatively new measure, and cut-off scores to identify individuals experiencing stress in the clinical range have not been published. It has several advantages, however, which justified its use in the present study. First, it includes subscales for avoidance and intrusion that were published first as part of an earlier measure, the IES. These have been shown to have good predictive ability (Horowitz, Wilner & Alvarez, 1979), and clinical cut-off scores for the combined scales are available. Second, it contains an additional, hyper-arousal scale that has solid, predictive validity with regard to trauma (Briere, 1997). Third, the IES-R has been found to have good construct validity (Weiss & Marmar, 1997).

Given the lack of published clinical cut-off scores for the IES-R, it was not possible to identify clinically significant levels of hyper-arousal. However, a

strategy validated by Horowitz et al. and Weiss and Marmar was used to identify—using those IES-R items drawn from the IES—those participants who were experiencing clinically significant levels of traumatic stress in the domains of intrusion and avoidance. Participants who obtained total scores on the two combined subscales from 0 to 8 were classified as being in the sub-clinical range, while those who obtained scores between 9 to 25 were considered mild. Participants with scores between 26-43 were considered moderately stressed, while those with scores over 44 were considered to be in the severe range of traumatic stress symptoms.

Context of euthanasia. Participants were asked to state their occupation and indicate the reasons for euthanasia at their workplace. Five common reasons were provided; namely, that the animals were sick, experimental, old, had behavioral problems, or were unwanted. Although these reasons sometimes may overlap, participants were simply asked to indicate if each reason ever applied in their workplace. They were permitted to select more than one reason for performing euthanasia if it was appropriate to do so.

Exposure to euthanasia: To gauge varying levels of exposure to euthanasia, participants first were asked how long they had been working with animals. Then they were asked to indicate, for each species listed, how many animals were euthanized in their workplace in an average week.

Training. Participants were instructed to indicate which type of training, if any, they had received of the following: animal handling, grief counselling for clients and staff, animal husbandry, stress management, and animal welfare issues.

Concern about animal death. Participants were asked to indicate on a 7-point Likert scale how concerned they were about the death of animals in nine different circumstances. These included killing of unwanted companion animals, killing of animals for food, experimental research, for product-testing of detergents and cosmetics, pest control, pain relief from illness or injury, culling of native wildlife, hunting, and for sport injuries—horse racing. A 7-point scale was used to increase the range of possible responses.

Social support. Participants were asked to indicate, on a 5-point Likert scale, their level of satisfaction with the support received from various individuals in relation to the euthanasia of animals. Potential sources of social support

listed were work colleagues, friends, employer, family, pets, and animals at the workplace.

Procedure

The managers of local veterinary clinics, humane societies, and laboratories were approached. The aims of the study were described, and permission was sought to distribute the questionnaires to appropriate staff. Individuals who subsequently volunteered to participate received a booklet containing an explanatory statement that outlined the purpose of the investigation, the anonymous nature of participation, the various questionnaires, and a postage-paid envelope. They were instructed to complete the questionnaires at their convenience and to return them either directly to the experimenter or to a collection point in their workplace.

Data Analysis

All analyses were performed using SPSS for Windows, Version 11.5. An alpha level set at .05 was applied, with Bonferroni adjustments being made as necessary. Skewness and kurtosis values for each variable were used to assess normality. Levene's test for equality of variance was computed where appropriate. Two participants indicated that they had not been exposed to euthanasia and thus were removed from the data file. In total, 148 participants were included in all data analyses.

Results

Characteristics of Animal Workers

Four themes arose in participants' responses to the question probing their primary reasons for entering an animal-based occupation. Many participants identified two or more reasons for their occupational choice. Of the sample, 71.3% identified animal-focused reasons that involved a love, respect, or empathy with animals. Job-focused reasons that included answers referring to the variety or challenge offered by the job or simply that the opportunity for employment arose were identified by 54.0% of participants. Of the participants, 53.4% identified self-focused reasons that referred to the satisfac-

tion participants received from their work interacting with, and helping, both animals and people. Career-focused reasons that included responses referring to income or advantages associated with entering a profession were identified by 16.2% of the sample.

Participants were asked to identify the best aspects of working with animals. Three themes arose in their responses. The first theme described satisfaction received from being in the presence of animals or from helping and caring for them in some way. More than half the sample (66.2%) identified this theme. The second theme referred to achieving personal goals at work and also was identified by more than half the sample (64.9%). The third theme involved the achievement of work-related goals: successfully treating sick animals or finding homes for unwanted animals. Of the participants, 41.2% identified this theme.

Almost all participants (70.1%) indicated aversive work conditions—the smells and mess associated with nonhuman animal work and the risk of personal injury from zoonosis, animal bites, and scratches—as being one of the worst aspects associated with their job. The second most commonly identified “worst aspect of the job,” listed by 49.3% of participants, was dealing with client/owner difficulties. This included problems regarding non-compliance or negligent clients/owners. Of the sample, 45.3% listed participation in animal euthanasia as the third worst aspect of the job. Concern about animal suffering was identified by 31.8% of the sample.

Traumatic Stress in Animal Workers

IES scores were calculated to identify participants experiencing clinically significant levels of euthanasia-associated traumatic stress when the domains of intrusion and avoidance were combined. These calculations indicated that the majority of participants reported symptoms that fell within the subclinical (50%) range, and no participant reported symptoms within the severe range of stress symptoms. However, much of the sample reported stress symptoms within the mild range (39%), and 11% of the sample reported symptoms within the moderate range. Although a lack of published data made it impossible to identify participants with clinically significant levels of hyper-arousal, scores on this scale typically were low. Within the possible range of 0-24, 55.2% of the sample obtained a score of 0, and none obtained a score above 9.

Event-related Factors

Reasons for Euthanasia in the Workplace

Participants were asked to indicate the main reasons for euthanasia in their workplace. The responses are summarized in Table 1.

Table 1: Percentage of Participants Representing Each Occupation Who Indicated Performing Euthanasia for the Reasons Listed

Occupational category	Veterinarian	Vet Nurse	Animal Shelter Staff	Research Staff
Reason for euthanasia	%	%	%	%
Sick	97.4	100.0	100.0	53.8
Old	92.1	95.7	91.9	38.5
Behavioral	81.6	63.8	89.2	11.5
Unwanted	42.1	40.4	73.0	30.8
Experimental	0	0	*5.4	96.2

* These animals were originally from a research center and were given to an animal shelter specifically for euthanasia.

Table 1 indicates that nearly all veterinarians, veterinary nurses, and animal shelter staff reported euthanizing nonhuman animals because the animals were sick and/or old. Research staff reported this as a reason for euthanasia significantly less frequently $\chi^2(3, n = 147) = 54.77, p < 0.05$; $\chi^2(3, n = 147) = 47.54, p < 0.05$. Nearly 90% of shelter staff also reported euthanizing nonhuman animals for behavioral problems. This also was identified as a reason for euthanasia by many veterinarians, but less frequently by veterinary nurses and quite uncommonly by research staff $\chi^2(3, n = 147) = 47.03, p < 0.05$. As expected, a high percentage of animal shelter staff reported euthanizing animals simply because they were unwanted. This was given significantly less often as a reason for euthanasia by other participant groups $\chi^2(3, n = 147) = 13.69, p < 0.05$, although the numbers in all groups were substantial. Very few workers, other than research staff, reported euthanizing animals for exper-

imental reasons $\chi^2 (3, n = 147) = 127.97, p < 0.05$. When this did occur, it was reported that the animals had been given to the animal shelter by a research center specifically for euthanasia.

Length of Time in Current Occupation

Participants were asked to indicate the length of time they had spent working in their current occupation. Many participants (49%) reported working with animals for more than 6 years. Others reported working with animals for 3 to 6 years (21.8%) or 1 to 3 years (17.7%). Only a small proportion of participants reported working with animals for less than 1 year, with 4.8% reporting working with animals for 6 to 12 months and 6.8% for less than 6 months. Thus, the potential level of most participants' exposure to euthanasia was substantial.

Training

Table 2 presents the number and percentage of participants who indicated they had received training in specified areas. From this table, it can be seen that animal handling and husbandry (including training in the technical aspects of administering euthanasia) were the most common forms of training received by participants in this sample. Training in animal welfare issues, stress management, and grief counselling were less common, being reported by just over one quarter of the participants.

Table 2: Number and Percentage of Participants Who Received Formal or Informal Training in Specified Areas

	YES	
	N	%
Animal handling	134	90.5
Animal husbandry	108	73.0
Animal welfare issues	12	32.4
Stress management	39	26.4
Grief counselling	39	26.4

Person-related Factors

Social support

Social support was measured by asking participants to indicate on a 5-point Likert scale (1 = not at all satisfied to 5 = very satisfied) how satisfied they were with various sources of social support. Mean scores were calculated and are presented in Table 3. A one-way repeated measures ANOVA revealed that there were significant differences in participants' satisfaction with the various sources of social support Wilks' Lambda = .55, $F(14, 112) = 18.28, p < .05$. Post hoc tests revealed that participants were significantly more satisfied with the social support received from their pets than with that received from other sources ($p < .05$).

Table 3: Means and Standard Deviations for Satisfaction with Social Support in Regards to Animal Euthanasia

	N	M	SD
Co-workers	142	3.94	1.02
Friends	139	3.78	1.18
Employer	134	3.55	1.22
Family	137	3.93	1.11
Pets	131	4.50*	0.83
Animals in the workplace	129	3.86	1.14

* significantly higher than other sources of support

A one-way between groups ANOVA also revealed significant differences in satisfaction with social support ratings based on occupational group, $f(3, 138) = 3.01, p < .05$. Post-hoc comparisons using the Tukey HSD test indicated that veterinary nurses were significantly more satisfied with social support than were research staff ($p < .05$).

Variables Associated with Traumatic Stress Symptoms

Total scores for the IES-R and the number of animals euthanized were computed. Items measuring training, level of concern over animal deaths, and social support were summed into single scales because Cronbach's alphas

for each scale revealed reasonable levels of internal consistency (Tabachnick & Fidell, 2001). Correlations then were calculated between reported stress levels (IES-R) and all available event and person-related variables. These are presented in Table 4.

**Table 4: Pearson's Correlation Coefficients for IES-R Scores
by Event and Person-Related Variables**

	IES-R total score	Satisfaction with Social support	Concern about animal deaths	# of deaths experienced	Training is specified areas	Length of time in job
IES-R total score						
Satisfaction with Social support	-.231**					
Concern about animal deaths	.393**	.035				
# of deaths experienced	.046	-.048	.163			
Training in specified areas	.121	.073	.181*	.032		
Length of time in job	-.209*	.090	-.085	.315**	-.169	

* $p < .05$

** $p < .01$

As can be seen from Table 4, scores on the IES-R were related significantly inversely to both satisfaction with social support and years spent in the occupation. Thus, participants who reported higher levels of satisfaction with social support reported less stress than did those who reported less satisfaction with social support. Participants employed for shorter periods reported more stress than did those who had been similarly employed for many years, even though more experienced workers—as expected—had greater levels of exposure to euthanasia. A significant positive correlation between IES-R scores and concern for animal deaths was observed, indicating that participants who were concerned more about animal deaths were significantly more stressed than were those who were less concerned. Perhaps, surprisingly, the number

of animal deaths experienced was not related to the IES-R total score; nor was the number of types of training received. However, level of training was correlated positively with concern over animal death.

Given that the reasons supplied for performing euthanasia were found to vary markedly across occupational contexts, the variation in stress levels across occupations was examined. Mean scores obtained for each occupational group on the IES-R were calculated and a one-way ANOVA conducted. However, reported stress symptoms were not found to vary across occupational contexts ($F(3, 141) < 1, p > 0.05$). Gender analyses based on mean IES-R scores, however, revealed that females ($m = 4.82, sd = 1.65$) had significantly higher IES-R scores compared to males ($m = 4.04, sd = .931$), ($t = -2.419, df = 143, p > 0.05$).

Discussion

The primary aim in this project was to investigate the incidence of PITS in a sample of workers who participated in performing euthanasia in veterinary clinics, research laboratories, and animal shelters. A second aim was to explore relationships between various event-related or person-related variables and stress symptoms. Although no participants in the sample reported severe levels of stress, 11% of the sample reported moderate levels of traumatic symptoms: recurrent thoughts, nightmares, and feelings (intrusion) and avoidance of emotions and ideas associated with the euthanasia of animals (avoidance). This is consistent with previous qualitative research demonstrating that performing animal euthanasia can evoke traumatic stress reactions in some persons (Arluke, 1991; White & Shawhan, 1996) and provides additional quantitative evidence of the prevalence of this problem.

The majority of the participants in this study indicated that their love of animals was the main reason they selected an animal-based occupation. Perhaps, it is not surprising, therefore, that enjoyment received from working with, and caring for, animals was listed as one of the most rewarding aspects of their work, while almost half of the participants identified performing euthanasia as one of the worst aspects.

Exploratory analyses revealed that concern over animal deaths was associated with reported traumatic stress. This supports Rollin's (1986) claim that

a love of, and affinity with, animals is likely to inflate the chance of moral stress occurring in animal workers who assume the dual responsibility of caring for and euthanizing animals. Unexpectedly however, the mean level of stress reported by the participants did not vary across occupation, even though the reasons given for euthanasia did vary depending on context: More animal shelter staff reported involvement in the euthanasia of healthy, unwanted animals. Mean level of stress reported by participants, however, varied across gender—females reporting more stress than did males.

Many participants in this study did not report any traumatic symptoms at all; stress symptoms, as indicated by IES-R scores, diminished with time spent working with animals. This finding refutes the hypothesis that traumatic stress is likely to be cumulative but is consistent with the stress inoculation hypothesis, which holds that exposure to stress fosters coping strategies. Alternatively, it is possible that only those not excessively troubled by exposure to euthanasia remain in animal-based occupations for any length of time, so that a selective process may account for the findings obtained. A fruitful avenue for future research would be to conduct a longitudinal study measuring stress symptoms in participants as they progress through animal-based occupations.

Completion of training in several relevant areas was not related to reported stress symptoms, although it seems likely that many participants received on-the-job training not elicited by the questionnaires administered. It was interesting to note that only one-quarter of the participants had received specific training in grief counseling or stress management. This is an area in which targeted educational programs should be developed and implemented. Training animal workers to have good husbandry skills and management skills is not likely to be sufficient to equip them with good coping skills.

A significant negative relationship was observed between satisfaction with social support and reported levels of stress, replicating previous studies indicating that social support acts as an effective buffer against stress (Cohen & Wills, 1985; Leavy, 1983). It was interesting that the highest perceived level of social support was attributed to pet animals, while the lowest perceived level of social support involved employers. Again, this is an area in which education programs for management may be required.

This study has several practical implications. First, it confirms perpetration-induced traumatic stress as a valid avenue of study in animal workers. Although almost all of the participants did not report clinically significant levels of euthanasia-related stress, those who did clearly require further research attention. That some individuals suffer perpetration-induced traumatic stress and others do not indicates the importance of examining risk and protective factors. Second, this study confirms that social support and work experience are important determinants of how well animal workers cope with euthanasia-related stress. Third, the study suggests that recruiters should canvas concern about animal death when appointing new staff, so that appropriate stress reduction measures can be implemented as required.

Some caution must be taken in interpreting the results from this study. The IES-R still is in a development stage; additional work is required to establish its reliability and validity as a measure of PITS. Many of the other scales employed were constructed specifically for the study. The lack of more suitable measures is regrettable and should be addressed in future work, which also may benefit from the inclusion of already validated tests, such as the Animal Attitude Scale (AAS) developed by Herzog, Betchart, and Pittman (1991). This could substantiate further a relationship between the incidence of PITS and attitudes toward nonhuman animals.

Also, the direction of causality in relationships identified between variables could not be established from the design employed. It may be that concern over animal death fosters traumatic stress or that experiencing stress promotes concern over animals. Similarly, it may be that a long career with animals inoculates workers against euthanasia-related stress or that only those less affected by stress persist with animal-based positions. Only future research can address these issues. It also will be important to establish whether personal characteristics—personality type, previous exposure to trauma, or way of coping—may predispose some individuals to the development of euthanasia-related stress. If this can be established, recruitment and training can be tailored accordingly. Clearly, however, much more research needs to be conducted in this area.

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