

# Supplementary Materials

## Survey Validation

The survey used in this study was created de novo. Details of the survey's development and validation are presented below.

### **1) Item Generation and Expert Review**

#### **Environmental-PMOs:**

Our environmental-PMO survey items were derived from surveys used by Claxton-Oldfield et al. and Fenwick et al. (<sup>1-4</sup>). From these previous surveys, we chose to only use PMOs that involve environmental phenomena, and we simplified the descriptions of these PMOs to make them as objective and succinct as possible. The first author of the current manuscript was in correspondence with Dr. Claxton-Oldfield during this process.

#### **Animal-PMOs and child-PMOs:**

Animal-PMO and child-PMO survey items were based on experiences told to the authors by veterinary colleagues. Experts on animal- and child-PMOs do not exist; To our knowledge, our study is the first to investigate this topic.

#### **Veterinary Euthanasia:**

Two of the authors are veterinary professionals who specialize in animal euthanasia, one is a clinical science professor at a college of veterinary medicine, and one is a scientist with extensive past experience in animal euthanasia.

## **2) Pilot Testing**

### **Target Audience:**

The target audience for our survey was veterinary professionals who perform animal euthanasia.

### **Test Group:**

Pilot testing was conducted amongst the authors themselves: two of the authors are veterinary professionals who specialize in animal euthanasia, one is a clinical science professor at a college of veterinary medicine, and one is a scientist with extensive past experience in animal euthanasia.

### **Survey Testing / Design:**

All members of the pilot test group went through multiple “test runs” of the survey, providing feedback on each iteration via “cognitive interview” type discussions <sup>(5)</sup> to improve clarity of wording and layout. Multiple iterations were tested before arriving at a final design that the entire group agreed upon.

## **3) Survey Validation**

### **External Validity:**

Our survey received 648 responses, with a 90% completion rate, suggesting minimal attrition bias and strong respondent engagement. This resulted in 581 completed responses, and a robust ~1:26 item-to-response ratio\*, which provides a high degree of statistical power, ensuring that observed patterns are not mere statistical artifacts <sup>(6,7)</sup>. This high response rate and high completion rate was achieved by designing our survey using single-item measures to prioritize a short completion time (<5 minutes), to help reduce self-selection bias <sup>(8-10)</sup> in an extremely time-constrained veterinary target population <sup>(11,12)</sup>.

\* While the number of items presented to respondents varied depending on whether they reported a PMO, 22 items would be presented if they reported one of each type of PMO.

Low self-selection bias is suggested by two aspects of our data. First, Figure 1A of the manuscript shows

that the percentage of respondents who reported  $\geq 1$  PMO remained relatively constant throughout the survey's promotion, starting at 72% and ending at 66%. This was even more the case for those reporting  $\geq 1$  environmental-PMO, with the percentage starting at 24% and ending at 19% (not shown in the figure). This stability, throughout the promotion of the survey in different groups, lacks the early peaks and subsequent declines that would be expected if there was high self-selection bias (<sup>13-16</sup>). Second, in response to a question about whether the respondent would support further research on PMOs (Figure 9 in the manuscript), a majority chose the moderate "Yes, somewhat" (32%) or "No, not really" (38%) options, as opposed to the more extreme options of "Yes, definitely" (26%) or "No, absolutely not" (5%). This "inverted-U", rather than "U-shaped", distribution shows nuanced, rather than polarized views regarding the survey's main topic, which strongly suggests low self-selection bias (<sup>17-20</sup>).

In our survey demographics 38% were mobile veterinarians and 96% specialized in cats and dogs. These percentages are higher than previous surveys of the veterinary population, which have reported 28.2% mobile veterinarians (<sup>21</sup>) and 71% specialized in cats and dogs (<sup>22</sup>). This suggests that our survey may be significantly under-representing veterinarians specializing in livestock.

### **Face Validity and Substantive Validity:**

To assess whether respondents understood the survey constructs we intended to measure, and responded authentically, we compared respondents' long-form PMO descriptions (optionally provided) to their multiple-choice answers. To do this, the authors first manually sorted long-form responses into PMO-type "buckets", while remaining blinded to respective multiple-choice responses. In a subsequent comparison, we found that 91% of our bucket-sorted, long-form responses had corresponding selections in respondents' multiple-choice answers (i.e. PMO type X described in long-form + PMO type X selected in multiple-choice). Broken down by PMO type, the percentages of congruence are animal-"Stare up into the air": 100%; animal-"Start/stop vocalizing": 92%; animal-"Approach/depart from the body": 94%; child-"Stare up into the air": 75%; child-"Point into the air": 0%; "sudden temperature change": 77%;

“sudden air flow”: 89%; “electrical malfunction”: 83%; “glowing light around the body”: 100%; “‘wavy’ visual distortions”: N/A; “‘mist’ formation”: N/A. These high percentages indicate that respondents understood the questions as intended and that their responses were non-random, supporting the survey's face validity and substantive validity.

To assess whether respondents understood and abided by the timing constraint described in PMO-related questions (“during, or right after, a patient's cardiac arrest?”), long-form responses were sorted into PMO-timing “buckets” using a set of rules designed and agreed upon by the authors (see Supplementary Materials). Figure 5A in the manuscript illustrates that a majority of PMO types, including animal-“stare up into the air”, animal-“start/stop vocalizing”, “sudden air flow”, and “electrical malfunction”, were most highly concentrated in the time of death (TOD) PMO-timing bucket. The timing alignment of these “PMO types of interest” with the timing constraint dictated in survey questions supports the face validity and substantive validity of the survey.

### **Construct Validity / Nomological Validity:**

Supporting the construct validity of our findings, we found a strong positive association between the number of euthanasias an individual performed and the number of PMOs they reported, indicating an exposure-related effect (Figure 3-A1 in the manuscript). This nomological validation shows that reports of PMOs were not random, but instead were systematically related to reports of professional exposure, as would be expected.

Further supporting construct validity, we found that the relative prevalence of different PMO types (i.e., the percentage of respondents who witnessed each type) closely matches the rank order of reported frequency (i.e., how often each type was experienced by those who witnessed them) (Figure 2-Top and -Bottom in the manuscript). This strong alignment between the frequency of observations by individuals and the overall prevalence of witnesses within the community suggests high nomological validity.

Finally, research on memory formation and long-term memory fidelity suggests that memories of PMOs may be more stable than typical episodic memories. While any memory can become distorted over time, research has shown that memory distortions are least likely to occur in scenarios involving 1) a negative mood (as is often the case during veterinary euthanasia) <sup>(23)</sup>, and 2) a memory-forming event that triggers positive emotions, (as is often the case with veterinary PMOs, as seen in Figure 8 of the manuscript) <sup>(24)</sup>. Furthermore, because of general apprehension around discussing PMO-type events with others <sup>(25)</sup>, these memories are also less likely to become distorted over time by social influence <sup>(26)</sup>. This gives us confidence that important details in our survey responses, such as the timing of PMOs relative to cardiac arrest, are accurate representations of the original event.

# Facebook Group Details

## **Veterinary Professionals Forum**

11.7k members

<https://www.facebook.com/groups/612232122260113/>

Ever wish there was a place where you could ask questions and bounce ideas off of other vet techs? Would you like to connect with other veterinary professionals? Network for job openings and Available CE? There's often more available to us than we think! This is a place we can share our thoughts, ask questions, and get to know other veterinary technicians!

Whether you are a VTS, a licensed/registered/certified veterinary technician or technologist, in tech school, or have been working as a tech and are grandfathered in, this is a closed group for you! (Note:: This is not a group for pet owners that are not in the veterinary field.) Please be respectful when discussing topics and to each other. Also, please refrain from speaking ill of a company or veterinary hospital and/or staff. We are professionals after all!

## **Pet death doula cafe**

248 members

<https://www.facebook.com/groups/500213251876401/>

A group for the cohorts of the Pet Death Doula program. This group is primarily to continue the helpful conversations we've had throughout the program. Lets keep in touch as our journeys go on.

## **Housecall and Mobile Veterinarians**

4.2k members

<https://www.facebook.com/groups/housecallvets/>

The group is designed for house call, ambulatory, and mobile veterinarians to discuss and network about the challenges to our unique practice style. Small animal, mixed, or large animal practitioners are all welcome. Vets and veterinary students only please! If your profile privacy settings make it unclear if you are a vet, please send me a message so I know to add you. While this group is for vets only so you can speak pretty freely, be mindful that this is Facebook, so just be aware when posting. We expect everybody to be adults and don't mind a little passionate discussion, but the group will be moderated if things get too crazy. Vet student participation is very welcome, but please identify yourself as such when commenting on cases.

## **IAAHPC Members Group**

592 members

<https://www.facebook.com/groups/758728254533421/>

Welcome to the International Association for Animal Hospice and Palliative Care members forum. We wanted to give everyone a place to discuss any business or animal hospice related topics in a private setting.

## **DVM Moms**

20.8k members

<https://www.facebook.com/dvmoms/>

This is a group for moms who are also veterinarians (or veterinarians who are also moms.) It is a place to share frustrations, triumphs, excitements, worries & (probably most of all) a little sense of humor to get through one more day. This can be about babies, work, husbands or wine - venting, boasting, or looking for advice. Opinions expressed in the group belong to the individual and do not represent the opinion of the DVMoms, LLC unless expressly stated to do so.

### **Companion Animal Euthanasia Discussion Group**

3.3k members

<https://www.facebook.com/groups/CAETA.euthanasia.forum/>

Our group is designed for those dedicated to improving the companion animal euthanasia experience for the betterment of the pet, caregiver, and professional team (vets, technicians, social workers, grief counselors, shelter staff). We welcome discussions around euthanasia technique options, grief support, euthanasia-related business management, research, sedation protocols, and just about anything euthanasia related for all companion species. It is moderated by instructors with the Companion Animal Euthanasia Training Academy. \*Please note: our group was created to support veterinary professionals. If you are a pet parent or caregiver seeking guidance we encourage you to visit our pet loss resource page here

<https://caetainternational.com/about/caeta-pet-loss-resources/>

### **Open Minded Scientists**

61 members

[www.facebook.com/groups/openmindedscientists/](http://www.facebook.com/groups/openmindedscientists/)

A place for healthcare workers to discuss notable "time of death experiences" (TDEs), in both human and animal EOL. Open Minded Scientists is a 501(c)3 nonprofit conducting research in this field.

## Promotional Text and Graphic

### Text Used on Facebook:

Open Minded Scientists, a nonprofit, is conducting a survey asking us, veterinary workers, about "time of death experiences". Your response to the survey will help us better understand these intriguing experiences, whether you've had one or not!

### Text Used in Flyer at Conferences:

Workers in human hospice sometimes have unusual experiences at their patient's time of death. Open Minded Scientists, a nonprofit, is conducting a short survey asking whether veterinary workers also have such "time of death experiences".

All responses welcome, whether you think you've had such an experience or not!

Results will be published in a peer reviewed scientific journal to increase knowledge and understanding of these intriguing events.

### Graphic used on Facebook and on Conference Flyer:





# References

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