Predicting noise fear in 12-month old dogs with a test and questionnaire given at 3- and 12-months old

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The importance of predicting

Noise-related anxiety disorders affect 50% of dogs across their lifetimes, and are highly co-morbid with and worsen other behavioural pathologies, which negatively affect cognitive ability.[1] This results in a decreased quality of life and welfare for pet dogs, and an increased risk of euthanasia.

By developing a method for veterinarians and owners to predict the trajectory of noise fear in dogs at 3 months, it is possible to prevent years of unnecessary suffering by implementing early intervention.

Methods

A 3.5 minute audio file of various sounds (weather, streams, fireworks, gunshots, and rockets) is played at test visits 1, 2, 3, and 4 (3, 6, 9 and 12 months, respectively). The maximum dBA was 81.3-93.2 dB. All tests were video recorded for later analysis.

Behavioural indicators of distress analyzed include panting, tail and body posture, attentiveness, and time spent licking food.

The pet dog version of the Working Dog Questionnaire (WDQ-Pet) is a client completed questionnaire about the dog's behaviour in varied physical and social environments. It is scored at each visit. For the 3- and 12-month test visits we assessed WDQ-Pet data about owner absence, method of punishment, varied of noises and vehicles

Hypotheses

1) A questionnaire can be used to predict the likelihood of developing noise reactivity in the future.

2) Early-life noise reactivity predisposes to increased risk of developing or worsening noise-related anxiety disorders.

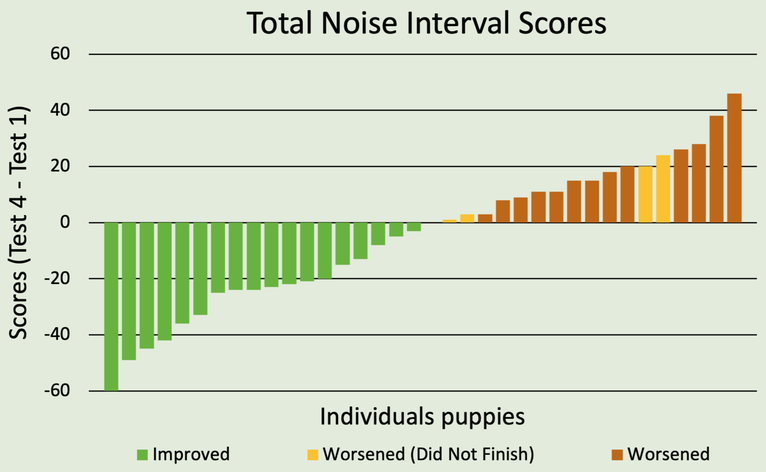

Figure 1. Noise test 4 score minus noise test 1 score

Scores were calculated based on interval data regarding the presence of distressed behaviours seen every 15 seconds of the test. 19 dogs (53%) improved between visits and had scores of 0 or lower and 17 dogs (47%) worsened with scores higher than 0 by combining scores for visit 1 and 4. ANOVA ((1,3); F = 18.91514; p = 0.0001) and Pearson correlation coefficient (R = 0.48, p = 0.03) showed significant differences between groups (improved/worsened at the 12-month test).

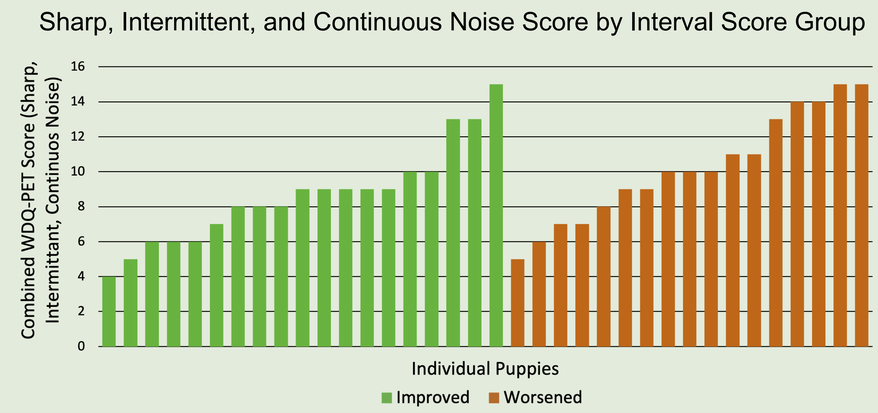

Figure 2. Comparison of total score for reactions to sharp, intermittent and continuous noise by dogs who improved or worsened in interval noise scoring

ANOVA ((1, 35), F = 3.496, p = 0.07) showed significant difference between groups (improved/worsened at the 12-month test). When comparing those with scores >/=10, and <10 by group, there was a significant difference (Chi-Square (1,36), = 3.9009, p = 0.048). Dogs in the worsened group more frequently had scores >/=10.

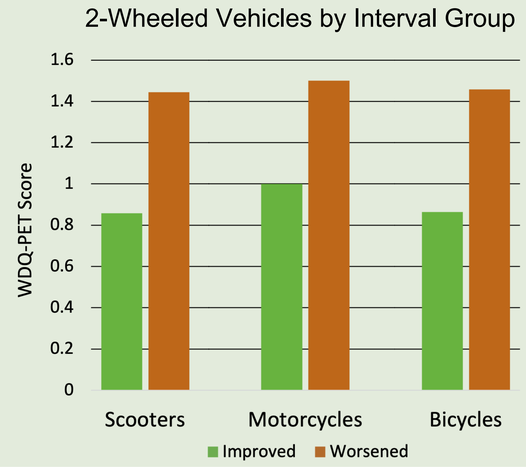

Figure 3. Comparison of WDQ-Pet scores for reactions to 2-wheeled moving vehicles and group (improved/worsened at the 12-month test) means

A significant difference between groups was found when scores for all 3 conveyances were combined. Dogs in the worsened group reacted more. T-test (t = 2.25052, p = 0.03), Cohen's d ((1.47-0.91)/0.933809 = 0.60).

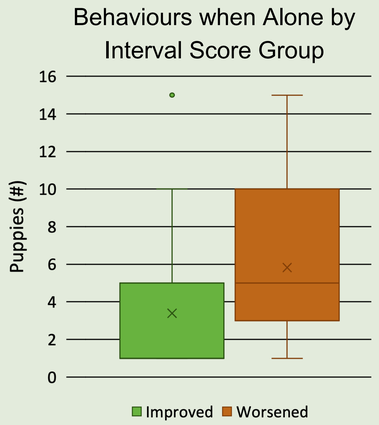

Figure 4. Presence of distress behaviours when left alone by group (improved/worsened at the 12-month test)

Dogs in the worsened group showed more signs of problems when left alone, according to scores reported by the WDQ-PET. T-test (t = 2.11047, p = 0.04).

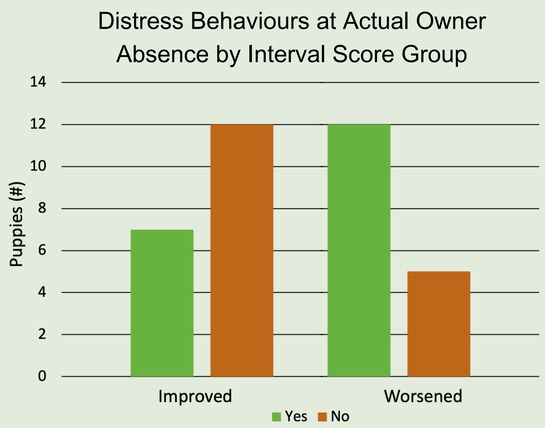

Figure 5. Presence of distress behaviours during actual owner absence by group (improved/worsened at the 12-month test

Dogs in the worsened group displayed more behaviours indicating distress when left alone. Z test for proportions (Z = 2.0248, p = 0.02), Chi-square test (Chi-square statistics = 4.098, p = 0.04).

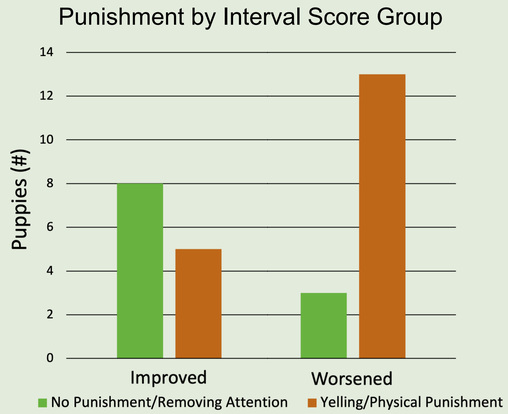

Figure 6. Correlation between punishment and noise group (improved/worsened at the 12-month test)

Dogs reported in the WDQ-Pet as having experienced punitive training techniques were found to have worsening responses to noise between tests 1 and 4. Chi-square (= 5.5776, p = 0.02), Yates correction Chi-square (=3.9082, p = 0.048). This finding is likely correlation, and not causal as the order of punishment and worsening of noise reactions cannot be known.

Results/Discussion

According to the data collected in this study, it is possible to predict the developmental trajectory of noise-related fear in puppies that are 3-months old using a questionnaire and noise test. This conclusion is based on comparisons between data collected from the noise tests at visit 1 (3-months) and visit 4 (12-months), using interval data to determine scores for distress behaviours displayed during 15 second intervals of the 3.5 minute audio file. This data showed significant worsening of these distress behaviours in 47% of dogs in the study.

Owner-reported behaviours from the visit 1 and 4 WDQ-Pet questionnaires showcase a relation between dogs who "worsened" between 3- and 12-months, and distressful behaviors seen in reaction to 2-wheeled vehicles, sharp, intermittent and continuous bouts of noise, and owner absences. This study also found a correlated finding with the worsening group and punitive training techniques reported in the WDQ-Pet, which requires further study to prove a definitive link to noise fear.

By finding, and confirming these connections, the questionnaire and noise test can be used in conjunction by veterinarians and owners to determine the likelihood of their puppy to develop noise-fear, and allow for early intervention. Early intervention is a key component to the successful treatment, proper management, and prevention of disorders such as noise reactivity, and related separation anxiety and other behavioural pathologies that negatively affect cognitive ability.[2, 3]

References

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