

Tracking: Could this simple test help predict behavioral pathology development in young dogs?

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Introduction

Behavioral pathologies such as fears, separation anxiety and canine post-traumatic stress disorder are one of the leading causes of surrenders and euthanasias in dogs^{1,2}. Despite this, veterinarians and behavioral specialists can only recognize and treat these pathologies after they have already developed and started causing problems for the client and dog. The purpose of the Puppy Project is to try and develop a short assessment that any veterinarian or dog trainer could do that could provide a risk assessment for the individual pup of developing a behavioral pathology with age. Early intervention and treatment can improve the overall welfare of the animal as well as the client and their family.

Methods

40 puppies were recruited for the study with 36 pups completing all required testing. Seven tests requiring no special equipment were adapted from a larger cognitive test battery previously used on working and pet dogs^{3,4}. All tests were timed and recorded using 2 cameras that covered the entire testing space. The Tracking/Focus Test was completed at the 3- and 12-month visits.

At 3 months, owners tested their dogs with coaching following a demonstration. At 12 months, the researchers tested the dogs in an attempt to impose greater standardization. A large yellow giraffe plush dog toy was used for the test itself and was slowly moved in a cross design (up and down, side-to-side) at a height that the dog could see but not grab the toy. Dogs were given a treat before the test once they entered the arena and afterwards, regardless of outcome. The test was stopped when the dog successfully tracked the toy in all directions, regardless of how many times they became distracted or unfocused. Successful tracking was defined as when the dog quietly followed the movements of the toy with its eyes.

All videos were scored for time spent on the focused tracking and on the overall time to evaluate the tracking. Additionally, dogs were evaluated during the test using a standardized ethogram/fear score system used throughout the tests⁵. All data were entered into an Excel sheet and analyzed using SPSS.



Images 1a & 1b. Hughie the yorkie puppy at 3- and 12-months of age demonstrating successful tracking.

Results

Fear scores and tracking times were non-normally distributed so data were analyzed with non-parametric statistics.

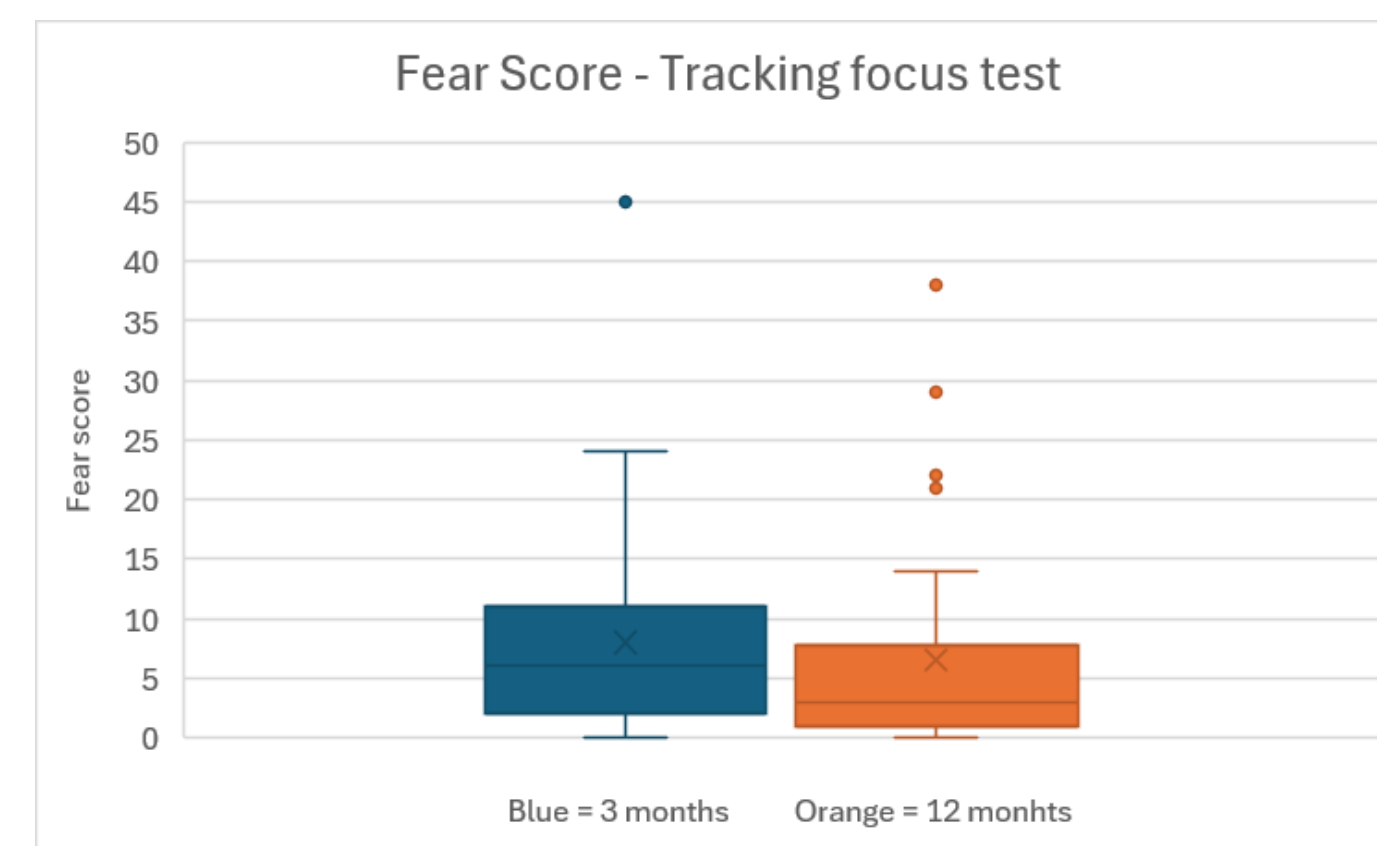


Figure 1. There was no difference in fear scores for individual dogs with age from 3-12 months (Wilcoxon signed ranks test - NS differences (W = 200.50, p = 0.155).

Figure 2. Distribution of fear scores with age. Negative #'s = fear scores improve with age; positive #'s = fear scores worsen with age. There was a significant difference between the improved v. worsened groups (Mann Whitney U test; (U = 0.00, p < 0.001). There was a moderate positive correlation between 3 and 12 month fear scores (Spearman's rho (rs(34) = 0.38, p = 0.024, $\rho = 0.38$).

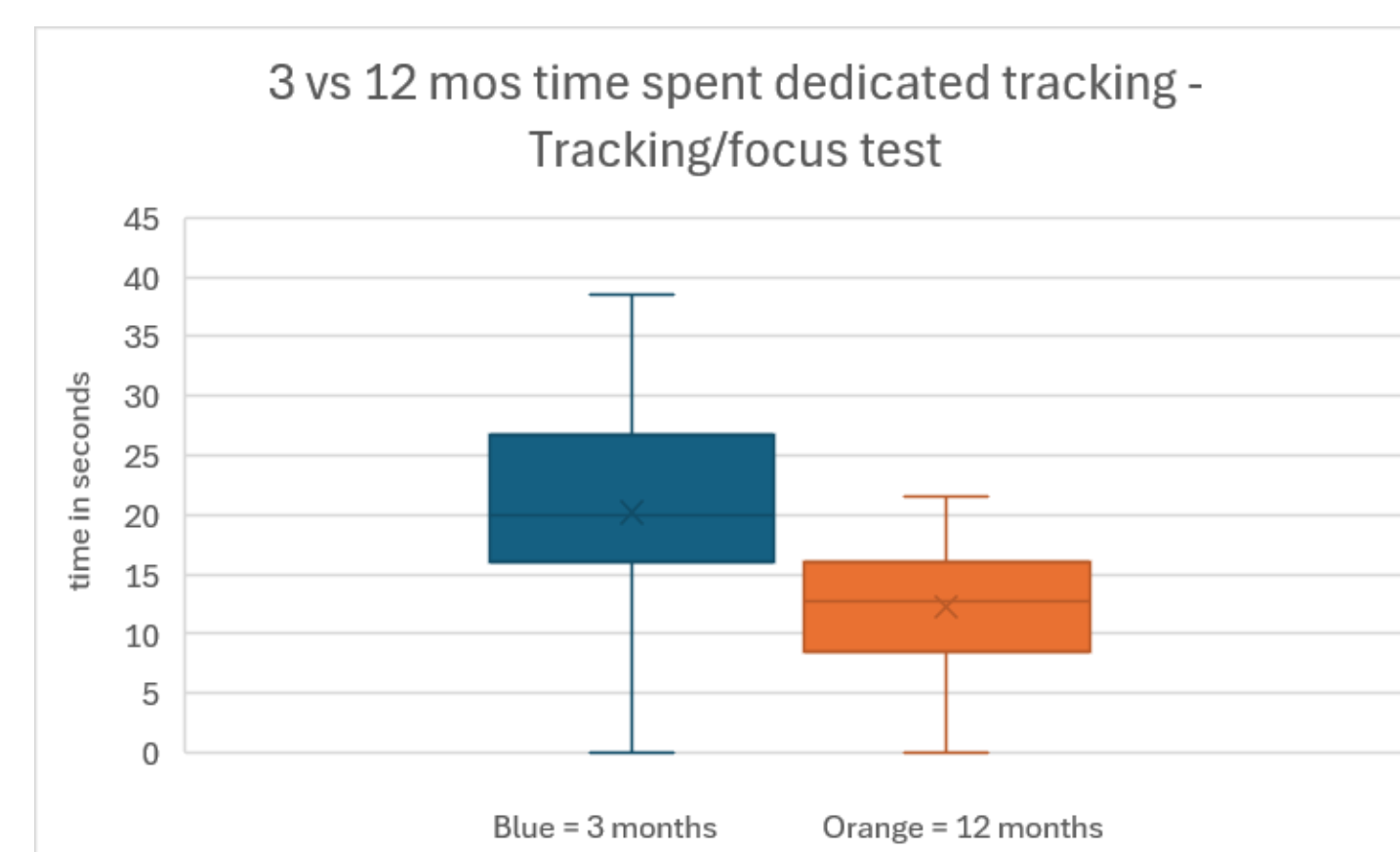
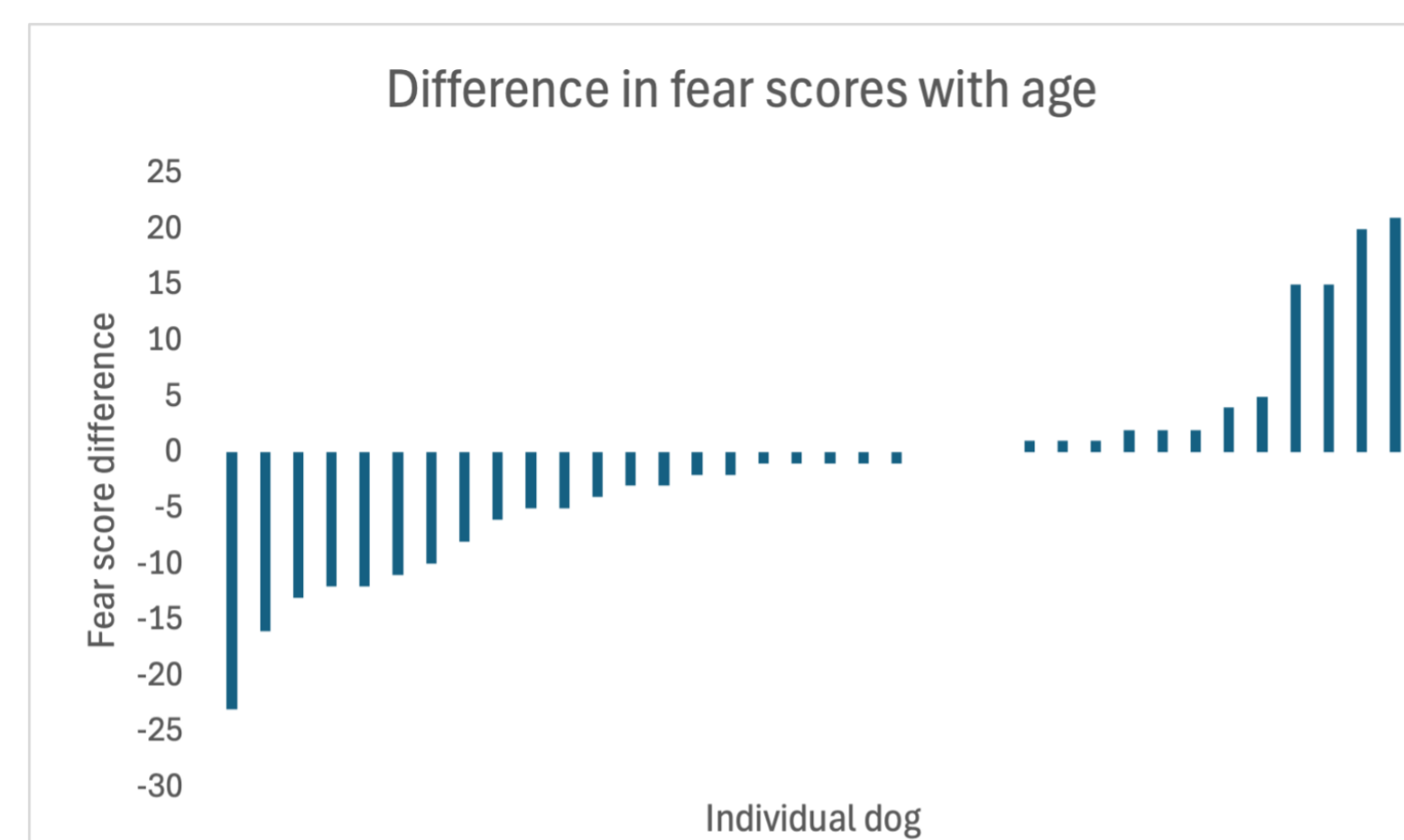
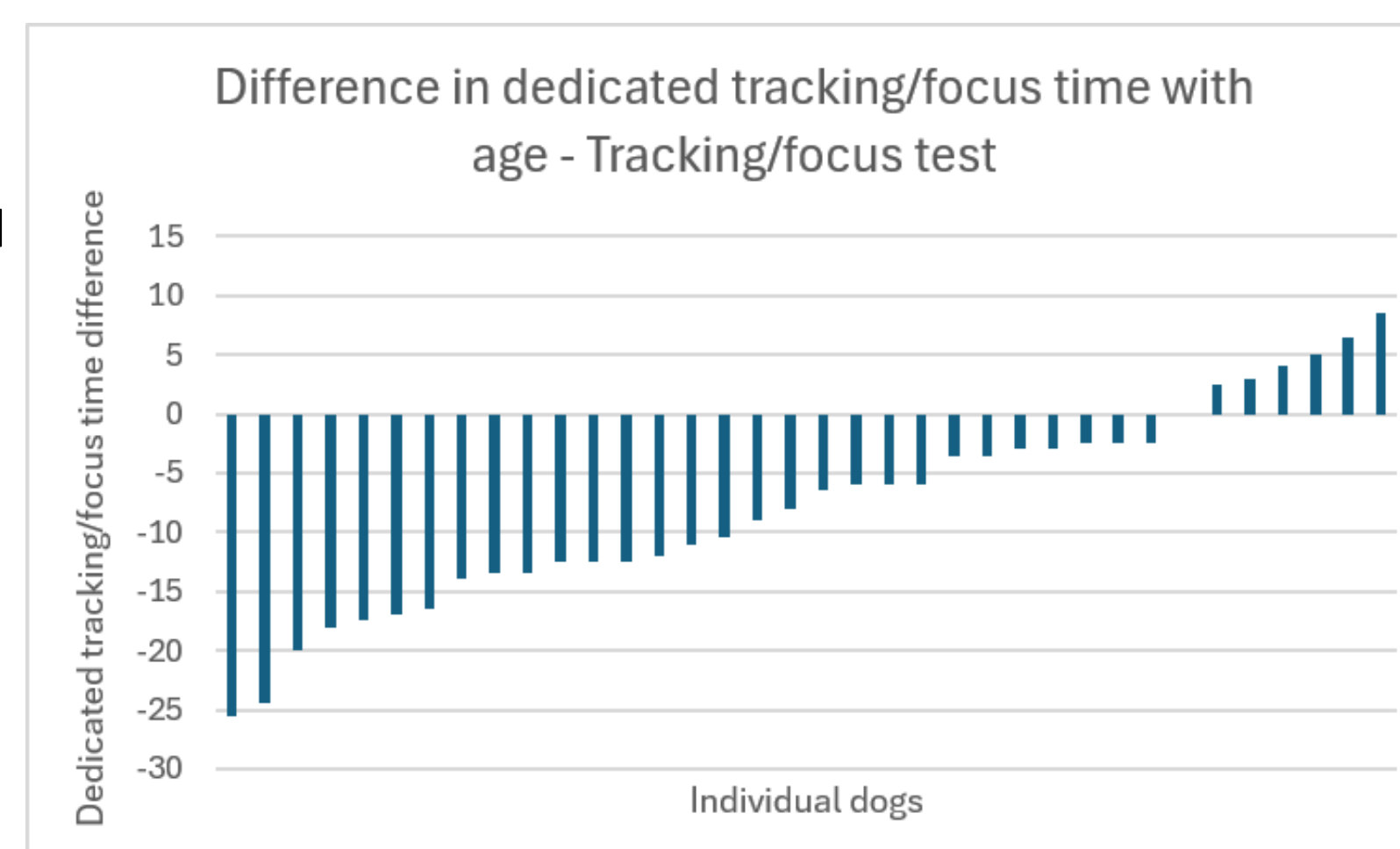


Figure 3: Dogs spend less time in dedicated/non-distracted tracking at 12 months than 3 months (Wilcoxon signed ranks test (2 tailed W = 63.00, p < 0.001).

Figure 4: There was a significant difference between the improved v. worsened groups (Mann-Whitney U test; U = 0.00, p < .001) for dedicated tracking time (distracted time excluded); negative #'s = dogs spent less dedicated time tracking; positive they spend more.



The *proportion* of dedicated tracking time, relative to entire time used, was significantly less at 12-months compared 3-months (Z = -5.19, p < 0.001).

There was a weak relationship between the time spent tracking at 3 months vs. 12 months (Spearman's rho (rs(34) = 0.23, p = 0.171, $\rho = 0.23$)), suggesting that multiple factors other than age affected tracking time.

When fear scores are compared to tracking/focus time at 3 and 12 months, there is a moderate and negative association at each age. *The more fearful you are, the less you focus* (Spearman's rho at 3 months (rs(34) = -0.34, p = 0.041, $\rho = -0.34$); Spearman's rho at 12 months (rs(34) = -0.40, p = 0.016, $\rho = -0.40$)).

Discussion

There were no significant differences in fear scores during this test for the pups between 3- and 12-months, and, unexpectedly, dogs spent significantly less time in dedicated tracking/focus at 12-month. However, there were moderate correlations for individual fear scores at 3- and 12-months, but only a weak correlation for dedicated time spent tracking across the two ages. Importantly, there was also a *moderate negative correlation for fear score and time spent tracking across both ages*; the more fearful the pup, the less time spent tracking. These data suggest that fear, rather than age, is the driving factor in how much time dogs at any age spend in dedicated tracking/focusing.

The finding that most dogs spent statistically less time, total, on the test and less dedicated tracking time at 12-months when compared with 3-months was unanticipated as most dogs improve their focus skills with age, training, and experience. The four dogs who significantly improved their tracking time with age all improved significantly in their fear scores, suggesting that with a better controlled test, this factor may be worthy of further examination.

Most tracking tests in dogs rely on extended and trained use of monitors, factors not possible given The Puppy Study mandate. Our data suggests that this tracking/focus test, in its current form may be too uncontrolled for a citizen science project, but that it may be possible to standardize it in an extended, in-person study so that it provides useful information about factors affecting ability to focus.

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