Usage of Emotional Reactivity Tests as a Puppy Assessment Method to Predict Working Dog Success

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Introduction

- The PennVet Working Dog Center (PVWDC) trains dogs for work in a variety of fields, categorized broadly into Urban Search and Rescue (USAR), Dual Purpose Police, Single Purpose Detection, and Research.
- Training often begins when the puppies are 8 weeks, but takes a year or more to determine their career suitability.
- Reliable puppy test for predicting working dog success is yet to be found -- crucial for saving time, money, and human resources.

Emotional Reactivity Test

- Study conducted by Auburn University in 2021 assessed 60 puppies at 3, 5, and 11 months using a three-section test battery: Performance, Emotional Reactivity, and Environmental Tests.
- The Emotional Reactivity Test (ERT) exposes dogs to five startling stimuli (novel object, sudden appearance of a stranger/object, animated object, acoustic startle).
- Stimuli vary based on dog age and are different for each timepoint
  - Ex. ranging from small garden gnome (novel object) to a large stuffed tiger (novel object)
- Live scorer evaluated startle responses on a scale of 1-5 (1 = severe fear, 5 = no fear, maintained work) – may be prone to human bias due to subjectivity.
- Found that ERT performance at 3 months was statistically predictive of career status at 3 years.

The ERT emerged as the most promising predictive test for puppy career outcome, outperforming the Environmental Test in predictive validity and feasibility and is not influenced by lack of training, unlike the Performance Test. However, Auburn only trains dogs for single purpose detection – is the ERT valid for working dogs in other careers?

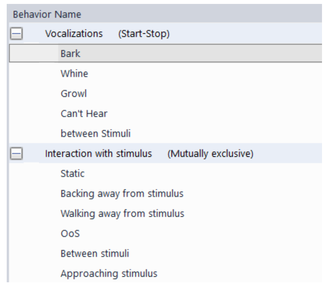


Fig. 1 Section of ethogram with vocalization and interaction behavior group.
7 behavior groups in total, grouped with similar or mutually exclusive behaviors.

Fig. 2 Novel Object for 5-month ERT

Fig. 3 Animated Object for 3-month ERT

Research Objectives

OBJECTIVE 1: Evaluate the validity of the Emotional Reactivity Test (ERT) for predicting variable career outlook in working dogs.

- Compare ERT scores of 6 Labrador Retrievers from one litter and 8 adult working dogs with known career status to assess whether test scores align with career.
- HYPOTHESIS: The ERT will reflect career status, with USAR dogs scoring the most points and Research dogs scoring the fewest points.

OBJECTIVE 2: Determine if the subjective live scoring aligns with objective video coding assessment in order to validate the ERT scoring system.

- Use ERT scores and videos at 12 and 20 weeks for 14 dogs from two litters – 8 German Shepherds and 6 Labrador Retrievers to assess whether subjective scores on a 1-5 scale align with objective behavioral coding.
- Code 28 videos (14 dogs at 2 timepoints) using objective behavioral coding software and compare coded data with live scores.
- HYPOTHESIS: The live ERT scores will have a negative correlation with stress behaviors coded using Observer software, as more fearless dogs will exhibit less stress behaviors.

Live Scoring & Behavioral Coding

Live Scoring

- A live scorer follows behind the handler and scores the dog's startle responses to each stimulus using a 5-point Likert scale – the total score is additive and out of 25
- A score of 5 reflects no startle response, ready investigation of the stimulus, and continued work (favorable for a working dog)
- A score of 1 reflects a severe reaction, strong reluctance to approach the stimulus, and interrupted work despite encouragement

Behavioral Coding

- A coder watches and scores a video of the ERT using Noldus Observer XT, a behavioral research software
- Instead of assigning subjective 1-5 values, it provides a way to objectively quantify behavior by using an ethogram as a coding scheme (see Fig. 1)
- 37 behaviors on ethogram sorted into groups (e.g. Interaction with stimulus) that are either mutually exclusive or start-stop

Fig. 4a

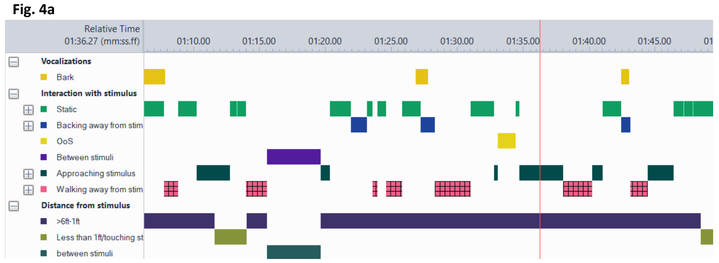
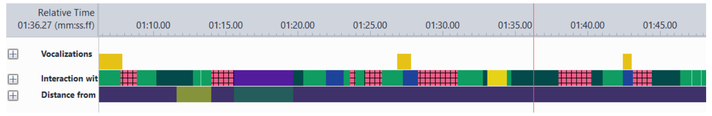


Fig. 4b



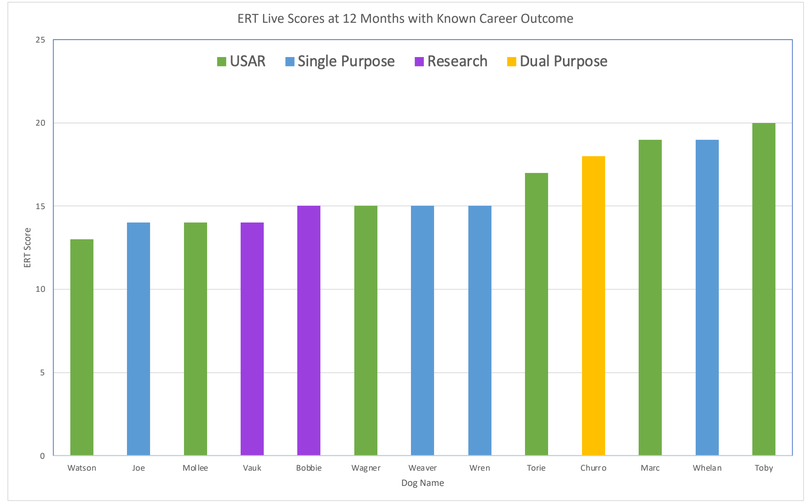
Figs. 4a&b Segments of Observer coded data visualization. Expanded and compressed, respectively.
Note: Only 3 of 7 total ethogram behavior groups shown in figures.

Results

1) Current data suggest that the ERTs are not very predictive of career outlook, but the sample size is very small and there is no data for the 8 German Shepherds yet (5 months old). The hypothesis suggested that USAR dogs should score the highest, but as seen in Figure 5, there was significant variation for USAR dogs, who scored both lowest and highest. However, the hypothesis is partially supported in that both research dogs had lower scores than most other dogs.

2) Behavioral coding for the 28 videos is in progress, as is establishing inter-rater reliability (IRR).

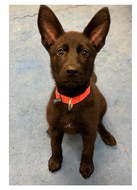
Fig 5. Bar graph comparing 12-month ERT scores and career outcomes



Next Steps

1) Complete ERT testing of 8 German Shepherds at 12 months. This will be added to existing data from Figure 5 to compare career outcomes and ERT scores.

2) Complete Observer behavioral coding and IRR analysis, and determine if the live scores align with video coding results. There should be a negative correlation between ERT scores and stress behaviors, as lower-scoring dogs should have more stress behaviors coded.



Figs. 6a&b Puppy from the German Shepherd litter and Labrador Retriever litter, respectively.

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