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Measuring Anxiety in Dogs

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Why is Anxiety important?

- ◆ **May predispose the development of anxiety disorders in Humans:**
 - **Humans:**
 - Panic disorder
 - Obsessive-compulsive disorder
 - Post-traumatic stress disorder
 - Social anxiety disorder
 - Specific phobias
 - Generalised anxiety disorder
 - **State-trait anxiety inventory**
 - Van Dam, N. T., D. F. Gros, M. Earleywine and M. M. Antony (2013). "Establishing a trait anxiety threshold that signals likelihood of anxiety disorders." Anxiety, Stress & Coping **26(1): 70-86.**



Canine anxiety

- ◆ **Canine anxiety is thought to be related to:**
 - Separation anxiety
 - Noise phobias
 - Inter-dog aggression
 - Impulse control aggression
 - Fear aggression



What is anxiety?

◆ Definition

- *"The apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic symptoms of tension"*
 - Different to fear which requires the presence of an actual or perceived threat

◆ State anxiety

- Anxiety present at a particular time – often normal

◆ Trait anxiety

- Tendency to be anxious across time

◆ Behavioural paradigm

- Test situations that the animal is placed into, designed to detect and measure specific behaviours.



Is anxiety contributing to behaviour problems?



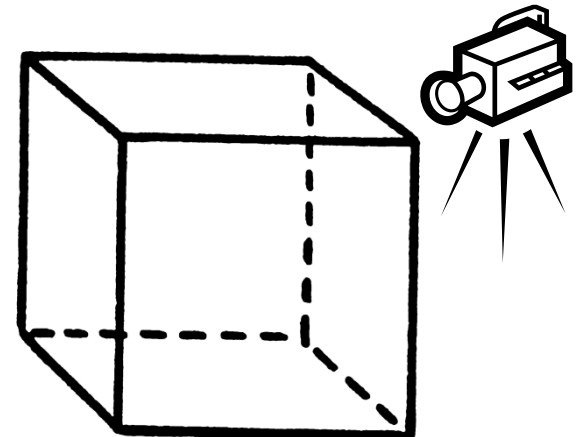
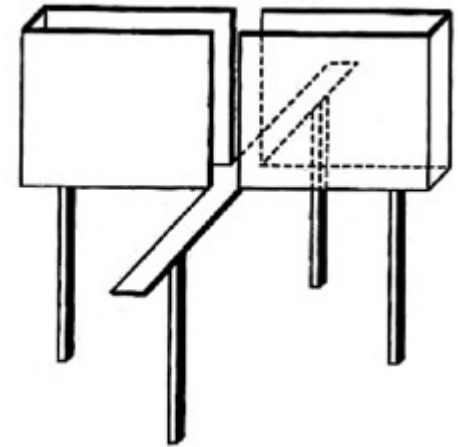
◆ Evidence

- **Anthropomorphising anxiety-like behaviors**
 - Vigilance, scanning, attentiveness, motor activity, autonomic hyperactivity, displacement behaviours
- **Treatment of anxiety disorders with anxiolytics** (benzodiazepines, SSRIs)
- **Neurophysiological measurements of dogs diagnosed with anxiety disorders**
 - Serotonin, cortisol, noradrenaline, heart rate



Measuring anxiety: Rodents

- ◆ **Established methods for measuring anxiety:**
 - **Rodents** - behavioural paradigms- 1000's of studies
 - **Anxiety:** elevated plus maze, open field
 - **Pharmacological validation** with anxiolytic (eg. Diazepam)





Measuring anxiety: dogs

◆ Established methods for measuring anxiety:

- Dogs - no established method yet

- Few studies
- Body language - displacement behaviors, vigilance,
- Sympathetic arousal
- Qualitative measurement of anxiety, not quantitative

- A few behavioural paradigm studies including some open field testing
 - Little baseline data
 - Measuring different traits/behaviors
 - Using different methods
 - Many focus on conditioned responses





Study overview

◆ Current studies:

- **1.** Behavioural paradigms designed to measure trait anxiety in **greyhound dogs**

– Open field test

- Response to acoustic tone
- Unconditioned place preference

- **2.** Measurement of stress coping style in greyhound dogs

- **3.** Greyhound Adoption Program (GAP) collaboration

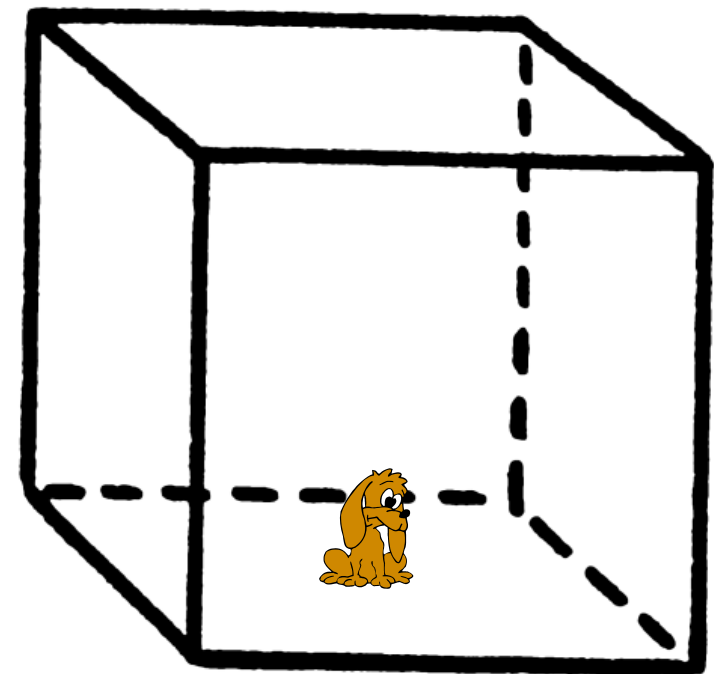




Study overview

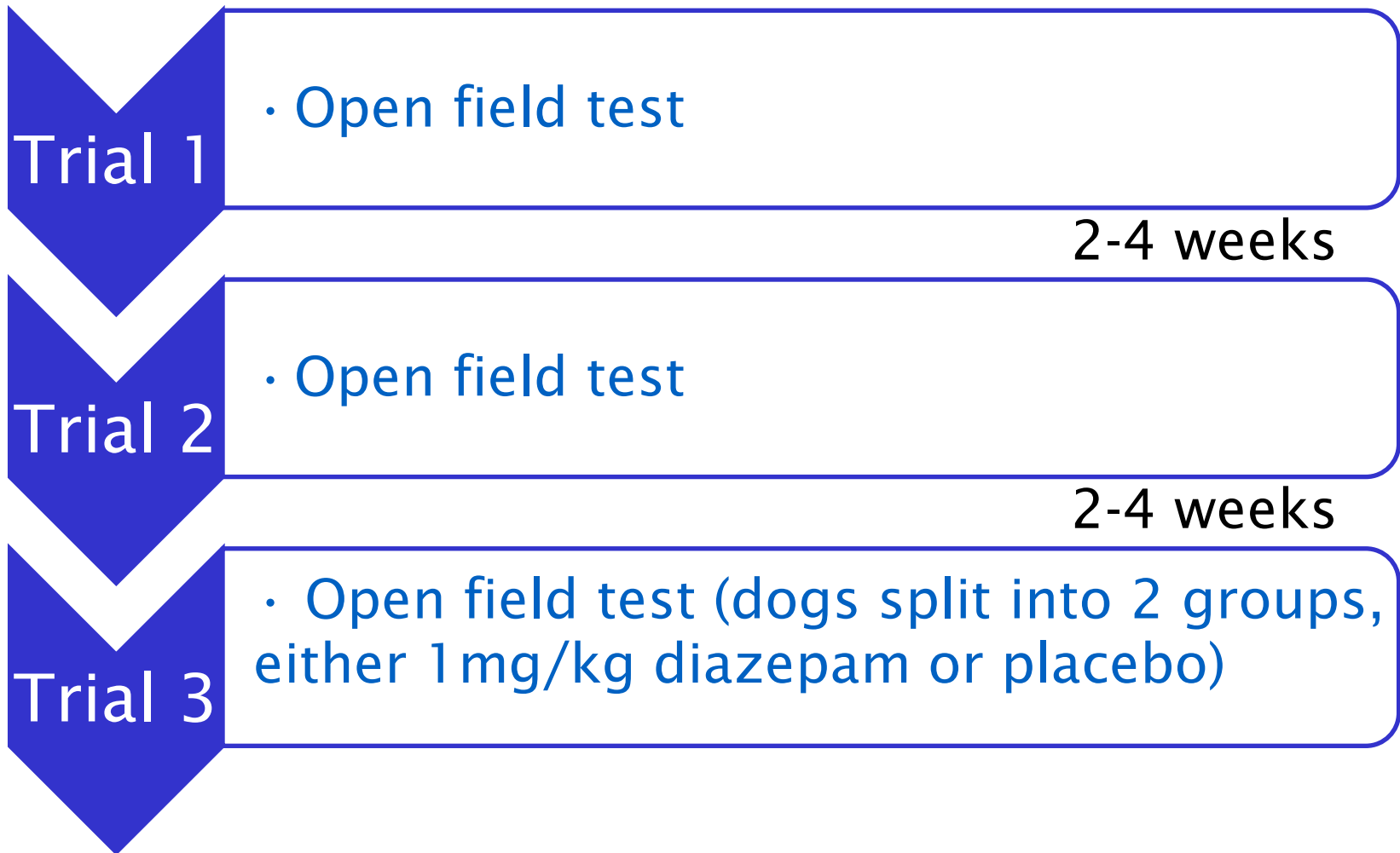
◆ Open field test

- Aiming to measure unconditioned behaviour in a novel environment
- 10 minute open field test (empty room), where the dog can choose to explore.
- Many factors influence exploratory behaviour, including anxiety which is believed to suppress this behaviour.





3 Trial Design



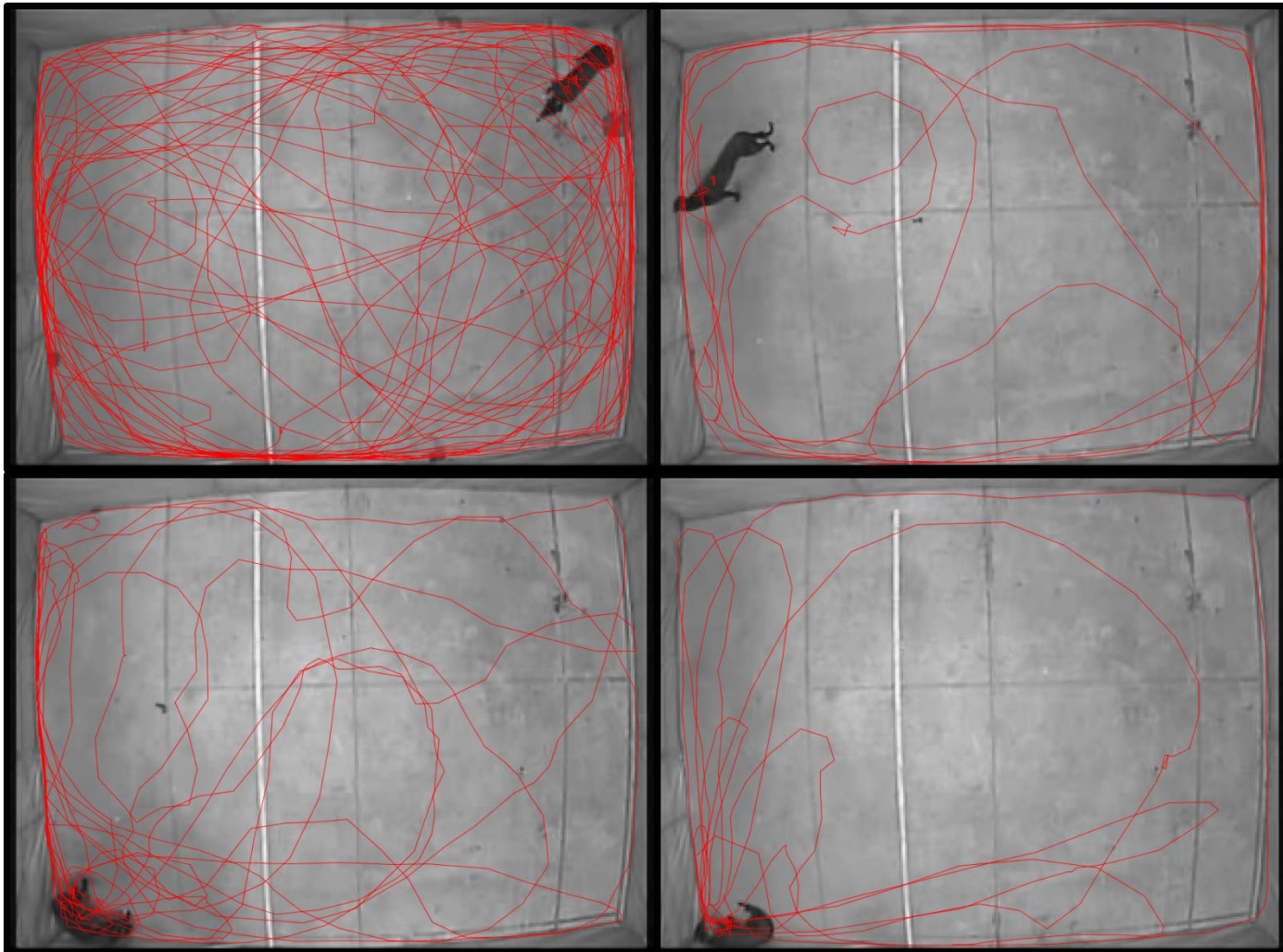


Video tracking



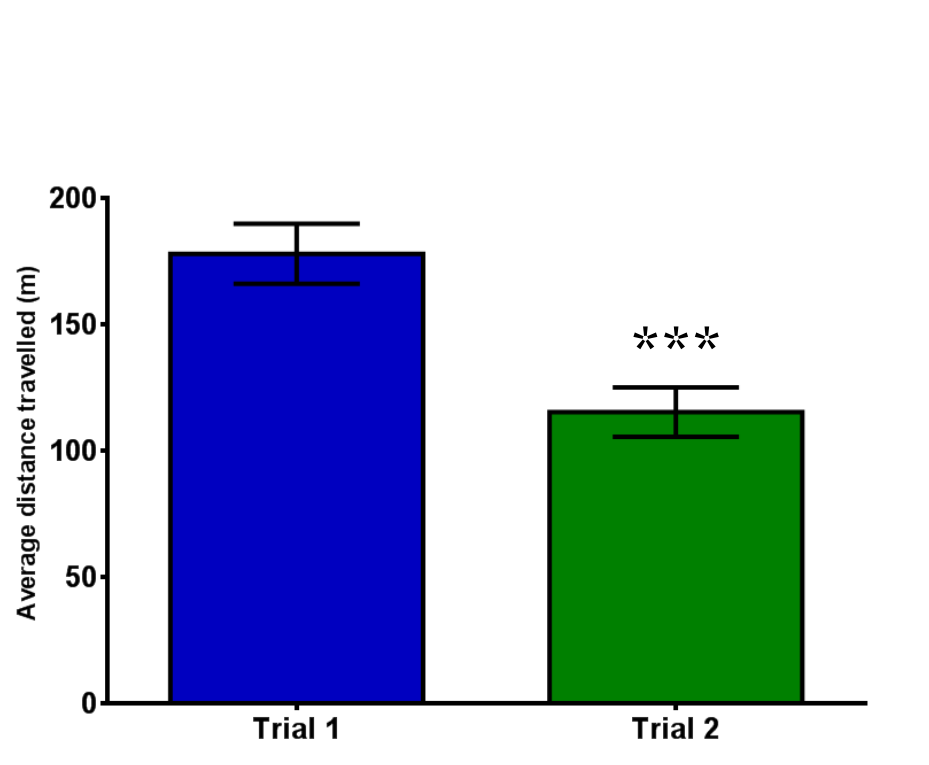


Open field test

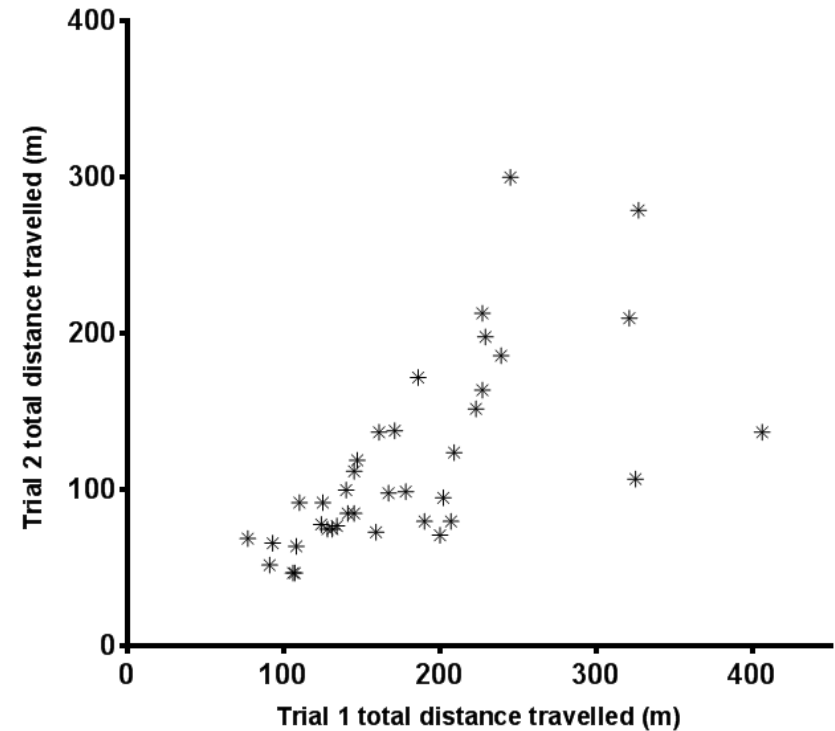




Activity during trials 1 and 2



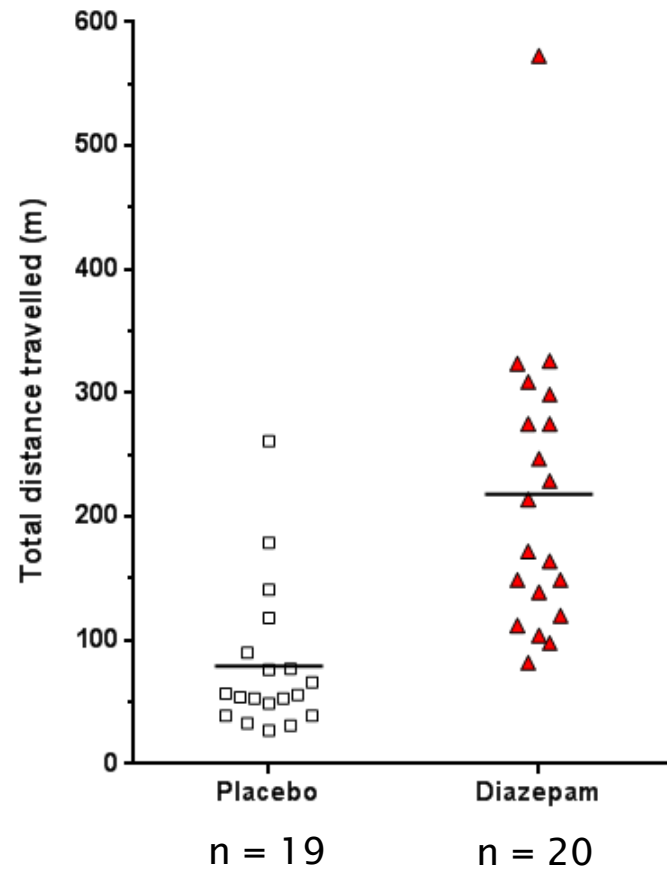
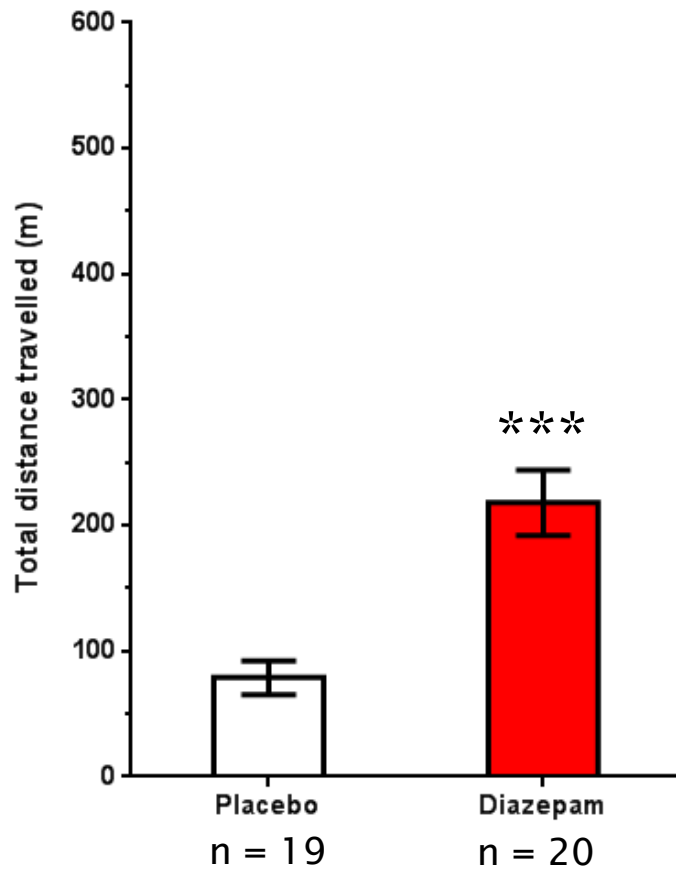
Mean +/- 1 SE
***p < 0.001
paired sample student's t test
n = 39



Spearman's correlation:
coefficient = 0.815
significance < 0.001
n = 39



Activity during third trial



Mean +/- 1 SE

***p < 0.001

independent sample student's t test



Final thoughts

- **Distance travelled was increased by diazepam**
 - Exploratory behaviour disinhibited?
 - Escape behaviour disinhibited?
- **Relevance of study to general practice**
 - Diazepam dose (1mg/kg) is similar doses used for thunderstorm/fireworks phobia
 - Non-clinical dogs
 - Paradigm eliciting minimal stress
 - Breed differences?





Research Team

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