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
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

- Developed 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

Trial 1
- Open field test

Trial 2
- Open field test

Trial 3
- Open field test (dogs split into 2 groups, either 1mg/kg diazepam or placebo)
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

Placebo
n = 19

Diazepam
n = 20

Total distance travelled (m)

n = 19

Diazepam
n = 20

Total distance travelled (m)
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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Additional thanks to Blood Bank staff and Melanie Conley

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