

Multi-Scent discrimination in dogs (*Canis lupus familiaris*)

Introduction

Dogs possess remarkable olfactory abilities surpassing humans, crucial in scent detection tasks. (Farr et al., 2021). However, understanding how dogs process and differentiate multiple odours, especially combined scents, remains limited. This study addresses this gap by exploring dogs' multi-scent discrimination. Operational dogs encounter diverse odour combinations, like explosive mixes in security or distinguishing missing persons in search missions (Lazarowski and Dorman, 2014). Current training focuses on single-scent discrimination, lacking efficacy in real-world scenarios with complex mixtures. Retraining methods like 'stew training' improve performance, but challenges like overshadowing persist. Bridging this gap is vital for enhancing scent detection applications in various fields.

Aims

Study aimed to investigate and develop training techniques tailored for multi-scent discrimination.

Followed a training plan and investigate the results



Methodology

Use classical conditioning method

Combine the scents Vanilla and Strawberry

Trained cue word "seek" to guide the dog to find the scent.

Successful detections were rewarded

Unsuccessful attempts prompt retry without reward.

Decoy scents (dog biscuits) are gradually added to introduce distractions.

Double blind tests carried out ensuring reliability

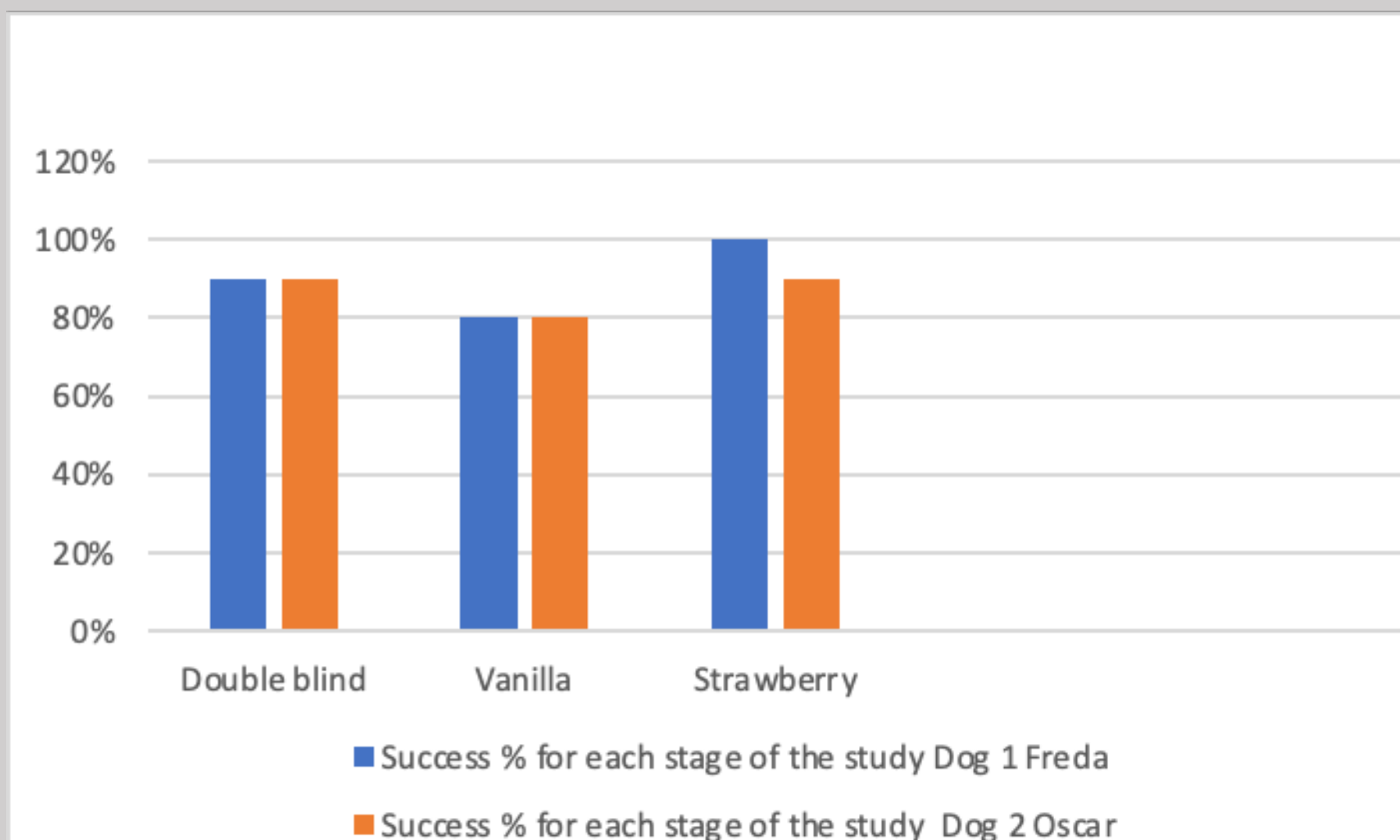
Success measures were frequency and latency

Specific scent discrimination was achieved by replacing mixed scents with individual ones.

Findings

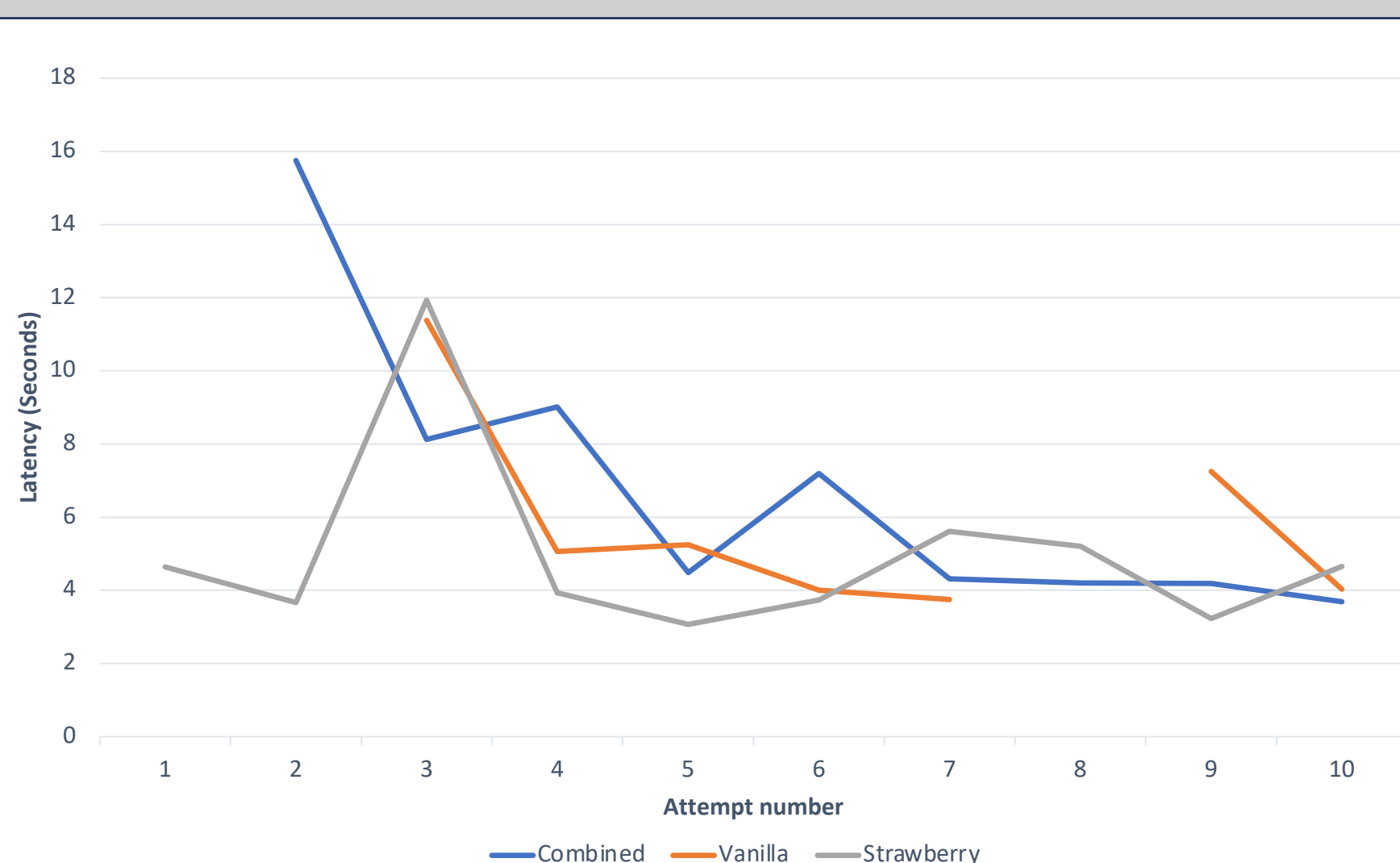
- Graph 1 shows both dogs had similar success percentages, however variation came when finding the strawberry scent the dog without any prior experience exhibited a higher detection rate.
- Graph 2 shows that the dog without any prior scent detection training exhibited faster latency times for each scent compared to the dog with previous experience.
- Moreover, it suggests that the training method might be beneficial for dogs that haven't undergone any prior scent training, possibly due to their receptiveness to learning new techniques or an absence of conflicting scent associations

Results



Our study aligns with previous research on scent detection training in dogs, supporting the effectiveness of respondent conditioning, akin to principles outlined by Lippi and Plebani (2019). Similarly, like Keep et al. (2021), our findings underscore the efficacy of combined scent training, especially for untrained dogs. While consistent with Lazarowski and Dorman (2014), we note variations in latency times between dogs, suggesting individual differences or training backgrounds. However, overshadowing remains a concern, impacting scent discrimination. Future research should address these limitations by controlling scent intensity, diversifying samples, exploring dilution ratios, and assessing long-term effects for optimized training strategies in working dogs.

Discussion



- Dogs possess remarkable olfactory abilities, allowing them to discern a variety of scents accurately.
- Combined scent training, employing respondent conditioning and positive reinforcement, enhances dogs' discrimination abilities.
- Previous training experiences significantly impact dogs' performance in scent discrimination tasks, emphasizing the need for tailored training methods.
- Initial training with combined scents does not hinder dogs' ability to discriminate between individual scents, contrary to previous assumptions.
- The research findings have practical implications for scent detection applications, informing the development of more efficient training protocols for working dogs.

Conclusion

References

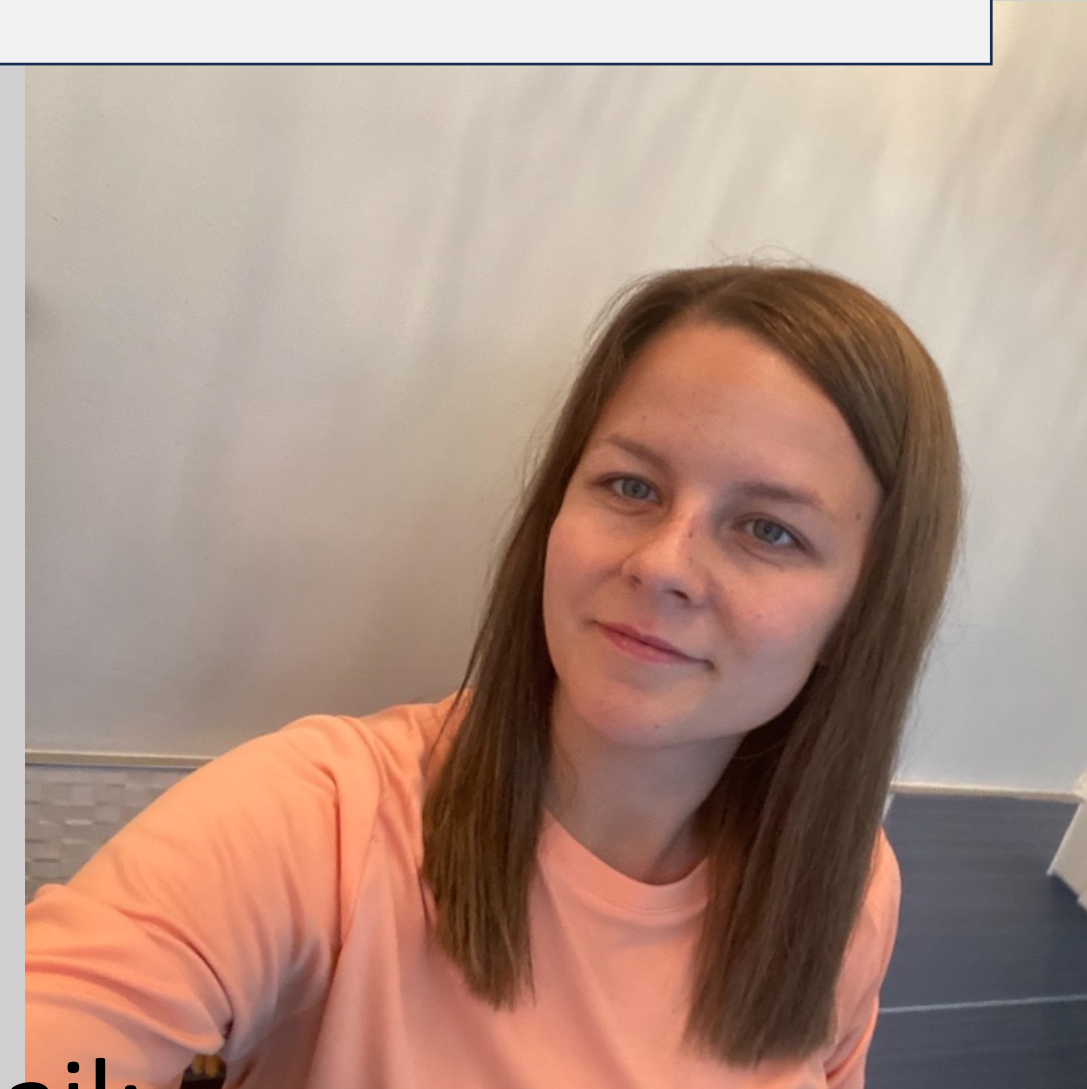
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Email:
Jodiesacre@Hotmail.com