



Rapid Scent Imprinting for Detection

Dogs

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UK

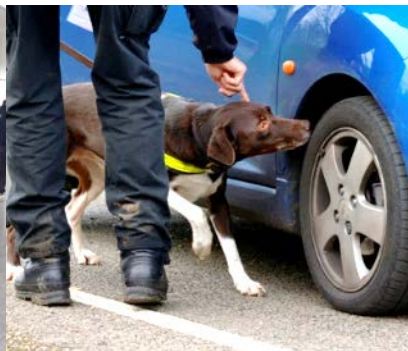
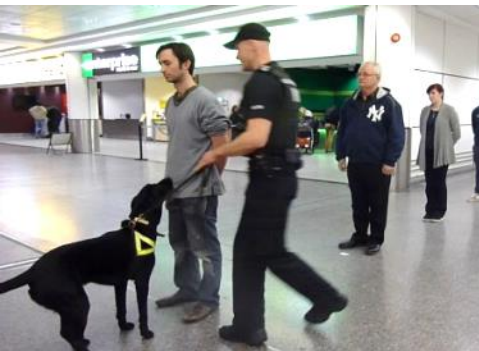
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Canine and Biosystems Team

- Support and enhance working dogs:
 - Understanding current canine capability
 - Supporting operational teams
 - Optimising performance
 - Developing new capabilities

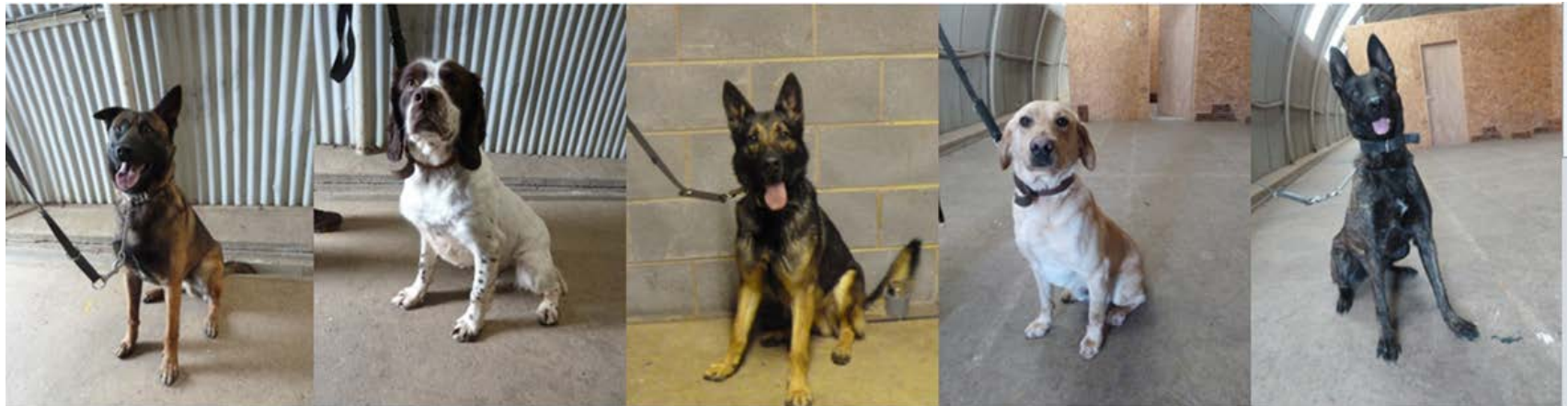


Rapid Imprinting Trial

- The aim of this pilot study was to understand how training schedule affects odour learning and memory:
 - To determine whether dogs can be effectively trained over very short training periods
 - To determine whether dogs can successfully recall trained odours after short and long periods without encountering the odour in the interim

Dogs

- Six dogs
 - Belgian Malinois, Springer Spaniel, German Shepherd, Labrador Retriever, Dutch Shepherd, Cocker Spaniel
- All aged between 1.5 - 3 years old at start of the trial
- All had received initial training on search technique and two odours



Training schedules

Training Schedule	No. of Rewards
0.5 days training	?
1 days training	?
3 days training	?
5 days training	?
0.5 days training plus training on two additional odours	?
3 days training plus training on additional odours	?

How many rewards?

- Training observed for one week
 - Stand based training
 - One handler with six dogs
- Average of 26 rewards per dog per day



Stand based training



Training schedules

Training Schedule	Rewards
0.5 days training	13 rewards
1 days training	26 rewards
3 days training	78 rewards
5 days training	130 rewards
0.5 days training plus training on two additional odours	5 rewards (4 rewards each on two additional odours)
3 days training plus training on additional odours	26 rewards (26 rewards each on two additional odours)

Trial design

- Balanced latin square
 - Six odours
 - Each training schedule was completed once by each dog
 - Each of the odours was used once for each schedule
 - Order effects were limited

balanced	A	F	G	H	I	J
Dog 1	half	five	one	three&two	three	half&four
Dog 2	five	three&two	half	half&four	one	three
Dog 3	three&two	half&four	five	three	half	one
Dog 4	half&four	three	three&two	one	five	half
Dog 5	three	one	half&four	half	three&two	five
Dog 6	one	half	three	five	half&four	three&two

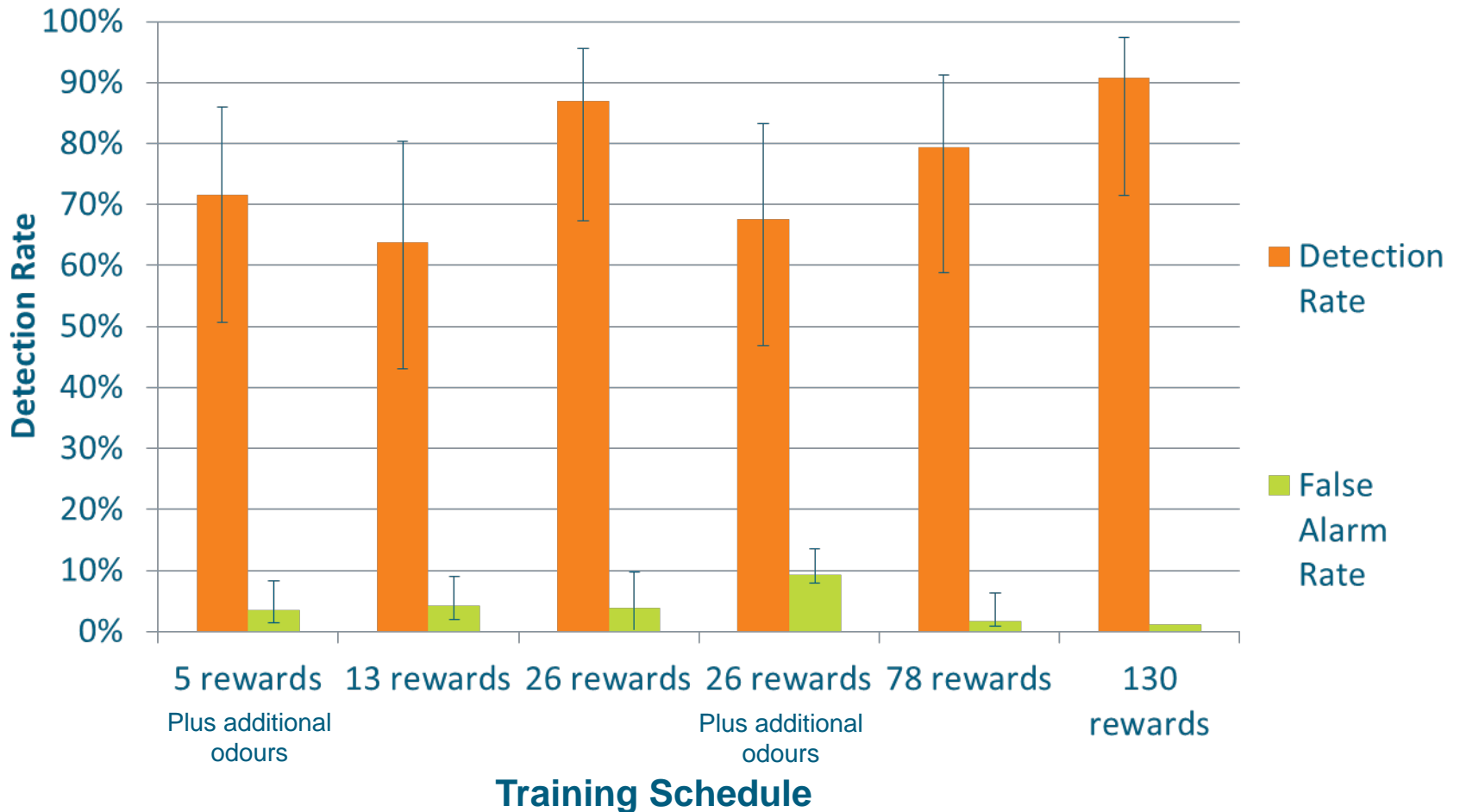
Testing

- Tested using Odour ID test protocol
- Eight stands per run
- Dogs work on lead – search each stand once
- 1 target odour and 7 distractor odours
- 5 positive runs, 1 blank run
- Between each run, target and 2 distractor odours replaced
- Tested at 1 day, 1 week, 2 weeks and 6 month time intervals

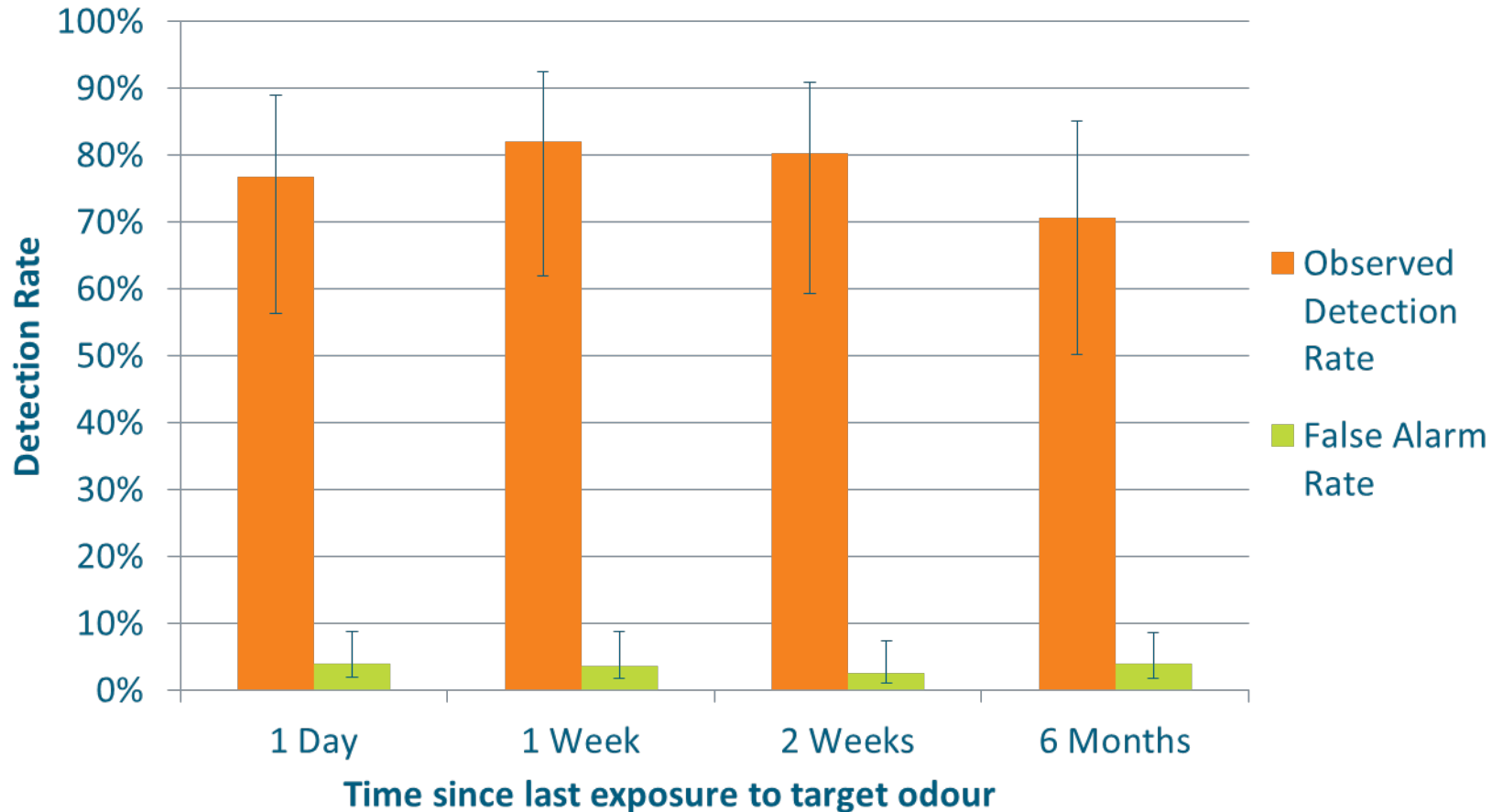


Porritt et al., (2015)) Validation of a short odour discrimination test for working dogs, Applied Animal Behaviour Science, Vol 165, 133-142)

Results – Initial learning



Results - memory



Conclusions

- Dogs given limited training (13-26 rewards) on a new odour had high detection rates (64-87%) immediately after training
- Training on multiple unrelated novel odours appears to be more challenging than training on a single odour (26 versus 26+additional odours)
- Dogs are able to remember an odour for up to six months without any exposure to that odour, when tested using an Odour ID test

Recommendations/next steps

- Collect data on larger sample size
- Determine whether this speed of odour learning is possible in realistic search scenarios
- Test odour recall in operationally realistic search scenarios following stand based training, stand based plus minimal search training and search training only
- Determine whether a dog's ability to generalise to odours related to their training target (e.g. different variants) is affected by limited training time and/or long periods of non-exposure to the target odour

Questions?

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