



Effect of impulsivity on detection performance in Military Working Dogs

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Overview



Impulsivity (or impulsiveness)



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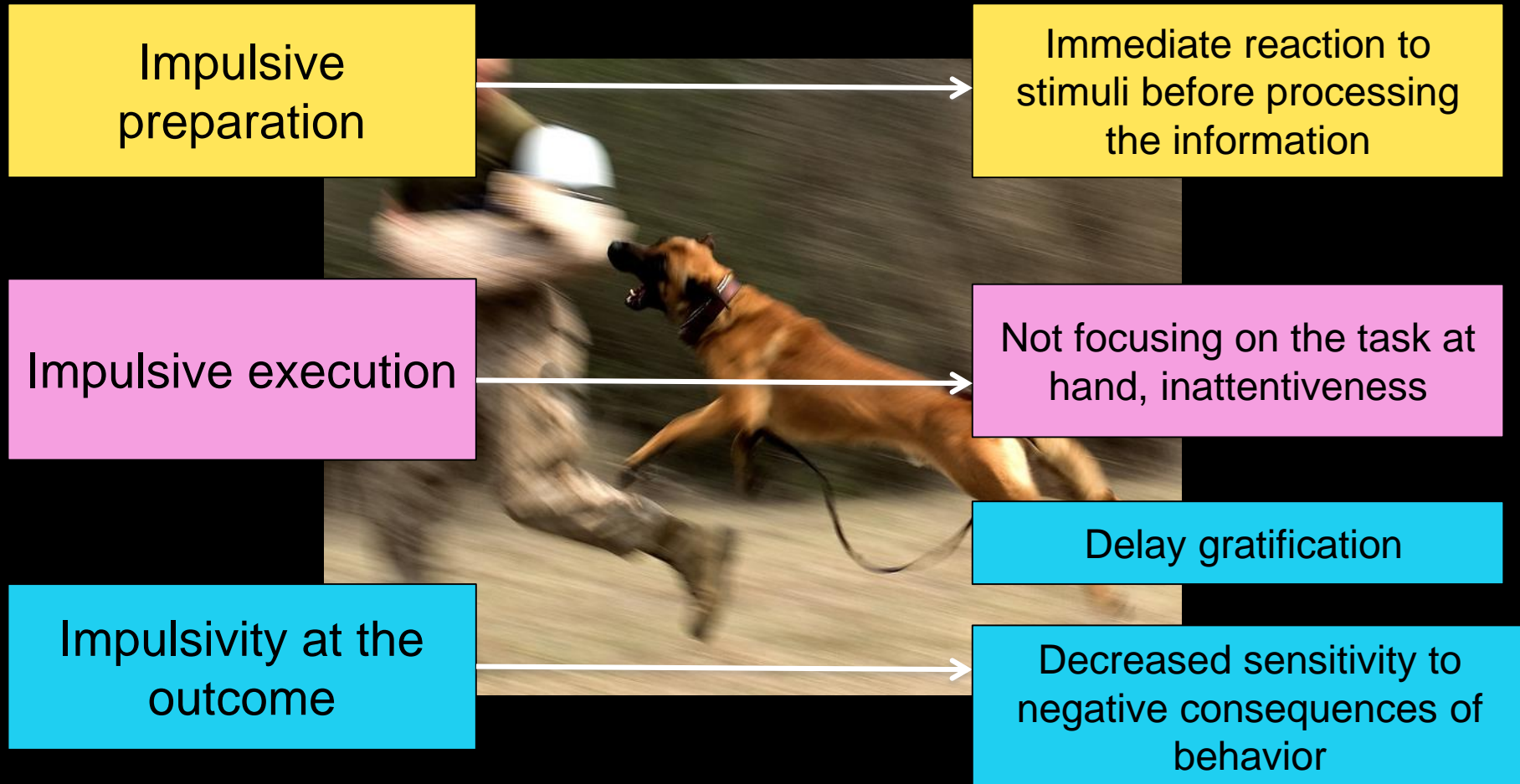
“Predisposition toward rapid, unplanned reaction without due consideration to the consequences”

Motor impulsivity

Cognitive impulsivity



Effect of impulsivity

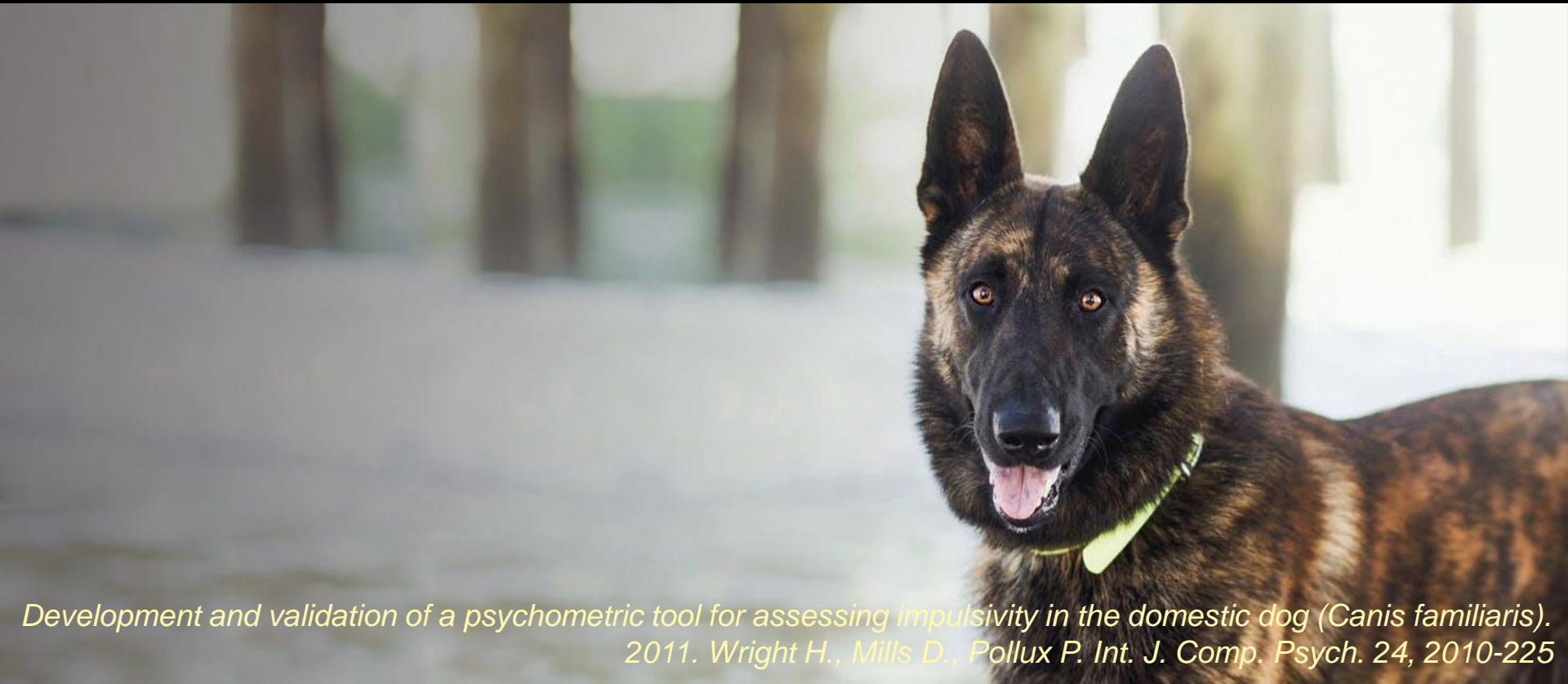


Impulsivity in dogs

- ✓ Stable over time (*Reimer et al. 2014*)
- ✓ Working-lines of Border Collies and Labrador Retrievers are more impulsive than their equivalent show-lines (*Ruiz Fadel et al. 2016*)
- ✓ Associated with poor inhibitory control
- ✓ Inability to tolerate frustration, and related to poor ability to problem solving (*Wright et al. 2011; Muller et al. 2015; Brucks et al. 2017*)
- ✓ Linked to destructive and aggressive behaviors (*Amat et al. 2013; Piotti et al. 2018*)

Dog Impulsivity Assessment Scale (DIAS)

- ✓ 18-questions handler completed scale
- ✓ Overall questionnaire score for impulsivity



*Development and validation of a psychometric tool for assessing impulsivity in the domestic dog (Canis familiaris).
2011. Wright H., Mills D., Pollux P. Int. J. Comp. Psych. 24, 2010-225*

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Factor 1 Behavior regulation



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Factor 1 Behavior regulation

Factor 2 Aggression and response to novelty



Dog Impulsivity Assessment Scale (DIAS)

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Factor 1 Behavior regulation

Factor 2 Aggression and response to novelty

Factor 3 Responsiveness



Dog Impulsivity Assessment Scale (DIAS)

- ✓ Delay of gratification task

(Wright et al. 2012; Brucks et al. 2017)

- ✓ Spatial discount paradigm

(Brady et al, 2018)

- ✓ DIAS scores and cognitive measures in behavior tests remain stable over time, from a young age into early adulthood and across adulthood

(Reimer et al., 2014; Brady et al. 2018)



Dog Impulsivity Assessment Scale (DIAS)



- ✓ Higher DIAS score specifically on “responsiveness” factor, have been found in active UK Police dogs compared to withdrawn for services counterparts (*Brady et al. 2018*)

Photo: Scandinavian Working Dog Institute (SWDI)

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Aim

Evaluate if the Dog Impulsivity Assessment Scale (DIAS) predict DoD MWD detection performance during training

Methods

- ✓ 54 DoD explosive detection of LAFB
 - ✓ 32 Belgian Shepherd Malinois
 - ✓ 13 German Shepherd
 - ✓ 9 Dutch Shepherd
- ✓ 13 Females – 41 Males
- ✓ Training progress check

Methods

- ✓ Training progress check
 - ✓ 3 substances
 - ✓ 3 different Heights - depths
 - ✓ Final trained alert response
 - ✓ Release of reward on command to hand or to ground (reward retrieval)

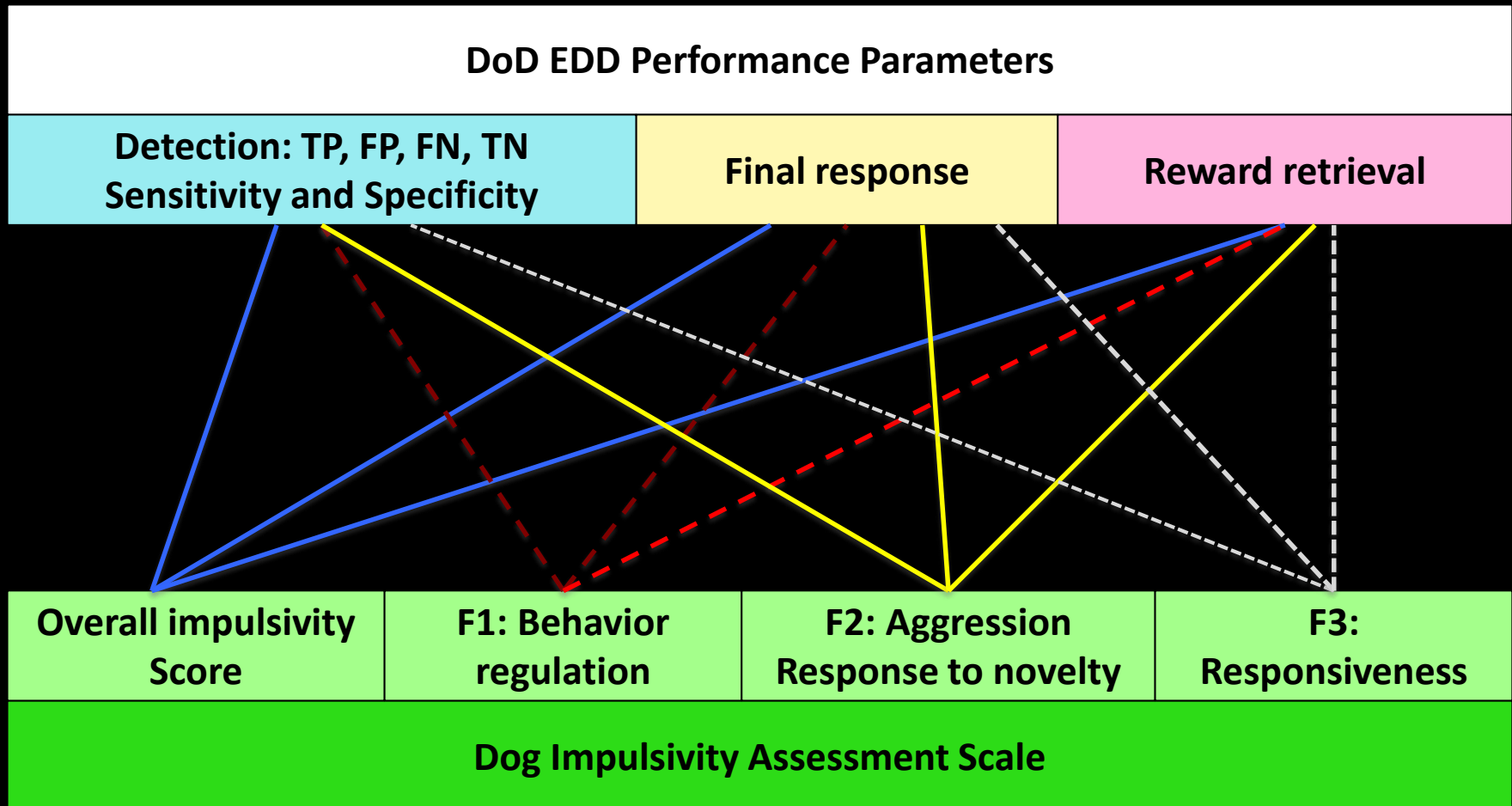


Methods

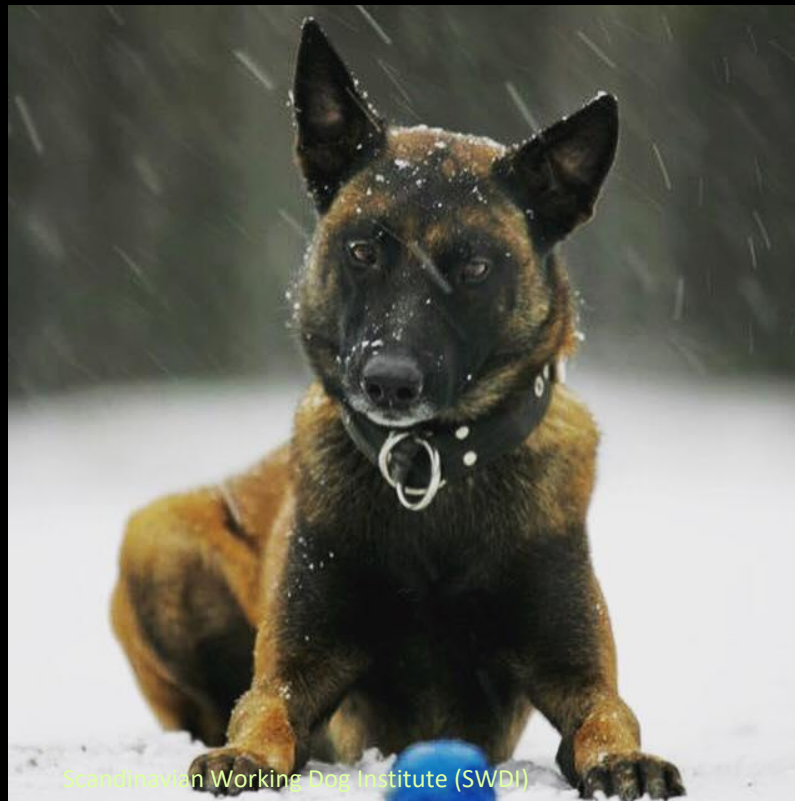
✓ DIAS questionnaire

		Strongly agree	Mainly agree	Partly agree, partly disagree	Mainly disagree	Strongly disagree	Don't know / not applicable
5	This dog becomes aggressive (e.g. growl, snarl, snap, bite, bark) when excited						
10	This dog is easy to train						
11	This dog is not keen to go into new situations						

Methods



Results



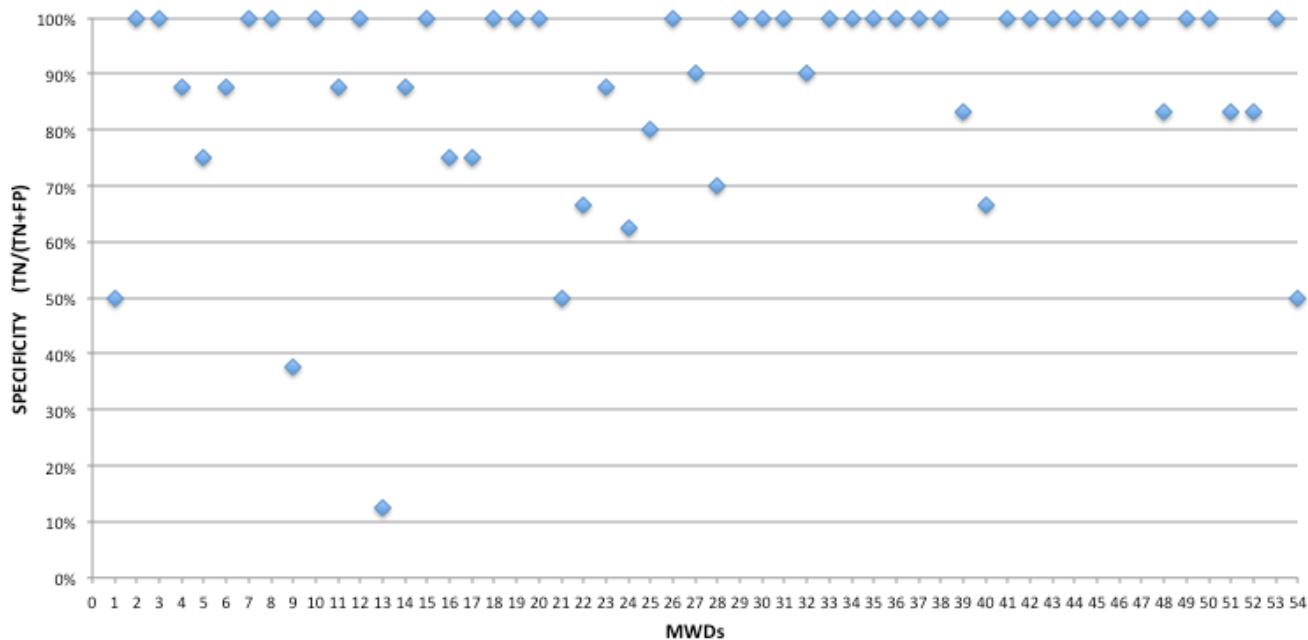
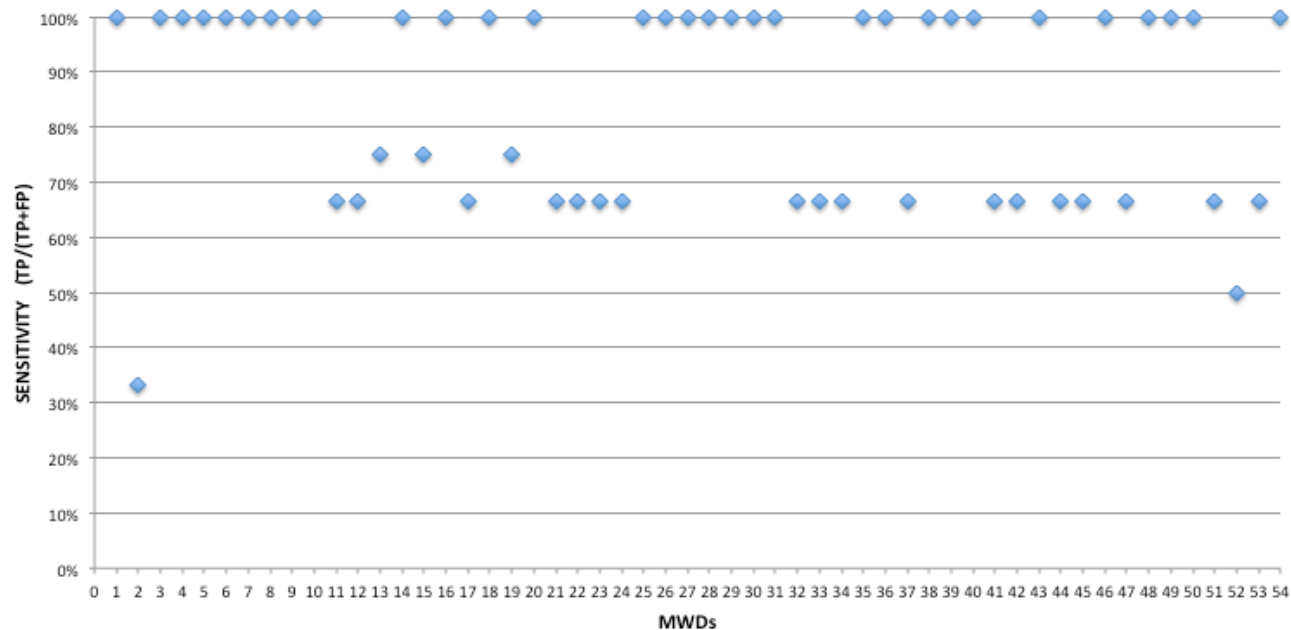
Scandinavian Working Dog Institute (SWDI)

Results: DIAS Score

DIAS SCORES	"Normal" range	DoD EDD mean±Std. Dev
Overall Questionnaire Score	0.52 (0.42- 0.62)	0.56±0.10
Factor 1 Behavior Regulation	0.47 (0.31-0.63)	0.57±0.13
Factor 2 Aggression & Response to Novelty	0.37 (0.22-0.52)	0.40±0.10
Factor 3 Responsiveness	0.70 (0.57-0.83)	0.70±0.13

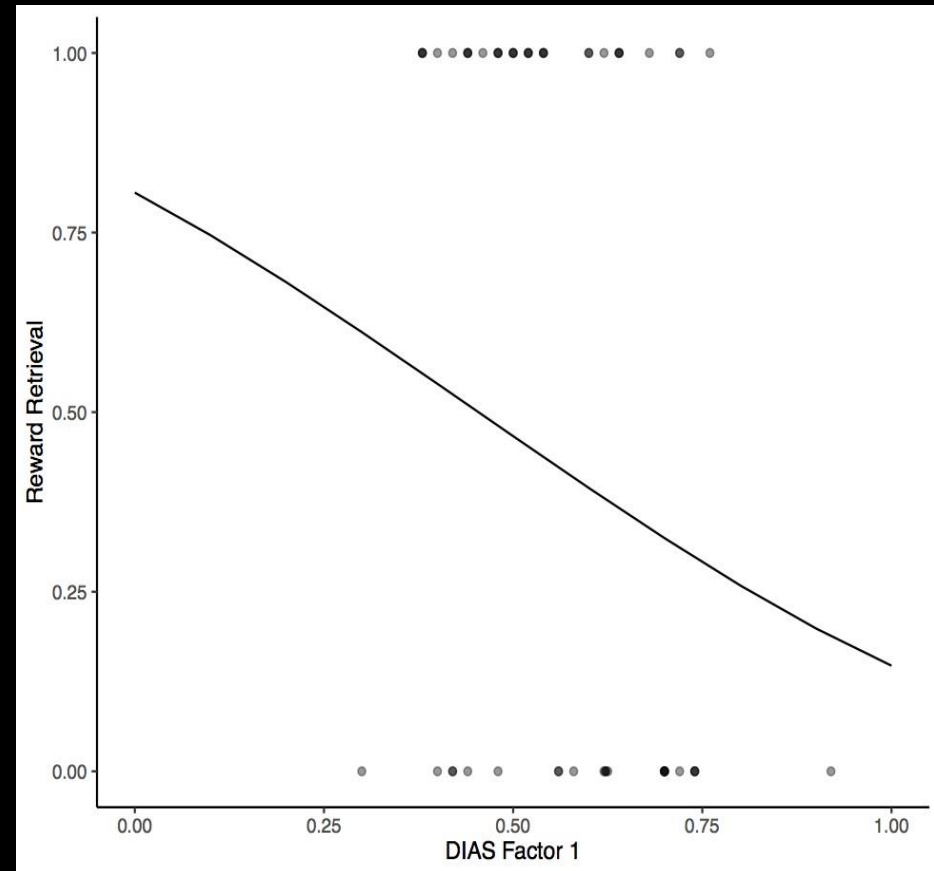
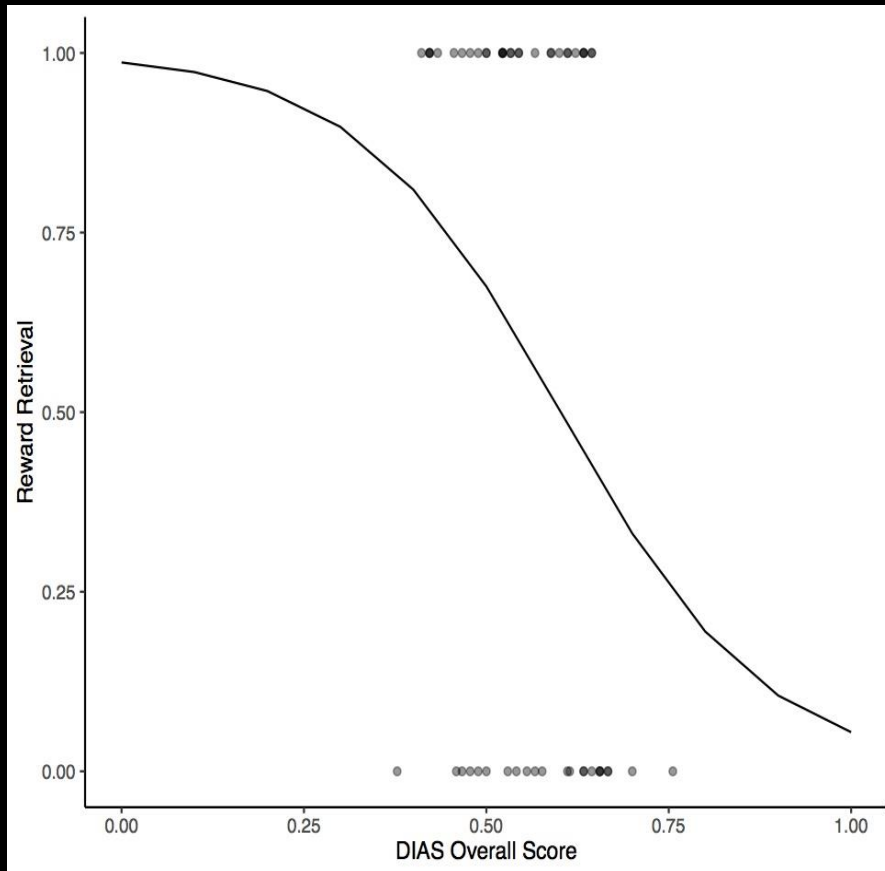
Results

Olfactory detection performance



Results

Reward release was predicted by overall DIAS score and specifically for the levels of behavioral regulation



Discussion and Conclusions

Higher score on behavioral regulation:

- Little control over a response to stimuli and “not thinking” before they act – *Training self-control*
- Decrease sensitivity to negative consequences of behavior – *using coercion might aggravate behaviors*
- Related to high arousal
- Low frustration tolerance and impulsivity are often related within an individual, particularly in aggressive behaviours (McPeake et al. 2019)



Discussion and Conclusions

- ✓ Psychometric tests relies on personal perception and memory
- ✓ Future work is ongoing to further investigate impulsivity levels in training parameters such as acquisition of a conditioned odor, focus on the detection task, independence on the search etc.
- ✓ The effect of the core affect and arousal on different aspect of detection and patrol performance

Acknowledgements



*The National
Academies of*

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MEDICINE



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Department of Defense
Military Working Dog
Veterinary Service

Thank you



<https://mwdt6a.org/>
Photo credit: Rachel Longo



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