Genetic parameters of a behavioural aptitude test in guide dogs

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Aptitude test at the Finnish guide dogs school

– The dogs are tested around the age of 18 months

– The test includes 11 traits
  – Temperament
  – Concentration
  – Nerve stability
  – Working ability
  – Stress
  – Dog distraction
  – People distraction
  – Traffic distraction
  – Afraid of strange places
  – Hardness
  – Trainability

Aim of the study

The aim of the study was to estimate the genetic parameters for the behavioural measures that are evaluated in an aptitude test used for selecting dogs for training

Material

- 465 Labrador Retrievers tested in 1997-2008
- 1682 observations
- The dogs were tested from 1 to 14 times
- 255 females and 210 males

Methods

- Fixed effects: sex, age, year of birth and season of birth
- Random effects: tester
- Repeatability animal model
- REML with VCE software (Groeneveld et. al. 2008)

Results

– Repeatability (r) and heritability (h^2) estimates

	Observations	*r*	$h^2 \pm$ s.e
Temperament	1329	0,42	0,20 (0,04)
Concentration	1038	0,48	0,18 (0,04)
Nerve stability	1563	0,48	0,26 (0,03)
Working ability	1547	0,38	0,12 (0,01)
Stress	985	0,53	0,29 (0,03)
Dog distraction	881	0,36	0,11 (0,04)
People distraction	1060	0,39	0,19 (0,05)
Traffic distraction	1185	0,28	0,07 (0,02)
Afraid of strange places	1393	0,55	0,09 (0,01)
Hardness	434	0,42	0,08 (0,03)
Trainability	1228	0,58	0,29 (0,06)

Genetic correlations

– Correlations were from low to very high (0,05-0,99)

– Standard errors were high in low correlations

– Temperament was negatively correlated with all other traits

– Dog distraction was also negatively correlated with hardness, but all other genetic correlations were positive

– Dog distraction, afraid of strange places and hardness had lowest correlations with other traits

– Strongest correlations were between concentration and trainability (0,99), nerve stability and trainability (0,98) and nerve stability and stress (0,98)

Conclusions

- Heritability estimates of the studied behavioural measures were between 0,07 and 0,29, and are largely in agreement with other studies
- Genetic correlations varied a lot, but were mostly high and positive
- High genetic correlations indicate the same genetic background
- Trait definition and recording of the traits needs to be further developed