Heritability of Mentality Traits in Swedish Dogs

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Financed by the Swedish Kennel Club (SKK)
Recording of behavior

• Long tradition to measure dog behavior in Sweden
• **Dog Mentality Assessment (DMA)** started in 1989, amended in 1997
• Developed from a test of military dogs
• Aimed at working dogs, age 1 year or older
• Has become very popular also in many other breeds
Recording of behavior

• New behavioral description started in 2012, Behavior and Personality Assessment in Dogs, Swedish acronym BPH.

• Why?
  – DMA became too popular, not enough test occasions
  – The idea behind BPH is that it should suit all breeds

• Similar set up as for DMA, with several standardized situations, but amended situations and different scoring system
BPH testing

- 24 locations
- 50 observers/judges
- 60 test leaders
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
3. Interest in food
4. Surprise
5. Noise
6. Approaching person
7. Surface
8. Shot (optional, over 90% do)
   • Film at youtube (search for BPH)
Scoring
Scoring

Subjective summary of the dog’s behavior at the end of test
BPH results from 5 breeds

- RHODESIAN RIDGEBACK
- LABRADOR RETRIEVER
- NOVA SCOTIA DUCK TOLLING RETRIEVER
- STAFFORDSHIRE BULLTERRIER
- AMERICAN STAFFORDSHIRE TERRIER
- GOLDEN RETRIEVER
- LAGOTTO ROMAGNOLO
- EJ STAMBOKFÖRD I SKK
- PERRO DE AGUA ESPANOL
- SHETLAND SHEEPDOG
- FRANSK BULLDOGG
- DANSK-SVENSK GÅRDSHUND
- CANE CORSO
- FLATCOATED RETRIEVER
- DVÄRGPINSCHER
- BORDERTERIER
- BERNER SENNENHUND
- IRISH SOFTCOATED WHEATEN TERRIER
- PUDEL, STOR
- WHIPPET
- FINSK LAPPHUND
- COCKER SPANIEL
- JACK RUSSELL TERRIER

N=482
N=445
N=371
N=310
N=262
BPH results from 5 breeds

- Based on all measurements 4 + 2 broader traits were defined using **factor analysis**, traits general for these 5 breeds:
  - Playfulness
  - Confidence
  - Sociability
  - Hostility
  - Curious and Confident
  - Positive and Energetic
- Also 4 or 5 traits were defined within each breed
<table>
<thead>
<tr>
<th>Trait</th>
<th>RR</th>
<th>LR</th>
<th>NSDTR</th>
<th>SBT</th>
<th>AST</th>
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<tbody>
<tr>
<td>Playfulness</td>
<td>42</td>
<td>19</td>
<td>27</td>
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<td>15</td>
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<td>Confidence</td>
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<td>31</td>
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### Heritabilities (%) for BPH traits

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<th>Trait</th>
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<tr>
<td>Average</td>
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<td>33</td>
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<td>34</td>
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Some conclusions and questions

- Reasonably high heritabilities for traits measured in BPH
- At least as high as for DMA-traits
- Makes selection based on BLUP breeding values possible and efficient
- But in what direction do we want to change the breed?
- Should traits be general or breed-specific?
- We lack information about relation between BPH and everyday behavior traits
What do we want to improve?

Indirect measures

- DMA
- BPH

Breeding value

Breeding goal?

- Everyday behavior
### Heritabilities (%) for breed-specific traits

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<tr>
<td>Confidence 1</td>
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<td>Sociability</td>
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<td>Perseverance</td>
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<tr>
<td>Average (SD)</td>
<td><strong>38</strong> (3)</td>
<td><strong>33</strong> (10)</td>
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<td><strong>34</strong> (15)</td>
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### Phenotypic correlations

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<tbody>
<tr>
<td>Playfulness</td>
<td>0.19</td>
<td>0.61</td>
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<tr>
<td>Confidence</td>
<td>0.79</td>
<td>0.23</td>
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<td>Sociability</td>
<td>0.29</td>
<td>0.67</td>
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<tr>
<td>Hostility</td>
<td>-0.09</td>
<td>-0.08&lt;sup&gt;ns&lt;/sup&gt;</td>
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\[ r_p(\text{CC} \& \text{PE}) = 0.41 \]  

Rhodesian Ridgeback
## Genetic correlations

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<tbody>
<tr>
<td>Playfulness</td>
<td>0.47</td>
<td>0.75</td>
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<tr>
<td>Confidence</td>
<td>0.85</td>
<td>0.17&lt;sup&gt;ns&lt;/sup&gt;</td>
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<tr>
<td>Sociability</td>
<td>0.35</td>
<td>0.72</td>
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<tr>
<td>Hostility</td>
<td>0.17&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>-0.00</td>
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\[ r_g(\text{CC} \& \text{PE}) = 0.31 \]

Rhodesian Ridgeback
BPH results from 5 breeds

Gen_Playfulness

- RR
- LR
- NSDTR
- SBT
- AST
BPH results from 5 breeds

Gen_Confidence

- RR
- LR
- NSDTR
- SBT
- AST
BPH results from 5 breeds

Gen_Sociability

- RR
- LR
- NSDTR
- SBT
- AST
BPH results from 5 breeds
BPH results from 5 breeds

Gen_CC

- RR
- LR
- NSDTR
- SBT
- AST
BPH results from 5 breeds

Gen_PE

- RR
- LR
- NSDTR
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BPH situations

1. Unknown person (test leader) approaches dog and owner
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
3. Interest in food
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
3. Interest in food
4. Surprise
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
3. Interest in food
4. Surprise
5. Noise
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
3. Interest in food
4. Surprise
5. Noise
6. Approaching person
BPH situations

1. Unknown person
2. Play with object (own favorite + standard; owner and testleader)
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