Can surface eye temperature be used to indicate a stress response in seals (*Phoca vitulina*)?

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**Introduction**

- Many mammalian species demonstrate a change in eye temperature (ET) in response to stressful, and possibly to painful routine procedures.
- Non-invasive infrared thermography (IRT) is increasingly being used to measure physiological stress responses in animals via changes in ET.

**Objective:** To determine whether the ET of harbour seal pups changes in response to routine handling (capture and restraint)

**Methods**

- Healthy ~ 90 d old pups randomly allocated to one of 2 treatments (*n* = 26 per treatment)
- ET recorded every ~10s with FLIR T300 IRT camera

**Treatment 1** (handled once)  
Baseline (3 min) | 10 min break | Period A (3 min) | Period B (3 min)  
--- | --- | --- | ---  
No handling | No handling | Restraint  

**Treatment 2** (handled twice)  
Baseline (3 min) | 10 min break | Period A (3 min) | Period B (3 min)  
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No handling | Restraint | Restraint  

- Max ET calculated for each image using FLIR Tools + software  
- Images from each 3-min recording period of each pup were then pooled

**Results**

- Compared to baseline, ET of pups restrained the first time increased 0.5 ± 0.18 °C (mean ± SE, *p* < 0.01) more than that of pups not handled.
- ET of pups that underwent a second handling increased a further 0.7 ± 0.08 °C (mean ± SE, *p* < 0.001) from the first time they were handled to the second time.

**Conclusions**

- Higher ET of handled vs. non-handled pups suggests that handling and restraint cause a physiological stress response detectable via IRT.
- Increased ET the second time pups were handled suggests the first handling likely was aversive, resulting in an anticipatory response to their second handling.
- These results show promise for the use of ET to indicate a stress response and for evaluating routine procedures in seals.

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