LEAST AUKLET PLUMAGE AND PERSONALITY

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Background

Animal decisions can be influenced by age, sex, physiological state, body condition and personality. How these variables affect individual responses to environmental conditions is key to predicting how animal populations will be affected by climate change.

Personality in animals is measured along a boldness—shyness continuum, and has been found to affect foraging, migration, and reproductive behaviors. In birds, the deposition of melanin (dark brown-black pigmentation) in some species is associated with a bolder personality.

Least auklets are ecosystem sentinels of the Bering Sea. They are a plankton eating seabird with highly variable plumage coloration on their throat and chest, Previous research indicates some of this variability is due to age.

Are least auklets with darker feathers also bolder? Linking a phenotypic marker to personality would help refine predictions about how least auklets, and the marine ecosystem they reflect, will respond to climate change.

Predictions

Darker (bolder) individuals will be closer to a novel object than lighter (shyer) individuals.
Alternatively: There is no relationship between plumage color and distance to a novel object.

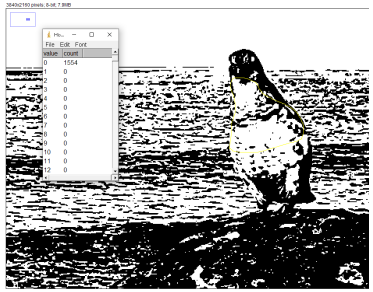
Darker (bolder) individuals land on rocks before lighter (shyer) individuals.
Alternatively: Lighter (older) individuals land on rocks before darker (younger) individuals OR there is no pattern to arrival order and plumage color.

Methods

Video footage of control and novel object trials collected at Zapadni (St. Paul island), Village and Kitnik (*Sivuqaq*) colonies using a GoPro.

Novel object:  small blue silicone ring (dog toy)

St. Paul Island		St. Lawrence Island	
8 July 2023	Control (30 min)	17 July 2023	Control (30 min)
	Novel Object (30 min)		Novel Object (30 min)
9 July 2023	Novel Object (30 min)	18 July 2023	Novel Object (30 min)
	Control (30 min)		Control (30 min)
		19 July 2023	Control (30 min)
			Novel Object (30 min)
		20 July 2023	Novel Object (15 min)
			Control (15 min)



Data Collection

Videos analyzed in BORIS.
Images analyzed in ImageJ.

Distance to Object

Snapshot of video footage every two minutes.
For each bird in the image:
Calculated proportion of black plumage.
Measured distance to novel object/its location.

Order of Arrival

Watched videos and took snapshot of birds in order of their landing in the study area.
Calculated proportion of black plumage

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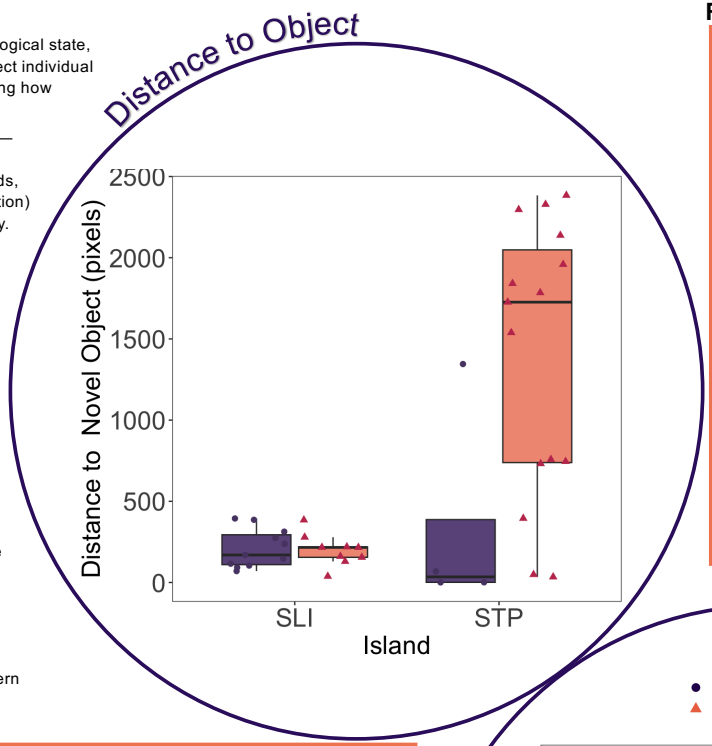
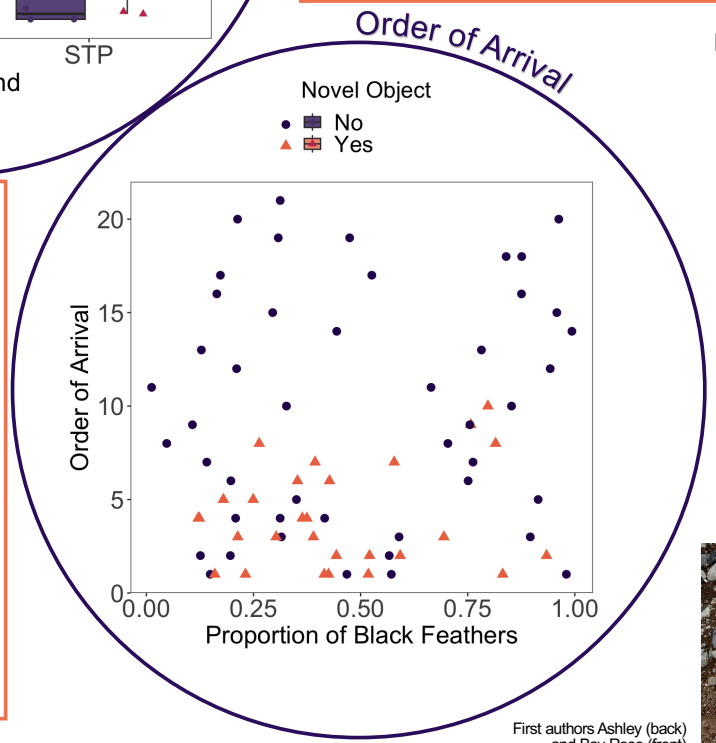




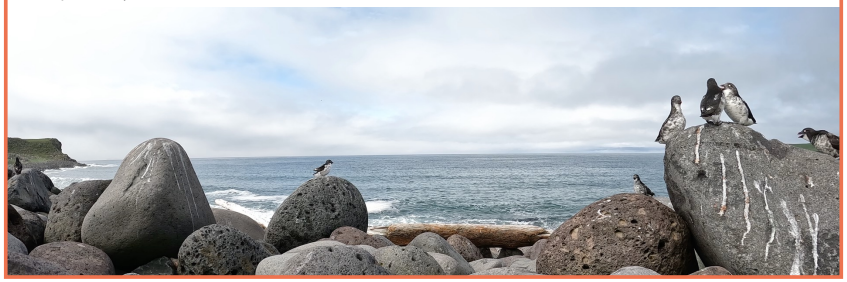
Results

Distance to Object

The proportion of black plumage had no effect on distance to the novel object ($F_{1,35} = 2.28$, $p = 0.14$). The novel object had no effect on the location of least auklets on St. Lawrence Island, but did have an effect on St. Paul birds ($F_{1,35} = 14.29$, $p = 0.0006$) regardless of plumage coloration. There was no difference in least auklet plumage coloration between the islands ($F_{1,37} = 2.18$, $p = 0.15$).

Order of Arrival

There was no relationship between arrival order and least auklet plumage coloration ($F_{1,71} = 1.4$, $p = 0.24$). When the novel object was present on the colony fewer birds accumulated between flushes ($F_{1,71} = 20.41$, $p < 0.0001$), but the coloration of birds present was similar between control and novel object videos ($F_{1,71} = 1.8$, $p = 0.18$).



Discussion

In this pilot study we found no evidence that plumage coloration was associated with personality.

Least auklets showed a behavioral response to a novel object on St. Paul Island but not *Sivuqaq*. Colony size (much larger) and frequent occurrence of trash may have reduced the effect of the novel object on *Sivuqaq* birds.

This study provides initial evidence that responses to a novel object can be detected in an uncontrolled setting where multiple individuals may be exposed to the object during the experimental trial. Additional trials and the use of alternative novel objects are needed to validate these results.

First authors Ashley (back) and Bay Rose (front).

Check out example videos here!

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