

Not Gonna Fly: Zoo Visitors' Effects on *Humboldt* Penguin Behavior

Lenny Blair - Eva Licht

Reed College Bio 342

Humboldt penguins increase heart rate and comfort behaviors in the presence of humans. It takes upwards of 30 minutes for the penguins heart rate to return to normal (Ellensburg).

If human interaction changes *Humboldt* penguins' behavior, then we should see an increase of comfort and aggressive behavior counts in the presence of zoo visitors.



Ethogram and Observation Methods

Used JWatcher to record 10 minute periods of focal and scan sampling of *Humboldt Penguin* (*Spheniscus humboldti*)



Analyzed with One-way ANOVA, analysis of variance, and pooled t-Test

Comfort behaviors:
Scratching
Head and body shakes
Yawning
Rapid wing flap
Aggressive behaviors:
Biting
Lunging
Conditional Events:
Human interactions
No human presence

Key Code	Behavior	Description
b	biting	contact with beak by pecking motion
g	scratching	uses bill or legs to scratch self
h	head shake	head flicks side/side perp to body
i	no humans present	
l	lunging	chasing other in short spurt
r	rapid wing flap	wings move as far ventrally then dorsally
s	body shake	head tilt body twists
t	standing	resting/not moving
u	human interaction	human stands 1 foot from glass
w	swimming	swims either surface or deep
x	sparring enclosure	stop collecting data
y	yawning	bill opens to fullest extent for ~ 1 sec

Distribution of Behaviors Without Human Presence

Distribution of Behaviors With Humans Present

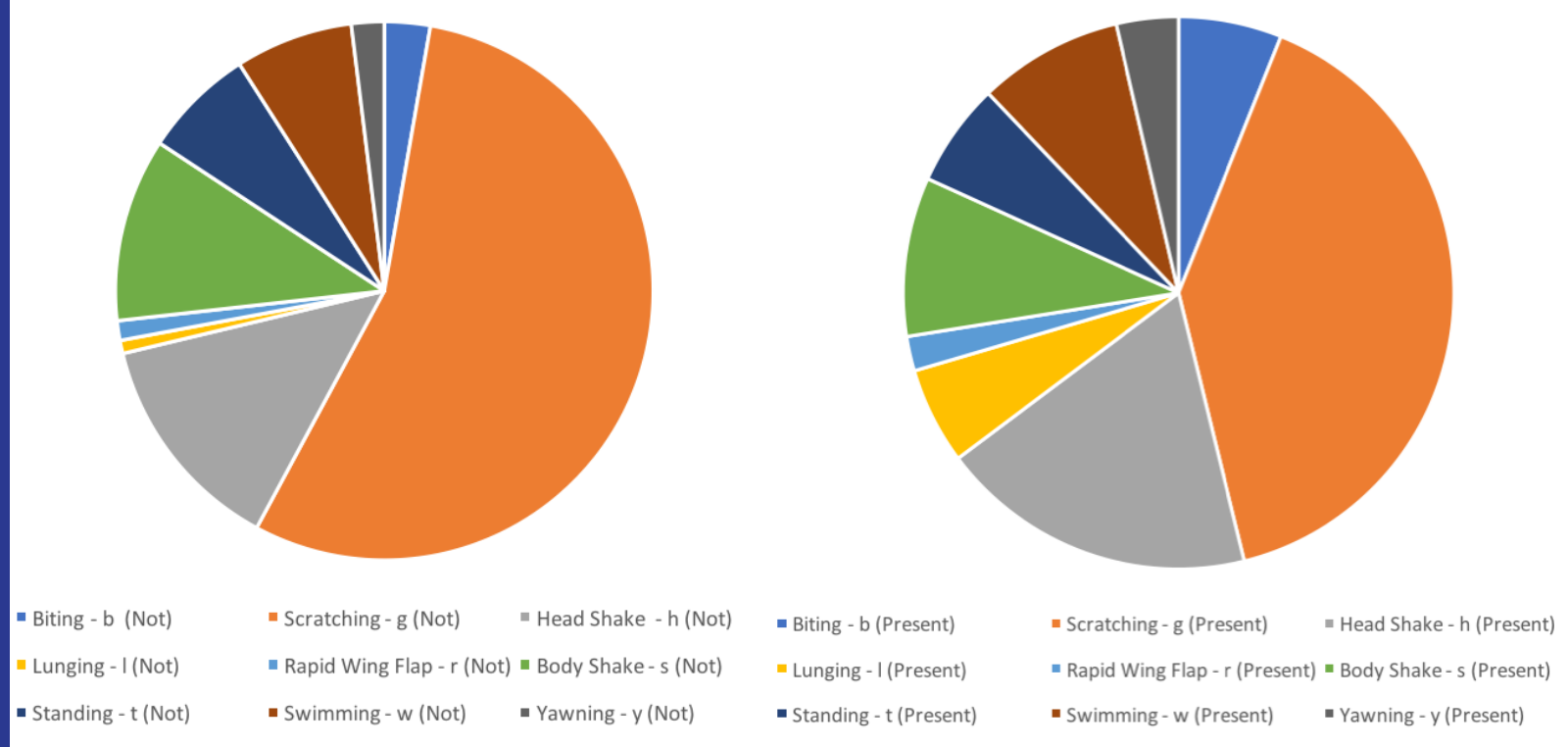


Figure 1. Comparison of distribution of counts of behaviors with and without humans present. Counts totaled from all four observation periods, and proportions of individual behaviors shown. No statistically significant differences in counts of individual behaviors between states of human presence.

P-Value for difference in comfort behaviors
 Prob > F: 0.8592
 P-Value for difference in aggressive behaviors
 Prob > F: 0.0593

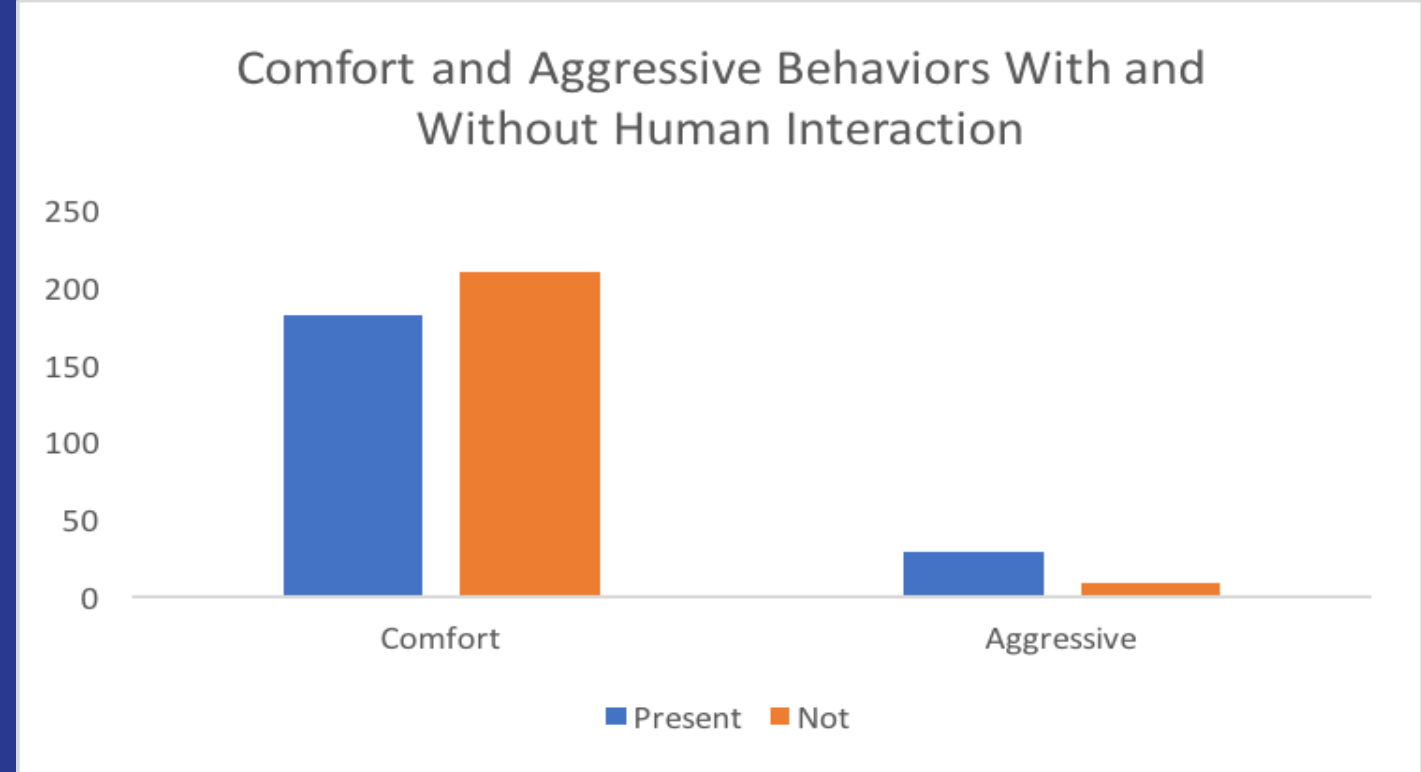


Figure 2. Counts of comfort and aggressive behaviors with (blue bars) & without (orange bars) humans presence; as there was no statistically significant difference in comfort behavior counts, our original hypothesis was not supported.

Conclusion

Future Studies could include more specific and detailed ethograms, control for outside and confounding variables, (time of day, disturbances, feeding times, etc). They could also be conducted in a laboratory setting where human interaction was timed consistently with breaks to allow for penguin distressing.

Our data show that penguins engage in more aggressive behaviors when humans are present. Their comfort behaviors are engaged at the same frequency whether or not humans are present. We believe the repeated presence of humans results in a continuation of comfort behaviors, regardless of human interaction.

References:

Ellenberg, Ursula, et al. "Physiological and Reproductive Consequences of Human Disturbance in Humboldt Penguins: The Need for Species-Specific Visitor Management." *Biological Conservation*, vol. 133, no. 1, Nov. 2006, pp. 95–106. *Crossref*, doi:10.1016/j.biocon.2006.05.019.

"Humboldt Penguin." *Oregon Zoo*, <https://www.oregonzoo.org/discover/animals/humboldt-penguin>.



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