

Likelihood of agonistic behavior by gull species in Humboldt County based on relative body size

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Introduction

Agonism is a survival pressure that wildlife must face. Gulls are commonly assumed to behave more agonistically than other birds (Taft 2018). Combined with the cosmopolitan range (Dieleman et al. 2002), gulls may harm other bird species. My objectives are to determine if gulls disproportionately direct agonistic behavior toward other species. I hypothesized that gull species would direct agonism disproportionately toward members of smaller species.



Figure 1. Focal species from top left to bottom right; western gull, ring-billed gull, glaucous-winged gull, mew/short-billed gull.

Methods

- 30-minute behavioral/critical incident sampling
- Number of individuals of each species in flocks was recorded
- Target of each agonistic behavior recorded
- Expected versus observed frequency analyzed via Chi-squared test

Results

- Western gulls disproportionately directed agonism toward members of other species that were larger and smaller sizes ($P < 0.05$).
- Ring-billed and mew gulls disproportionately directed agonism toward members of their own species and same-sized species ($P < 0.05$).
- Glaucous-winged gulls disproportionately directed agonism toward members of their own species ($P < 0.05$) but proportionally directed agonism to species of each size ($P = 0.08$).

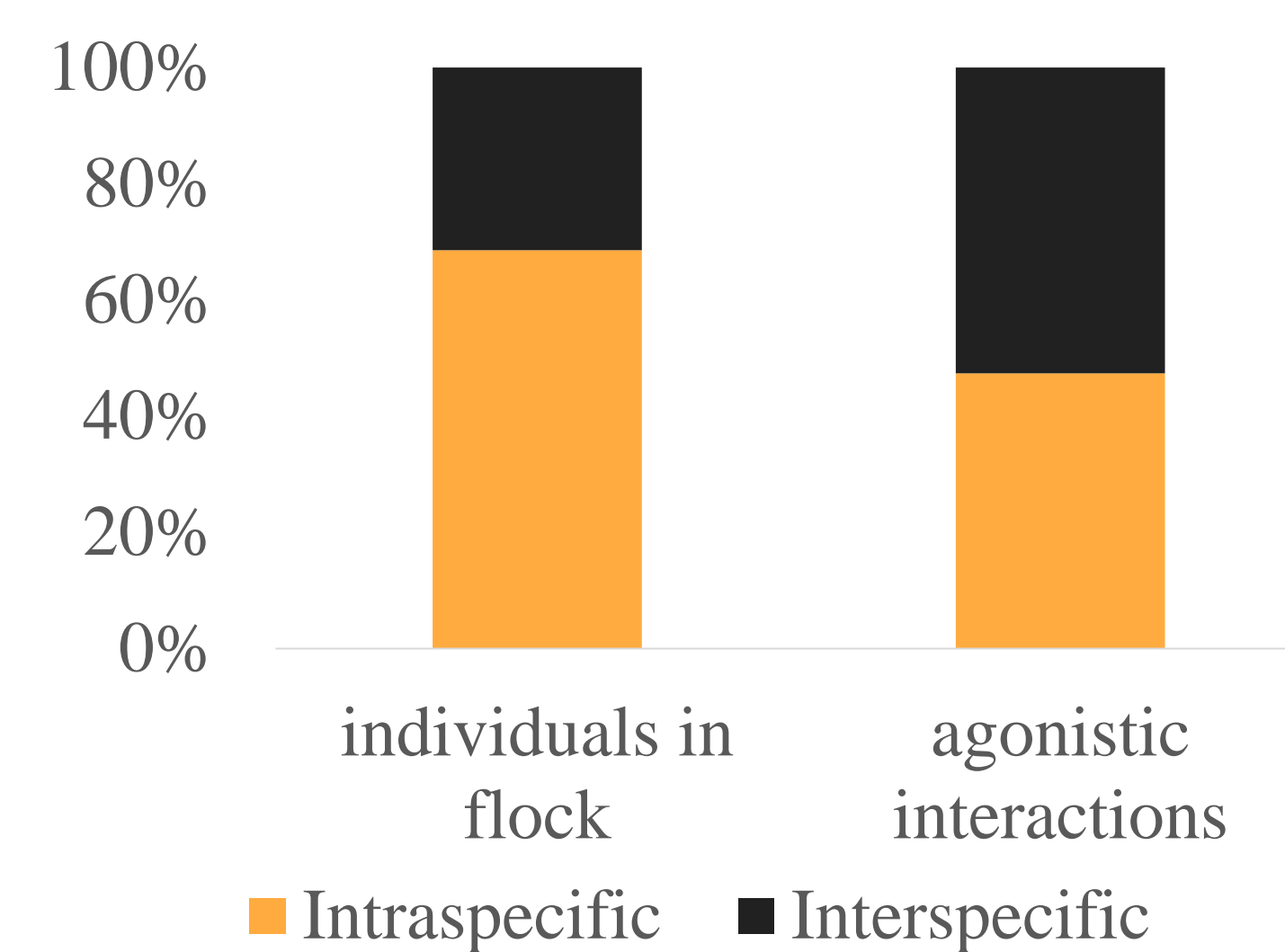


Figure 1. Western gull proportion of agonistic interaction versus individuals.

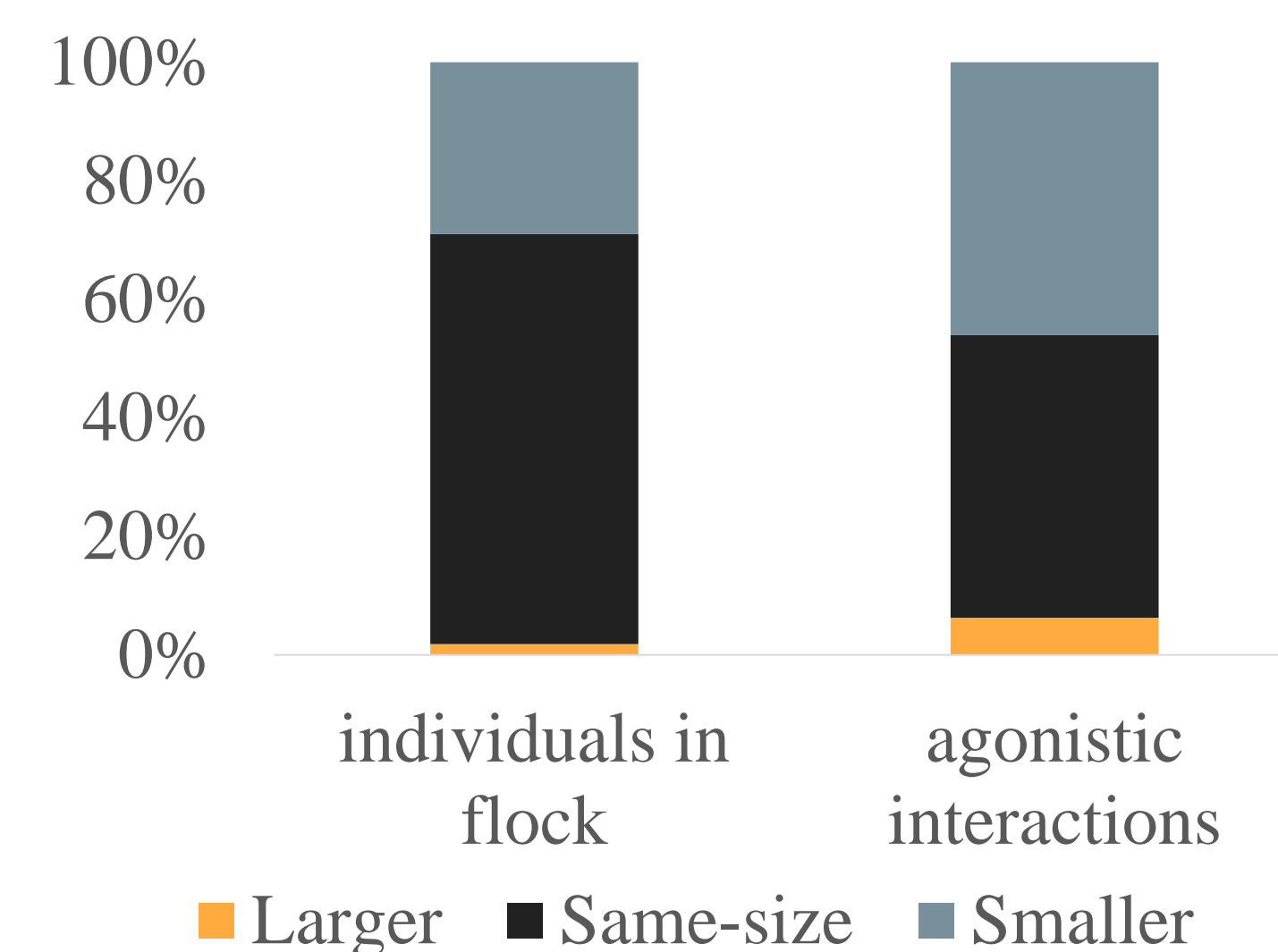


Figure 2. Western gull proportion of agonistic interactions versus individuals.

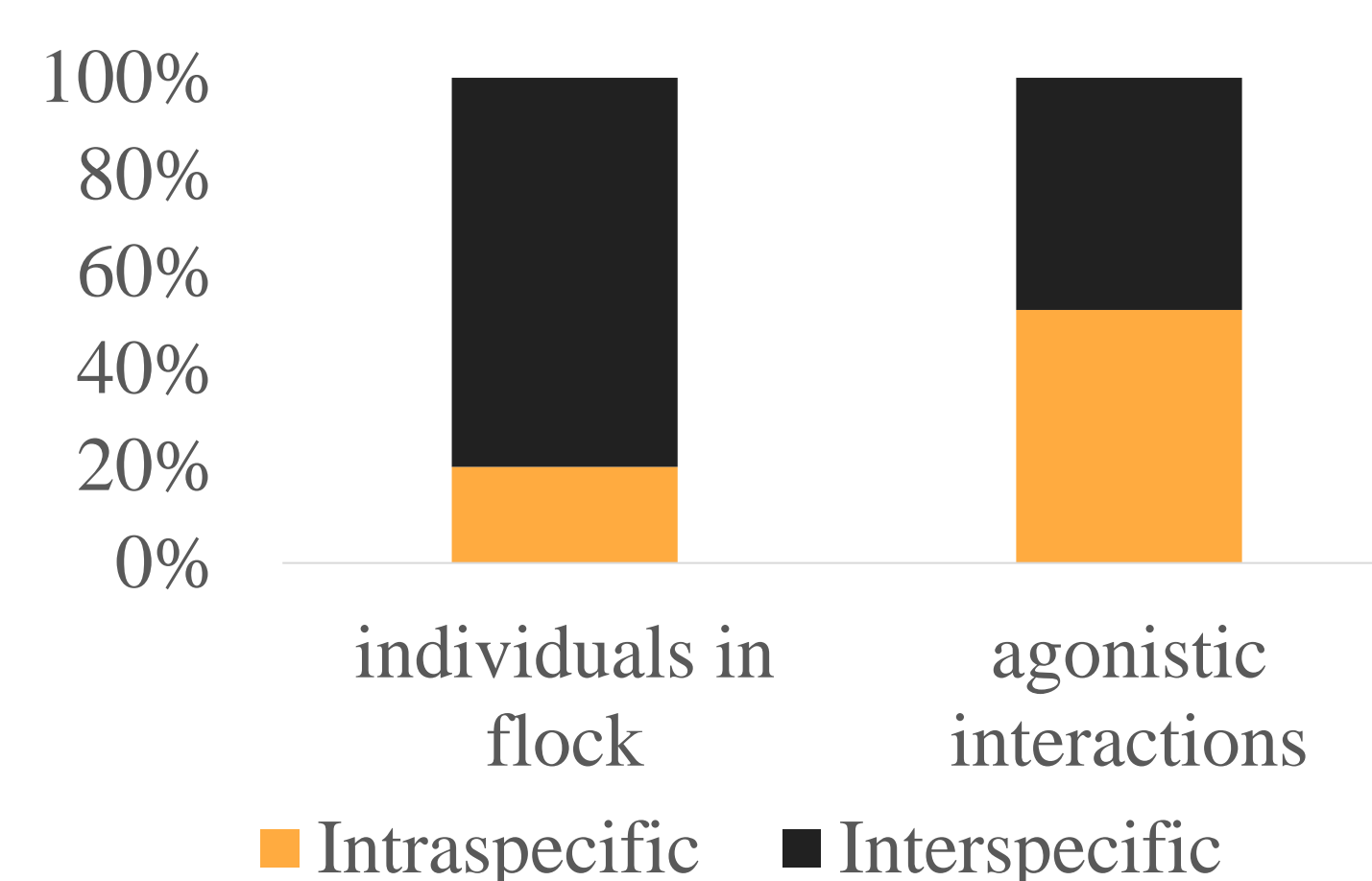


Figure 3. Ring-billed gull proportion of agonistic interaction versus individuals.

	Western gull	Ring-billed gull	Glaucous-winged gull	Mew gull
Larger	19	2	NA	0
Same-sized	144	15	7	3
Smaller	375	6	43	NA

Table 1. Glaucous-winged gull proportion of agonistic interaction versus individuals.

Discussion

Observations of ring-billed, glaucous-winged gulls, and mew gulls directed agonism disproportionately, but not toward species of smaller sizes. Western gulls directed agonistic behavior toward members of other species, including larger and smaller ones, partially supporting my hypothesis. I observed a greater abundance of western gulls in my study area than other gull species (Table 2). More research should be done on the effect that having a majority population has on agonistic behavior.

	Western Gull	Ring-billed Gull	Glaucous-winged Gull	Mew Gull
Individuals	913	81	11	52
Agonistic Interactions	143	48	17	20

Table 2. Observed number of individuals and agonistic behaviors from each species



Figure 6. Agonistic behavior.

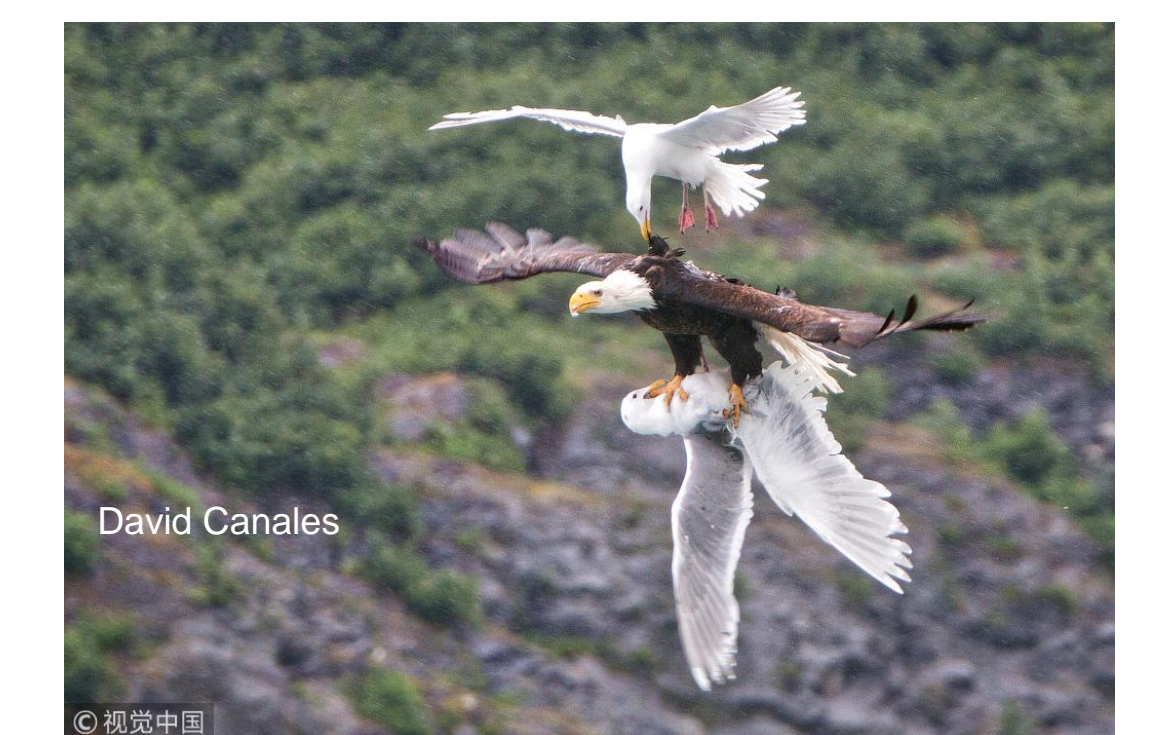


Figure 7. Predator mobbing.

Citations and Images

- Dieleman, S. J., T. G. G. Groothuis, and A. F. H. Ros. 2001. Social stimuli, testosterone, and aggression in gull chicks: support for the challenge hypothesis. *Hormones and Behavior* 41:334-342.
- North American Bird Conservation Initiative [NABCI]. 2022. The state of the birds, United States of America, 2022. <https://www.stateofthebirds.org/2022/>. Accessed 18 April 2023.
- Taft, D. 2018. The biggest bully on the beach. *The New York Times*. Accessed 18 April 2023.

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