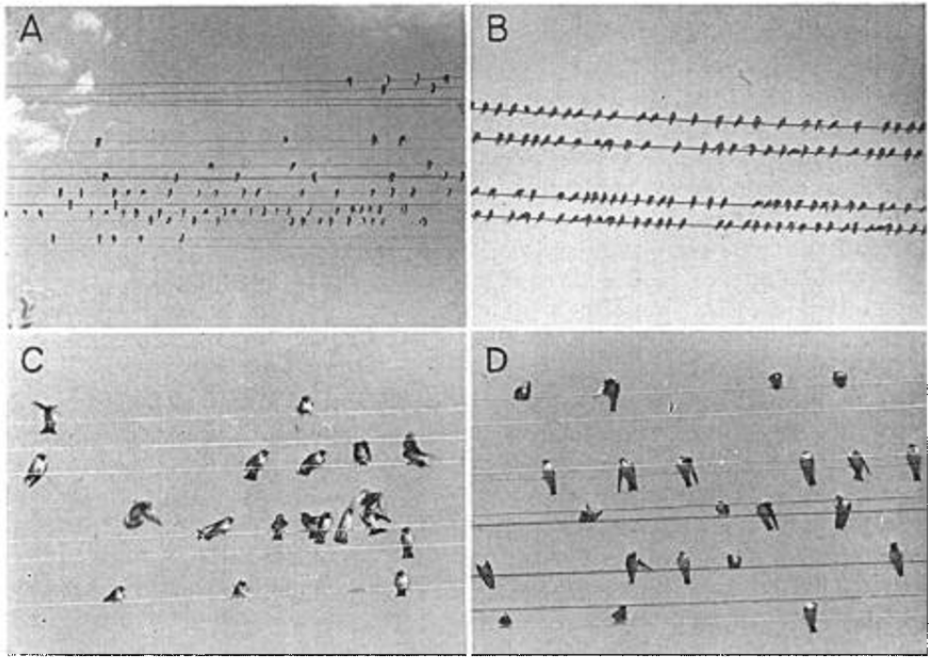
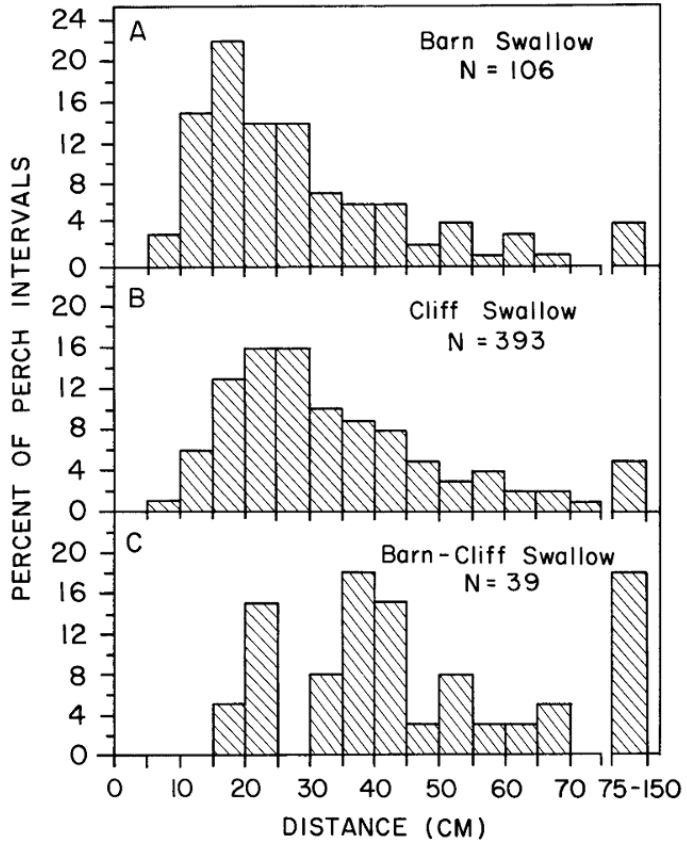


Sociality

Dr. Ethan Linck
Office: 305 Lewis Hall

Birds mostly maintain individual distance





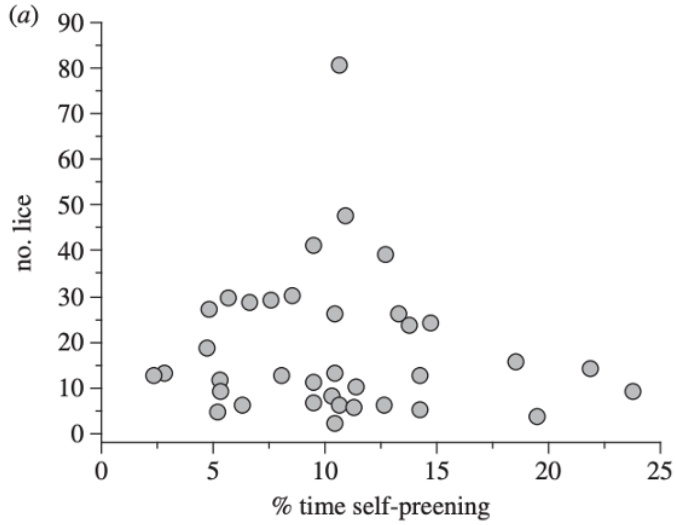
(Emlen 1952; Hutton 1978)

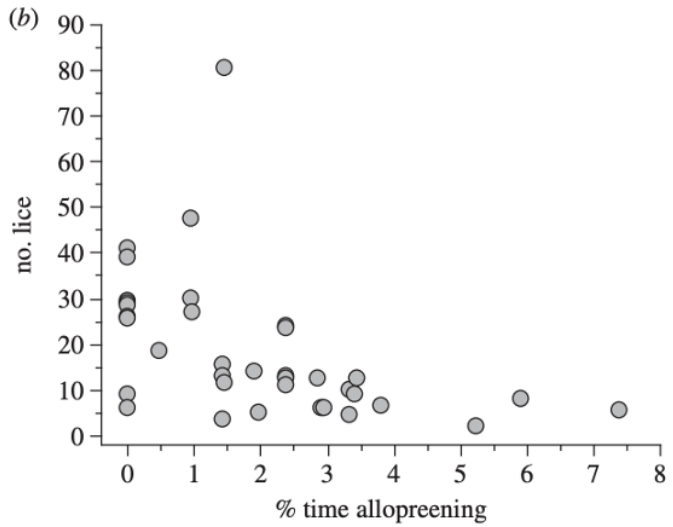
Allopreening reduces parasite load

- **allopreening**: the act of grooming another individual





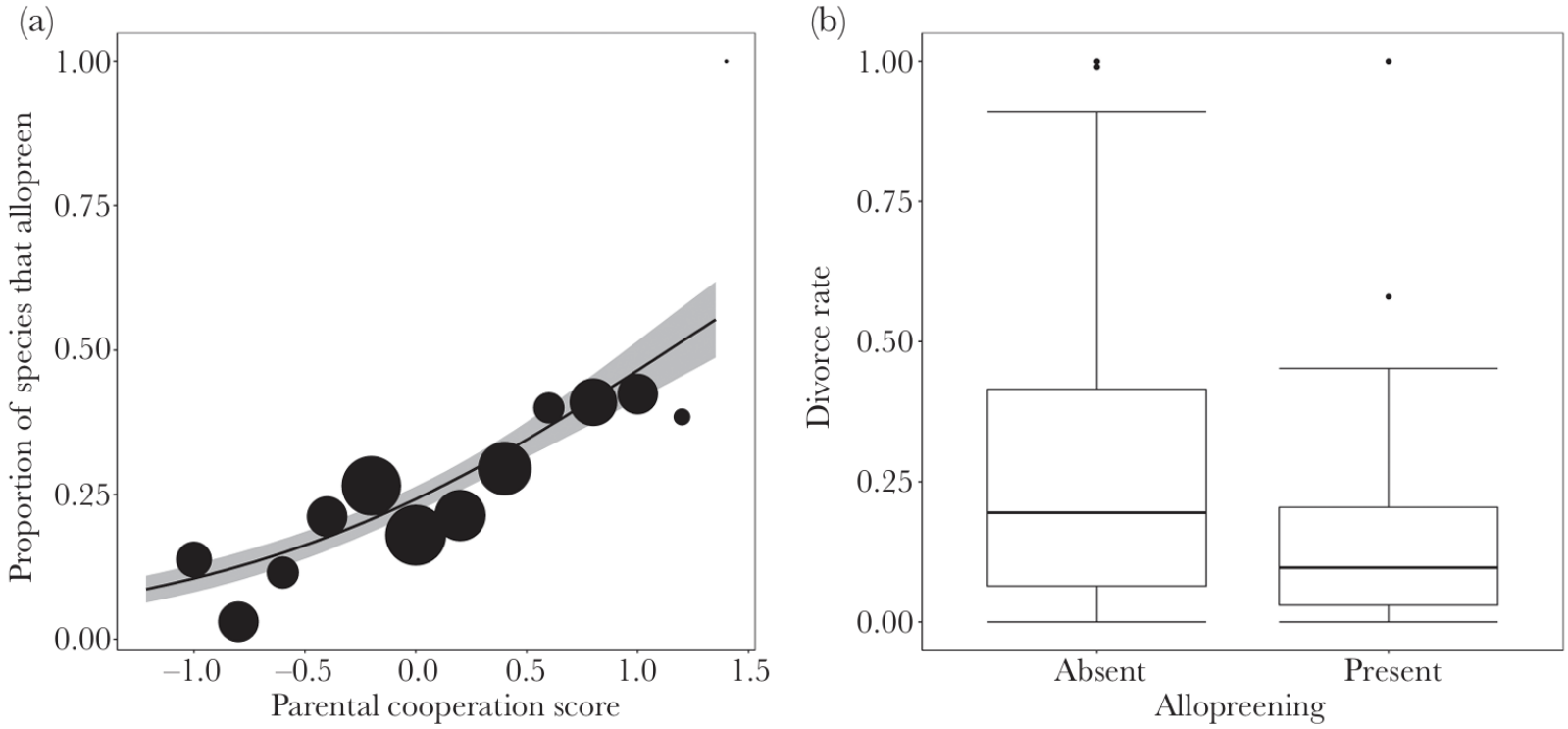




(Cornell; Audubon; Villa et al. 2016)

Allopreening helps maintain relationships

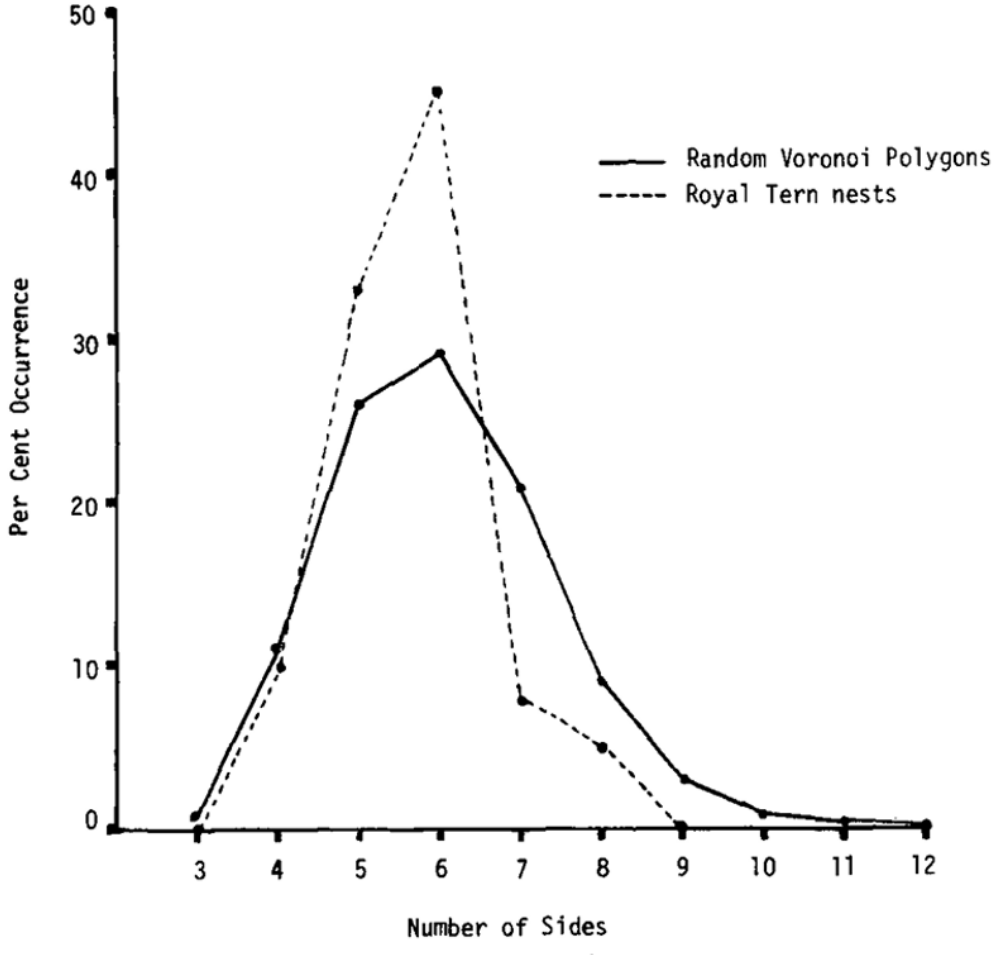
- **allopreening**: the act of grooming another individual



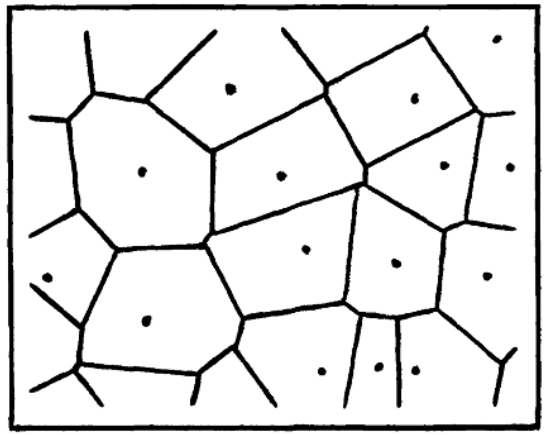
(Kenny et al. 2017)

Territorial behavior involves defending resources

- Royal tern nests approximate **Voronoi polygons**—packed shapes encompassing the region closest to random points



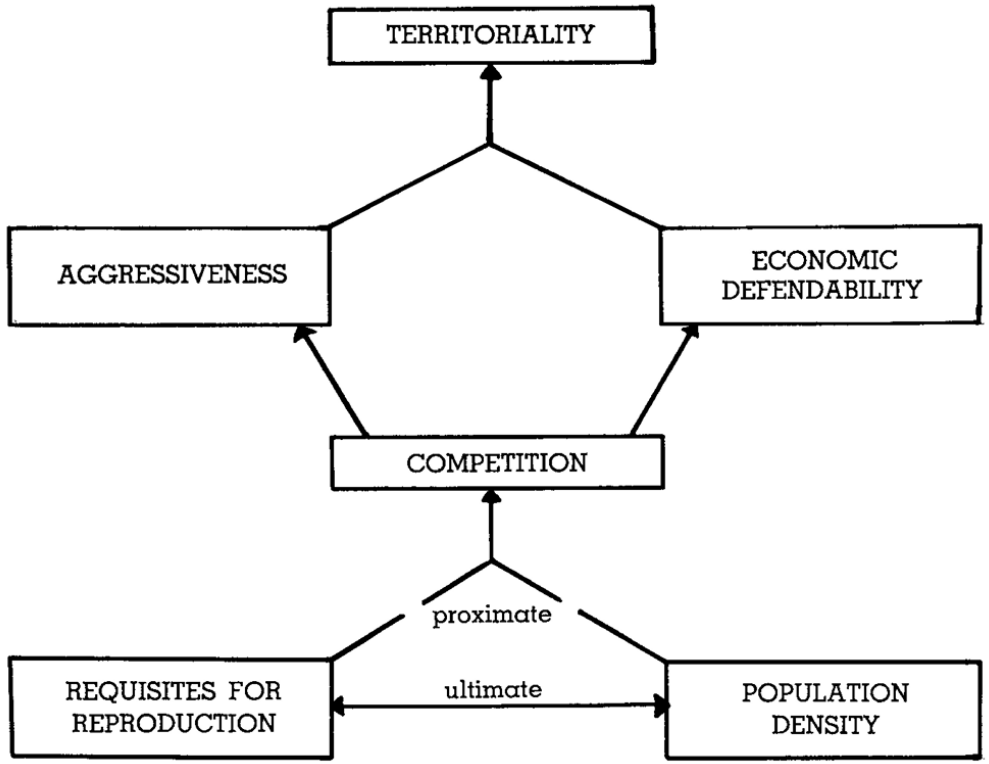




(*Thalasseus maximus*; Buckley & Buckley 1977)

Territorial behavior evolves when resources are defensible

- "Economic defendability" depends on limited temporal variability and spatial variability of resources.



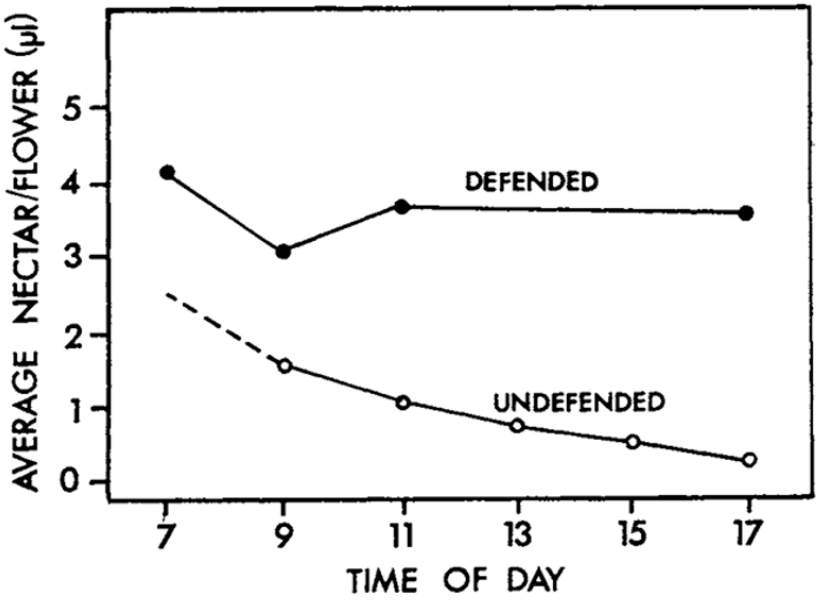
(https://www.youtube.com/watch?v=Dd86PbABNpQ)

(Brown 1964)

Territorial defense depends on payoff

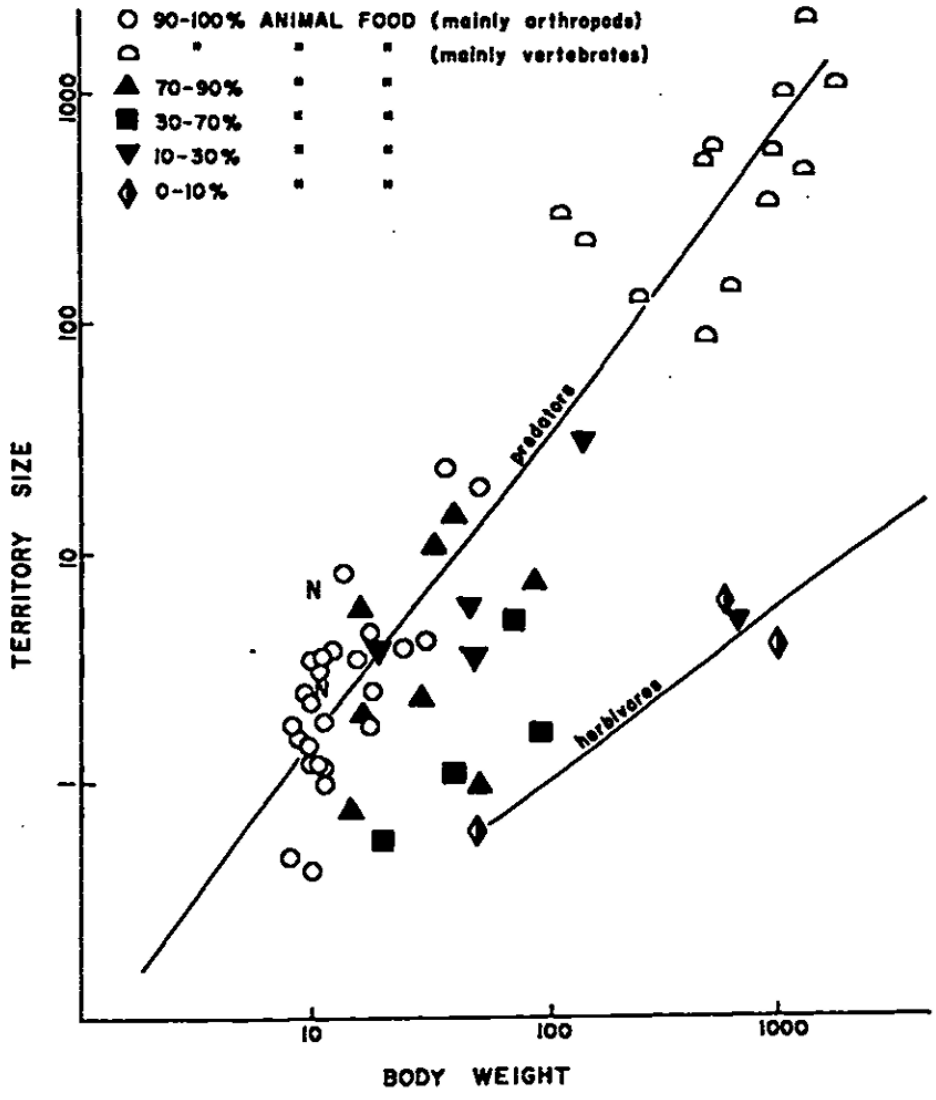
- Sunbirds expend energy defending nectar-rich flowers, but not nectar-poor ones





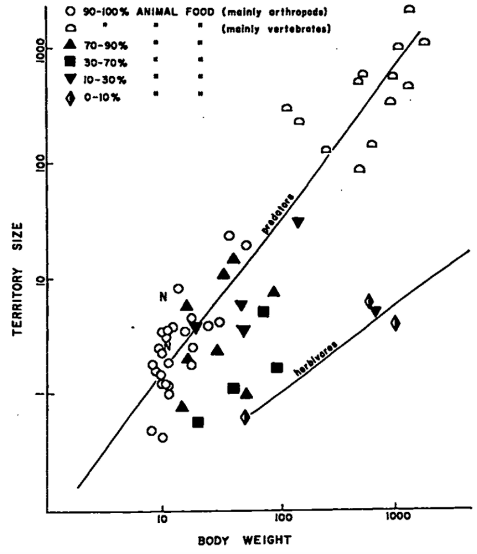
(*Drepanorhynchus reichenowi*; Gill & Wolf 1975)

Territory size generally scales with body size



(Schoener 1968)

Why do territories scale differently for predators vs prey?



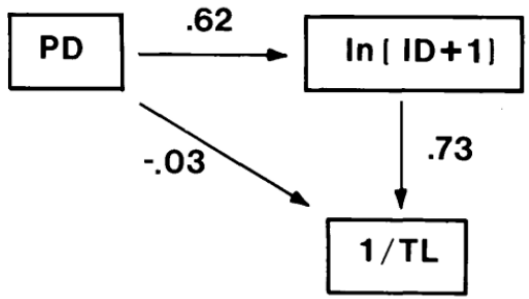
(Schoener 1968)

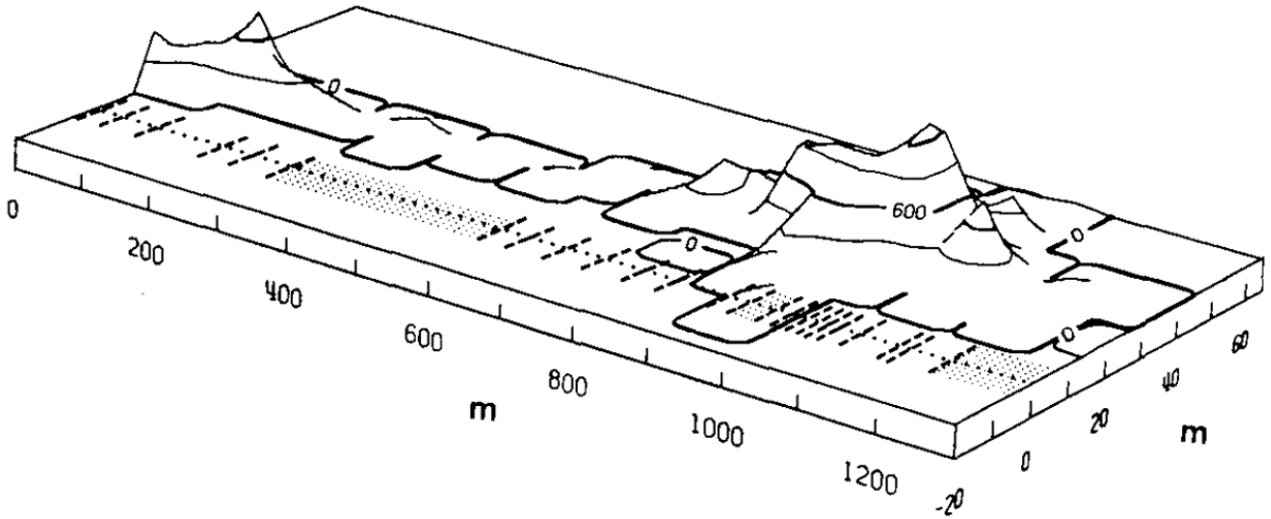
a) predators must travel farther for food
b) less energy is available to predators than to herbivores at the same body size.
c) predators require more energy because digesting animal tissue is less efficient
d) predators have higher metabolic rates

Sanderling territory size inversely correlated to prey density

- Below: contours = prey abundance, dashed lines = territores, PD = prey density predictor, ID = intruder density predictor, TL = territory length



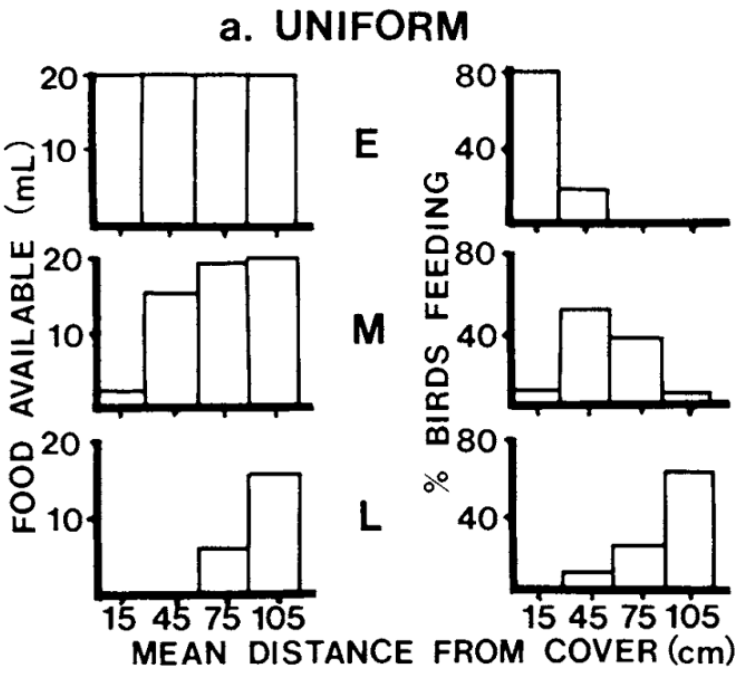


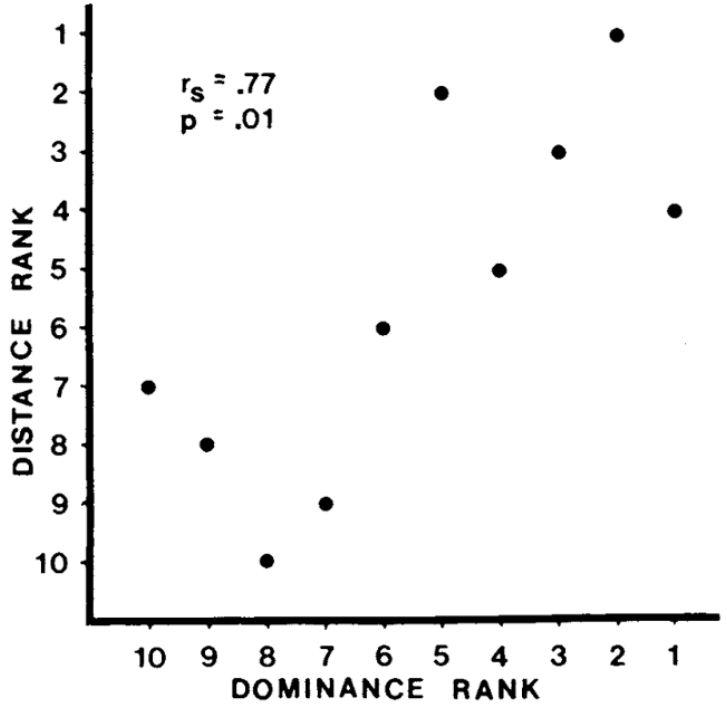


(*Calidris alba*; Myers et al. 1979)

Social rank reduces conflict

- White-throated Sparrows preferentially feed near habitat cover (L); dominant birds feed at most protected patches





(Schneider 1984)

Plumage cues convey social rank

- Young Harris' sparrows avoid those dyed to look like adults





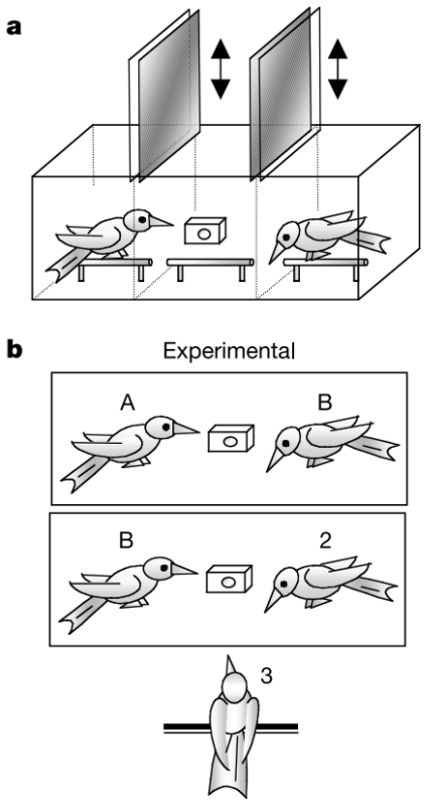
Table IV. Rates of interactions among dyed and control birds during the first observation period

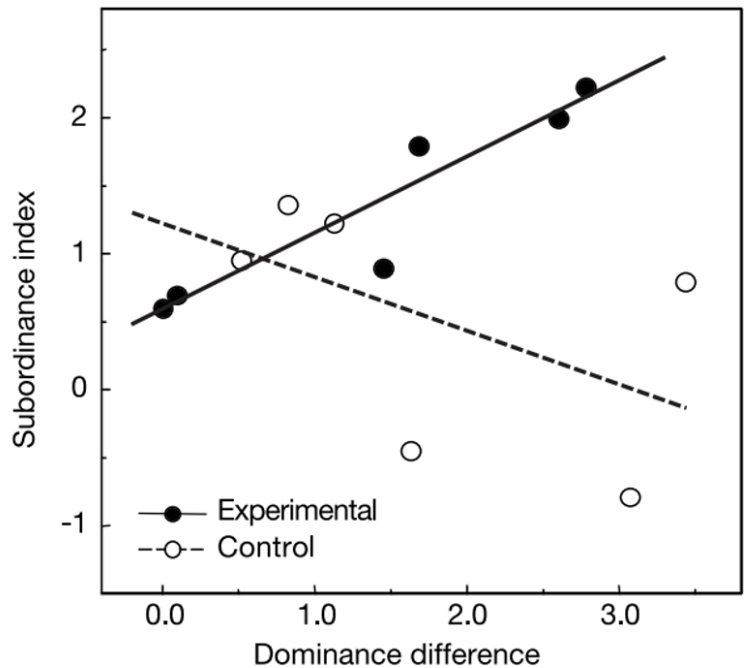
	Males		Females	
	Dyed × dyed	Control × control	Dyed × dyed	Control × control
No. of independent dyads (*D*)	21	28	15	15
No. of interactions (*I*)	37	117	33	73
Rate (*I*/*D*)	1·8	4·2	2·2	4·8
Statistics	$\chi^2 = 23{\cdot}2$; $df = 1$; $P < 0{\cdot}001$		$\chi^2 = 15{\cdot}0$; $df = 1$; $P < 0{\cdot}001$	

(Cornell; Rohwer 1985)

Can birds infer social rank by observation?

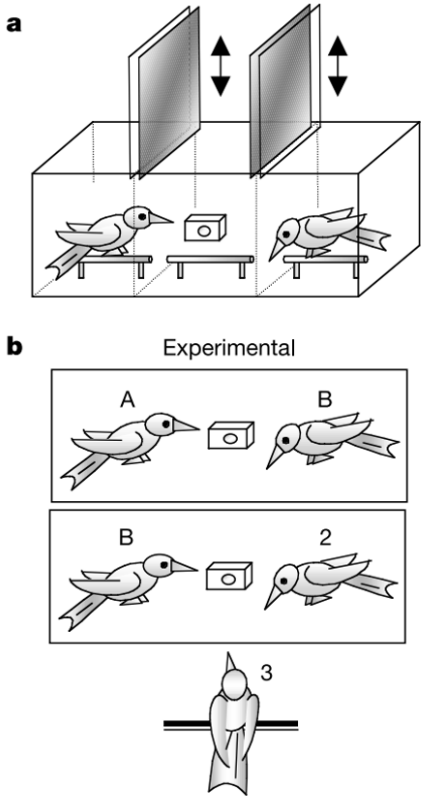
- encounters between Pinyon Jays of different status
- "experimental" birds watch other interactions with known superior
- **subordinance index**: how subordinate an observer is in a trial
- **dominance difference**: "ranking" difference between birds

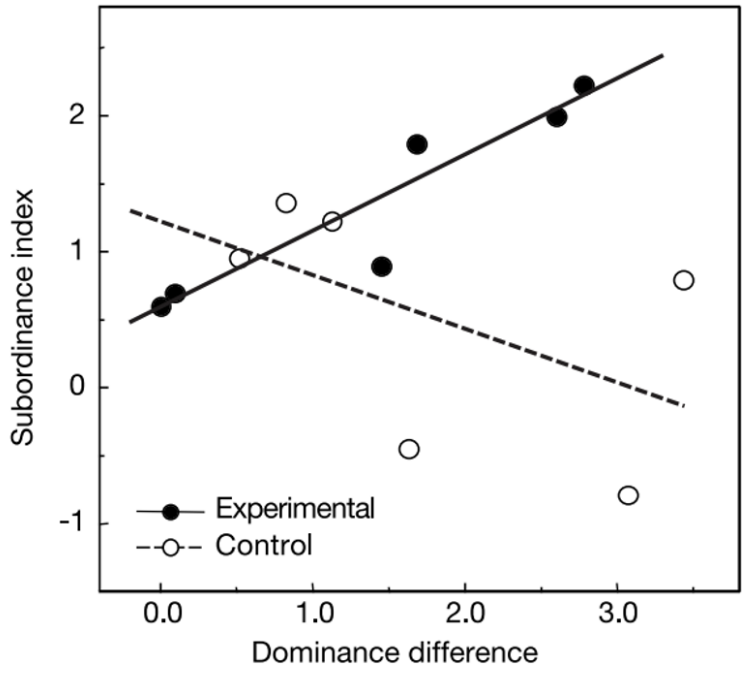




(Paz-y-Miño et al. 2004)

Can birds infer social rank by observation?



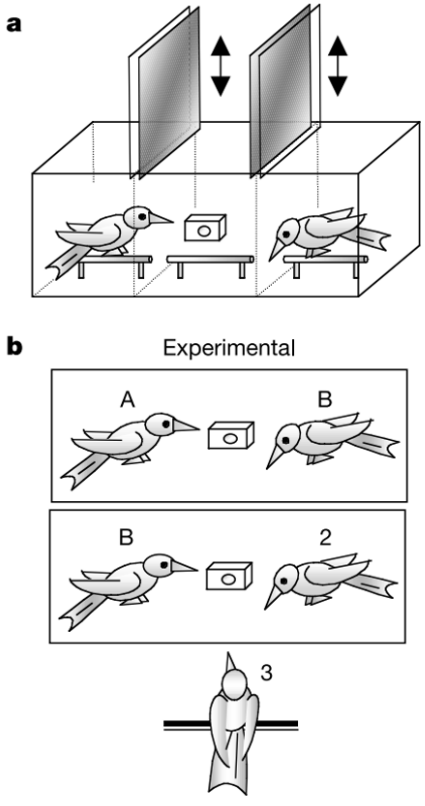


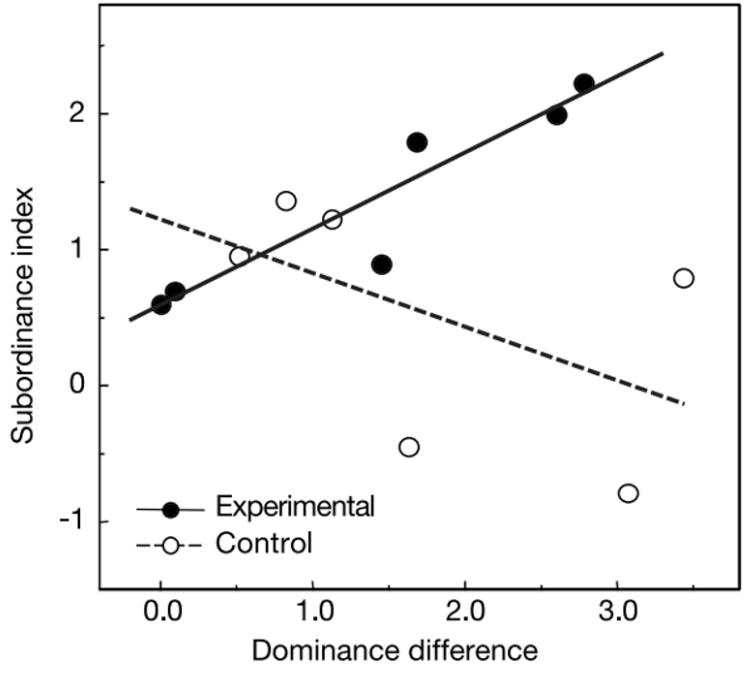
(Paz-y-Miño et al. 2004)

a) yes
b) no
c) i'm still asleep
d) it depends

Birds can infer social rank by observation

- Pinyon jays that observe an individual of higher rank losing in competition to a third individual will subordinate to that individual, too ("transitive inference")





(Paz-y-Miño et al. 2004)

Interspecific social interactions

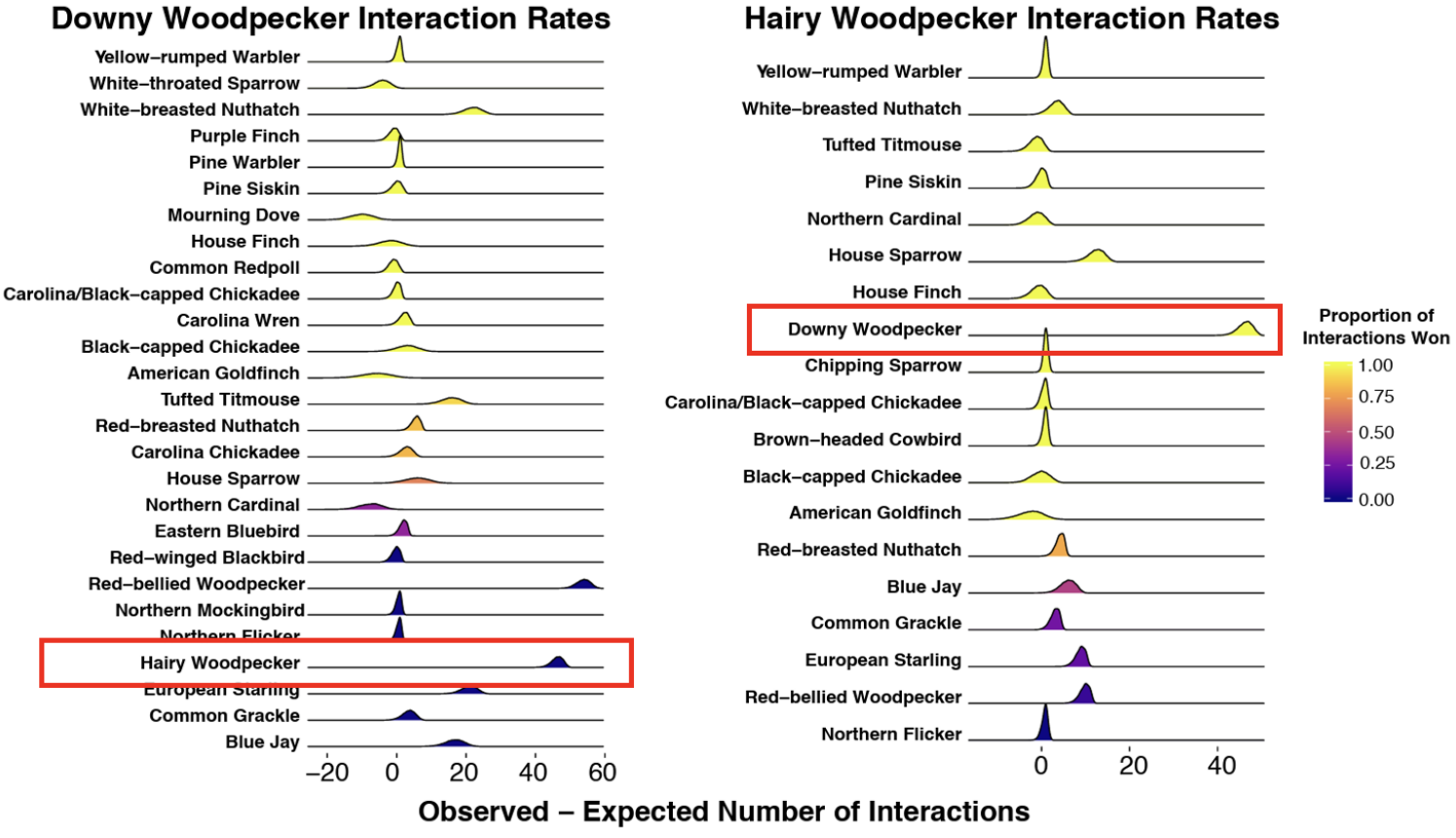
- **Interspecific Social Dominance Mimicry**: a subordinate species evolves to mimic a dominant ecological competitor to avoid attack



(Prum 2014)

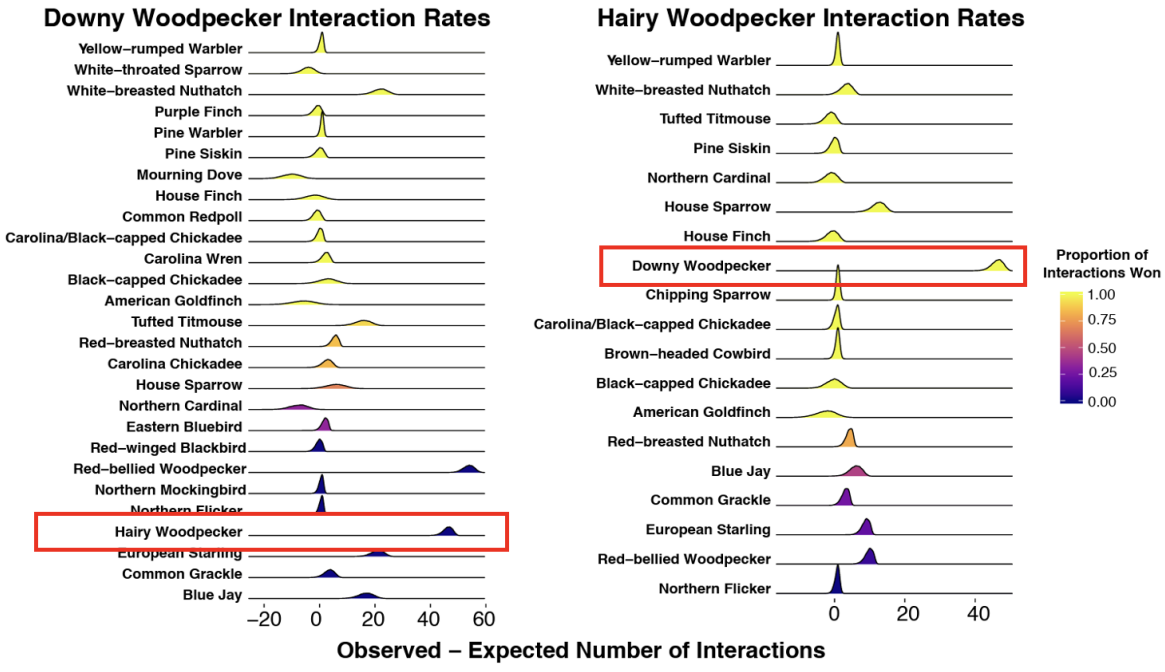
ISDM in Hairy / Downy Woodpeckers?

- Prediction of hypothesis: DOWO experience reduced aggression from HAWO
- Interaction data from Project FeederWatch



(Leighton et al. 2018)

ISDM in Hairy / Downy Woodpeckers?

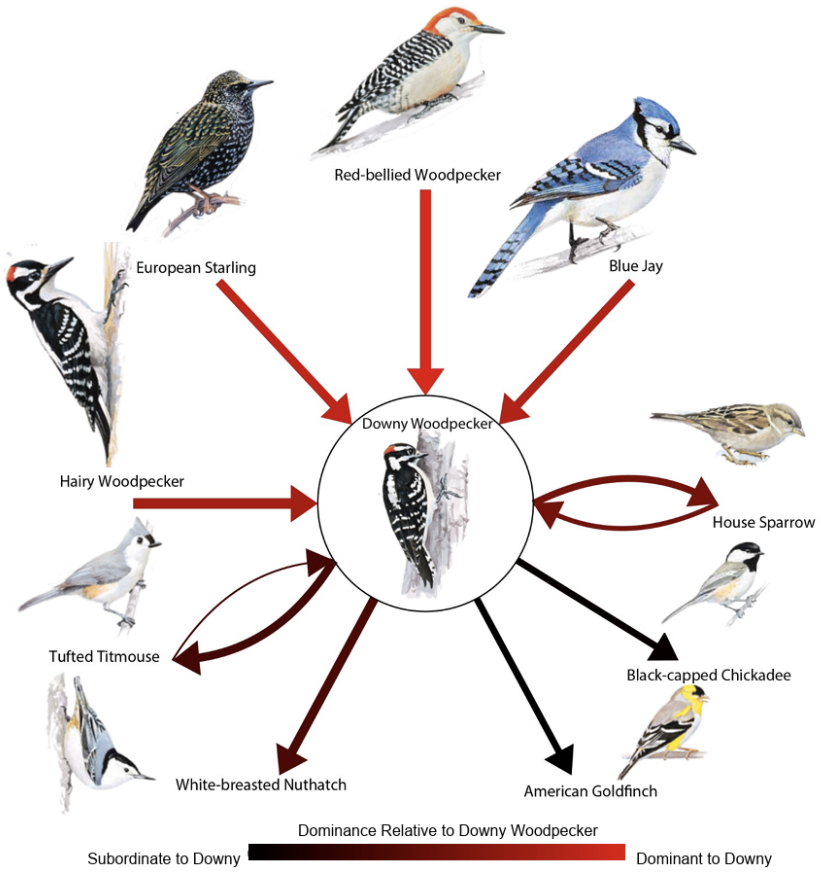


(Leighton et al. 2018)

a) yes
b) no
c) i'm still asleep
d) it depends

Downy Woodpeckers more dominant than predicted by body mass

- Alternative hypothesis: mimicry fools third-party species

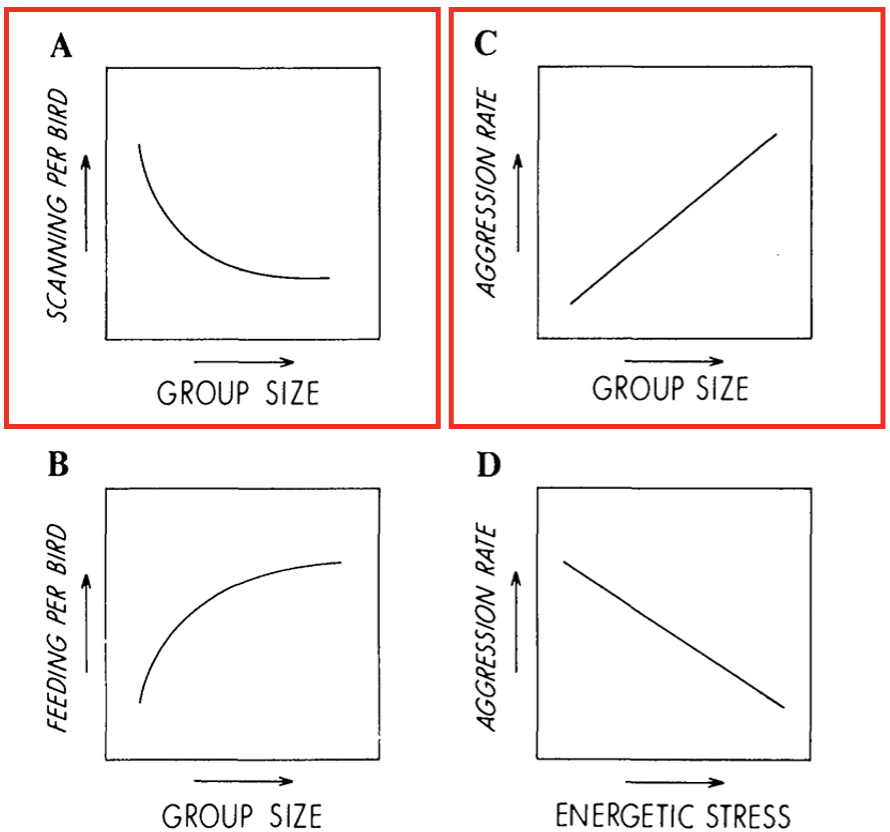


(Leighton et al. 2018)

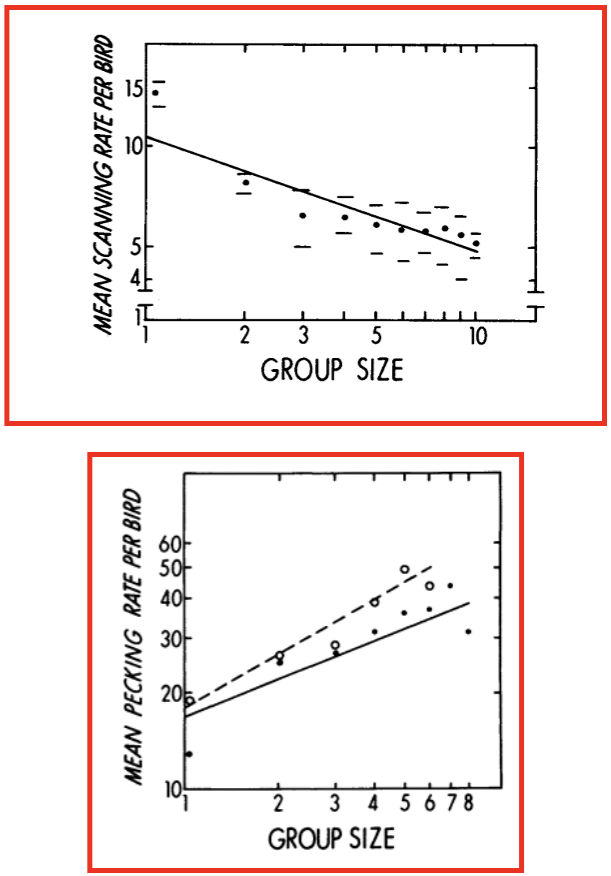
Flocking has costs and benefits

- Optimal flock size mimimizes time spend feed, fighting, and scanning for predators
- Predictions of theory met for Yellow-eyed Juncos

theory



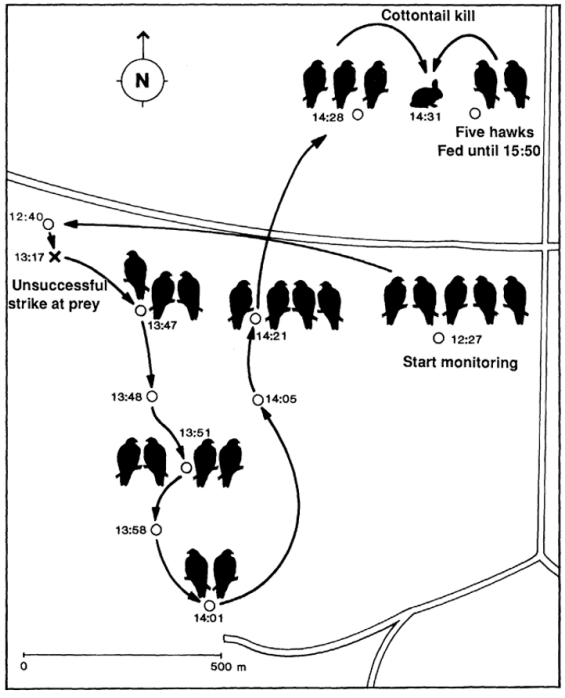
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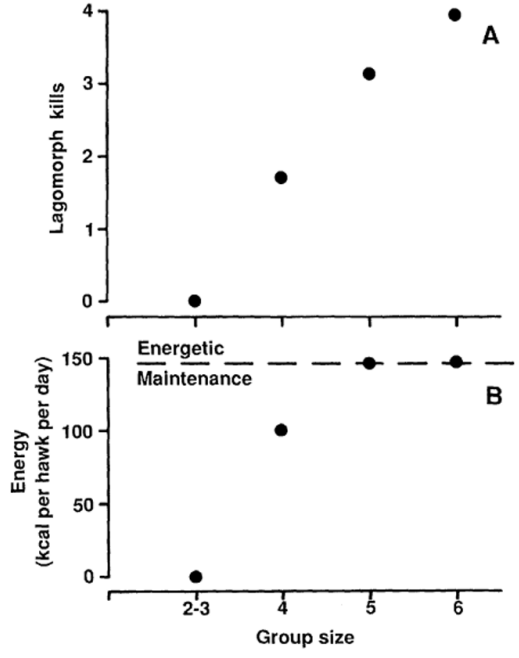


(Caraco 1979, 1980)

Cooperative hunting in Harris' Hawks

- Harris' Hawks hunt in groups of 2-6, something previously known only from large mammals
- Leapfrog search pattern and successive "relay" strikes
- Cooperative hunting reduces energetic costs, increases odds of success

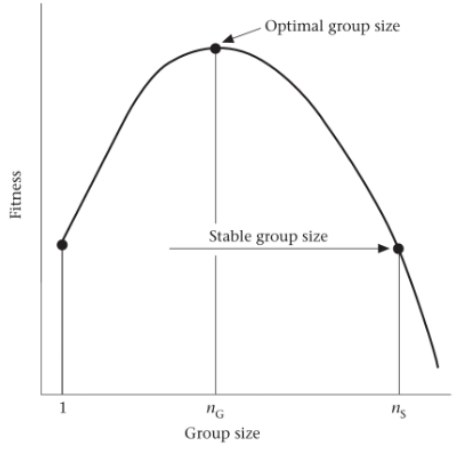




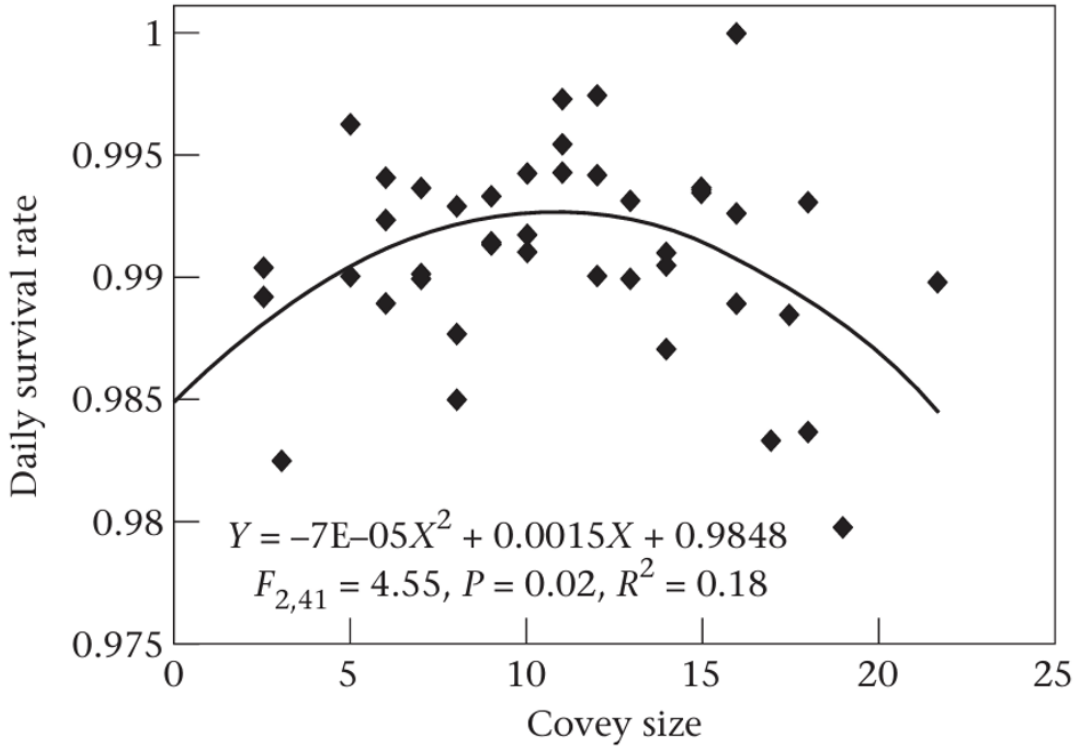
(Bednarz 1988)

Optimal quail covey size

- Northern Bobwhite covey size balances protection from predators with competition for food







(*Colinus virginianus*; Williams et al. 2003)

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