Dear Editor:

I would like to ask that you consider our manuscript “Friends aren’t food: pinyon jays show context-dependent numerical cognition” for review and publication in *Biology Letters*. Animals must often discriminate different quantities of objects in their environment, from food items to conspecifics. Yet we know little about how numerical cognitive abilities compare across different object types. Species, and individuals within a species, vary in their numerical cognitive abilities, leading researchers to investigate the mechanisms that underlie context-dependent decision making under controlled experimental settings.

We conducted experiments to investigate quantification of both food and conspecifics in pinyon jays, a corvid species. Each experiment was replicated with two sets of birds, where most birds experienced both the food and social experiment. This within-subject design is the first experiment of its kind to directly measure across contexts. In the food experimental task, subjects chose which of two quantities of food they would prefer to consume. Based on past research, we would expect individuals to use both the ratio and difference between items offered. In this study, numerical ratio predicted choice more often than numerical difference predicted choice. Indicating, that ratio might be a more salient numerical cue for Pinyon Jays than numerical difference. In this paper we used mixed effect modeling to examine whether animals were using ratio and difference independently of each other or if they were being conflated together in the literature due to the kinds of statistical tests being used. We found that ratio and difference were not independent and more work needs to be done to tease apart the relationship between ratio and difference in nonhuman numerical cognition work with complex mathematical models.

To investigate quantification of conspecifics, we place pinyon jays in a Y maze with different number pairs of conspecifics at the end of each arm of the maze. Neither ratio nor difference predicted choices in either replication of the social experiment. Though quantity is important for selecting food items, other factors such as flock mate identity may be more important for selecting social groups to join.

We provide the first experimental demonstration that the type of objects to be quantified may drive the cognitive processes that animals use. Given the robust literature on nonhuman numerical cognitive abilities and the fact that many adaptive problems beyond foraging require sensitivity to quantities, we encourage further exploration of numerical cognition of non-food objects, making these studies of great interest to the readership of *Biology Letters*.

Attached you will find the manuscript, figures, and supplementary materials. Additionally, we have posted the preregistration, raw data, and R code needed to replicate all our findings and figures at the [Open Science Framework](https://osf.io/g45nk/). We have posted a preprint of this article at [PsyArXiv](https://doi.org/10.31234/osf.io/kxgwt). This work is original and has not been previously published or submitted to another journal. This research is the culmination of my master’s work and I would appreciate this paper to be considered for the early career researcher competition.

Sincerely,

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