

Dear PCI RR Managing Board,  
Dear Recommender Dieter Lukas,  
Dear Editor,

We would like to thank you for the opportunity to revise and resubmit our Stage 2 registered report (RR), entitled “Do Ecological Valid Stop Signals Aid Detour Performance? A Comparison of Four Bird Species.”

We would like to thank you for your constructive feedback. In this Stage 2 resubmission, we have carefully addressed all comments and suggestions in our responses below, where line numbers correspond to the manuscript with tracked changes.

We declare that this revised Stage 2 RR remains original and unpublished. All authors have approved the submission of the revised Stage 2 RR in its current form. I will be responsible for keeping my co-authors informed of our progress throughout the further editorial review process.

We would like to thank you for your time and effort, and for your consideration of our revised Stage 2 RR.

Sincerely,  
Anneleen Dewulf (on behalf of all authors)

**1a. The changes in the methods and results now help to make it clear which analyses were originally planned and how these were modified. However, it is still slightly confusing that in the method section you separate the "registered model" from the "applied model", when the results talk about "registered comparisons". Maybe change the headers in the result section to "registered comparisons with the applied model" to make it clearer how it links to the different method section?**

We have changed the headers in the result section for both of our dependent variables.

**1b. In addition, I think it would be helpful to expand the first paragraph of the method section on the applied model with a more explicit statement that the "violations of certain assumptions, and issues with model convergence" mean that the outcomes of the originally registered model are meaningless or misleading. This is a requirement according to the PCI RR policy: section 2.9 of the Guide for Authors states that all registered analyses must be reported unless it is now clear that the originally planned analysis plan is now inappropriate. To strengthen this point, you might want to mention that the statistical inferences on which you based your decision to change the original models are presented in the supplementary material (and potentially add any statistical inferences which you based your decision on if they are currently not explicitly stated in the supplementary materials).**

We have revised and clarified the first paragraph of the Methods section. Additionally, we have provided a detailed statistical rationale for removing the random slope for species, highlighting the presence of perfect or near-perfect correlations among random effects, which indicate redundancy, as well as the boundary singularity issue. This explanation has been included in the supplementary materials and referenced in the manuscript. Violations of model assumptions are illustrated in the supplementary plots from the earlier version of the manuscript (Stage 2, V1), and model convergence issues can be reproduced using our data analysis pipeline R script.

#### Method: Applied Model

Following the registered inspections and analyses, changes were made to the registered models to address model complexity, violations of certain assumptions, and issues with model convergence, as these problems would undermine the validity of the original model's outcomes and lead to misleading or unreliable results. The statistical inferences supporting these changes are provided in the supplementary materials (Dewulf, Garcia-Co, et al., 2023) (line number: 475-479).

**2. You might want to add an additional column to your study design table to explain which inferences you are drawing about the three questions now that your study is concluded. Some of the recently accepted stage 2 manuscripts at PCI RR have done so in case you want examples. I think it can help the reader to quickly get a summary of the study.**

We have added an additional column 'Observed outcome' to the study design template.

#### Observed Outcome

##### Question 1:

The applied models did **not support** the prediction for either dependent variable. This suggests that the adaptation to a specific ecological niche cannot account for variation in stop-signal detection (at least, not in the detour task).

##### Question 2:

The applied models **supported** the predictions for both dependent variables. Exploratory analyses taking into account (potential) interaction effects between Species and Trial revealed that gulls learned to inhibit interacting with the barrier itself but without an

overall improvement in detour latency, whereas the other species became faster at detouring and interacted less with the barrier over time.

Question3:

The applied models did **not support** the prediction for either dependent variable. Performance generally improved across trials (Question 2); however, this improvement did not interact with the species-specific ecological validity of the stop signal.

**3. There was one comment from a reviewer about the species' ecological niche, where I think you could elaborate a bit more in the discussion to help readers who are not as familiar with these species or who are considering how your findings might translate to their species. My interpretation of the reviewer's comment asking for an example would be to more specifically refer to what exactly in the environment of these specific species might lead to such cognitive adaptations. I realise that you are being careful and do not want to speculate about inferences that are beyond the scope of this study. However, given that you specifically mention "certain ecological niches" and "context-specific factors", it might help the reader to see what you could mean by those and which kind of environmental conditions others might want to pay attention to when considering differences in detour performance.**

We have included a speculative example in the manuscript.

Discussion

Speculatively, this may relate to adaptations to the species' ecological niches. Inhibition of unrewarded responses is likely to be a critical component of adaptive behaviour across the different ecological niches experienced by the species tested here, and therefore more easily learned by all species. In contrast, navigating obstacles may depend more on context-specific factors, such as available navigational cues and spatial scale. This may make learning more challenging for some species, especially if the test environment does not match their ecological niche. For example, while gulls may excel at using large-scale spatial cues in open spaces, they may struggle with small-scale obstacles in confined environments such as a test box. However, more research is needed to explore this idea. (line number: 673-681).