

Cross-modal individual recognition in the African penguin and the effect of partnership

Luigi Baciadonna, Cwyn Solvi, Sara La Cava, Cristina Pilenga, Marco Gamba and Livio Favaro

Article citation details

Proc. R. Soc. B **288**: 20211463.

<http://dx.doi.org/10.1098/rspb.2021.1463>

Review timeline

Original submission: 28 June 2021
Revised submission: 13 September 2021
Final acceptance: 20 September 2021

Note: Reports are unedited and appear as submitted by the referee. The review history appears in chronological order.

Review History

RSPB-2021-1463.R0 (Original submission)

Review form: Reviewer 1

Recommendation

Accept with minor revision (please list in comments)

Scientific importance: Is the manuscript an original and important contribution to its field?

Excellent

General interest: Is the paper of sufficient general interest?

Excellent

Quality of the paper: Is the overall quality of the paper suitable?

Excellent

Is the length of the paper justified?

Yes

Should the paper be seen by a specialist statistical reviewer?

No

Do you have any concerns about statistical analyses in this paper? If so, please specify them explicitly in your report.

No

It is a condition of publication that authors make their supporting data, code and materials available - either as supplementary material or hosted in an external repository. Please rate, if applicable, the supporting data on the following criteria.

Is it accessible?

Yes

Is it clear?

Yes

Is it adequate?

Yes

Do you have any ethical concerns with this paper?

No

Comments to the Author

The manuscript deals with the potential ability of banded penguins (*Spheniscus demersus*) to recognize conspecifics through a cross-modal recognition system. Moreover, the authors took into account if/how the level of familiarity can shape this behaviour. The introduction is broad enough to catch the attention of readers coming from different disciplines (e.g., evolutionary biology, animal behaviour, comparative psychology and cognition) and the methodological approach is good. Owing to the novelty of the approach (and the consequent lack of literature), the authors provided some possible hypotheses explaining why partners and non-partners evoked different reactions to the calls. Obviously, such hypotheses need to be tested in the future, however I found the discussion well balanced and the possible explanations reasonable and highly parsimonious.

Minor points:

Lines 54-55 - Please change the sentence as follows: "Humans have the ability to visualise familiar people by simply hearing their voice"

Line 97 - "interaction" should be "interactions"

Line 180-181 - be consistent with 5 and/or five

Lines 287-298 - I think this part (Hypotheses and Predictions) should be the last paragraph of the introduction and not the first paragraph of the Results section.

Line 338 - maybe "territorial" instead of "territorially"

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Line 347-349 - Maybe "The reason why we observed no differences between conditions in duration and frequency of looking may be explained by the behavioural significance of contact calls."

Line 361 - Change into "...time- and energy-demanding"

Line 380-387 - I find this second explanation much more convincing...

As for "the partner separation effect" (I like this hypothesis too!), is it possible that when penguins are not able to see their partner anymore, they experience a high state of arousal with a negative valence? Their sudden reaction should prevent them to express the expected behaviour...

Review form: Reviewer 2

Recommendation

Accept with minor revision (please list in comments)

Scientific importance: Is the manuscript an original and important contribution to its field?

Acceptable

General interest: Is the paper of sufficient general interest?

Acceptable

Quality of the paper: Is the overall quality of the paper suitable?

Acceptable

Is the length of the paper justified?

Yes

Should the paper be seen by a specialist statistical reviewer?

No

Do you have any concerns about statistical analyses in this paper? If so, please specify them explicitly in your report.

No

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Is it accessible?

No

Is it clear?

No

Is it adequate?

No

Do you have any ethical concerns with this paper?

No

Comments to the Author

Cross-modal individual recognition in the African penguin and the effect of partnership RSPB-2021-1463

Review by Tom Hart; tom.hart@zoo.ox.ac.uk, signed review.

Limitations of review: I work on most aspects of penguins, including behaviour, but I've only published once on choice experiments. I am happy evaluating the statistics in this manuscript and I have no conflict of interest.

Summary: This ms looks at whether penguins recognise familiar vs less familiar conspecifics and whether they pay more or less attention to a vocal cue when it is incongruent with the bird they have just seen.

N=10 is an extremely small sample size, but there is a strong effect size despite this, even when individual is taken into account.

Specific points:

My main criticism is that the results section is quite difficult to follow, in particular the paragraph at L300. I think you might consider a flow diagram or infographic to show the different comparisons, or put brackets on Figure 2 to demonstrate which comparisons you are referencing. L246- define or italicize each of the duration of looking and use this later – eg I think at 311. That would clarify a lot of the confusion

L268-269: This sentence about individual included as a random effect is repeated at 273.

Decision letter (RSPB-2021-1463.R0)

06-Sep-2021

Dear Dr Baciadonna

I am pleased to inform you that your manuscript RSPB-2021-1463 entitled "Cross-modal individual recognition in the African penguin and the effect of partnership" has been accepted for publication in Proceedings B.

The referee(s) have recommended publication, but also suggest some minor revisions to your manuscript. Therefore, I invite you to respond to the referee(s)' comments and revise your manuscript. Because the schedule for publication is very tight, it is a condition of publication that you submit the revised version of your manuscript within 7 days. If you do not think you will be able to meet this date please let us know.

To revise your manuscript, log into <https://mc.manuscriptcentral.com/prsb> and enter your Author Centre, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision. You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript and upload a new version through your Author Centre.

When submitting your revised manuscript, you will be able to respond to the comments made by the referee(s) and upload a file "Response to Referees". You can use this to document any changes you make to the original manuscript. We require a copy of the manuscript with revisions made since the previous version marked as 'tracked changes' to be included in the 'response to referees' document.

Before uploading your revised files please make sure that you have:

- 1) A text file of the manuscript (doc, txt, rtf or tex), including the references, tables (including captions) and figure captions. Please remove any tracked changes from the text before submission. PDF files are not an accepted format for the "Main Document".
- 2) A separate electronic file of each figure (tiff, EPS or print-quality PDF preferred). The format should be produced directly from original creation package, or original software format. PowerPoint files are not accepted.
- 3) Electronic supplementary material: this should be contained in a separate file and where possible, all ESM should be combined into a single file. All supplementary materials accompanying an accepted article will be treated as in their final form. They will be published alongside the paper on the journal website and posted on the online figshare repository. Files on figshare will be made available approximately one week before the accompanying article so that the supplementary material can be attributed a unique DOI.

Online supplementary material will also carry the title and description provided during submission, so please ensure these are accurate and informative. Note that the Royal Society will not edit or typeset supplementary material and it will be hosted as provided. Please ensure that the supplementary material includes the paper details (authors, title, journal name, article DOI). Your article DOI will be 10.1098/rspb.[paper ID in form xxxx.xxxx e.g. 10.1098/rspb.2016.0049].

4) A media summary: a short non-technical summary (up to 100 words) of the key findings/importance of your manuscript.

5) Data accessibility section and data citation

It is a condition of publication that data supporting your paper are made available either in the electronic supplementary material or through an appropriate repository. Please see our Data Sharing Policies <https://royalsociety.org/journals/authors/author-guidelines/#data>.

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- Phylogenetic data: TreeBASE accession number S9123
- Final DNA sequence assembly uploaded as online supplemental material
- Climate data and MaxEnt input files: Dryad doi:10.5521/dryad.12311

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[http://datadryad.org/submit?journalID=RSPB&manu=\(Document not available\)](http://datadryad.org/submit?journalID=RSPB&manu=(Document not available)) which will take you to your unique entry in the Dryad repository. If you have already submitted your data to dryad you can make any necessary revisions to your dataset by following the above link. Please see <https://royalsociety.org/journals/ethics-policies/data-sharing-mining/> for more details.

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Once again, thank you for submitting your manuscript to Proceedings B and I look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.

Sincerely,

Dr Locke Rowe

mailto:proceedingsb@royalsociety.org

Associate Editor

Board Member: 1

Comments to Author:

Dear Authors,

As you will see, both reviewers were positive about your study, and had only a handful of minor points. I agree with reviewer 2's comment that certain parts of the results section were a bit difficult to follow, and an improved presentation (either with better labeling or with an improved figure) would help with clarifying which comparisons are being referenced.

I would also add that it would strengthen the case for the importance of your study to explain a bit better what your study adds to what is already known from the crow research. Is it simply to

look for this ability in a different bird? Or is the main point that penguins are thought to be less "clever" and so necessary to show that even birds that aren't especially skilled at complex cognitive tasks use multitmodal cues? Further, why penguins? Can we now extrapolate to "most birds" from here? Or are penguins another special case among birds?

Reviewer(s)' Comments to Author:

Referee: 1

Comments to the Author(s)

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Line 361 – Change into “...time- and energy-demanding”

Line 380-387 – I find this second explanation much more convincing...

As for “the partner separation effect” (I like this hypothesis too!), is it possible that when penguins are not able to see their partner anymore, they experience a high state of arousal with a negative valence? Their sudden reaction should prevent them to express the expected behaviour...

Referee: 2

Comments to the Author(s)

Cross-modal individual recognition in the African penguin and the effect of partnership RSPB-2021-1463

Review by Tom Hart; tom.hart@zoo.ox.ac.uk, signed review.

Limitations of review: I work on most aspects of penguins, including behaviour, but I've only published once on choice experiments. I am happy evaluating the statistics in this manuscript and I have no conflict of interest.

Summary: This ms looks at whether penguins recognise familiar vs less familiar conspecifics and whether they pay more or less attention to a vocal cue when it is incongruent with the bird they have just seen.

N=10 is an extremely small sample size, but there is a strong effect size despite this, even when individual is taken into account.

Specific points:

My main criticism is that the results section is quite difficult to follow, in particular the paragraph at L300. I think you might consider a flow diagram or infographic to show the different comparisons, or put brackets on Figure 2 to demonstrate which comparisons you are referencing. L246- define or italicize each of the duration of looking and use this later – eg I think at 311. That would clarify a lot of the confusion

L268-269: This sentence about individual included as a random effect is repeated at 273.

Author's Response to Decision Letter for (RSPB-2021-1463.R0)

See Appendix A.

Decision letter (RSPB-2021-1463.R1)

20-Sep-2021

Dear Dr Baciadonna

I am pleased to inform you that your manuscript entitled "Cross-modal individual recognition in the African penguin and the effect of partnership" has been accepted for publication in Proceedings B.

You can expect to receive a proof of your article from our Production office in due course, please check your spam filter if you do not receive it. PLEASE NOTE: you will be given the exact page length of your paper which may be different from the estimation from Editorial and you may be asked to reduce your paper if it goes over the 10 page limit.

If you are likely to be away from e-mail contact please let us know. Due to rapid publication and an extremely tight schedule, if comments are not received, we may publish the paper as it stands.

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All supplementary materials accompanying an accepted article will be treated as in their final form. They will be published alongside the paper on the journal website and posted on the online figshare repository. Files on figshare will be made available approximately one week before the accompanying article so that the supplementary material can be attributed a unique DOI.

Thank you for your fine contribution. On behalf of the Editors of the Proceedings B, we look forward to your continued contributions to the Journal.

Sincerely,

Dr Locke Rowe

Editor, Proceedings B

mailto: proceedingsb@royalsociety.org

Associate Editor:

Board Member

Comments to Author:

Dear Authors,

Thank you for the revised version of your manuscript. I believe that all of the concerns raised by the reviewers and myself have been adequately addressed.

Appendix A



**Department of Life Sciences and Systems
Biology, University of Turin, Turin, Italy**

Luigi Baciadonna

E-mail: luigi.baciadonna@unito.it

Dear Prof Rowe,

Please find attached a revised version of the manuscript (RSPB-2021-1463) entitled "Cross-modal individual recognition in the African penguin and the effect of partnership". In this new version, we made all the changes requested: below, we first repeat the requested change in bold and then follow each one with our response.

Thank you for your time and effort. We hope that you will find the new version of the manuscript suitable for publication in for *Proceeding of the Royal Society B, Biological Sciences*.

Sincerely,

Luigi Baciadonna (also on behalf of all co-authors)

Editor Comments

Dear Authors,

As you will see, both reviewers were positive about your study, and had only a handful of minor points. I agree with reviewer 2's comment that certain parts of the results section were a bit difficult to follow, and an improved presentation (either with better labeling or with an improved figure) would help with clarifying which comparisons are being referenced.

We are delighted with the positive feedback received, which included helpful suggestions. We apologise for the clarity issues. We have made the terms used in both the methods and results consistent and labelled Figure 2 to help make the comparisons made clearer.

I would also add that it would strengthen the case for the importance of your study to explain a bit better what your study adds to what is already known from the crow research. Is it simply to look for this ability in a different bird? Or is the main point that penguins are thought to be less "clever" and so necessary to show that even birds that aren't especially skilled at complex cognitive tasks use multmodal cues? Further, why penguins? Can we now extrapolate to "most birds" from here? Or are penguins another special case among birds?

We are unaware of anyone thinking that penguins are less clever. We also don't believe we can confidently extrapolate our findings to most birds, as we believe this ability (as most abilities) to be linked to the ecological pressures which each species endures. We feel that in the first paragraph of our discussion section and also the extensive ending paragraph, we have laid out the importance of our findings without overstatement. We hope you agree with this.

Referee: 1

Comments to the Author(s)

The manuscript deals with the potential ability of banded penguins (*Spheniscus demersus*) to recognize conspecifics through a cross-modal recognition system. Moreover, the authors took into account if/how the level of familiarity can shape this behaviour. The introduction is broad enough to catch the attention of readers coming from different disciplines (e.g., evolutionary biology, animal behaviour, comparative psychology and cognition) and the methodological approach is good. Owing to the novelty of the approach (and the consequent lack of literature), the authors provided some possible hypotheses explaining why partners and non-partners evoked different reactions to the calls. Obviously, such hypotheses need to be tested in the future, however I found the discussion well balanced and the possible explanations reasonable and highly parsimonious.

Thank you for these positive comments.

Minor points:

Lines 54-55 – Please change the sentence as follows: "Humans have the ability to visualise familiar people by simply hearing their voice"

Changed as suggested (lines 54-55)

Line 97 – "interaction" should be "interactions"

Changed as suggested (line 97)

Line 180-181 – be consistent with 5 and/or five

Changed to be consistent throughout (e.g., lines 162, 163, 164 and 180).

Lines 287-298 – I think this part (Hypotheses and Predictions) should be the last paragraph of the introduction and not the first paragraph of the Results section.

We respectfully disagree and hope this is simply a difference in style/structure preference. For the initial paragraph of the results section, we chose to remind the reader of the main hypotheses and predictions of the study, as we feel it is often the case that readers will skip the methods and jump straight to the results. We would therefore maintain the current structure, unless required for publication.

Line 338 – maybe “territorial” instead of “territorially”

Changed as suggested (line 336).

Lines 343-345 – I guess the rationale at the basis of this hypothesis, but I think it requires a little bit explanation about why cross-modal recognition should be important during hunting context. I suppose that amongst the waves it could be not so easy to catch the chest dots of companions, right?

Good point. Thank you. We have changed the sentence as follows (lines 341-346):

“Cross-modal recognition may have proven valuable in the turbulent environment amongst the waves and rocks, where visual identifiers, e.g., their unique pattern of black spots (Fig 1), may not be a reliable salient cue to recognise others. Therefore, to better coordinate and maintain contacts during hunting sessions, other cues were necessary, e.g. vocal calls.”

Line 347-349 – Maybe “The reason why we observed no differences between conditions in duration and frequency of looking may be explained by the behavioural significance of contact calls.”

Changed as suggested (lines 348-350).

Line 361 – Change into “...time- and energy-demanding”

Changed as suggested (line 362).

Line 380-387 – I find this second explanation much more convincing... As for “the partner separation effect” (I like this hypothesis too!), is it possible that when penguins are not able to see their partner anymore, they experience a high state of arousal with a negative valence? Their sudden reaction should prevent them to express the expected behaviour...

We agree that this could be a possibility. However, we feel that because we did not look at the emotional states of the penguins, it would be a bit tangential to dig into such a specific hypothesis that would entail discussing emotional theories.

Referee: 2

Comments to the Author(s)

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N=10 is an extremely small sample size, but there is a strong effect size despite this, even when individual is taken into account.

Thank you for your time and suggestions which have been helpful in improving the manuscript.

Specific points:

My main criticism is that the results section is quite difficult to follow, in

particular the paragraph at L300. I think you might consider a flow diagram or infographic to show the different comparisons, or put brackets on Figure 2 to demonstrate which comparisons you are referencing.

We apologise for the lack of clarity. We have now revised the methods and results sections using terms consistently across sections and added *p* values and brackets to Figure 2 indicating the comparisons we make in the results section. We hope that these changes have made things clearer.

L246- define or italicize each of the duration of looking and use this later – eg I think at 311. That would clarify a lot of the confusion

We have now italicised each of the dependent variables throughout the manuscript (e.g., lines 246, 249-250, 267-268).

L268-269: This sentence about individual included as a random effect is repeated at 273.

Thank you for pointing this out. We deleted the first sentence and change the second iteration to state (lines 270-272): "*The identity of the penguins was included as a random factor to control for repeated measurements of the same subject in all models performed*".