23-Jan-2018  
  
Dear Mr Edmiston:  
  
Your manuscript has now been peer reviewed and the reviews have been assessed by an Associate Editor.  The reviewers’ comments (not including confidential comments to the Editor) and the comments from the Editors are included at the end of this email for your reference. As you will see, the reviewers and the Editors have raised some concerns with your manuscript and we would like to invite you to revise your manuscript to address them.  
  
We do not allow multiple rounds of revision so we urge you to make every effort to fully address all of the comments at this stage. If deemed necessary by the Associate Editor, your manuscript will be sent back to one or more of the original reviewers for assessment. If the original reviewers are not available we may invite new reviewers. Please note that we cannot guarantee eventual acceptance of your manuscript at this stage.  
  
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It is a condition of publication that you make available the data and research materials supporting the results in the article. Datasets should be deposited in an appropriate publicly available repository and details of the associated accession number, link or DOI to the datasets must be included in the Data Accessibility section of the article (<http://rspb.royalsocietypublishing.org/site/misc/preparing-article.xhtml#question10>). Reference(s) to datasets should also be included in the reference list of the article with DOIs (where available).  
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Electronic supplementary material:  
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.  
  
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Thank you for submitting your manuscript to Proceedings B; we look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.  
  
Best wishes,  
  
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mailto: [proceedingsb@royalsociety.org](mailto:proceedingsb@royalsociety.org)  
  
Associate Editor, Dr Katie Slocombe  
  
Comments to Author:  
Thank you for revising your manuscript. One reviewer had some outstanding concerns, that I suggest could be tackled in the following way:  
  
1. Acknowledge that imitation alone is not sufficient for sounds to be used as words - other cognitive and intentional processes are also required for this.  
2. You may wish to consider revising the title so you are not claiming that these vocalisations are words, but rather more word-like (e.g. Imitation makes human vocalisations more word-like)  
3. You could discuss in the general discussion that imitation in modern humans is shaped by the biases and constraints of a modern, language competent brain and thus, prior to language evolving, imitation may not have had the same effects as you found here (so be more tentative about how clearly these findings relate to early word emergence in our ancestors).  
4. You could clarify the number of iterations in your chains needed to see the stabilisation of sounds.  
  
Reviewer(s)' Comments to Author:  
  
Referee: 1  
  
Comments to the Author(s).  
Edminston et al, present an interesting and very innovative work aimed at studying the role of vocal imitation in the evolution of language and in the generation of vocabulary.  In this resubmitted manuscript the authors have  appropriately discussed the issues I raised in the first review.  
  
Referee: 2  
  
Comments to the Author(s).  
Review of “The emergence of words from vocal imitations” by Edmiston et al  
  
The manuscript is a resubmission of a previous version I reviewed. I think the authors did a good job in responding to many of the concerns myself and the other reviewers raised to the previous version (e.g., comparing the methods they used in Exp 1 with iterated learning, explain better the methodology used in Exp 3). The current version is very well written and clearer than the previous one.  
  
Perhaps it is because this version makes the basic assumptions and claims clearer, I am afraid that I still have important reservations concerning the paper. In particular:  
  
1.      The assumption that imitation is the only key to the origin of language. It is argued that because many signs are transparently linked to their referents (they are iconic), thus their origin must be rooted in imitation. The argument then continues that, if this is the case for sign languages, it could also be the case for vocal imitation. I do question the plausibility of the argument. My main point is that the fact that imitation is possible and can be seen in some modern signs (as well as in onomatopoeias) is not sufficient to argue that it was the key to language origin. This neglect many other aspects that have been discussed, perhaps to me most important is that in order to have a communicative system, the signs (being imitative or not) have to stand for their referents. In other words, there must be a mental representation of an object in the environment that can be evoked by an imitative/iconic form in order for such form to be a word (see discussions in Bickerton D. 2009 Adam’s tongue: how humans made language, how language made humans. New York, NY: Hill & Wang.  
Kendon A. 1991 Some considerations for a theory of language origins. Man 26, 199 – 221. (doi:10.2307/ 2803829). Imitation can help evoking the referent but there needs to be a mental representation to link the imitation to the referent in the world.  Note in this respect that a fundamental difference between non-human calls and human language is what Bickerton (2009, see also Perniss and Vigliocco, 2014) call functional vs conceptual reference, not (or not only) in the mechanisms of imitation.  
  
2.      The expectation that in Experiment 1 vocalizations become more word-like (vocalizations are also referred as words in the text – e.g., title of paper -- which I think is misleading). That is, when modern subjects are asked to imitate through generations environmental sounds, these imitations become less similar to the original seed sound but begin to incorporate features of human language such as they are easier to copy, they are easier to write and they tend to become more categorical. My main problem here is that there is a straightforward alternative account for this. Imitations reflect biological constraints on what is easier to hear and to articulate as well as cognitive biases related to the fact that modern humans have language and, arguably, speech is the most common type of vocalization we produce and hear. Through generations, the biological and cognitive biases become more visible. However, no such biases and constraints might have been at work during language evolution as the biological and cognitive constraints could be the result of evolution, not the mechanism underscoring it.  
  
3.      A more minor issue relates to how was the number of generations (max 8) decided? I understand that the vocalization at the end of the chains were more similar to one another, but I would like to see that vocalizations stabilize and that this is used to decide how many generations to have.  Related, roughly half of the chains do not have more than 4-5. How is this taken into account? How many generations are necessary to see the biases in action?  
  
  
In sum, I think the work is rigorous and well presented. However, I do not think it really advances our understanding of  language origin. It may be that a revision that more clearly articulates the assumptions and how these are necessary to explain the emergence of language could be sufficient. I am doubtful, however, that the methods used are the best way to address the question.  
  
  
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Abstract: People have long pondered the origins of language, especially the words that compose them. Here, we report a series of experiments investigating how conventional spoken words might emerge from imitations of environmental sounds. Does the repeated imitation of an environmental sound gradually give rise to more wordlike forms? In what ways do these words resemble the original sounds that motivated them (i.e., iconicity)? Participants played a version of the children’s game “Telephone”. The first generation of participants imitated recognizable environmental sounds (e.g., glass breaking, water splashing). Subsequent generations imitated the previous generation of imitations for a maximum of 8 generations. The results showed that the imitations became more stable and word-like, and later imitations were easier to learn as category labels. At the same time, even after 8 generations, both spoken imitations and their written transcriptions could be matched above chance to the category of environmental sound that motivated them. These results show how repeated imitation can create progressively more word-like forms while continuing to retain a resemblance to the original sound that motivated them, and speak to the possible role of human vocal imitation in explaining the origins of at least some spoken words.  
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