April 9, 2021

Dear Dr Berenbaum,

Editor-in-Chief: Proceedings of the National Academy of Sciences

Please consider the attached article titled ‘Modelling a primate technological niche, authored by Dr. Jonathan S. Reeves, Dr. Tomos Proffitt, and Dr. Lydia V. Luncz for publication in *The Proceedings of the National Academy of Sciences.*

We confirm that this manuscript constitutes original research and has not been published elsewhere nor is it under consideration by another journal.

Our study uses agent-based modelling to investigate the mechanisms through which short distance tool transport observed in chimpanzees produce landscape scale patterns of tool-use. Chimpanzee stone tools have been recorded, in some instances, kilometers from where they naturally occur. However, the movement of tools over such distances has never been observed. To date, few studies have attempted link observed behaviors to the landscape scale pattern as these two processes operate on different timescales. We illustrate how the how repeated re-use and transport can move tools over large distances. Moreover, we also show how this behavior can lead to the redistribution of tool material across the broader landscape. The complimentary material record produced by this model also provide broader insights into how this behavior produces an archaeological signature.

By presenting a comprehensive analysis of the model outcomes we are able to elucidate the environmental factors that promote the redistribution of tool-material across the broader landscape. We are also able to show how the aggregate effects of repeated short distance tool transport bouts can influence the overall accessibility of resources and opportunities for tool-use over the long term. This has significant implications for primate tool-use as it shows the capacity to short-distance tool transport to substantially modify the broader tool-using environment over the long term. Furthermore, these results also have bearing on hominin evolution as it implies that early hominins may have had the capacity to modify their environments prior to the advent of curated tool transport. Finally, also have implications for how we interpret material culture, as the archaeological signature of this record is largely dependent on the broader landscape.

We believe that *PNAS* is the correct place to publish this research as it focuses on a current and developing discussion on the mechanisms that facilitate tool-use in both living primates and hominins.

We suggest the following reviewers as suitable to assess our study because of their expertise on stone tool transport and primate stone tool use.

Prof. William McGrew (University of St. Andrews; [wcm2@st-andrews.ac.uk](mailto:wcm2@st-andrews.ac.uk))

Prof. Kevin Laland (University of St. Andrews; [knl1@st-andrews.ac.uk](mailto:knl1@st-andrews.ac.uk))

Prof. Alison Brooks (The George Washington University; [abrooks@email.gwu.edu](mailto:abrooks@email.gwu.edu))

Prof. Steven Kuhn (University of Arizona; [skuhn@email.arizona.edu](mailto:skuhn@email.arizona.edu))

Please contact me if you have any questions, and I look forward to hearing from you.

Sincerely,



Dr. Jonathan Reeves­­