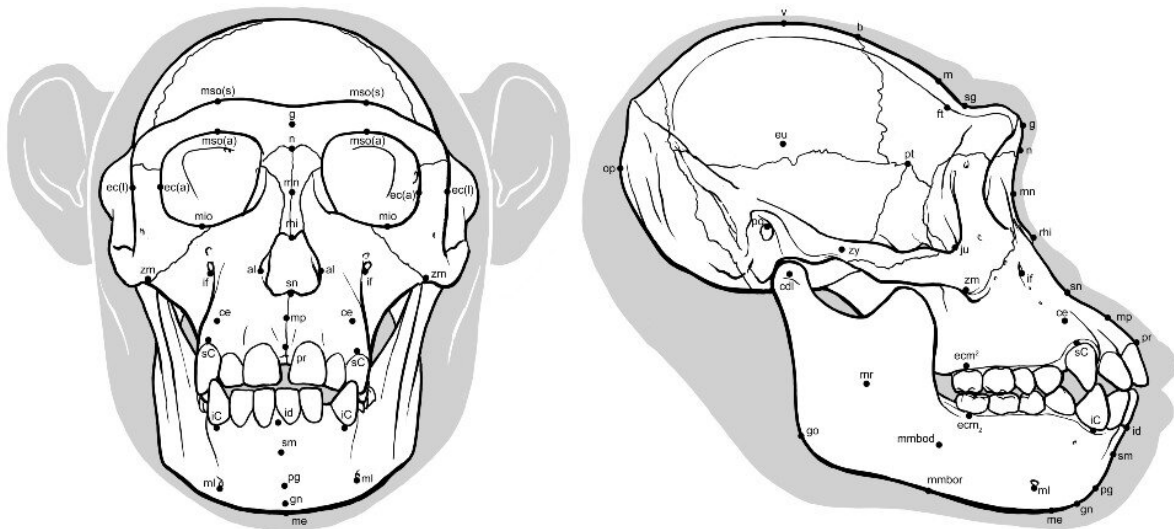


Soft tissue measurements critical to hominid reconstruction

June 4 2021



Cephalometric landmarks -- measurements of the skull -- are critical for accurate measurements of facial soft tissue such as in these numerous landmarks positioned on the skull of a chimpanzee. Credit: Ryan M. Campbell

Accurate soft tissue measurements are critical when making reconstructions of human ancestors, a new study from the University of Adelaide and Arizona State University has found.

"Reconstructing extinct members of the Hominidae, or hominids,

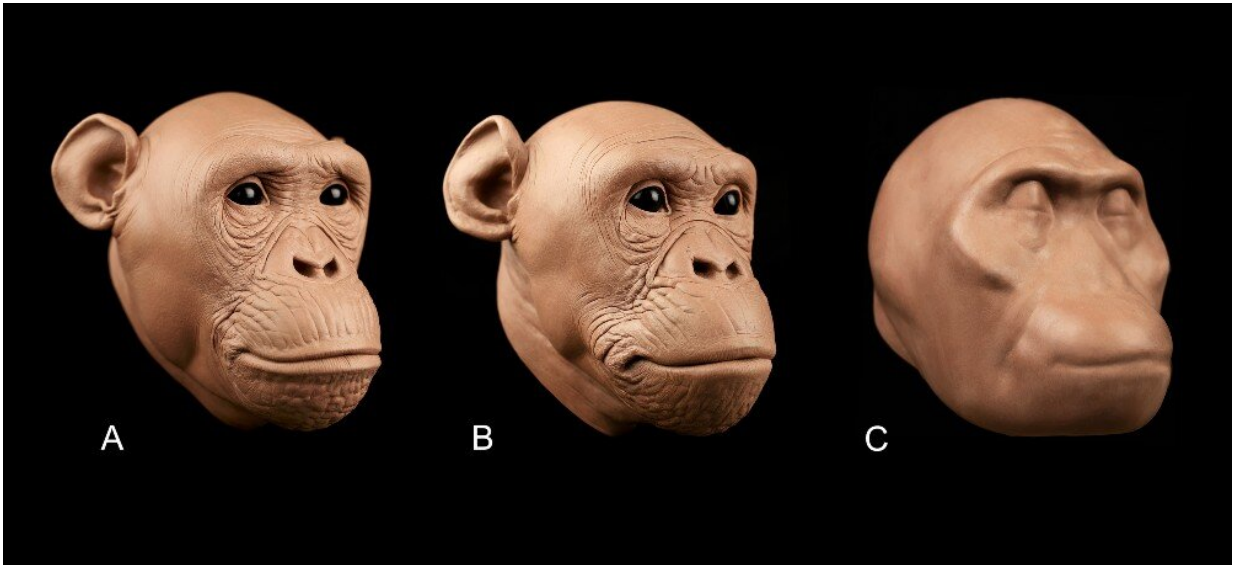
including their facial soft [tissue](#), has become increasingly popular with many approximations of their faces presented in museum exhibitions, popular science publications and at conference presentations worldwide," said lead author Ph.D. student Ryan M. Campbell from the University of Adelaide.

"It is essential that accurate facial soft tissue thickness measurements are used when reconstructing the faces of hominids to reduce the variability exhibited in reconstructions of the same individuals."

Hominids have been readily accepted to line the halls of even the most trusted institutions. They are predominantly used for disseminating [scientific information](#) to the public in museum displays and students in university courses, which will influence the way humanity is perceived and defined more generally.

"Up until now soft tissue [reconstruction](#) has been based on mean tissue depth measurements which does not take into account variation in tissue depths between individuals," says Mr Campbell.

In this study, published in the journal *PLOS ONE*, the authors have formulated a facial soft tissue thickness dataset for adult chimpanzees, and a set of regression equations that can be used to reconstruct the [soft tissues](#) for ancient hominids, such as those dated from 4.0 to 1.2 million years ago.



The soft tissue for these approximations of hominid faces was predicted using equations developed by the authors. No facial features are present in the ancient hominid (C), as the authors admit their equations say nothing about them. Credit: Ryan M. Campbell.

The study was co-authored by Gabriel Vinas, a Master of Fine Arts candidate at Arizona State University who handles the sculpting in the lab.

"Correlations have been found and multiple regression models have been used to generate equations for improving estimations of soft tissue thickness from craniometrics in modern humans," he said.

"We looked at tissue depths in present day chimpanzees to identify correlations in skin and bone."

This article represents the first time that such a collection of tissue depth data has been collected and presented for chimpanzees in a systematic manner.

"The soft tissue thickness data for [chimpanzees](#) are freely available for anyone to download on Figshare.

"The equations, which resulted directly from this research, are also included and can be implemented in future practitioners' reconstructions," said Mr Campbell.

"This research is invaluable for future efforts reconstructing ancient hominids, as well as for comparative studies within and outside the discipline of biological/physical anthropology."

Provided by University of Adelaide

Citation: Soft tissue measurements critical to hominid reconstruction (2021, June 4) retrieved 6 May 2024 from <https://phys.org/news/2021-06-soft-tissue-critical-hominid-reconstruction.html>

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