Accepted Manuscript

Through a filter, darkly: population size estimation, systematic error, and random error in radiocarbon-supported demographic temporal frequency analysis

William A. Brown

PII: S0305-4403(14)00383-5

DOI: 10.1016/j.jas.2014.10.013

Reference: YJASC 4223

To appear in: Journal of Archaeological Science

Received Date: 24 August 2014

Revised Date: 14 October 2014

Accepted Date: 16 October 2014

Please cite this article as: Brown, W.A., Through a filter, darkly: population size estimation, systematic error, and random error in radiocarbon-supported demographic temporal frequency analysis, *Journal of Archaeological Science* (2014), doi: 10.1016/j.jas.2014.10.013.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Highlights

- As a tool for middle range theory-building, Monte Carlo simulation provides a powerful way to explore the influence of stochastic data generation processes (DGPs) linking population growth dynamics to archaeological or paleontological temporal frequency distributions (*tfds*).
- As a confounding factor in the use of *tfds* as demographic proxies, calibration interference is not as clearly understood as previously believed. It modulates the degree of variance observed between identically generated *tfds* in a time-dependent manner, but it does not regulate the direction of such variance.
- Calibration interference interacts with sampling error and other stochastic processes in the process of *tfd* formation. Sampling error is responsive to sample size in particular, with more dramatic differences between identically generated *tfd*s expected at smaller sample sizes.
- When the demographic *TFD* underlying sample *tfds* exhibits peak structures, these structures may instead manifest as a series of high-frequency, high-amplitude peaks and troughs in *tfds* derived from them.
- Subjecting *tfds* to kernel density estimation or similar moving average analyses may mitigate the effects of both calibration interference and sampling error, allowing us to identify real long-run structures in *tfds*.

Download English Version:

https://daneshyari.com/en/article/7442499

Download Persian Version:

https://daneshyari.com/article/7442499

Daneshyari.com