**Cover letter**

Dear editors of Journal of Human Evolution,

My co-authors and I are pleased to submit our manuscript titled “*Global climate influenced the evolutionary history of brain size increase in some mammalian lineages, but not in hominins*” for review by Evolution. To our knowledge, this represents the first study that directly tests the proposed relationships between several aspects of global climate (trend, variability, rate of change) and brain size evolution across a multiple taxonomic orders using a statistically rigorous procedure.

Using cranial capacities of fossil specimens (n = 227), we found that some taxa (e.g. Perissodactyla, Carnivora) did indeed show evidence of relationships between the deep-sea core oxygen isotope records (as a proxy for global temperature/aridity) and evolutionary changes in cranial capacity. However, importantly, hominins (n = 189 individuals) demonstrated no evidence of such brain-climate interactions once data had been properly detrended to guard against the potentially confounding effects of temporal autocorrelation. These results counter previously proposed hypotheses of paleoclimate being a primary driver of brain size increase and behavioral flexibility in hominin evolution. We thus believe that this study provides a much-needed statistically rigorous test of long standing hypotheses of brain-climate interactions in mammalian evolution.

Thank you very much for your time and consideration. We look forward to the opportunity to publish in Journal of Human Evolution.

Many thanks,

Brian M. Schildera, W. Andrew Barra, René Bobeb,c, Chet C. Sherwooda

*aDepartment of Anthropology, Center for Advanced Study of Human Paleobiology,*

*The George Washington University, USA*

*bDepartamento de Antropología, Universidad de Chile, Santiago, Chile*

*cInstitute of Cognitive & Evolutionary Anthropology, University of Oxford, UK*