

MODELING TOOL USE ACROSS SPACE: AN EXPERIMENTAL APPROACH TO EXPLAINING SUBSISTENCE TOOL TECHNOLOGY IN *PAN TROGLODYTES*.

S.M. Lindshield, E. Otárola-Castillo, J.D. Pruetz

Iowa State University, Ames, IA, USA,

Presenter's Email: slind@iastate.edu

Tool use was once considered a trait that separated humans from the rest of the animal world. Today scientists are aware that tool use is common in a number of other species. While primatologists have enhanced our knowledge of certain aspects of tool use behaviors in nonhuman primates, factors driving subsistence-related tool use remain poorly understood. To address this, we explored and modeled relationships between the biotic and abiotic variables influencing tool use in wild chimpanzees (*Pan troglodytes*) in a subsistence/foraging context across their geographical distribution. We reviewed the literature and compiled a list of common tool use behaviors across long-term study sites where habituated chimpanzees were directly observed. For each site, we recorded ecological community data, including mammals, insects, and chimpanzee plant food species. Additionally, we used the WorldClim database to acquire a series of abiotic variables specific to each site (e.g., elevation, precipitation, temperature). Using a multimodel inference approach, we also compared all environmental models to models of cultural transmission using the available data to arbitrate between them. We present the best model arbitrated by the available data, accounting for most of the variation in tool use behavior over the chimpanzee geographical distribution. Further information collected at sites included in our sample as well as at new field sites will serve to update our models and refine our knowledge of processes driving tool use. A deeper understanding of such processes enables us to better understand how species-environment interactions influence the emergence of tool use behavior.

Keywords: Tool Use, Chimpanzees, Multivariate Statistics, Spatial Modeling