

## ORIGINAL RESEARCH ARTICLE

# Morphological trajectories suggest significant changes in preference and design intent associated with Gahagan bifaces from Caddo burials in the American Southeast

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## ARTICLE HISTORY

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## ABSTRACT

Gahagan bifaces express significant differences in morphology across the same geography as Caddo bottles and Perdiz arrow points, and there is a significant difference in the shape, size, and form of Gahagan bifaces found in the ancestral Caddo area and central Texas. This study asks whether Gahagan biface morphology differs between stratigraphically-defined—and chronologically discrete—burial contexts at the Mounds Plantation and George C. Davis sites, and whether Gahagan biface morphology might differ in morphology based on qualitative differences in Caddo burial practices. Results indicate a significant difference in size between burial contexts at Mounds Plantation and George C. Davis, where the pattern of morphological differences is inverted. At both sites, shape remains consistent and does not differ among contexts, indicating an established **shape preference** that may have shifted significantly in size due to cyclical differences in the variable social mechanisms associated with raw material procurement. Gahagan bifaces also differ in shape between burial contexts where a biface was placed *alongside an individual* and those found as part of a cache *alongside the northern wall of the burial feature*. Each burial tradition articulates with a distinct **community of practice** relating to Gahagan biface **placement** and **design intent**.

## KEYWORDS

Caddo; NAGPRA; archaeoinformatics; 3D geometric morphometrics; museum studies; digital humanities

## 1. Introduction

Once upon a time...

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## **Data management**

The analysis code associated with this project can be accessed through this document or the GitHub repository, which is digitally curated on the Open Science Framework DOI: 10.17605/OSF.IO/Y7B39. The reproducible nature of this undertaking provides a means for others to critically assess and evaluate the various analytical components (Gray and Marwick 2019; Peng 2011; Gandrud 2014), which is a necessary requirement for the production of reliable knowledge.

Reproducibility projects in psychology and cancer biology are impacting current research practices across all domains. Examples of reproducible research are becoming more abundant in archaeology (Marwick 2016; Ivanovaitė et al. 2020; Selden Jr., Dockall, and Shafer 2018; Selden Jr., Dockall, and Dubied 2020; Selden Jr et al. 2021), and the next generation of archaeologists are learning those tools and methods needed to reproduce and/or replicate research results (Marwick et al. 2019). Reproducible and replicable research work flows are often employed at the highest levels of humanities-based inquiries to mitigate concern or doubt regarding proper execution, and is of particular import should the results have—explicitly or implicitly—a major impact on scientific progress (Peels and Bouter 2018).

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