

# Exploring Neanderthal handedness. The contribution of digital applications

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## Abstract

The *NeandLang* project investigates Neanderthal capability of speech articulation. This is based on the neurophysiological evidence that speech capacity is directly related to the formation of cerebral lateralization reflected also in the right- over left-handedness dominance. Research explores the rate of hand lateralization on these hominins through the examination of their manual specialization imprinted in the technical procedures of lithic production. To this end observations deriving from both experimental (stone tools produced by modern knappers) and archaeological data (Neanderthals' stone tools from Kalamakia Cave-Peloponnesus) are compared. A series of digital applications are incorporated in our methodological protocol in order the research objectives to be met:

Software for the analysis of the experimental sessions' video recordings contributes to the understanding of the kinematics characterizing the knapping procedures manual specialization and their consequences imprinted on the lithic products.

3D scanning, photogrammetry, GIS analytical tools and digital image processing of the experimentally produced lithics and archaeological objects enable targeted technical observations and calculations to be made.

Construction of special databases permit an evaluation of the collected data and lead to the identification of handedness patterns.

In this paper, we present the digital methodology of our study along with the results obtained.

The use of innovative digital approaches to the research of interplay between knapped stone technology and hominin cognition are also discussed.