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# Can Phylogenetics and Factor Analysis be Complementary? The Geometric Microliths as a Case Study

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## Abstract

To achieve a better knowledge of archaeological processes and events, and thus increase our comprehension of past societies, one of the first necessary steps is the systematisation of the archaeological record. In this sense, within the field of lithic industry, there have been many methodological proposals trying to organise how we understand the past material assemblages. From the development of synthetic (or comprehensive) observational typologies to the approach through different hierarchical classifications (from mathematical clustering to taxonomical perspectives), all of these techniques have in common the awareness that archaeological knowledge will not come from the identification of specific types, but from the correct interpretation of the relationship among those types, and how their evolutionary patterns relate within the rest of the archaeological record.

In this present communication we try to go deeper into our knowledge of type significance, and we do so by exploring two different analytical techniques, applied to the geometric microliths of the Eastern Iberian Peninsula. In the first place, we will use factor analysis. This technique is commonly used to assess causal relationships in different research fields and in particular, it has demonstrated its great accuracy in the field of lithic typology. Second, we will use Bayesian phylogenetics to try to understand the stylistic hierarchical relationships between the different geometric microliths. Although not yet very common, phylogenetics have been used in Archaeology to assess a number of research questions, starting in the end of the 20th century, and consolidating in the last years.

Due to different theoretical discussions, it is not frequent to find the combination of these techniques. However, we want to explore their possible complementarity. While phylogenetics try to establish hierarchical relationships through time, based on the inheritance of different traits, factor analysis can be pointed to understanding the causes conditioning those same relationships. If we can successfully combine both techniques, we will significantly increase both our understanding of the past, and the possible veracity of our methods to understand that past.

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