

Readability determines the presence of writing: materials, light effects, and sign sequences on Cretan Hieroglyphic seals

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Cretan Hieroglyphic, an undeciphered script of the Middle Bronze Age (roughly 1900-1700 BCE), represents the earliest known form of writing in Europe. Approximately half of its occurrences, including the earliest appearances, are found on seals. Serving as both luxury items (hard-stone ones denoting high status) and administrative tools (inscribed ones denoting hierarchical prominence), seals have sparked suspicion about how their physical features (material, color etc.) influenced the emergence of writing on them. However, research combining physical attributes and writing on seals has been lacking.

To address this, I conducted a Social Network Analysis of prismatic seals. Nodes of the network corresponds to seals. The connection between two nodes indicates the number of features the corresponding seals share. I included physical alongside 'epigraphical' (number and type of sequences) features.

The study reveals a correlation between readability (i.e., the ease of visually discerning an inscription) and number of inscribed faces (Figs. 1-2), the latter being proportional to the owner's hierarchical position. Through autopsy, I found that readability depends upon the stone's diaphaneity (the opaquer the seals, the more readable they are), the intaglio depth, and the paleography. Therefore, deeply engraved opaque stones typically have a high number of inscribed faces, while transparent and translucent often have only one. Seals that underwent artificial enhancement of opacity through heating display writing on all their faces.

Readability also impacts the content of the inscriptions. Sign sequences popular on soft-stone seals are normally limited, on hard stones, to lowly readable seals. Moreover, techniques employed for highly readable inscriptions require an outstandingly skilled engraver. The conclusion is that readability likely determined the value of seals, and thus, the status of their owners, as well as the significance of Hieroglyphic on seals.

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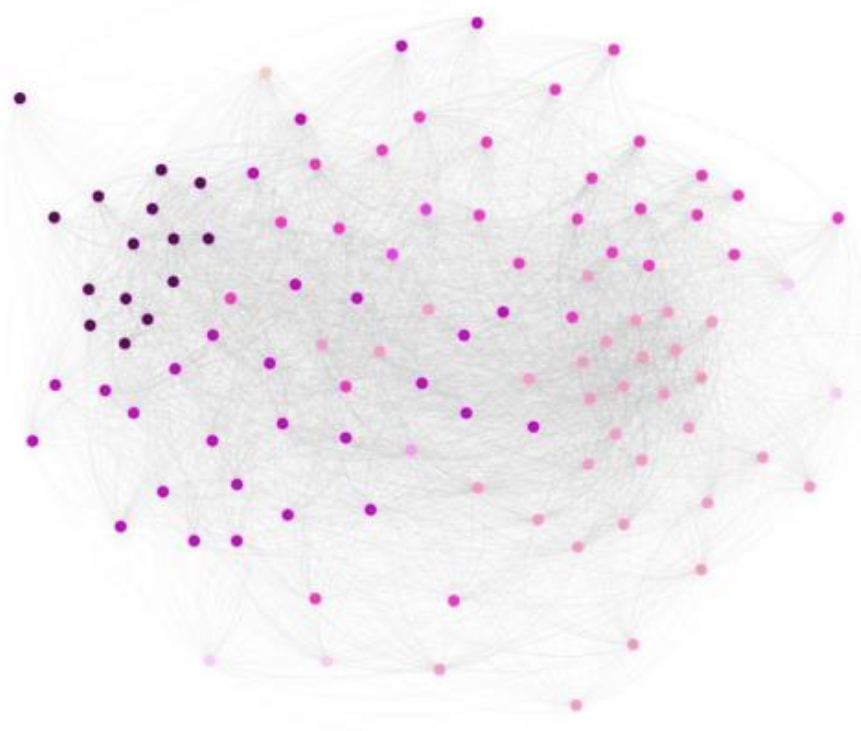


Figure 1 - SNA model with nodes colored according to their readability, i.e., the darker they are, the higher is the readability of the related seal

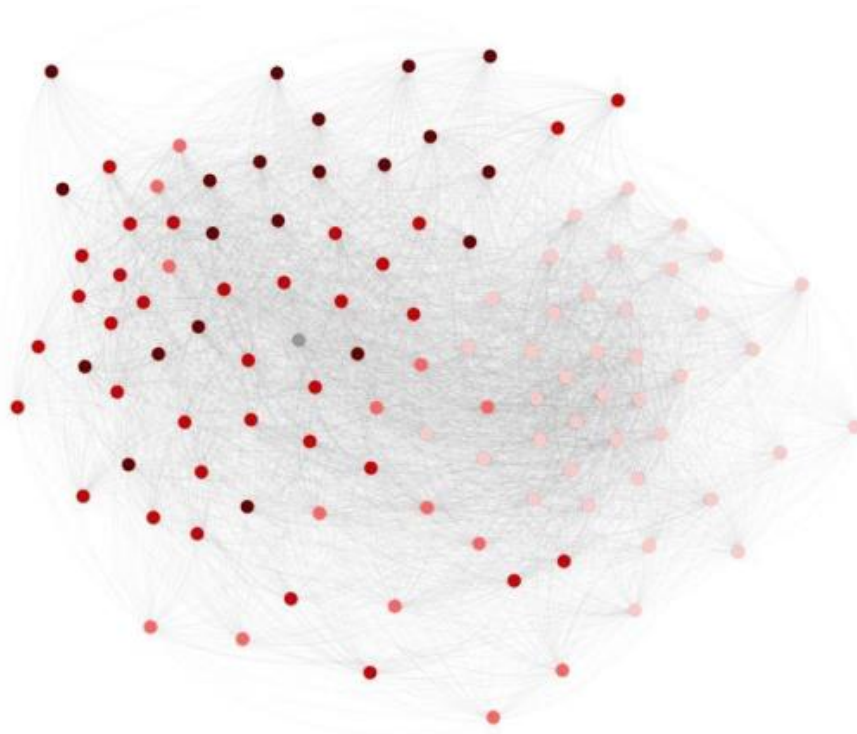


Figure 2 - SNA model with nodes colored according to the number of inscribed faces, i.e., the darker they are, the higher is the number of inscribed faces of the related seal