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Electronic version

URL: <https://journals.openedition.org/acost/3837>

DOI: 10.4000/11ruy

ISSN: 2431-8574

Publisher

ACoS

Electronic reference

Anastasia Chrysanthi Solomou, "Thinking through and about anthropomorphic figurines. A cognitive and neuroarchaeological approach to the study of peak sanctuary practices", *Les Carnets de l'ACoS* [Online], 24 | 2024, Online since 01 June 2024, connection on 19 January 2025. URL: <http://journals.openedition.org/acost/3837> ; DOI: <https://doi.org/10.4000/11ruy>



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Les Carnets de l'ACoSt

No. 24 (2024)



The Association for Coroplastic Studies

<https://terracottastudies.org>

<https://journals.openedition.org/acost/>

ISSN format électronique : 2431-8574



Thinking through and about anthropomorphic figurines. A cognitive and neuroarchaeological approach to the study of peak sanctuary practices

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Abstract. One of the defining characteristics of Cretan peak sanctuaries are the clay anthropomorphic figurines, which are observable in large quantities on nearly all such sites, and which are seldom associated with other contexts. The exclusivity and omnipresence of these artefacts renders them one of the most suitable areas of research with a view to re-examining the practices and performances taking place on these sites. This study focuses on the clay anthropomorphic figurines, following a neuroarchaeological and cognitive approach, drawing on neurological studies regarding the function and neurological and mental sequelae of mirror neuron activation, as well as concepts of material engagement, and the use of the figurines as a form of shared exographic memory system. The figurines are thereby seen as vital active constituents of the cognitive processes taking place in these sites, facilitating and enhancing the cognitive preparation for –and participation in– the peak sanctuary performances. Through this approach, the role of these objects as part of a larger cognitive network, shared by the participants of the peak sanctuaries throughout Crete, is proposed, and the potential socio-political and economic significance of this role is highlighted.

Keywords. Minoan, peak sanctuaries, figurines, cognition, neuroarchaeology, Aegean Bronze Age

Introduction

1. During the Middle Minoan (MM) I period (approximately around 2000 B.C.E.), peak sanctuaries come into use all around Crete,¹ though the sites studied to-date are primarily concentrated in central and eastern Crete (**fig. 1**). The majority of these sites went out of use towards the end of the MM period (approximately 1750 B.C.E.), with the rise of the New Palaces and the subsequent centralisation of the ritual landscape, whereas a smaller number remain in use until the beginning of the Late Minoan (LM) period (approximately 1600 B.C.E.).² In the past there has been some debate regarding the qualifying criteria for defining a site as a peak sanctuary, however one of the definitions most widely cited is that devised by Peatfield³ which defines a peak sanctuary as: “A site on or near the summit of a mountain, situated to maximise human interaction [...], and identified as a shrine by the presence of specific groups of animal and human clay figurines[...].”
2. As is made clear through this definition, one of the identifying characteristics of peak sanctuaries is the presence of specific clay figurines, including anthropomorphic figurines, and indeed, the exclusivity of these artefacts renders them one of the most suitable axes of investigation when attempting to re-examine or re-interpret peak sanctuaries and the practices taking place there.

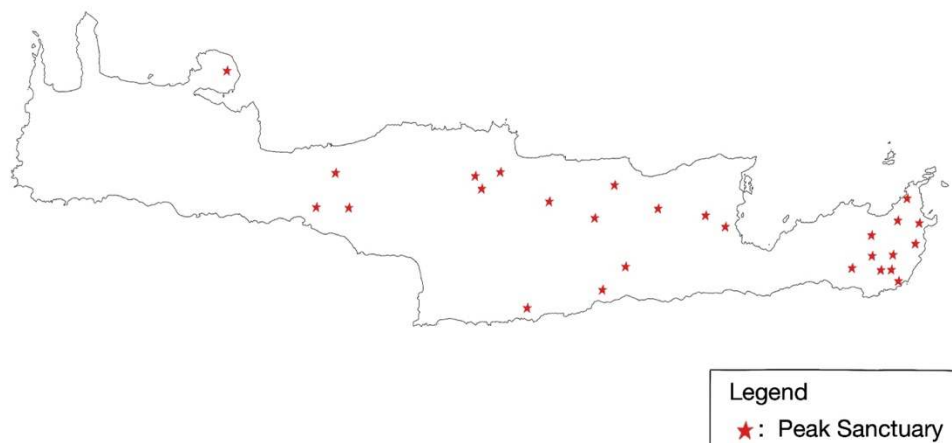


Fig. 1 – Map of Crete displaying the distribution of the main peak sanctuaries identified throughout the island (created by the author)

3. The repertoire of clay figurines found on peak sanctuaries includes anthropomorphic and zoomorphic figurines, as well as depictions of body parts, such as legs and arms.⁴ The anthropomorphic figurines can be found depicting a variety of poses or movements, but have been divided into closed postures (**fig. 2a**), where the hands are in direct contact with the torso, and open postures (**fig. 2b**), where the hands are facing away from the body.⁵ Though there is regional

¹ Peatfield 1987, 89.

² *Ibid.*, 89–90, 131.

³ Peatfield 1992, 60.

⁴ Morris 2009, 179; Zeimbeki 2004.

⁵ Peatfield, Morris 2012, 239.

differentiation in the production of these figurines, there is a high degree of standardisation regarding their form, the movements depicted, as well as the methods of production.⁶

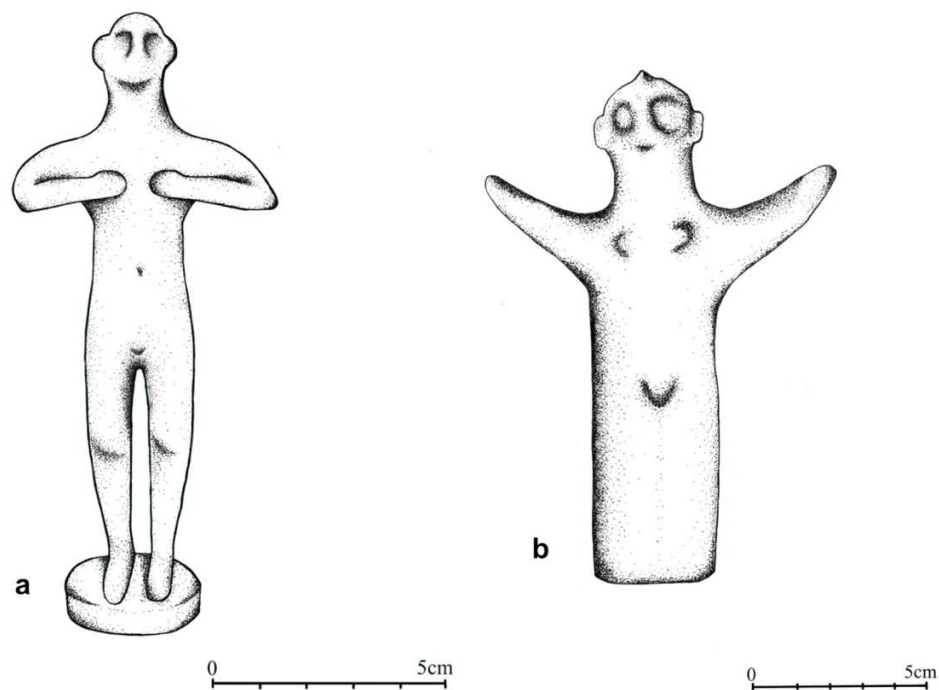


Fig. 2a – Example of a closed posture (drawing by author). **Fig. 2b** – Example of an open posture (drawing by author)

4. Regarding the interpretation of these figurines, it has been suggested that they depict worshipers rather than deities, provided that there are no observable traits to suggest they could be representations of the divine.⁷ However, approaching their usage has proven to be rather convoluted; there have been suggestions of their function as offerings, which were subsequently ritually broken after or during the ritual,⁸ as well as studies disputing the ritual nature of the fragmentation of the figurines.⁹ Other researchers have suggested that they would have been placed on a sort of bench or altar and displayed,¹⁰ that they may have served as a sensorial stimulus, or that they constituted a more or less passive image of the performances taking place.¹¹ Effectively, these figurines have attracted the attention of many scholars, and just as many interpretations, however, this paper aims to shift the questions we ask about these objects from what they were, to why they were, and from what the participants were thinking about these figurines to how they were thinking through them. As omnipresent in peak sanctuaries, these objects would have played a pivotal role in the practices

⁶ Murphy 2018; Kyriakidis 2005, 91.

⁷ Myres 1903.

⁸ Peatfield 1992, 67.

⁹ Murphy 2018.

¹⁰ *Ibid.*

¹¹ Peatfield, Morris 2012, 242–243.

taking place and in shaping the experiences and the perceptions of the participants, and therefore the current study examines the clay anthropomorphic figurines through a cognitive, neuroarchaeological approach, with a view to explore this very role.

1. Mirror neuron activation

5. One of the key properties of the figurines is their function as visual stimuli and visual cues; as something to be observed. As icons,¹² they are reflecting gestures and movements, and by extension it is the kinesiology of the figurines that is to be observed. This is supported by the variation in gestures depicted through the figurines,¹³ indicating that movement would be one of the key differentiating factors between these objects and that that would be where focus would be drawn.
6. Neurologically, during the observation of a motor act, special mirror neurons are fired in the brain, which are effectively mirroring –within the brain— the act that is observed.¹⁴ The same neurons are also fired in the same region of the brain when an individual performs the specific motor task themselves.¹⁵ This process allows both for action understanding (to understand *what* action is being executed), but also for intention understanding (to understand *why* a specific action is being executed) and therefore it is considered to play a significant role in social cognition.¹⁶
7. Studies regarding mirror neuron activation in correlation with dance can be particularly insightful in understanding the role of the figurines in peak sanctuary practices. For example, the study of Calvo-Merino et al.,¹⁷ which introduced dancers as spectators to different forms of dance pieces with a view to studying the activation patterns in the brain using fMRI. The results of the brain imaging techniques on the spectators indicate the activation of sensory-motor neurons related to the preparation of the movements witnessed. A study by Jola et al.,¹⁸ which additionally included individuals who frequently watched dance performances, measured corticospinal excitability using Transcranial Magnetic Stimulation (TMS). Results showed corticospinal excitability equivalent to the muscle activation of the dancers within the group of ‘experienced’ spectators. Essentially these studies indicate that when the spectators were observing someone else dance, their brains were effectively mirroring the movements made by the dancers, with the relational experience to dance increasing the mirror activity. One final study, which approaches the lived experience of the figurines more closely, is that of Orgs et al.,¹⁹ where static images of movements were used, as opposed to live dancing. This study was able to identify the activation of equivalent motor areas during the visual recognition of the series of static dance poses. This would better resemble the visual input and the cognitive processes associated with the observation of the figurines as representing a series of gestures and movements.

¹² Pierce 1932.

¹³ Morris 2009, 182.

¹⁴ Kilner, Lemon 2013, R1057.

¹⁵ Acharya, Shukla 2012, 118.

¹⁶ Fogassi et al. 2005, 666.

¹⁷ Calvo-Merino et al. 2005.

¹⁸ Jola et al. 2012.

¹⁹ Orgs et al. 2016.

8. Furthermore, despite there being no direct archaeological evidence for music production during the performances taking place on peak sanctuaries (except for triton shells which are suggested to have been used as instruments), this study also explores how the figurines could have potentially been entangled in the cognitive processes associated with auditory perception, given that music has been suggested to have been a part of the experience of peak sanctuary rituals in the past.²⁰ Following a similar framework to the studies previously described, Hoenig et al.²¹ implemented a study focusing on professional musicians. The musicians were visually introduced an instrument and the activation patterns in the brain were recorded using fMRI. Results show that the neural activation was not only observable in areas associated with the visual conceptual processing of instruments, but also in areas associated with the auditory perception of sound.²² Nonetheless, this connection was observed solely on professional musicians and therefore its relation to the practices taking place on peak sanctuaries and the participants would depend on their expertise regarding the instruments (if any were used) or the production of the sounds used during the performances (if sounds were made using the voice or other objects). Therefore, if the individuals depicted in different postures through the figurines would have also been singing or producing sounds in direct association with these movements, the neuronal activation in the brains of the participants engaging with these objects could have been multisensorial.
9. This would suggest that, through the figurines, the participants would have been able to actively cognitively take part in the performances illustrated by the figurines before even physically actually being in the performances. The figurines would have also been mentally preparing the participants prior to the practices, given that the participants would have been engaging with these objects during their production and preparation and during the ascent to the peak sanctuary.

2. Material engagement

10. Aside from allowing the participants to cognitively experience the performances of peak sanctuaries, these objects can be considered within the context of material engagement, the concept that the mind is the result of the synergistic functioning of the brain, the body, and the surrounding environment.²³ Effectively part of the cognitive processes required to carry out a task are transferred, carried out, facilitated by our bodies and things in our environment.
11. Under this prism, the gestures and movements of the figurines would facilitate the learning of the performances taking place for those not yet familiar (if any) and would also facilitate the working memory of those who had already been initiated and recognised the movements to be made. This can be supported through a study by Clone et al.²⁴ comparing the accuracy of learning dance movements upon visually observing the movements to be made compared to attempting to learn the movements at the time they are being shown, by synchronous imitation. Results showed higher efficacy and accuracy in the learning process in the cases where the movements were visually observed prior to attempting to recreate them. For the peak sanctuaries this would suggest that without the existence of the figurines, if non-initiated participants were to attempt to follow along with the performance by following the lead of the experienced individuals, the learning process would not be

²⁰ Peatfield 1992, 76.

²¹ Hoenig et al. 2011.

²² *Ibid.*, 1721.

²³ Malafouris 2019.

²⁴ Clone et al. 2021.

as successful and efficient. Prior engagement with the figurines would have activated the necessary preparatory motor areas to facilitate the later learning of the movements to be carried out. On the other hand, regarding the already initiated, the figurines would have served as a form of exographic memory system,²⁵ which would have relieved the brain proper from the cognitive load of remembering the gestures and movements to be made. This is potentially evidenced archaeologically by the very specific patterning of the placement of the figurines attested in Atsipadhes, where those depicting closed gestures are concentrated towards the centre, whereas those depicting open gestures are located in the periphery.²⁶ They could have in fact been deposited as such to function as signs, as visual cues, indicating to the participants what to do, where, and at which stage of the practices.

12. Finally, the peak sanctuary anthropomorphic figurines can be viewed as a readily perceptible real-life material mediator, which would have allowed the participants to perceive an abstract concept, a performed idea.²⁷ Therefore, they would have rendered this performed idea more effective, tangible, and accessible; something to engage with. As such, and given their omnipresence on peak sanctuaries, the figurines would have embodied fundamental concepts of the peak sanctuary practices, where the standardisation of the form of the figurines would therefore indicate a shared perception of this performed idea, potentially a shared belief system. The physicality of the figurines would have allowed the participants of the peak sanctuary performances to transcend time and space and would have connected performances of the past, present, and future throughout the island.

3. Discussion

13. Considering the standardisation of the figurines and their entanglement in the cognitive processes taking place during peak sanctuary practices, it is proposed here that they can be viewed as part of a larger shared cognitive network, specifically in association with the belief system (should the ritual nature of the practices be accepted). This would suggest that the populations engaging with these objects shared a way of thinking, of processing, and perceiving their belief system. Within this network the figurines would not only ensure a common shared experience in all peak sanctuaries, but would also actively prepare participants prior to the practices, enhance their experiences, and enable the active participation of all those present, whether they were physically taking part in the performances or not. This role of figurines as part of the material repertoire ensuring the creation of a shared common perception and experience would consequently suggest that by controlling the production of these objects, one could control the reproduction of the belief systems and the practices associated with them. This is especially conceivable within the context of practices involving dance or movement, given that neurologically it has been found in a study by Grosbras et al.²⁸ that when one is observing performances such as dance, cognitive processing is reduced and the emotional response is enhanced, particularly when accompanied by music. This would render such practices an ideal context for re-negotiation of beliefs but also of the socio-political and economic status quo.

²⁵ Donald 2010.

²⁶ Peatfield, Morris 2012, 239.

²⁷ Malafouris 2013.

²⁸ Grosbras et al. 2013.

14. Indeed, this could be what is observed during the Neopalatial period, when a lot of peak sanctuaries fall out of use with the rise of the New Palaces, when the practices are centralised.²⁹ During this time the peak sanctuaries are less connected, with the views from one to another, as well as the views to lesser important settlements, becoming restricted, relative to previously, and there is an evident attempt to centralise practices to Juktas, the largest peak sanctuary, located in central Crete.³⁰ The architectural setting of the practices also changes, with the construction or elaboration of buildings, and therefore so do the affordances of the sites for performances, as well as the perception of the sites.³¹ Finally, a series of different types of objects, such as luxury objects, and symbols, such as the horns of consecration and double axes, appear, as well as larger figurines and figurines made of bronze.³² The introduction of this repertoire suggests a change in the practices taking place and the perceptual and cognitive affordances of the site. The change in the materiality of the figurines (with the incorporation of a larger variety in sizes and materials) would have disrupted this cognitive network, with these aspects of differentiation hindering the reproduction of this shared cognitive and perceptual network, and by extension the shared experience of peak sanctuary practices. This would suggest that even if the maintenance of the production and use of clay anthropomorphic figurines can be seen as an attempt to maintain the belief system, the lived experience of the practices (and by extent the belief system) would have been fundamentally changed. These changes can be considered in the light of the palaces who, in attempt to consolidate their power through religion, reproduced the existing practices with, however, some modifications and added elaboration, which could have served for differentiation, manipulation, and centralisation.

Conclusion

15. This paper has attempted to approach figurines as an active constituent of the minds of those engaging with them, and of the performances taking place in peak sanctuaries. These objects would have worked to cognitively prepare the participants for the experience, as well as to enhance it, and ensure its reproduction. The figurines from Minoan peak sanctuaries have rightfully received a lot of scholarly attention, considering that they are part of the only tangible evidence available to archaeologists of this abstract belief system, and as such they have the ability to demonstrate how the latter would have been organised, spread, reproduced, and maintained throughout generations. They can potentially also be seen as part of the pathway followed towards the institutionalisation of cult practice, which in turn could be seen as directly linked to the passage to the rise and consolidation of the New Palaces. Therefore, exploring these figurines through a cognitive and neuroarchaeological theoretical framework allows for the investigation of the cognitive mechanisms in play that would have permitted the consolidation of this pan-Cretan phenomenon at first, as well as the later rise of the New Palaces, the subsequent societal changes, and its demise.

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²⁹ Peatfield 1990, 131; Megarry 2011, 415.

³⁰ Soetens et al. 2002, 162, 165; Peatfield 1990, 131.

³¹ Peatfield 1990, 127.

³² *Ibid.*

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