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# Mesolithic shadow play? Exploring the performative attributes of a zoomorphic wild reindeer (*Rangifer tarandus*) antler artefact from Finland

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## ABSTRACT

Throughout history, humans have told stories to one another. Although these stories have largely disappeared over the course of time, they have sometimes left material remains, for instance in the form of rock art. However, rock art might not be the only materialization of prehistoric storytelling practices. On the contrary, if made active again, other prehistoric artefacts might also bring past storytelling practices back to life. In this paper, we examine how storytelling might have taken place in Late Mesolithic Finland (c. 6800–5200 cal BCE). As a case study, we investigate a zoomorphic wild reindeer (*Rangifer tarandus*) antler artefact from southern Finland, the so-called ‘Lepaa artefact’, with multidisciplinary methods arising from the traditions of experimental archaeology, 3D technologies, and artistic research. As a result, we suggest that Mesolithic storytelling might have been entangled with ritual practices and accompanied by performances that resemble traditional shadow theatre.

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## KEYWORDS

Mesolithic archaeology; storytelling; shadow theatre; ritual performance; artistic research; 3D technologies

## Introduction

Stories and their production and consumption are a central part of people’s lives. It can even be said that storytelling is at the very heart of our humanity, as no other animals gather to listen or tell stories as humans do. Although the oral tradition of the Stone Age has disappeared, it is clear that stories were also important to Stone Age peoples (e.g. Boyd 2009). In contemporary forager communities, for example, stories are an important source of generalized historical, social, and ecological knowledge, and accordingly play an important role in their survival (Scalise Sugiyama 2017). Stories can be used to convey information about hunting skills, what plants are suitable for collection, or what to do if food is not available (Minc 1986; Sobel and Bettles 2000). Because stories were passed from one generation to the next, people did not need to have first-hand

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knowledge of everything, as oral tradition made it possible to store the collective information of many people over time (Tomasello 1999). Even though stories were likely also told for pure entertainment, the role of storytelling as a collective memory of the community has undoubtedly been central in pre-historic times.

Despite the significance of storytelling in human history, the subject has not played a large role in the Stone Age archaeology of Fennoscandia. Instead, research has more commonly emphasized, for example, issues relating to technology, subsistence, mobility, and ritual. However, all of these activities and practices might also have been accompanied by storytelling. Indeed, stories were likely told when moving from place to place, or when tools or pots were produced, or when sitting by the fire in the evening. Moreover, similarly to other activities conducted by Stone Age people, storytelling also has a material aspect. For example, in the performing arts, stories can be told through dance, movement, or music. Some items might even be manufactured solely for storytelling purposes. Among the Alaskan Inuit peoples, for example, the *yaaruitla* stories of young girls are told by sketching and erasing the story in the mud with so-called story knives (Oswald 1964). Although these knives were often carefully carved from bone, ivory, or wood, they were nonetheless exclusively manufactured for children's storytelling activities. This is noteworthy, since distinguishing, for example, adult ritual actions from the activities of children in the archaeological record can be difficult (Langley and Litster 2018). Indeed, from the late nineteenth century onwards, prehistoric portable art is invariably linked to ritual or symbolic or ritual behaviour in the deep past. Accordingly, in the context of the northern European Mesolithic, decorated bone or antler knives – such as the aforementioned story knives – would likely be catalogued as 'prestige items' or 'ceremonial knives' instead of 'storytelling devices' or 'toys'.

This being said, it must be noted that storytelling – like other types of performances – is also commonly entangled with religion and ritual actions (DeMarrais 2014). For example, in the distinct tradition of Indian shadow puppetry, great epics and sacred narratives have been performed side by side for centuries (Oliveira Lopes 2016). As Hinduism often describes gods and goddesses as shadowy figures, shadow theatre performances were a powerful way to visualize these heavenly bodies. At the same time, the use of shadow puppets resulted in a more interactive and eye-catching performance than previous traditions that still used narrative representations (Oliveira Lopes 2016, 193). The pictorial designs of the shadow puppets – often made of animal skins – nonetheless show a clear technical and stylistic connection with other pictorial traditions in India, suggesting that shadow puppets in India are likely a technological step towards a more kinetic storytelling tradition.

Curiously, although there is no direct evidence of shadow play performances from the Stone Age (Chen 2003), there are striking similarities between shadow theatre and prehistoric rock art in the way that the images of both traditions



were brought to life by using the interaction of light and darkness. For example, Marc Azéma and Florent Rivère (2012) have suggested that the Upper Palaeolithic rock art of France might have been animated by moving a torch over the images, which often represent several overlapping pictures of the same animal. With this practice, the animals – and the stories and myths likely told about these animals – came to life in a way that is similar to shadow theatre or early cinema. Indeed, since these paintings were created deep inside caves, in places where sunlight could not reach, the paintings would not only have moved along with the dim light available to Palaeolithic people, but appeared from and disappeared into the overwhelming darkness (Pettitt 2016, 15–17). Remarkably, even at open-air rock art sites – places where the darkness is not as overwhelming as in caves, even during the night – the motifs carved into the bedrock tend to transform and move along with the shifting light (Nyland and Steberggløkken 2021), suggesting that the interaction of light and darkness was a fundamental feature already in prehistoric ritual performances. Indeed, as rock art is often interpreted as the materialization of traditions such as creation myths (e.g. Herva and Lahelma 2020; Nyland and Steberggløkken 2021), these sites could represent a similarly entangled relationship of storytelling and religion to that of the Indian shadow puppetry tradition.

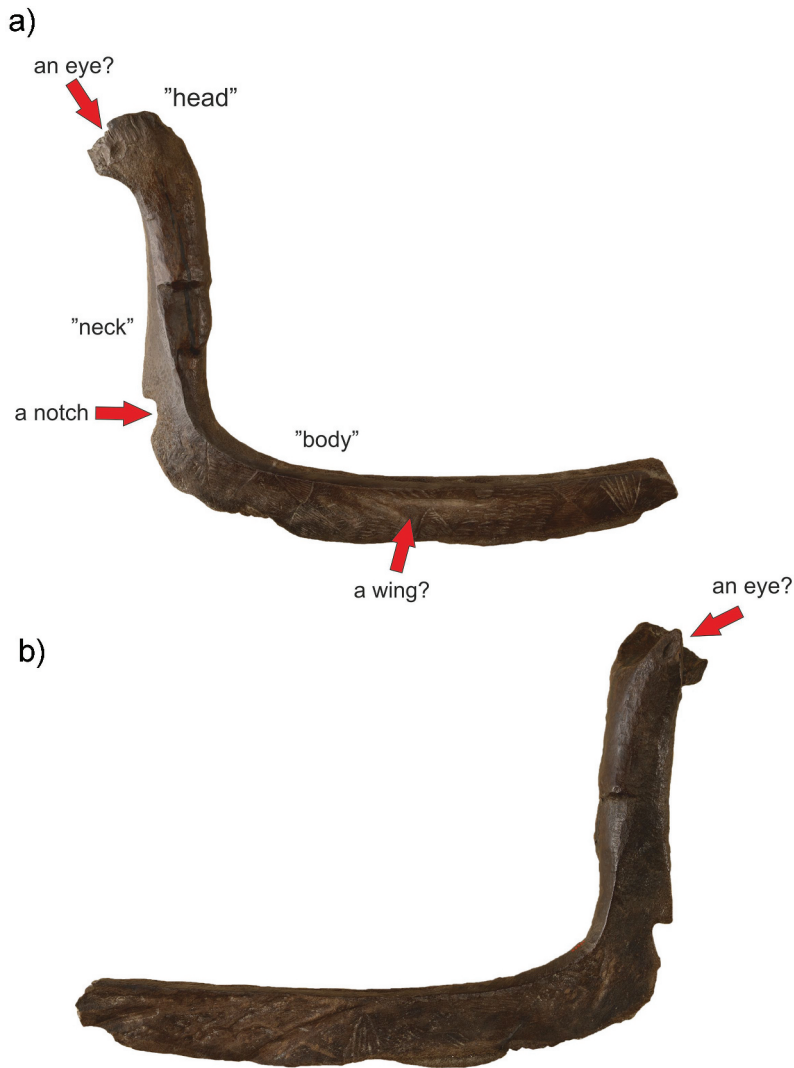
However, were such stories told only at these special sites, or could we also discover evidence of storytelling performances outside the realm of rock art? In this paper, we will ponder how such performances might have taken place during the Late Mesolithic of Finland (c. 6800–5200 cal BCE), and consequently what kind of material remains these practices could have left. As a case study, we revisit a zoomorphic wild reindeer (*Rangifer tarandus*) antler artefact, the so-called ‘Lepaa artefact’, from southern Finland (Figure 1). Although this artefact has been decorated with engraved geometric patterns typical of Mesolithic portable art (e.g. Clark 1975; Oshibkina 1989; Nash 1998; Płonka 2003; Vang Petersen 2019), its ambiguous shape, which resembles an animal – or a combination of several animals (Figure 2) – sets it apart from all of the other antler items known from the period (Ojanen 2002, 13; Mannermaa 2016, 24–25). Since no clear parallels for the item are known, the function of the object has been debated, and several different explanations – such as a snow beater (Ojanen 2002, 13), a drum hammer, or a storytelling device (Mannermaa 2016, 27) – have been suggested.

In this paper, we aim to explore the uses of this item by approaching it from the angle of relational archaeology, a field of study that rejects the classic ‘humanistic’ divides such as nature–culture, human–animal, and animate–inanimate, and instead accepts the agency and personhood of both humans and other-than-human agents (e.g. Harrison-Buck and Hendon 2018; Herva and Lahelma 2020). To do so, we introduce a novel and highly multidisciplinary approach that combines archaeological study with 3D technologies and artistic research – an approach that emphasizes the personal process of the practising



**Figure 1.** The find location of the Lepaa item. Map: M. Ahola.

artist in knowledge production (e.g. Hannula, Suoranta, and Vadén 2005; Borgdorf 2012; Kaila, Seppä, and Slager 2017). Although multiple collaborations and interchanges have been conducted between archaeologists and artists during the past 20 years or so, it is still more common to ground art to archaeology than to use artistic practices in the examinations of the archaeological record (Bailey 2018). In this paper, we aim to show that art and artistic research can be used as a method to understand the past. Indeed, by accepting that bodily and sensorial experience, vagueness, and ambiguity – something



**Figure 2.** The Lepaa artefact, viewed from two sides. (a) The side representing a water fowl. Note the geometrical ornamentation on the distal section of the item, and the eye-like engraving on the proximal end of the artefact. (b) The side representing other animals, or a combination of several animals. Note an eye-like engraving also situated on the distal section of this side of the item. Photographs: M. Haverinen/Finnish Heritage Agency (copyright licence CC BY 4.0). All modifications by the authors.

innate for art and artistic research – play a pivotal role also in archaeological interpretation (e.g. Sørensen 2016; Marila 2017), we use the multidisciplinary approach to investigate whether the Lepaa artefact could represent a materialization of a storytelling tradition, and if so, how it might have been used.

## The ambiguous Lepaa antler artefact

The Lepaa antler artefact was discovered as a stray find from the bottom of the Lepaanvirta River, in southern Finland, in the late 1950s (Ojanen 2002, 13; Mannermaa 2016, 22). According to a radiocarbon determination obtained from the artefact in 2001,<sup>1</sup> the artefact is c. 8000 years old and dates to the Late Mesolithic of Finland (Haggrén et al. 2015). During the Mesolithic, the find location of the artefact was a narrow strait between two peninsulas, near the mouth of the river that ran into a bay of the Litorina Sea (Ojanen 2002, 13). As the location of the find suggests a context that was also waterlogged during the Mesolithic, the item likely represents a votive deposit (Mannermaa 2016, 22–27). Indeed, since several Stone Age axes have also been recovered from the Lepaanvirta River, this place might have been somehow significant for the people inhabiting the region (Ojanen 2002, 22).

The Lepaa artefact was most probably made from a shed antler, and its form was mainly determined by the curved shape of the antler (Figure 2; Mannermaa 2016, 22). To analyse the form and decoration of the artefact, Kristiina Mannermaa (2016) has divided the artefact into three parts that bring to mind the basic form of an animal: the 'head', the 'neck', and the 'body' (Figure 2A). The 'head' of the artefact consists of the proximal end of the antler, which has not been modified extensively. However, two artificial depressions resembling eyes were nonetheless carved symmetrically on both sides of the proximal end (Figure 2; Mannermaa 2016, 25). The 'neck' of the artefact, on the other hand, has been smoothed and reshaped by carving a notch in between the 'neck' and 'body' parts of the item (Figure 2A). If this item would have been used as a tool, the 'neck' would have probably functioned as the handle of the tool, with the notch providing support for the index finger. However, the notch might also relate to the way the item was carried or fastened. In fact, the item shows some polishing on the lower edge of the 'body' (Figure 2), suggesting repeated contact with soft material (Mannermaa 2016, 27). Without further analysis it is impossible to determine whether this polishing is the result of rubbing against clothes while carrying the item, or from using the artefact, perhaps as a scraper or snow beater.

The 'body' or distal section of the artefact has been intensively ornamented with carved geometric patterns that seem to appear in layers, probably representing various chronological phases of carving and re-carving (Figure 2; Mannermaa 2016, 22–23). The most distinctive ornamentations are various triangle and hourglass patterns filled with shorter or longer strokes and furrows (Figure 3). In addition, on the mid-part of the 'body' there is a fan-like motif that could represent a wing (Figures 2A and 3; Mannermaa 2016, 25). Indeed, at first glance the item looks like a stylized water bird (Figure 2A). However, when the artefact is turned around, the image of the water bird becomes more blurred



**Figure 3.** Detail picture of the ornamentation of the artefact. Note the wing-like effect created by the three deeper carvings and the small horizontal lines. Photograph: K. Lassila.

and the natural shape of the proximal end brings to light other images that resemble a bear, a fish, and a snake (Figure 2B; Ojanen 2002, 13; Mannermaa 2016, 25–26).

What is remarkable about the Lepaa artefact is that the animal forms present in the artefact are not artificially rendered to any great extent, but rather appear from the natural shape. Indeed, even though the ‘head’ part has been modified by carving eyes, it otherwise mainly follows the natural form of the antler. Accordingly, it seems that the Mesolithic people also recognized the natural, zoomorphic form of the antler. In neuropsychology, the phenomenon of recognizing patterns, shapes, and familiar objects – often faces – where they do not actually exist is called visual pareidolia (Liu et al. 2014). Although pareidolia is most commonly known from popular culture and social media, where people post pictures of various objects with human expressions, the phenomenon has also been connected to prehistoric contexts (Lahelma 2008; Bednarik 2017; Needham et al. 2022). For example, the so-called ‘stone persons’ on Fennoscandian rock art cliffs are natural rock formations that have taken an anthropomorphic shape (Figure 4; Lahelma 2008). According to Antti Lahelma (2008, 60), these anthropomorphic features might have contributed to a notion that the cliffs were inhabited by spirits, or were even considered to be numinous living beings. Since these cliffs are also occasionally the source of echoes (Rainio et al. 2017), such ‘living cliffs’ would even have had a voice of their own.

Remarkably, pareidolia also seems to have been manifested in other Mesolithic antler items. For example, similarly to the Lepaa item, several perforated antler items from Germany and Poland seem to portray elks, although they have not been reshaped extensively (Kabacinski, Hartz, and Terberger 2011). Indeed, differing from the famous Mesolithic elk-head statues, which were carefully sculpted to represent the hoofed ruminant mammal (e.g. Mantere and Kashina 2020), these perforated antler artefacts follow the natural





**Figure 4.** The anthropomorphic rock art cliff of Valkeisaari, eastern Finland. Photograph: A. Lahelma.

form of the antler more carefully (Kabacinski, Hartz, and Terberger 2011) (Figure 4). However, with a stub of one beam left to represent the ear of the elk, and with a perforated hole in the place of the eye, the animal shape of these items is nonetheless evident. In this sense, it seems plausible that – similar to the Lepaa artefact – the animal form was seen already in the natural shape of the antler. However, to reinforce the natural zoomorphic shape, slight modifications were still undertaken.

Taking a relational view on the Lepaa item, Mannermaa (2016) has suggested that the ambiguous form of the item might have been intentional, and should be understood in terms of transformation and liminality, a so-called state of in-

betweenness. Indeed, the Mesolithic peoples likely dwelled in a world where the relationship between humans, animals, and natural elements was more interactive, and the world itself was constantly moving, changing, and coming into being (Herva and Lahelma 2020, 6–11). Within such a worldview, a tree, for example, could be a person-like being in one context and an object in another. Similarly, the antlers would not only have incorporated elements of their original animal agency (Conneller 2004), but could also have become something else – either naturally or in the hands of people. Indeed, from a relational perspective, non-humans are not merely passive objects, but active players that can be defined as living according to how they reacted and were reacted to (e.g. Watts 2013; Herva and Lahelma 2020). Explored within a relational worldview, the ambiguous shape of the Lepaa artefact can rather comfortably be interpreted as intentional (Mannermaa 2016).

### Performative attributes of the Lepaa artefact

Given the zoomorphic shape of the Lepaa artefact, its geometric ornamentation rendered in several phases, and its waterlogged find location, it seems evident that this item was an unusual object that was likely circulated from one person to another and then sacrificed or put to rest. As already suggested earlier, the natural zoomorphic shape might also have contributed to a notion that the item possessed elements of these animal agencies. Curiously, this interpretation can, in fact, be further supported by a recent study (Vang Petersen 2019) that suggests geometric ornamentation – similar to that present on the Lepaa artefact – was not purely aesthetic, but served an apotropaic, magical purpose. Indeed, if the item was considered somehow alive, such ornamentation would likely have been needed to protect the user of the artefact. Likewise, the artefact could have needed special treatment – such as a water burial – before it could be removed from circulation.

In the light of all of the aforementioned, it seems evident that the Lepaa artefact was considered to be a special object. At the same time, however, its function is still unclear. Indeed, even though the overall shape of the artefact does resemble a snow beater (Figure 5), no other objects interpreted as snow beaters are known from Mesolithic northern Europe. Moreover, as the Lepaa artefact dates to the Holocene thermal maximum, and specifically to the period when the highest winter temperatures occurred in Fennoscandia (Borzenkova et al. 2015), it is questionable whether objects known from nineteenth-century Siberia or Alaska are the best analogues for this period. At the same time, however, the Lepaa artefact also does not resemble any known tools from the Mesolithic of northern Europe.

Paving the way for a new line of interpretation, Mannermaa (2016) has suggested that the Lepaa artefact might have been used in storytelling. Indeed, drawing on the zoomorphic shape of the item, Mannermaa (2016) proposed



**Figure 5.** A snow beater of made of a split deer antler, with a length of approximately 33 cm. Collected from the indigenous Chukchi peoples of north-eastern Siberia during the early twentieth century. Photograph: Unknown photographer/Finnish Heritage Agency (copyright licence CC BY 4.0).

that by rotating the item, the animals depicted in the artefact would appear and disappear in association with the storyline. In this sense, the storyteller would have also acted as the ‘keeper’ of the animals living inside the artefact. Although this hypothesis is intriguing, and could also explain the need for protection and the waterlogged find location of the artefact, there is no further support – for example, from living tradition or written accounts – for such a practice. However, if we imagine a time and place during which storytelling often takes place – during the evening and by the fireplace – the idea of rotating an item in the flickering light to tell a story takes on a new dimension. Indeed, since the ambiguous form of the item portrays several animals, the artefact should be able to cast shadowy forms of these animals when rotated against a light source. Compared to a practice where the focus is placed solely on the item itself, the use of light and darkness to illustrate a story creates a stronger, more embodied experience. In fact, since the interplay between light and darkness clearly played a pivotal role in prior and contemporary rock art tradition (Azéma and Rivère 2012; Pettitt 2016; Nyland and Steberg-løkken 2021) – and as a recent study suggests, also in regards to mobile art (Needham et al. 2022) – the power of light to move and transform images could very well have been a well-known and widely used practice during the Mesolithic. By manipulating the shadows, the animals depicted in the Lepaa artefact could have been moved, merged together in the sense of metamorphosis, or accompanied by the shadows of other objects or creatures. In other words, the artefact could have been used in a form of storytelling that resembles the shadow theatre tradition.



## An experimental archaeology of performance

To explore this hypothesis, we produced a three-dimensional copy of the Lepaa artefact to experiment with how it would function as a shadow theatre puppet. Accordingly, in November 2020, we digitally scanned the object – on display at the National Museum of Finland – with an Artek LEO handheld scanner. The digital image was produced with Artek Studio 15 software, and the three-dimensional print was manufactured at Aalto University Media Lab in December 2020 (Figure 6). Due to the lack of HD quality in Artek LEO software, however, the three-dimensional copy does not portray a detailed reproduction of the use-wear or decoration of the artefact. However, since the focus of this research is specifically on the shape and performative attributes of the artefact, the quality of the Artek Leo scans was acceptable.

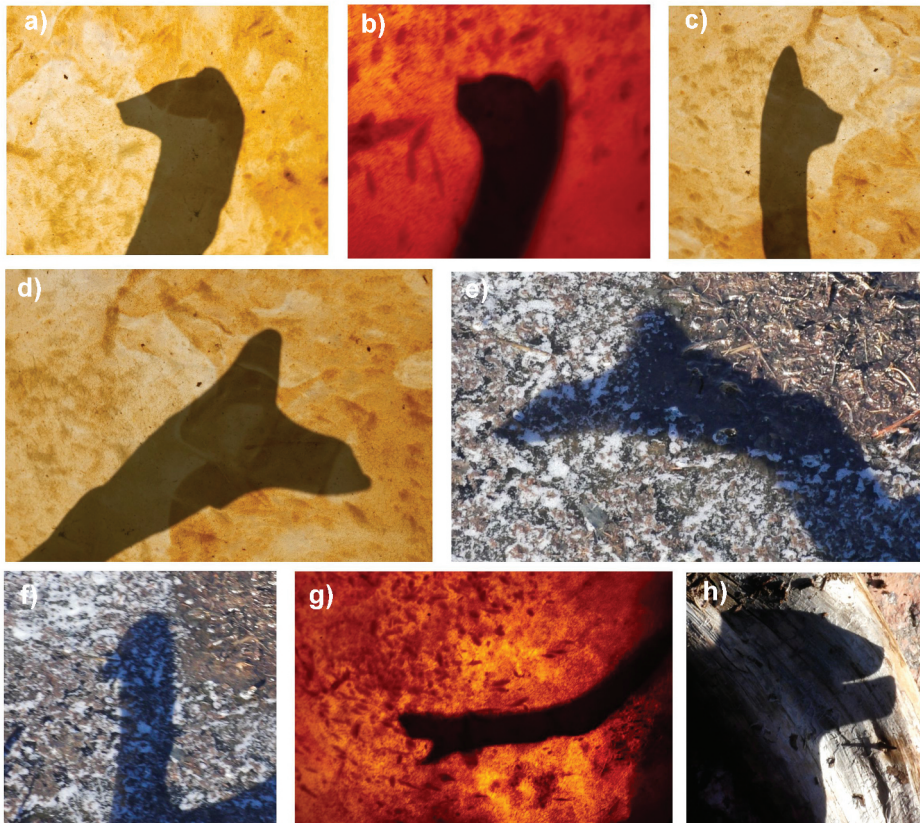
After the digital scanning and printing process, the three-dimensional print of the Lepaa artefact was given to professional shadow puppetry artist Elviira Davidow to experiment with. Following the tradition of artistic research, Davidow investigated the item by creating art with the object. The immersive and introspective methodology of artistic research aims to reduce the distance to the object of study to such a degree that the work of art, the creative process, and the signifying context themselves all become constituent parts of the research (e.g. Hannula, Suoranta, and Vadén 2005; Borgdorf 2012; Kaila, Seppä, and Slager 2017). Accordingly, artistic research suggests that by studying the personal process of a practising artist through the creative process of art making, new perspectives on and insights into the research topic can be brought to light. For the purposes of this research, the



**Figure 6.** The three-dimensional print of the Lepaa artefact. Photograph: K. Lassila.

signifying context – the archaeological background – was brought from outside the normal working parameters of the artist. Accordingly, the creative process was conducted in discourse with the first author of the paper. In this sense, the method used resembled experimental archaeology, which aims to practically test archaeological hypotheses by reproducing and using artefacts in a manner that simulates what might have happened in the past (e.g. Foulds and Millson 2013). In fact, the method used could also be seen as an experimental archaeology of performance.

Within her creative process, Davidow explored the item by using different natural light sources and materials that would have been available to the Mesolithic people. Accordingly, Davidow used the three-dimensional print of the Lepaa artefact to cast shadows on different natural surfaces (earth, wood, and skin), changing and playing with the angle of the light provided by sunlight and firelight (Figure 7). Occasionally, Davidow also combined natural materials,



**Figure 7.** Shadowy forms created by Elviira Davidow with the three-dimensional print of the Lepaa artefact. (a) A bear-like image cast onto skin in sunlight. (b) A feline-like image cast onto skin in firelight. (c) A pine marten-like image cast onto skin in sunlight. (d) An elk-like image cast onto skin in sunlight. (e) An elk-like image cast onto snowy ground in sunlight. (f) A water fowl-like image cast onto snowy ground in sunlight. (g) A snake-like image cast onto skin in firelight. (h) An animal-like image cast onto wood in sunlight. Photographs: K. Lassila.



**Figure 8.** A shadowy form of a water fowl created with the three-dimensional print of the Lepaa artefact and combined with the artist's own hands. Photograph: K. Lassila.

such as branches or her own hands, to create more enigmatic shadowy forms (Figure 8). For the purposes of this paper, the creative process was documented by photographs and videos. Aside from its role in this research, the material will also be used to create short films and photographic art. These art works will also be accompanied by a shadow theatre performance that Davidow created during the research process.

As a result, we were able to document the shadowy forms of several different animals resembling a bear, a snake, an elk, and a water fowl (Figure 7). While some of these animals could be clearly seen in the item itself – such as the profile of the bear (Figure 2B) – others emerged only through the work of art created by Davidow. For example, the profile of an elk (Figure 7D,E) manifested when the light was directed from one side, while others could be produced only when the light was projected onto an uneven surface (Figure 7H). It was eminently clear that the item contained abundant performative attributes. Although these attributes are clear even in the still photographs, they were even more evident during the live performance (Supplementary material 1), where the shadowy creatures – and accordingly the item itself – seemed to come alive.



However, even though the item worked as we anticipated, the shadowy forms were not easy to manipulate. For example, even though the flickering light of the fire made the shadow forms more alive than, for instance, direct sunlight may have, the constant movement of the flames also made the shadows hard to control. In fact, according to Davidow, this made the artefact unreliable as a shadow puppet, and she would not use it herself in a predetermined storyline. Nonetheless, Davidow concluded that the shadowy forms of the artefact were evident, and from her point of view the artefact could have been used in a type of storytelling where the object itself creates the plot line, or rather, several plot lines.

### Mesolithic shadow play?

Although the three-dimensional print of the Lepaa artefact is not as obvious a shadow puppet as, for example, the flat leather puppets used in the Indian shadow theatre tradition, its ability to cast the shadowy forms of several animals – including species that are not present in the material form of the item – makes it possible that the original artefact was also used in performances resembling shadow play. However, as the shadows of the object changed swiftly along with the angle of the light, these performances were likely not storytelling sessions with predetermined plot lines. Indeed, as natural light sources are not as easily manipulated as modern flashlights, for example, the shadows might easily take on an unintentional form. On the other hand, this might also make the storyline take an unintentional turn. Indeed, when casting shadows with a three-dimensional artefact and using solely natural light sources, the storyteller is not in control of all of the shadows. On the contrary, the shadows are manipulated by the form of the light source and the casting object itself. Exploring this idea in the light of Sørensen's theory of vagueness (Sørensen 2016), the unpredictable interplay of light and shadow might, in fact, have been the key to the use of the object. In other words, the vague qualities of the artefact were not only experienced, but also orchestrated on purpose. From a relational perspective, the artefact would have had an agency of its own.

The idea of an artefact with a visible agency is intriguing. Indeed, it is possible that the Mesolithic people understood the shadowy forms of the item as the souls of the animals these forms represented. Although speculative, this line of interpretation is supported by ethnographical information collected among the hunter-gatherer peoples of northern Eurasia, who commonly believed that humans and non-human agents contain 'shadow souls' that follow the person into death (Siikala 2016, 370). Even today, the Siberian Yukaghirs believe that all physical entities have a second modality of being, or a 'hidden side', which they call *ayibii*, meaning 'shadow' in their native language (Jiménez and Willerslev 2007). This shadow force inhabits the borderline of the visible world and possesses the power to reverse

almost any action. Accordingly, it refers to the idea of a ‘doppelgänger’ or ‘twin’ that appears simultaneously with the visually perceived object, but in the shape of its wraith (Jiménez and Willerslev 2007, 528). Curiously, the concept of *ayibii* captures the very essence of a shadow. Indeed, from the perspective of cognitive sciences, shadows are a perceptual anomaly, evident to the eyes but not graspable by the hands (Tversky 2018). As Barbara Tversky explains:

They [shadows] do not behave like other shapes and cannot be discovered in the usual ways; they are enigmatic, and the unknown can tantalize but also frighten. They can be sensed by the body, not by touching them, but by blocking them; not as pressure, texture or weight, but as cooler than the unshadowed regions around them. They can be manipulated but not by grasping them – there is nothing to grasp. They can be manipulated only by manipulating something else, by moving the light source or by moving the caster. (2018)

Consequently, shadows tend to be considered mysterious, or even dangerous, in a variety of traditions (Casement 2003; Jiménez and Willerslev 2007; Willerslev 2007; Oliveira Lopes 2016; Tversky 2018). This, on the other hand, seems to suggest that if the Lepaa artefact was used for storytelling purposes, these practices were likely entangled with religion and ritual. Indeed, if the Mesolithic people using the artefact believed that the item had an agency of its own, the performances created with the artefact might have had more of a connection, for example, to the practices conducted at the rock art sites than to everyday storytelling by the hearth. In other words, even if the Lepaa artefact clearly possesses performative characteristics, it does not seem to represent the materialization of mundane storytelling practices. On the contrary, given the meanings attached to shadows (Jiménez and Willerslev 2007; Oliveira Lopes 2016) and the way that the interplay of light and darkness was used in relation to rock art (Azéma and Rivère 2012; Pettitt 2016; Nyland and Steberggløkken 2021), it is reasonable to assume that the ‘shadow play’ produced with the Lepaa artefact was used for ritual purposes. This being said, it must also be noted that, during prehistory, ritual and rational aspects were not as clearly separated as they are today, and ritual practices were tightly interwoven into daily activities (e.g. Brück 1999; Bradley 2005). In fact, it may be that distinguishing storytelling from ritual performances is an impossible – or even unnecessary – task.

## Conclusions

To conclude, our re-analysis of the enigmatic Lepaa antler artefact brought to life novel performative attributes from the item that could not have been accessed through traditional archaeological research methods. Indeed, by producing a three-dimensional print of the artefact and exploring this object by combining archaeological and artistic research, we were able to show that the Lepaa artefact

could cast the shadowy forms of several different animals. However, despite these evident performative attributes, in the hands of a professional shadow play artist the artefact was still not reliable enough for traditional storytelling. Indeed, since some of the shadowy animal forms manifested only with a specific angle of light, the shadows present, for example, during noonday may well have differed of those present in the morning sunlight. Similarly, the shadows cast from a flickering fire were constantly on the move. In this sense, visualizing a predetermined storyline with the artefact would have been very difficult. Consequently, the item cannot be interpreted as the materialization of a specific storytelling practice, as the story knives of the Inuit peoples are.

However, even though the Lepaa artefact might not relate to storytelling as we understand the practice, it seems evident that it could have been used in shadow play performances. In fact, given the enigmatic nature of shadows – as well as the way shadows are connected with souls among many historical and living hunter-gatherer peoples (Siikala 2016, 370) – it could be plausible that the Mesolithic people believed that the Lepaa artefact was inhabited by several shadow souls of different animals, and accordingly had an agency of its own. This notion might be, on the one hand, the result of the pareidolia phenomenon and, on the other, the tradition of using light and darkness to create and experience prehistoric art. Nonetheless, the item would likely have been considered to be special, and consequently might have been used in ritual performances that could have took the form of a shadow play.

## Note

1. (Hela-516)  $7420 \pm 75$  BP or 6434–6099 cal BCE at 95.4% (Ojanen 2002, 13; Mannermaa 2016, 22).

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