

A cognitive approach to the earliest art

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Abstract

This paper takes a cognitive perspective to assess the significance of some Late Palaeolithic artefacts (sculptures and engraved objects) for philosophical concepts of art. We examine cognitive capacities that are necessary to produce and recognize objects that are denoted as art. These include the ability to attribute and infer design (design stance), the ability to distinguish between the materiality of an object and its meaning (symbol-mindedness), and an aesthetic sensitivity to some perceptual stimuli. We investigate to what extent these cognitive processes played a role in the production and appreciation of some recently discovered Palaeolithic artefacts.

I. THE PROBLEM OF FIRST ART

Palaeolithic paintings, sculptures and engravings are unequivocally recognized as art: many historical overviews of art¹ start with prehistoric material, usually Franco-Cantabrian cave paintings from Chauvet, Lascaux, and Altamira. The recent archaeological discovery of older symbolic artefacts may push back the time when the earliest art appeared. These artefacts include objects in bone, ochre and ostrich eggshell with geometric engravings from southern Africa, dated to 77,000–55,000 BP², and figurative mammoth ivory sculptures from Swabia, southwestern Germany (40,000–32,000 BP). What warrants the intuition³ that these objects are artworks? After all, the cultural and social contexts of these Ice Age artefacts differ from those of the modern world, and there are no written records to reconstruct their meanings and functions.

First art is a theoretical concept that denotes the earliest artworks within a particular tradition⁴. Arguably, multiple artworks qualify as first art: archaeological evidence indicates that some forms of art emerged independently at different times across the world, a pattern that cannot be explained by gaps in the archaeological record alone. To give but one example, figurative painting appears significantly earlier in Europe (33,000 BP, Chauvet cave, France) than in Africa (27-25,000 BP, Apollo 11 cave, Namibia)⁵, or East Asia (10,000 BP, Borneo)⁶, suggesting that figurative painting may have been invented independently in disparate cultures. First art presents a puzzle to most recent concepts of art, because these require cultural contextual information on the function, producers, and the art critical context in which artworks are made—information unavailable for Palaeolithic art. Did the cave painters of Chauvet, Cosquer and Altamira depict large terrestrial mammals and birds mainly as a source of aesthetic pleasure, a form of art for art's sake⁷? Were the paintings primarily meant to be accurate depictions of animals, similar to instructive illustrations in field guides, used for educational purposes⁸? Or do the cave walls bear evidence of encounters with the denizens of the spirit world during trancelike states in shamanic rituals⁹? Cluster concepts, as advocated by amongst others Gaut¹⁰ and Dutton¹¹, involve a list of features that are typical for art objects, but it is unclear which of these apply to Palaeolithic art, e.g., are they *expressive of emotion* (Gaut), or was there anything akin to *artistic criticism*

(Dutton)? Historical definitions cannot easily accommodate first art either, because they have a recursive structure; they define artworks by virtue of their relationship to earlier artworks¹², and again, we know nothing of these. The philosophical analysis of first art presents problems additional to that of non-western art. In both cases, one cannot indiscriminately apply criteria specific to western art; a focus on western art in aesthetic theories has left other artistic traditions underanalyzed¹³. Though one can often rely on ethnographic information to get insights into the function and aesthetic significance of these objects¹⁴, this information is unavailable for first art.

Yet, as Davies¹⁵ observes, “our acknowledgement of certain items as first art seems to rest on our direct recognition of them as such, not on abstract reasoning.” In a similar vein, Lamarque¹⁶ reflects that “what is most striking about all Palaeolithic cave painting is the sense of affinity that modern viewers experience, despite the immense cultural divide,” even though we have no idea about their cultural meaning. We readily identify objects from remote cultures and periods as art, and seem to possess a folk concept of art. Just like humans have had folk concepts of biological species long before the rise of modern biology, they may have a tacit and inarticulate concept¹⁷ of what a work of art is like, which guides their identification of artworks independent of aesthetic theory. This does not imply that folk concepts are immune to cultural influence. On the one hand, folk concepts have universal features, like the supposition of internal mental states that is common to folk psychology across the world. On the other hand, western folk psychology is arguably influenced by Freudianism (e.g., the supposition of a subconscious state of mind), whereas that in China is influenced by Confucianism (e.g., the importance of ancestry in a person’s identity). Similarly, the western folk concept of art may be coloured by aesthetic theories, such as in its higher regard for painting and sculpture compared to other art forms. Yet, although indigenous terms for ‘art’ may be lacking, people across cultures seem to be able to recognize and appreciate what we would call artworks. Vanuatu tree-fern sculptures and Ivory Coast masks have a place in western museums and interiors, and Melanesian and West African artists incorporate western media and styles in their work. Were it not for stable human

cognitive capacities, we would have a hard time explaining the appeal of Lascaux II, the replica of the Magdalenian cave that attracts thousands of visitors every year, or indeed the adoption of western techniques and media in artistic traditions from small-scale societies, like Native American ledger art—and vice versa, like the influence of those traditions on post-impressionists. This spontaneous recognition of artistic behaviour across time and space, back to the Palaeolithic, motivates a cognitive approach to art. It is likely that Palaeolithic artists had a mind like ours. For one thing, they were members of our species, *Homo sapiens*. Also, archaeological evidence for behavioural modernity, in the form of standardized tools, structured living spaces, and economic exchange networks, dates back to at least 40,000 BP in Europe. In Africa, this transition was probably earlier and more gradual¹⁸. Behavioural modernity is likely not a purely psychological property, but arose as an interaction between human cognition and culture¹⁹. Stable features of human cognition may explain what is common to art behaviour in disparate cultures.

In this paper, we propose a cognitive approach to art. Rather than listing features that are characteristic of art objects, we will consider what cognitive processes are typically involved in the recognition of objects and performances as artworks. The shift in focus from art *objects* to cognitive *agents* is motivated by naturalistic theories that propose that art is a product of normal human perceptual and motivational processes²⁰. While these theories are not uncontested, they provide a fruitful framework to approach art production and appreciation with methods from cognitive psychology. From this point of view, artworks do not form an exceptional category of objects, but rather, they are products of cognitive capacities that are present in all neurologically healthy humans. The ubiquity of art across cultures, the universal human ability to recognize and appreciate it, and the early and spontaneous emergence of artistic behaviour in child development (as is evident in an early disposition to draw, sing, dance, play word games²¹) suggests that producing and enjoying art may be a stable part of the human cognitive repertoire. This cognitive approach allows us to include artworks from distant places and cultures, even from those we know virtually nothing about, including material culture from the Palaeolithic.

II. COGNITIVE REQUIREMENTS FOR ART

In terms of conceptual analysis, a cognitive approach to art provides a set of higher-order criteria that need to be satisfied so that artworks can be created and recognized. In other words, it concentrates on abilities that are necessary to create and understand art, not on any features that define the objects themselves. This approach can be situated within the *abilities view* of concepts, a philosophical theory that argues that concepts are not definitions but abilities that are specific to cognitive agents²². According to a descriptivist theory of concepts, having the concept CAT requires one to list features typical of cats, like furriness, triangular ears, and a long tail. By contrast, the abilities view argues that agents who possess the concept CAT do not have to provide a definition of what cats are, but rather, that they are able to recognize cats from non-cats with fair reliability under a broad range of conditions. Likewise, having the concept ART entails the ability to recognize art in a wide variety of circumstances. Additionally, it enables one to make meaningful inferences about artworks one has not encountered previously, and to guide actions²³ like art production or art criticism. Regarding the concept ART as an ability can provide a solution to the problem of borderline cases, since the ability need not be infallible. After all, a child who can identify specific cats, like a Siamese behind a window or Misty, the neighbour's tabby, with fair reliability has the concept CAT even if she is puzzled by ocelots or wildcats. Similarly, borderline cases like found art or chimpanzee paintings can challenge the expertise of art critics, but it would be far-fetched to conclude from this that said critics do not have the concept ART. According to the abilities view, having the concept ART does not require that one is able to list any properties of art but rather that one is able to identify particular instances (artworks) that fall under this concept's extension. The abilities view allows for concepts to be inarticulate and tacit, as seems to be the case for the folk concept of art.

To identify which cognitive processes are required for art production and appreciation, we draw on theories, experimental results and empirical evidence

from developmental psychology²⁴ and cognitive neuroscience. Although art production and recognition require a wide range of cognitive skills (e.g., semantic memory, visual or auditory perception), we focus on those skills that we believe typify behaviours related to art. They include the design stance (the recognition of intentionality), symbol-mindedness (the realization that something represents something other than itself) and aesthetic sensitivity (the qualitative appreciation of perceptual stimuli). We then examine to what extent these processes played a role in the production of Palaeolithic artefacts, in particular figurative sculptures from southwestern Germany and southern African engraved objects, using methods from cognitive archaeology²⁵. A cognitive approach to art can draw meaningful links between Palaeolithic and contemporary western and non-western art, despite the widely diverging cultural and social contexts in which these objects were made.

The design stance

Artworks are almost invariably products of human intentional actions. This forms the basis of Levinson's intentional-historical theory of art²⁶, which conceptualizes artworks as those entities that have been successfully created with the intention that they be regarded in a certain way, which is a way in which prior artworks have been correctly regarded. Bloom²⁷ extended this concept to artefacts in general. He argued that manufacturing and understanding artefacts is governed by an intuitive design stance—humans are guided by the inferred intentions of the designer when they categorize and name artefacts. One can infer that a schooner in a bottle belongs to the category of ships, even though the object is not seaworthy, because one can infer from its shape that the maker intended it to represent a ship. Also, we still see a broken chair as a chair, even though it may no longer fulfil its function. Levinson²⁸ has objected to this extension of his intentional-historical stance to artefacts in general, because it places artworks on a par with other artefact kinds, and does not seem to reserve a special place for artworks. However, if we conceptualize art in terms of its constituent cognitive abilities, this is not a serious objection, since there is no a priori reason why humans would not draw on cognitive capacities that are used in

other domains when reasoning about or creating artworks. Consequently, to gain a better understanding of how intentionality plays a role in art production and evaluation, it is useful to examine how humans infer design, and how creator and artefact are causally linked.

The design stance emerges early in ontogeny, and it is a characteristic feature of children's art. Although they are not skilled artists, toddlers name their drawings using the same terms as the real-world objects that capture their interest, such as 'house' or 'daddy'. These early works are similar to those of adult artists in that both skilled artists and young children take an intentional perspective towards categorizing and naming their artworks. When one asks three-year-olds to draw a picture of a lollipop and a balloon, these two drawings look virtually identical. Yet the subjects will consistently refer to the pictures according to what they intended to depict when they produced the drawings²⁹. Also, like adults, children as young as two years are guided by the intention of the maker when they name pictures that hardly resemble what they depict. When they witness an adult drawing a circle that could be either of two unfamiliar disc-shaped objects, they take the gaze direction of the artist as a cue for which of the items is drawn. The toddlers reliably point at the object the adult was looking at when asked which object was depicted³⁰.

These and other studies suggest that foreknowledge about the intentions of the maker is a critical feature in our evaluation of artefacts. Gelman and Bloom³¹ showed children and adults a variety of objects, but subjects were divided into two groups, each of which got distinct accounts of how the objects came into being. For example, in the case of an irregular-looking stone object, the unintentional version said that someone smashed a piece of rock in a fit of rage. In the intentional account, subjects heard how an agent carefully chipped pieces off the rock. Only the children and adults who heard the latter version called the object a sculpture. This indicates that our appreciation that something is an artwork is substantially driven by our beliefs about its genesis, not only by its perceptual characteristics. This is also detectable at the neural level: when subjects believe they are listening to a piece of music that was written by a composer, activation patterns in their brains look very different from those of

subjects who listen to the same piece that they believe is computer-generated. The first group of participants, but not the latter, exhibit a high activation in brain areas that are involved in the attribution of mental states and the inference of intentions of others³². The experimental evidence indicates that the design stance is an important element of art appreciation. Although one can never claim with absolute certainty whether or not the *Iliad* was intentionally created to be a work with literary qualities, we can reasonably infer this from formal properties of the work, such as its elaborate language and extended imagery³³.

Symbol-mindedness

Humans today are immersed in a world of visual markings, such as arabic digits, letters, and pictures, in the form of advertisements, documents and traffic signs. Our fluency with these representations makes it hard to realize the complex cognitive processes involved in their interpretation. In order to make and understand artworks, one must be able to decouple the symbolic meaning of an artwork and the material it is made from. Understanding this decoupling between the meaning of an object and its medium constitutes a necessary condition for symbolic thought. For instance, in order to interpret Rousseau's *Surprise* (1891), one needs to realize that the painting itself is made of canvas, covered with oil paint, but that it represents a tiger in a stormy tropical landscape. Given that in this case referent and symbol are so much alike, some might not even consider the tiger to be a symbol at all. For the purpose of this paper, we will not draw fine-grained distinctions between symbol, token, etc., but use DeLoache's³⁴ psychologically motivated concept of symbol, according to which a symbol is something that someone intends to represent something other than itself—nothing is inherently a symbol, but only becomes so by virtue of an intentional act. This relatively simple working definition presupposes fairly complex skills: next to an understanding of the dual nature of a symbol as both object and representation of something other than itself, it requires the recognition of intentionality and design. The decoupling of the material nature of a symbol and its referent emerges early in development. Controlled experiments have shown that infants prior to 18 months treat pictures much as if they were

real objects, attempting to pick a photograph of a toy off the page, or to put on pictures of shoes³⁵. By the second year of life, however, children can interpret pictures correctly, point and name them, and pay more attention to their meaning than to their shape³⁶.

Although representational visual art is not produced in all cultures, several empirical studies have shown that people unfamiliar with figurative representations can recognize them spontaneously. An early study³⁷ focused on a western child, brought up without exposure to any pictorial representations, such as picture books, television or figurative wallpaper. At 19 months, the boy was able to recognize and reliably name line drawings of his toys and common household objects. Deregowski and colleagues³⁸ showed line drawings of complex scenes, such as a hunter stalking a goat, to members of an Ethiopian culture without pictures or drawings. Again, these subjects recognized and named the depicted objects correctly. Martlew and Connolly³⁹ asked children from a Papua New Guinean culture without figurative art or access to photography to draw a man. Although the children had never produced drawings before, they drew recognizable anthropomorphic figures. These studies indicate that people are probably naturally endowed with an ability to recognize iconic representations for what they depict, and that cultural exposure is not necessary for its development. Art critically depends on this pre-existing ability, as even most nonplastic arts require the ability to make a distinction between medium (e.g., sound waves or moving limbs) and what it represents, such as the moods expressed in a piece of instrumental music, like the traditional Chinese guqin piece *A drunken fisherman sings in the evening*, where the plucking on pentatonically tuned strings is meant to juxtapose the tranquillity of rustic life with the rowdiness of the drunken fisherman. We can safely infer that early representational artworks are about something, i.e., that they are meant to symbolically convey something other than themselves—it seems reasonable to suppose that a small Palaeolithic sculpture that has the shape of an ibex actually represents an ibex. Thus, among archaeologists, the presence of figurative art is universally regarded as evidence for symbolically-mediated behaviour⁴⁰. As we will see, there is more controversy about the symbolic meaning of nonfigurative

designs. In order to be of methodological interest, a concept of symbol should not be so broad as to include all objects that have some ornamental or aesthetic value⁴¹, yet not so narrow that all forms of non-iconic representation are a priori excluded. Deloache's definition of symbols is productive in this regard, since it also allows for non-iconic symbols. Shell beads, for instance, can be symbolic, provided that they encode social meaning (e.g., when they are used as ethnic markers), but not if they are merely used as body-decoration.

Aesthetic sensitivity

Many authors⁴² take aesthetic appreciation to involve the sensory and qualitative appreciation of artworks and other objects, yielding a distinct sense of pleasure. Like in other animals, the human nervous system is wired in such a way that some forms of sensory input appear to us as more striking and pleasing than others. Artworks capture our attention precisely because artists that created them have homed in on propensities of the human nervous system⁴³. Given that our senses are constantly bombarded by impressions, the nervous system needs to prioritize some cues over others⁴⁴. Barry⁴⁵ argues that aesthetic preferences find their origin in the brain's reward system, which guides attention to relevant perceptual input, i.e., perceptual input that is likely to yield information that is relevant to survival and reproduction.

While this evolved function provides a plausible explanation for why humans are capable of aesthetic experience, and which aesthetic criteria are likely to be more culturally widespread than others, it does not imply that all pleasurable sensations are aesthetic responses. Still, if correct, this theory could explain why at least some forms of art are particularly salient across cultures, such as the representation of the human face in masks, portraits, and busts. Humans share with other primates an innate ability to detect faces. This ability likely evolved in primates because they live in complex social groups, and they need to reliably discriminate between individual group members. Already from birth, infants (and baby monkeys) have a visual preference for face-like stimuli; for example, they look significantly longer at a schema with two dots at the top and one dot at the bottom than at one with one dot at the top and two at the

bottom⁴⁶. The most important cues for faces are the eyes and mouth. Interestingly, many forms of art amplify these features—masks across the world tend to exaggerate the size of eyes and mouth, and pay considerably less attention to eyebrows, eyelashes, cheeks or nose (think, for example, of the Aztec mosaic masks, or Dan masks from Côte d’Ivoire). One experimental study⁴⁷ indicates that this effect even holds in realistic portraits: self-portraits and likenesses drawn from memory by art students show significant increases in the size of eyes and lips, an effect that is also discernible in historical portrait art, such as in the striking Fayum mortuary portraits.

III. COGNITIVE CAPACITIES AND THE EARLIEST ART

In the previous section, we outlined three types of cognitive processes that play a role in the production and appreciation of art. By focusing on human cognition, we can understand Palaeolithic artworks as products of the same kinds of cognitive processes that still give rise to art today. In order to allow for an in-depth discussion, we will examine two case studies: mammoth ivory sculptures from Swabia, Germany and engraved objects from southern Africa.

Sculptures from southwestern Germany

As we have seen, archaeologists universally accept the emergence of representational art as proof of symbolically-mediated behaviour. The earliest uncontested figurative representations found to date are small mammoth ivory figurines from Swabia, southwestern Germany, that represent animals, therianthropes (half-human, half-feline creatures), and humans. They are dated to 40,000–32,000 BP, and belong to the Aurignacian cultural complex, the oldest *Homo sapiens* culture in Europe. These objects are unequivocally the result of intentional design. This can be inferred from the highly complex shapes, and the resemblance to objects in the real world, mainly mammoths, horses, and carnivores. Several of the objects are pierced, presumably to be suspended as personal ornaments. The sculptures are made of mammoth ivory, a material that is notably difficult to work due to its growth rings. Their production required considerable expertise with ivory and its fracturing properties, and a great

investment of time—using only materials that were available at the time, it took an experimental archaeologist 27 hours⁴⁸ to copy the 5 cm-long horse figurine from Vogelherd (Fig. 1c). The artefacts were finished with incisions and polished with hematite, an effective metallic abrasive that is still used by contemporary ivory carvers⁴⁹. Although mammoth tusks are large, most figurines are tiny, no more than 5 cm across. We can infer that the objects were made with much care and attention to detail.

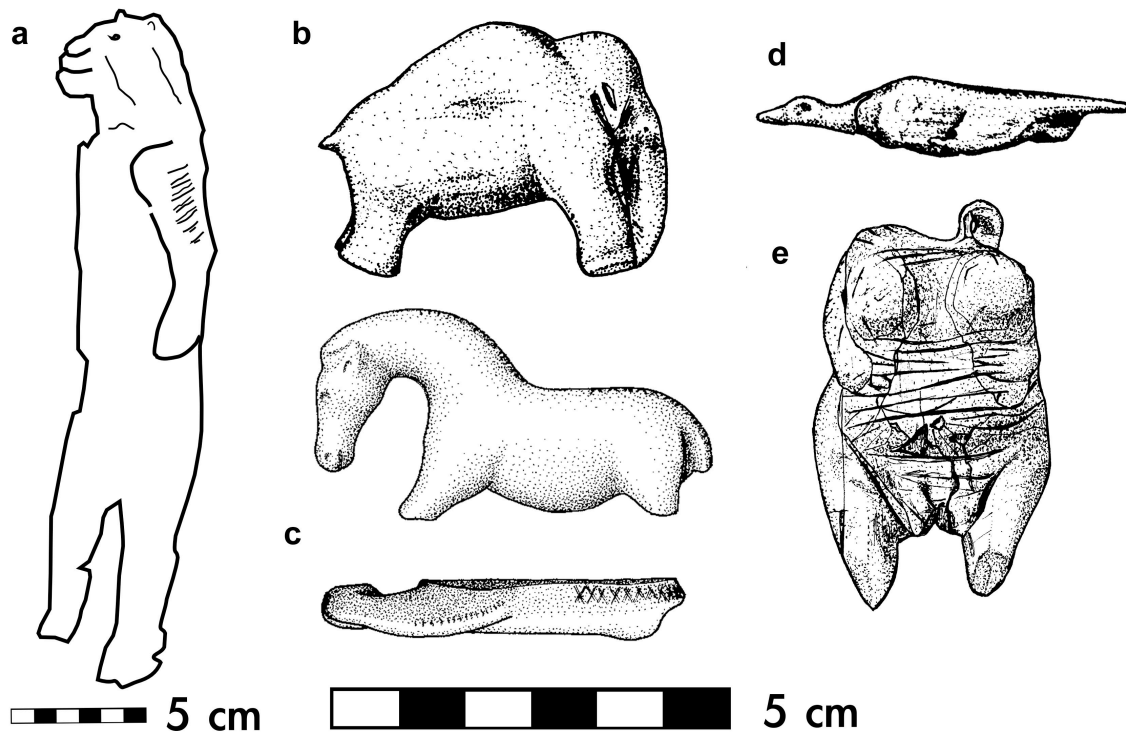


Fig. 1: Mammoth ivory figurines from Swabia, Germany. (a) therianthrope figure from Hohlenstein-Stadel; (b) mammoth and (c) horse (side view and top view) from Vogelherd; (d) waterfowl and (e) female figurine from Hohle Fels⁵⁰.

The easily recognizable depictions, the attention with which they are finished, and the consistent style (preference for ivory as material, small size) indicate a fully developed design stance. Given that most objects resemble entities in the world, we can be fairly certain that the makers imbued them with symbolic meaning. At the very least, the mammoth-shaped figurine (Fig. 1b) was

intended to represent a mammoth. Next to this, it may have had other symbolic meanings as well (e.g., endurance, power), but we know none of these. The sculptures are rich in relevant details, including the hump on the mammoth's shoulder (Fig. 1b), the horse's arching neck (Fig. 1c), and the protruding breasts and buttocks of the female figurine (Fig. 1e), while less telling details, like hands and feet are underplayed. Interestingly, 15- to 18-month-olds gain most information from pictures that are rich in relevant details. They can transfer this knowledge to objects in the real world: detailed pictures, but not schematic depictions, enable them to learn the names and properties of novel objects or animals they never encountered in the real⁵¹. This may explain why Palaeolithic animal imagery tends to represent animals in profile, the way they are most recognizable, not unlike the widespread use of animal profiles in natural history books. This strongly indicates that the Swabian figurines were intentionally made to symbolically represent the real-world objects they resemble. Many of the objects have geometric engravings, including crosshatchings (Fig. 1c), parallel lines (Figs. 1a and 1e) and chevrons. The stability of these motifs across the figurines may suggest that they had an additional symbolic meaning, the code of which is lost. The therianthropes form a special case, since their referents are non-existing entities. The therianthropes from Hohlenstein Stadel (Fig. 1a) and Hohle Fels probably represent religious agents, as many cultures know supernatural entities like these.

What about aesthetic value? Although the Swabian sculptures look alluring and beautiful to us today, there is no guarantee that they had the same effect on their Pleistocene makers. Even within western culture, the aesthetic appreciation of Palaeolithic art has been variable. As recently as 1972, the palaeoanthropologist von Köningswald⁵² proposed in earnest that the so-called Venus figurines, which are now uniformly praised for their charismatic beauty, were grotesques carved with the purpose to scare intruders away. Nevertheless, there is some reason to believe that the Swabian figurines were made with the intention to be aesthetically appealing. Our main motivation for this is the choice of the material, mammoth ivory. Interestingly, the Aurignacians did not use ivory to make tools, for which they preferred stone, bone and antler, but exclusively

reserved this material for beads and sculptures⁵³. Together with the technical difficulties involved in the working of ivory, this suggests that it was a choice material, maybe also because of its specific sensuous lustre. The fact that the makers or the owners polished the sculptures carefully, and used special material to do so, further supports this hypothesis.

Engraved artefacts from southern Africa

Let us now examine whether engraved ochre and ostrich eggshell objects from the Middle Stone Age (MSA, a *Homo sapiens* African culture) might qualify as the oldest forms of non-representational art. They date between 77,000–55,000 BP. As evidence for symbolic and artistic behaviour is markedly rare prior to 40,000 BP⁵⁴, claims for non-representational art before this date need to be treated with caution. To see whether these engraved objects might indeed qualify as art, we will examine whether they were deliberately designed, had symbolic meaning and appealed aesthetically to their contemporaries.

The term ‘engraved’ already carries an inherent implication of design, and indeed some of the markings look convincingly intentional. The best-known exemplar is SAM-AA 8938, an engraved ochre piece (5.4 cm long) from Blombos Cave, dated to ~77,000 BP (see <http://www.svf.uib.no/sfu/blombos> for an illustration). It appears to show a crosshatched design, consisting of two series of parallel lines that are intersecting, bounded top and bottom by long horizontal lines and divided through the middle. However, most other engraved objects from Blombos look far less spectacular⁵⁵. In order to assess whether the makers had an intentional design in mind, the shape of the objects alone does not provide enough information. Blombos Cave yielded 8224 pieces of ochre⁵⁶; among this plenitude only 15 bear incisions. The majority of these incised ochres show signs of grinding, and most are intentionally knapped or broken⁵⁷. Experimental studies⁵⁸ demonstrate that ochre is an effective binding agent for adhesives, in particular, to haft stone or bone points onto wooden shafts. Many MSA points have ochre and plant residues on their ends, indicating that they were hafted by mastic that contained ochre, and bound with twine⁵⁹. This implies that some of the engravings on ochre may have been byproducts of functional

processes. On the other hand, despite their rarity, engraved artefacts are found in several southern African MSA sites, suggesting that they may be part of a regional tradition⁶⁰. These objects bear non-representational incisions, and are of durable but soft materials. Microscopic analyses⁶¹ suggest that some of the markings are deliberate, not merely byproducts of functional activities. For example, the engravings on SAM-AA 8938 required considerable control and skill.

The fact that the engravings were deliberate does not entail that they were symbolic. As virtually anything can be a symbol, and as in principle there are no limitations to what a symbol might refer to, it is difficult to assess this archaeologically. For example, small variations in functional stone blades might have had symbolic meaning (e.g., provide information about group membership), but this would be impossible to confirm without cultural background information. The incision patterns on the MSA artefacts may well be the result of the scoring of ochre fragments for testing their suitability as hafting agent. Of course, these explanations (functional and symbolic) need not be mutually exclusive: a person may have started scoring ochre to test how it crumbled, but got caught up in this act and developed the strokes into an appealing design⁶².

Even if the design is deliberate, this still does not mean it is symbolic, as modern telephone-pad doodling aptly illustrates⁶³. Let us assume for a moment that the engraved pieces are symbolic. The question is then, why are they so rare? After all, symbolic cultures, even those with sparse material culture teem with symbolic artefacts. Cain⁶⁴ suggested that the marked artefacts might have served to affirm personal identity. Hunter-gatherers like the Kalahari !Kung typically live in egalitarian communities, where food and other resources are shared equally among members. In order to differentiate themselves from others, some members of these groups make personal art objects⁶⁵. These objects are typically rare, vary in quality (since the artists are not specialists), and are stylistically and materially diverse—properties that fit the engraved MSA artefacts. If Cain's hypothesis is correct, then the marked artefacts would indeed have symbolic meaning. However, the !Kung are but one small-scale society, and it would be mistaken to take them as a model for all African Stone Age cultures. Gunn's⁶⁶ analysis of scratchings in Australian aboriginal rock art reveals that these highly

variable motifs are mainly a result of spontaneous scribbling, with little or no symbolic meaning, mainly serving as a creative outlet for the individual, not unlike doodling. Thus, Henshilwood et al.'s⁶⁷ characterization of the MSA ochres as symbolic seems premature.

One potential line of evidence for symbolism is the existence of enduring or repeated designs (conventions) that change or get replaced over time. Using this criterion, a more convincing case for symbolism can be made for engravings found on 270 ostrich eggshell fragments from Diepkloof Rock Shelter, dated to 65-55,000 BP (Fig. 2)⁶⁸. These fragments were likely parts of flasks that were used for storing and transporting water—ostrich eggshell containers are still used by southern African hunter-gatherers today. Many small-scale societies do not have representational art, but use stylistic abstract elements on functional objects like basketry, weaponry or pottery as a way to denote ownership or group membership. These elements encode social meaning, hence are symbolic. The eggshell fragments bear a limited number of recurring motifs, including hatched bands (Figs. 2a and 2c) and parallel lines (Fig. 2b). These motifs suggest a degree of standardization: the hatched band motif, for example, always began by the long parallel lines, followed by engraving of the shorter, perpendicular lines. A diachronic change in the designs can be observed: the hatched band pattern is only found in the lower layers of Diepkloof, and is absent in its upper levels, where it is replaced by the parallel line motif⁶⁹. Both the limited number of designs and the cultural evolution manifest in this site stand in stark contrast with the variable Blombos material, where no recurring motifs can be discerned. Given the clear imposition of recurrent design and the difficulties associated with engraving eggshell (which is prone to fracture), it seems unlikely that these designs were spontaneous scribbles. The Diepkloof eggshells are therefore more plausible (although not indubitable) candidates for symbolic material culture in the MSA than the Blombos ochres.

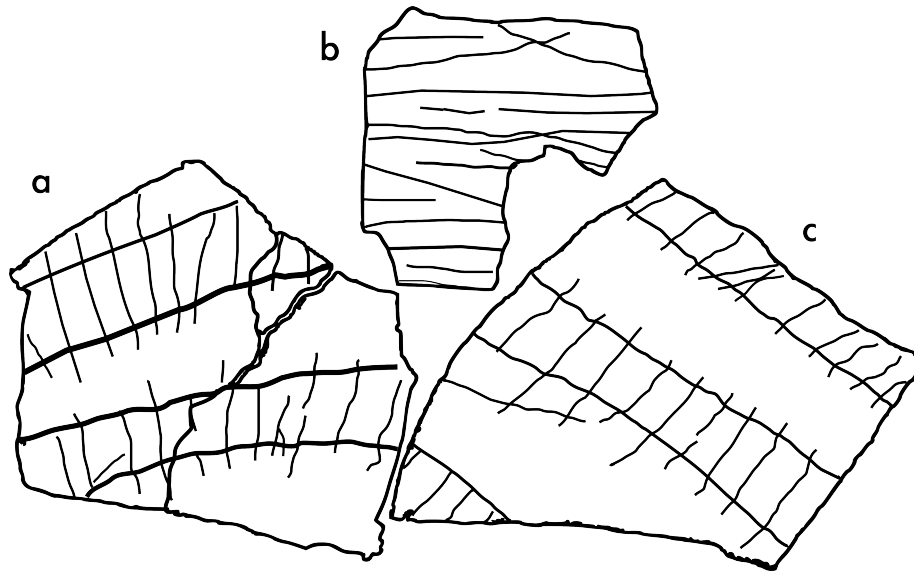


Fig 2: Engraved ostrich eggshell fragments from Diepkloof Rock Shelter⁷⁰

As the extensive media coverage of the South African material shows, it has an obvious aesthetic appeal to us. How can we assess whether it held the same appeal to MSA people? The fact that many of the Blombos ochres are red implies to some archaeologists⁷¹ that they were intentionally picked out for their colour, which would have had not only aesthetic value but also symbolic meaning. However, the redder ochre is, the higher its iron content, and the higher the iron content, the better it makes bone or stone points stick to wooden shafts, as it critically contributes to the homogeneity of the adhesive⁷². Moreover, in small-scale societies red ochre is also used for tanning hides, as an insect repellent, or for medicinal purposes, although it is unclear whether Pleistocene hunter-gatherers used it as such. Therefore, the selection of red ochre could have been for functional, rather than aesthetic or symbolic purposes, though one does not exclude the other—there is no way to make it out.

The MSA engravings are geometric, mostly consisting of straight lines. Geometric designs are a pervasive element of Palaeolithic art. They feature on most of the Swabian figurines, and are found alongside many animal paintings in Franco-Cantabrian cave art⁷³. Did straight lines appeal aesthetically to Palaeolithic people, as they did to more recent artists like Mondriaan or Malevich? According to Hodgson⁷⁴, the pervasiveness of geometric motifs across

human cultures from the earliest art onwards can be explained by the fact that such designs evoke strong responses in our early visual system. Orientation-selective cells in the primary visual cortex (area V1) respond strongly to straight lines, especially horizontal and vertical ones⁷⁵. Does the fact that geometric designs appeal aesthetically to us imply that the MSA engraved objects were intended to be aesthetically pleasing? After all, some of the regular geometric designs on younger African artefacts have been interpreted as calendrical notation systems⁷⁶. In those cases, notches are grouped into sets that have some numerical correspondence to lunar cycles or other seasonally recurring events⁷⁷. The older MSA material does not show this systematic grouping, making a notational interpretation unlikely. It seems reasonable to infer an intended aesthetic value for the Diepkloof ostrich eggshells, especially given that the geometric designs show a high degree of standardization, being stably reproduced for long periods of time. The Blombos material is more idiosyncratic: if it appealed aesthetically to its engravers, this did not lead to a widespread adoption of designs in the community.

IV. CONCLUDING REMARKS

What guides our spontaneous recognition of some Palaeolithic artefacts as artworks? A cognitive approach allows for a relatively fine-grained conceptual analysis of artworks. Because it does not require culture-specific contextual information, it can be extended to the study of first art. Underlying our ability to recognize art are three cognitive abilities: the design stance, symbol-mindedness and aesthetic sensitivity. By conceiving art as an ability that is present in all neurologically healthy humans, it is possible to trace continuities between early artworks and art today. In this context, it is meaningful to say that the Swabian ivory sculptures and perhaps also the more elaborate among the southern African engraved objects, especially the decorated eggshell flasks from Diepkloof, are artworks.

Endnotes

¹ See, e.g., Horst W. Janson, *History of art* (Englewood Cliffs, N.J.: Prentice Hall, 2004), a widely used textbook.

² BP stands for 'before present'. In archaeology, it is the standard way to specify dates in the past. 'Present' actually refers to 1950, roughly the beginning of radiocarbon dating.

³ E.g., Nicholas J. Conard, "Palaeolithic ivory sculptures from southwestern Germany and the origins of figurative art", *Nature* 426 (2003): 830-832.

⁴ Stephen Davies, "First art and art's definition", *Southern Journal of Philosophy* 35 (1997), 19-34.

⁵ Conard, *ibid.*

⁶ Valérie Plagnes, Christiane Causse, Michel Fontugne, Hélène Valladas, Jean-Michel Chazine, and Luc-Henri Fage, "Cross dating (Th/U-¹⁴C) of calcite covering prehistoric paintings in Borneo", *Quaternary Research* 60 (2003): 172-179.

⁷ John Halverson, "Art for art's sake in the Paleolithic", *Current Anthropology* 28 (1987): 63-89.

⁸ Steven Mithen, "To hunt or to paint: Animals and art in the Upper Palaeolithic", *Man* 23 (1988): 671-695.

⁹ David Lewis-Williams, *The mind in the cave: Consciousness and the origins of art* (London: Thames & Hudson, 2002).

¹⁰ Berys Gaut, "The cluster account of art defended", *British Journal of Aesthetics* 45 (2005): 273-288.

¹¹ Dennis Dutton, *The art instinct* (Oxford: Oxford University Press, 2009).

¹² E.g., Jerrold Levinson, "Extending art historically", *Journal of Aesthetics and Art Criticism* 51 (1993): 412-423. See Davies, *ibid.*, for a discussion of the problem of first art and historical definitions.

¹³ Stephen Davies, "Non-western art and art's definition", in *Theories of art today*, ed. Noel Carrol (Madison: University of Wisconsin Press, 2000), 199-216.

¹⁴ Davies, 2000, *ibid.*

¹⁵ Davies, 1997, *ibid.*, 27.

¹⁶ Peter Lamarque, "Paleolithic cave painting: A test case for transcultural aesthetics," in *Aesthetics and rock art*, eds. Thomas Heyd and John Clegg (Aldershot: Ashgate, 2005): 21-35, 33.

¹⁷ See also Harold Osborne, "What is a work of art?", *British Journal of Aesthetics* 21 (1981): 3-11.

¹⁸ Sally McBrearty and Allison Brooks, “The revolution that wasn’t: A new interpretation of the origin of modern human behavior”, *Journal of Human Evolution* 39 (2000): 453-563.

¹⁹ Kim Sterelny, “What is behavioural modernity?”, <http://www.institutnicod.org/Sterelny-WhatisBehaviouralMordernity.pdf>.

²⁰ E.g., Vilayanur S. Ramachandran and William Hirstein, “The science of art: A neurological theory of aesthetic experience”, *Journal of Consciousness Studies* 6 (1999): 15-51; Anne Marie Barry, “Perceptual aesthetics: Transcendent emotion, neurological image”, *Visual Communication Quarterly* 13 (2006): 134-151.

²¹ Ellen Dissanayake, *Art and intimacy: How the arts began*. (Washington, D.C.: University of Washington Press, 2000).

²² E.g., Ruth Millikan, *On clear and confused ideas* (Cambridge: Cambridge University Press, 2000).

²³ Ruth Millikan, “A common structure for concepts of individuals, stuffs and real kinds: More mama, more milk and more mouse”, *Behavioral and Brain Sciences* 21 (1998): 55-65.

²⁴ In using developmental studies, we do not mean to imply that Palaeolithic artists were like children. Rather, the results of developmental psychology point to stable features of human cognition that robustly arise early in development.

²⁵ The subdiscipline of archaeology that seeks to identify thought processes and cognitive abilities of past peoples from their material culture.

²⁶ Levinson, *ibid.*

²⁷ Paul Bloom, “Intention, history, and artifact concepts”, *Cognition* 60 (1996): 1-29.

²⁸ Jerrold Levinson, “Artworks as artifacts”, in *Creations of the mind. Theories of artifacts and their representations*, eds. Eric Margolis and Stephen Laurence (Oxford: Oxford University Press, 2007), 74-82.

²⁹ Paul Bloom and Lori Markson, “Intention and analogy in children’s naming of pictorial representations”, *Psychological Science* 9 (1998): 200-204.

³⁰ Melissa A. Preissler and Paul Bloom, “Two-year-olds use artist intention to understand drawings”, *Cognition* 106 (2008): 512-551.

³¹ Susan A. Gelman and Paul Bloom, “Young children are sensitive to how an object was created when deciding what to name it”, *Cognition* 76 (2000): 91-103.

³² Nikolaus Steinbeis and Stefan Koelsch, “Understanding the intentions behind man-made products elicits neural activity in areas dedicated to mental state attribution”, *Cerebral Cortex* 19 (2009): 619-623.

³³ Levinson, 1993, *ibid.*

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- ³⁴ Judy S. DeLoache, “Becoming symbol-minded”, *Trends in Cognitive Sciences* 8 (2004): 66-70.
- ³⁵ Judy S. DeLoache, Sophia L. Pierroutsakos, David H. Uttal, Karl Rosengren, and Alma Gottlieb, “Grasping the nature of pictures”, *Psychological Science* 9 (1998): 205-210.
- ³⁶ Melissa A. Preissler and Paul Bloom, “Two-year-olds appreciate the dual nature of pictures”, *Psychological Science* 18 (2007): 1-2.
- ³⁷ Julian Hochberg and Virginia Brooks, “Pictorial recognition as an unlearned ability: A study of one child’s performance”, *American Journal of Psychology* 75 (1962): 624-628.
- ³⁸ J.B. Derogowski, E.S. Muldrow, and W.F. Muldrow, “Pictorial recognition in a remote Ethiopian population”, *Perception* 1 (1972): 417-425.
- ³⁹ Margaret Martlew and Kevin J. Connolly, “Human figure drawings by schooled and unschooled children in Papua New Guinea”, *Child development* 67 (1996): 2743-2762.
- ⁴⁰ E.g., Terrence Deacon, *The symbolic species. The co-evolution of language and the human brain* (London: Allen Lane, 1997), 374-375.
- ⁴¹ Gregory Currie, *Arts and Minds* (Oxford: Oxford University Press, 2004), chapter 12.
- ⁴² Darwin already proposed that the appreciation of beauty is a human universal, which has its roots in the perceptual and motivational systems of nonhuman animals. Charles Darwin, *The descent of man, and selection in relation to sex* (London: John Murray, 1871).
- ⁴³ Semir Zeki, “Art and the brain”, *Daedalus* 127 (1998): 71-103.
- ⁴⁴ Ramachandran and Hirstein, *ibid.*
- ⁴⁵ Barry, *ibid.*
- ⁴⁶ Teresa Farroni, Mark H. Johnson, Enrica Menon, Luiza Zulian, Dino Faraguna, and Gergely Csibra, “Newborns’ preference for face-relevant stimuli: Effects of contrast polarity”, *Proceedings of the National Academy of Sciences USA* 102 (2005), 17245-17250.
- ⁴⁷ Marco Costa and Leonardo Corazza, “Aesthetic phenomena as supernormal stimuli: The case of eye, lip, and lower-face size and roundness in artistic portraits”, *Perception* 35 (2006), 229-246.
- ⁴⁸ Randall White, *Prehistoric art. The symbolic journey of humankind*. (New York: Harry N. Abrams, 2005).
- ⁴⁹ White, *ibid.*
- ⁵⁰ Fig 1a was redrawn from <http://www.loewenmensch.de>. Figs 1b, d and e were drawn by Ralf Ehmann, Fig. 1c was drawn by Achim Frey, these drawings are reprinted with permission from the Institut für Ur- und Frühgeschichte, University of Tübingen.

⁵¹ Patricia A. Ganea, Megan Bloom Pickard, and Judy S. DeLoache, “Transfer between picture books and the real world by very young children”, *Journal of Cognition and Development* 9 (2008): 46-66.

⁵² G.H.R. von Königswald, cited in Sarah Nelson, “Diversity of Upper Paleolithic ‘Venus’ figurines and archaeological mythology”, in *Powers of observation: Alternate views in archaeology*, eds. Sarah M. Nelson and Alice B. Kehoe (Washington, D.C.: American Anthropological Association, 1990), 11-22.

⁵³ Randall White, “La parure en ivoire des hommes de Cro-Magnon”, *Pour la Science* 43 (2004): 98-103.

⁵⁴ White, 2005, *ibid.*, 68.

⁵⁵ See figures in Christopher Henshilwood, Francesco D’Errico, and Ian Watts, “Engraved ochres from the Middle Stone Age levels at Blombos Cave, South Africa”, *Journal of Human Evolution* 57 (2009): 27-47.

⁵⁶ Alex Mackay and Aara Welz, “Engraved ochre from a Middle Stone Age context at Klein Kliphuis in the Western Cape of South Africa”, *Journal of Archaeological Science* 35 (2008): 1521-1532.

⁵⁷ Henshilwood et al., *ibid.*

⁵⁸ Lyn Wadley, “Putting ochre to the test: Replication studies of adhesives that may have been used for hafting tools in the Middle Stone Age”, *Journal of Human Evolution* 49 (2005): 587-601.

⁵⁹ Marlize Lombard, “The gripping nature of ochre: The association of ochre with Howiesons Poort adhesives and Later Stone Age mastics from South Africa”, *Journal of Human Evolution* 53 (2007): 406-419.

⁶⁰ Chester R. Cain, “Implications of the marked artifacts of the Middle Stone Age of Africa”, *Current Anthropology* 47 (2006): 675-681.

⁶¹ Mackay and Welz, *ibid.*

⁶² Thanks to Grant Ramsey for this suggestion.

⁶³ For a discussion of the difficulties in inferring symbolism, see Whitney Davis, “The origins of image making”, *Current Anthropology* 27 (1986): 192-202.

⁶⁴ Cain, *ibid.*

⁶⁵ Polly Wiessner, “Style and social information in Kalahari San projectile points”, *American Antiquity* 48 (1983): 253-276.

⁶⁶ Robert Gunn, “Sketching the surface: Scratched petroglyphs at Parker Point, Dampier, Western Australia”, in *Exploring the mind of ancient man: Festschrift to Robert G. Bednarik*, ed. Peddarapu C. Reddy (New Delhi: Research India Press, 2007), 35-51.

⁶⁷ Henshilwood et al., *ibid.*

⁶⁸ Pierre-Jean Texier, Guillaume Porraz, John Parkington, Jean-Philippe Rigaud, Cedric Poggenpoel, Christoph Miller, Chantal Tribolo, Caroline Cartwright, Aude Coudenneau, Richard Klein, Teresa Steele, and Christine Verna, “A Howiesons Poort tradition of engraving ostrich eggshell containers dated to 60,000 years ago at Diepkloof Rock Shelter, South Africa”, *Proceedings of the National Academy of Sciences USA* 107 (2010): 6180-6185.

⁶⁹ Texier et al., *ibid.*

⁷⁰ Redrawn from Fig. 1 in Texier et al., *ibid.*, p. 6181.

⁷¹ Henshilwood et al., *ibid.*

⁷² Wadley, *ibid.*

⁷³ Lewis-Williams, *ibid.*

⁷⁴ Derek Hodgson, “Understanding the origins of paleoart: The neurovisual resonance theory and brain functioning”, *PaleoAnthropology* (2006): 54-67.

⁷⁵ Zeki, *ibid.*

⁷⁶ Alexander Marshack, *The roots of civilization. The cognitive beginnings of man's first art, symbol and notation.* (Mount Kisco: Moyer Bell, 1991).

⁷⁷ Johan De Smedt and Helen De Cruz, “The role of material culture in human time representation: Calendrical systems as extensions of mental time travel”, *Adaptive Behavior* (in press).