



Searching for the Individual: Characterising Knowledge Transfer and Skill in Prehistoric Personal Ornament Making

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Abstract

Research on prehistoric personal ornaments has focused on patterns in materials, technology and processes of change but struggles to place human thought and action at the centre of interpretation. However, striking examples of variations in production, altered and mended ornaments and different levels of skill visible in the quality of finished products, and subsequent adjustments made to them are a recurring feature of archaeological ornament assemblages. In addition to regional data on preferences for types and materials, the movement of ornaments between locations and interregional influences, this evidence provides crucial clues about choices, individual makers, and perceptions of the learning process. This article asks to what extent decision-making, individual levels of skill and the expectations surrounding learning or knowledge transmission can be successfully identified and interpreted using the often-limited information available from prehistoric assemblages. Examples taken from Neolithic assemblages in Turkey are used to explore the mutually shaping human-ornament relationship, intention, expectations of normality and divergence from expectation in the production of ornament assemblages. Ornaments are found to be subject to structured and unstructured adjustments within complex biographies and an active area of individual interpretation of shared concepts.

Keywords Neolithic · Turkey · Maker · Biography · Decision-making · Personal ornaments

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Introduction

The ‘performance characteristics’ (for definition see Schiffer, 2004, p. 579) of prehistoric ornaments, their small size and wide variety of materials, may have made them a suitable area for experimentation and innovation (Arnold, 2012, p. 279). The range of skills and depth of knowledge required in their production (Gurova et al., 2013) were often as great or greater than in other categories of artefacts such as pottery or stone tools. Their apparent lack of utility, itself much debated (d’Errico & Vanhaeren, 2009; Micheli, 2012a; Stiner, 2014; Tejero et al., 2020), does not negate their important economic and/or social role. Indeed, the mobility of ornaments, which were part of long distance procurement networks, as well as being widely traded or exchanged from early in their prehistoric use, indicates that they were both valued and desired (e.g., Baysal, 2013a; Cristiani et al., 2014; Murillo-Barroso & Martínón-Torres, 2012). Disentangling personal ornaments from interpretations of power and attendant wealth through materiality (discussed by Walker & Schiffer, 2006) or gendered stereotypes (Varella et al., 2015) and situating them within diachronic interpretations of prehistoric social practice and identity is a difficult process. They carry an accumulated legacy of interpretation as decorative and aesthetic (Zaidel et al., 2013) or valuable and exotic (the ‘Western Gaze’, Bender, 2003).

In the Neolithic context, the lack of obvious accumulation of wealth or evidence of its bodily manifestation, as well as ornaments’ perceived role as secondary to subsistence related technologies and activities (Baysal, 2020, p. 5), means that these artefacts have often fallen between the cracks in research. The effective colonisation of past production activities with Western views and European capitalism (Costin, 1991; Miller, 1995) as well as gender stereotypes (Gilchrist, 2012) means that in interpretations, past workers are made to conform to certain rhythms of practice — full or part time labour — patterns of thought — efficient action — and especially economic rationalisation of activities. A generally art historical approach to ornaments for most periods, focusing heavily on materials, quality and value (e.g., Atk, 2007; Bingöl, 1999; Dubin, 1987; Tait, 2006), effectively removes human agency from the story. Ethnographic approaches, on the other hand, suggest the centrality of ornaments in constructing and re-constructing individual and collective identities and thus bring us closer to human agency (e.g., Hodder, 1982; McAdam, 2008; Williams, 1987). In these studies, however, ornaments are often treated as a static and passive form of material culture as opposed to inquiring into the potential agencies of individual beads and other items of personal ornamentation throughout their multi-faceted life histories. In archaeology, the effects of these various approaches are evidenced in the proxies that have been chosen among items of prehistoric portable material culture as representative of both life in the past and processes of change — usually ceramics or chipped stone. However, at Franchthi Cave (Perlès, 2013), stone tools and beads tell very different stories. While the former would typically be given precedence based on economic importance, analyses indicate it was beads that were driving production activity and engagement with the site. As this example

shows, economic models for efficiency and evolutionary progress are not easily applicable to artefacts with layers of meaning, value and continuities that stretch for millennia, do not conform to modern value expectations and rarely conform to change as traced in other contemporary materials (Bar-Yosef Mayer, 2005; Perlès, 2013). Such examples illustrate that craft was not a product either of elite control or of poor egalitarian communities eking out what they could with meagre resources (Costin, 1998). Indeed, accumulating early Neolithic examples of unexpectedly sophisticated and intensive craft activity and well organised workshop areas in Turkey makes clear that the requisite knowledge and skill existed for sophisticated high volume production even from the earliest of permanent settlements such as Körtik Tepe and Boncuklu Tarla in southeast Turkey (Kodaş, 2019; Özkaya and Coşkun, 2011). Such evidence supports the transformation of the evolutionarily driven, economically centred view of high volume production to a consideration of ‘artisan identity’ in which ‘...in the act of crafting, artisans give material expression to ideas about roles, identities, and relationships in the social world’ (Costin, 1998, p. 3).

Although personal ornaments are closely associated with the human body, typologically driven archaeological interpretations have struggled to centre humans and particularly the biographical human-ornament relationship within their narratives. This results from human agency, beyond the *chaîne opératoire*, being slow to find a role in ornament research and artefact studies continuing, as a result, to be centred on typologically-led recording, focused on objects’ state at time of deposition (although see e.g., Chapman, 2013; Ifantidis, 2011; Ifantidis & Papageorgiou, 2011). It is unlikely that anyone would now argue that ornaments are not used as an active means of communication (Kuhn & Stiner, 2007), structuring relationships, identities and often technological innovations (Esin, 1995; Lehner & Yener, 2014; Pickard & Schoop, 2013). This extends to the process of ornament-making in which not only knowledge of the technology to complete a task successfully, but also the ability to communicate this technology and skill to others is important (Sigaut, 2009, p. 43–44). Within this context, identities in a group could be transformed and acceptance of conformity to existing ideas is encouraged. Separating such person-to-person experience from economic explanations of utility is important if an understanding of Dobres’ (2000, p. 148), ‘...technological practice as the dynamic “becoming” of technicians, mindful communities of practice, and material culture through the sensual, lived, and engaged experience of working with the physical world in socially constituted arenas situated in time and space’ is to be realised.

While one of the authors has engaged previously with identifying and characterising the nature of ornament production in broad terms, asking whether specialisation existed in the Neolithic and if so, how it could be defined (Baysal, 2013b), ongoing research has increasingly revealed smaller scale, individual and personal details of ornament making. Here, we explore the often ephemeral evidence for creative human-ornament interaction and, using examples from the Turkish Neolithic, look at how the hands of different makers and their different roles in biographical processes might be characterised. Examples from several sites explore at a micro scale both how the signature techniques of makers and evidence for artefacts’ biographies aid the interpretation of the various interactions of the artefacts throughout their

lives. This evidence is used to think about how much we can expect to see the individual maker in different aspects of ornament evidence, whether choices and actions were structured or unstructured and whether each maker exhibited the same level of skill or intention of outcome. In moving beyond economic production models or categorizations of actions and processes to look at decision-making and expectations on an individual level, a picture of the small scale of diachronic ornament transformation, as well as individual makers, is brought to the fore. These are used to question the usefulness of broadly typologically categorising physical remains that encompass documentable micro-scale diversity and details of varied biographical human-ornament interactions.

Approaches to People and Ornament Production

Narrating the Ornament Production Process

Studies of ornament production in prehistoric contexts have focussed on production areas at which evidence for each stage of manufacture is present in the archaeological record (e.g., stone bracelets at Orman Fidanlığı and Kanlıtaş in northwest Turkey, Ay-Efe, 2001; Baysal et al., 2015). Those in which this was of a consistent and repeated nature, or arranged in distinct workshop areas, have the greatest potential for the identification and description of the production process (as at Kumartepe or Çayönü in southeast Turkey, Calley & Grace, 1988; Grace, 1990; Iovino & Lemorini, 1999). Makers of Neolithic ornaments have largely been characterised by both their skill level, based on the quality of products or difficulty of manufacture of the artefacts, and their place of operation based on workshop evidence, often with reference to specialised production (e.g., Alarashi, 2016; Baysal, 2013b; Baysal et al., 2015; Martinez-Sevilla et al., 2020; Perlès & Pion, 2020, p. 238). Workshop data has enabled the most detailed interpretations of possible differences between skilled (experienced) and apprentice (inexperienced) craftspeople, but with little discussion of the people themselves and their individual actions and thoughts, focus instead being on generalisations of process (as discussed by Arnold, 2012). In a workshop assemblage, identifying the difference between discard caused by a mistake, faulty material or difficulty of production, as opposed to lack of skill and incorrect choices, relies on tracing patterns of discard and the specific characteristics of different pieces abandoned at each stage of production (Arnold, 2012; Perlès & Pion, 2020). There are very few examples in which there is sufficient evidence of abandoned items related to practice or production waste to define patterns in activities.

In the Neolithic at Franchthi Cave in Greece, *Cerastoderma glaucum* shells were used to manufacture disc beads with a standard process and set of skills evidenced through production remains from different stages of manufacture (Perlès & Pion, 2020). Within this assemblage, a distinction was made between abandoned pieces that could never have resulted in a product that conformed to the expected norms due to poor material/technical choices, and practice pieces that were apparently not intended to become finished ornaments (Perlès & Pion, 2020, p. 238). These were used to question who might have been involved in activities in the production area,

with the conclusion that alongside specialists producing large numbers of high-quality products, apprentices would have been learning the standardised technique. Importantly, the number of ‘deviant’ pieces at the site is relatively low and the number of specialists is also considered to have been small (Perlès & Pion, 2020, pp. 242–243). This gives an idea of a community activity in which people of different statuses were acting in the same area engaged in different aspects of the same task.

Stone bracelets have been a focal point in studies of Neolithic ornament production because of their strong association with intensive raw material source exploitation (Martinez-Sevilla et al., 2021). A *chaîne opératoire* and the relationship between raw material source, workshop area and skill level or failure rate can even be established through evidence from surface survey because of the relative standardisation of processes and localised activities (Baysal et al., 2015). In the case of stone bracelets in Neolithic Iberia, the dichotomy in skill and choice is seen in the approach to material selection and working, with a visible difference in the methods preferred by skilled and unskilled makers (Martinez-Sevilla et al., 2020). This has been documented through material at quarry sites, where skilled craftspeople and apprentices, most likely younger members of the community, appear to have worked side by side in completing relatively simple processes and as well as learning techniques (Martinez-Sevilla et al., 2020, pp. 15–16).

In both these examples, the actions of two hypothetical sets of individuals are evaluated and then compared — those who possess the knowledge and skill to perform a task using the conventional gestures (Dobres, 2000, p. 152) and those who do not, but who apparently wish to do so. What remains unanswered in these cases is the degree of success/wastage, or the number of people engaged in each task, because at the site of production activity, the archaeologist is confronted almost entirely by evidence of failure — broken, abandoned or unsuitable pieces — in the archaeological record. Even in the most ideal of archaeological contexts, there remains uncertainty about who was carrying out which activities and particularly the potential age range of apprentices, which can only currently be judged according to the minimum age necessary for the motor skills that would have been required for each individual task (Perlès & Pion, 2020, p. 242).

Here, we may refer to ethnographic examples that suggest the centrality of talent and social role, as well as age and the development of motor skills in learning and apprenticeship that involved various stages. In small-scale societies, play and imitation are the main mechanisms of learning as opposed to a formal and strict teaching format, and knowledge transfer between social age groups (*i.e.*, children, adolescents, adults) is often based on oral storytelling (Riede et al., 2021). In such an ‘informal learning’ context, participation in the production processes for children is often not ‘producing’ but observing, helping and assisting (Wendrich, 2012, p. 9). While the *chaîne opératoire* is embedded in strictly defined rules, apprenticeship is rather informal, dependent on the skill, enthusiasm and time investment of usually younger individuals (Wendrich, 2012, pp. 11–12). Among the social age groups as potential apprentices, Nowell and French (2020, p. 16) discuss ethnographic accounts of hunter-gatherer/forager societies and suggest that the liminal stage of adolescence is crucial with increased cognitive ability, creativity and free time for social learning of complex skills usually from non-parental adults. The objects

produced by previous generations may also serve as a venue for learning through copying/imitating the styles and techniques (Wendrich, 2012, p. 12 and chapters therein).

Field experimentation study of modern-day bead-making/knapping workshops in Cambay, India, has detected different skill levels of bead-makers relating to their duration of apprenticeship. The specialised bead-makers in the production of high-quality beads go through an apprenticeship of about 7 to 10 years. The apprenticeship duration of the bead-makers who produce beads of lower quality is about 3 years. The results of the experimental study indicate that the apprenticeship duration determines the organisation strategies and the control that the maker has over their movements. The less skilled makers know the necessary techniques but have ‘unorganized’ production strategies, are not yet familiar enough with the varying properties of the raw materials (*e.g.*, hardness and homogeneity) and the tools and do not yet have sufficient control over their movements to achieve high-quality finished products. The specialist makers are better organised, have control over their movements and can adapt to the constraints encountered during the production process (Bril et al., 2000; Roux et al., 1995).

Techniques, Gestures, Skills and Circulation: Approaching the Makers and Users

In most cases, data from ornament production areas is not available, either because material has not been studied or production areas have not yet been found, which is the case for most materials. In some examples, indirect inferences can be made about some aspects of production and producers. In the earliest of settled sedentary communities of the Neolithic, there was significant organisation in ornament production and use seen in the repeated manufacture of certain forms, choices of particular materials and use of specific technologies (*e.g.*, ‘butterfly’ beads, Alarashi, 2016; procurement of marine shells, Bar-Yosef Mayer, 2005, Baysal, 2013a; drilling techniques, Coşkunso, 2008). Usually, we are reliant on even more ephemeral evidence of makers’ actions, carried by the ornaments themselves, from which it is possible to extrapolate the processes in which they may have been involved. For example, blue fluorapatite beads, which are geographically widely distributed at sites across Anatolia from the last centuries of the 7th millennium BCE, share similar forms and an unusual raw material and production process that suggest a single place of manufacture. However, there is no concrete evidence of locality of production, no distribution drop-off by distance, or regionally specific formal similarities in other materials, and certainly no information about the people involved in the production context (Baysal, 2020). These artefacts therefore retain their anonymity in the archaeological record.

Returning to the ‘butterfly’ beads, despite the lack of workshops belonging to their production, the sharing of similar forms and techniques in each site located in geographically distant zones in southwest Asia is striking. Beyond typological analogies based on the forms of the beads, a *chaîne opératoire* approach supplemented with contextual studies and microwear analysis contributes to understanding and reconstructing the biography of each bead by identifying their deposition

processes, as well as detecting the specific techniques involved in their manufacture, and different modes of use. During the 8th millennium BCE, these beads were often produced from hard and knappable stones such as chalcedony group materials (e.g., carnelian), and their manufacturing techniques differed from the techniques employed for softer stone types. The *chaîne opératoire* of carnelian beads is well documented through macroscopic and microscopic analyses conducted on assemblages from Neolithic southwest Asia (Alarashi, 2014, 2016; Groman-Yaroslavski & Bar-Yosef Mayer, 2015; Yelözer & Alarashi, 2021) as well as on ethnographic examples from India (Bril et al., 2000; d'Errico et al., 2000; Pelegrin, 2000; Roux et al., 1995). Each step (heating, debitage by direct or indirect percussion, shaping by percussion and/or pressure, abrasion/grinding, drilling with mechanical rotary abrasion, and finishing by fine polishing with the help of abrasives and liquids) requires varying degrees of skill, know-how and experience. Almost the entire process of production can be narrated through the traces left on these beads' surfaces. Although the exact place of their production (i.e., workshops) and the route of their distribution during the Neolithic is still not well known, carnelian nodules found in sites where these beads were also found in finished form (Alarashi, 2014) and the sites where long, cylindrical drills were found (Coşkunsu, 2008) in the Euphrates Basin indicate their production in this region during the 8th millennium BCE (see also Alarashi, 2016). However, there are sites such as Aşıklı Höyük, an early Neolithic (8350–7350 cal BCE) site in western Cappadocia (Özbaşaran et al., 2018; Stiner et al., 2021) (Fig. 1), where the 'butterfly' beads were found with no evidence of on-site production (i.e., bead-making debris, bead blanks, raw material nodules) (Fig. 2). The possibility of workshops outside settlements where bead-makers met and exchanged technical know-how, as well as finished objects, should also be kept in mind (Yelözer, 2018, p. 19).

These large beads made from hard stones including carnelian reveal various stages in production that required knowledge and experience of different techniques. A vast amount of time investment for learning and production, as well as skill would

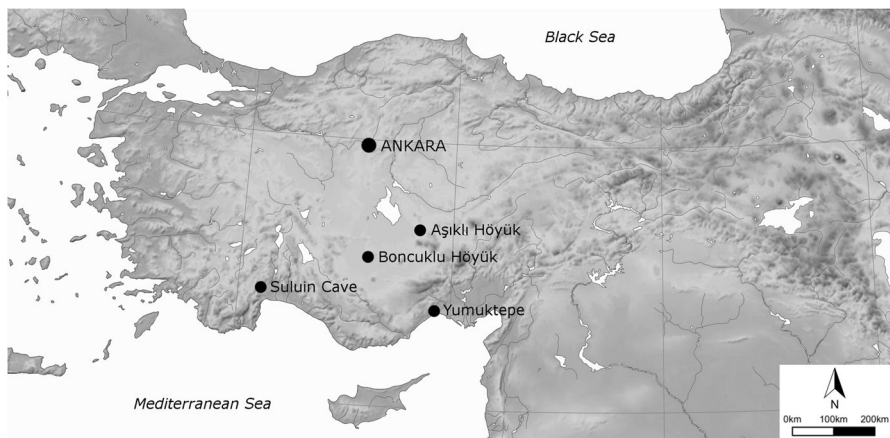


Fig. 1 Map of Turkey and surrounding regions showing the location of example sites in the text

Fig. 2 Example of a carnelian ‘butterfly’ bead from Aşıklı Höyük, Aksaray, Turkey (see Fig. 3.3 for the perforation) (Photo courtesy of the Aşıklı Höyük Research Project)



have been a prerequisite. Especially the drilling of the long, narrow perforations on these very hard stones with delicate stone drill bits hints at the presence of specialists in the case of very well-aligned perforations while allowing us to discuss decision-making, ‘creative adaptability’ and skill in cases where we can detect the difficulties the maker encountered during the drilling process. The steps in production always followed the same routine, almost in a standardised manner, *e.g.*, perforation always took place after shaping the bead. The microwear analysis of the ‘butterfly’ beads from Aşıklı Höyük reveals that the abrasion/grinding striations of the shaping process are interrupted by the perforation holes. Pecking marks overlapping these striations are related to the preparation of a platform to initiate drilling (Fig. 3.1–2). All examples were drilled bidirectionally. The abrasion striations along the circumference of the drilling profiles are continuous, suggesting the use of a mechanical tool with a full rotational motion. This standardisation was intertwined with skill and endurance, defined by Wendrich, (2012, p. 3) as ‘the physical ability to perform the proper action in the proper sequence at the proper time’ and the learning of correct motions, gestures and body movements while gaining adaptability to the constraints of the raw materials.

Despite this consistency and standardisation in techniques and forms, the difficulties that different makers encountered and the solutions they created can be observed. Differences in the morphologies of the drilling profiles allow us to understand the forms of the tools used, the motions applied and thus approach the individuals through their archaeologically traceable actions. The drilling profiles vary between cylindrical and sub-cylindrical to conical and sub-conical morphologies (Fig. 3.5–6). They sometimes overlap in perfect or good alignment (Fig. 3.3–4), while we observe the efforts of the maker to align the tubes with additional motions and gestures in other cases. In one example, the first perforation was drilled in a

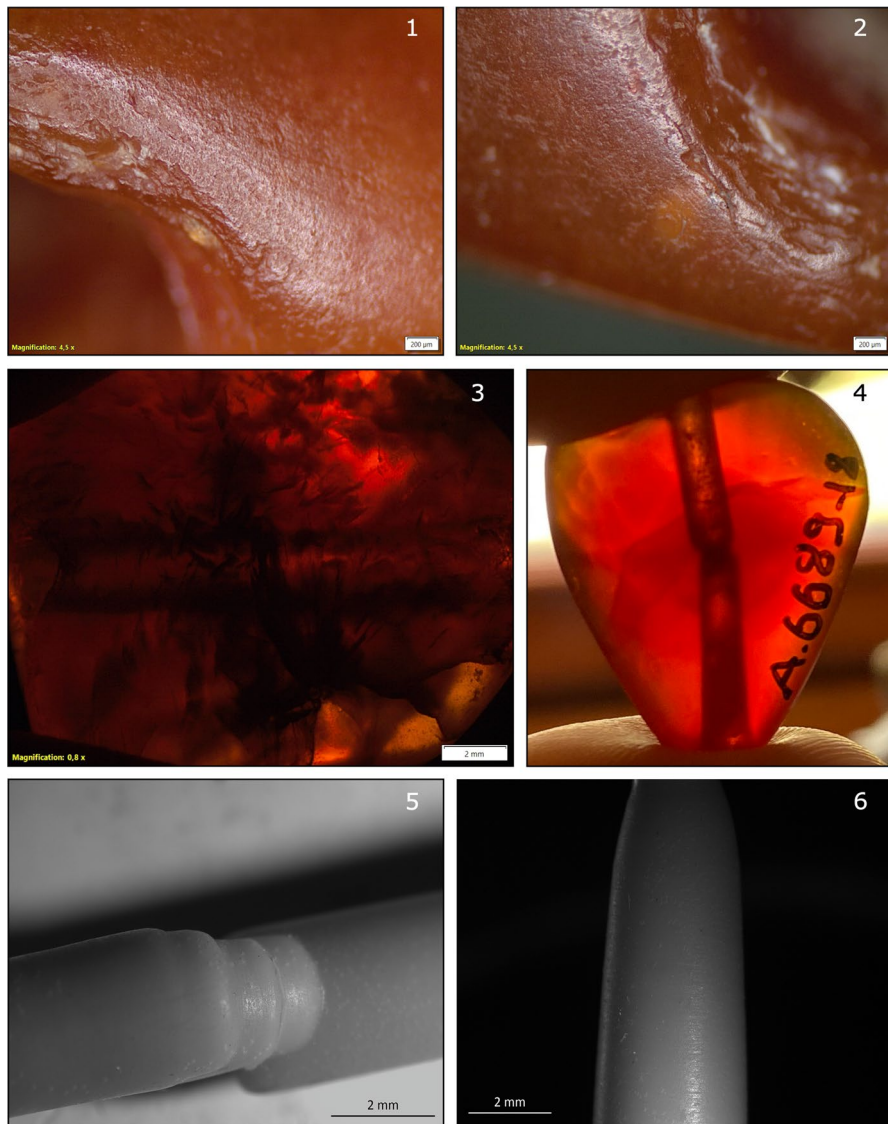


Fig. 3 Close-up views of carnelian 'butterfly' beads from Aşıklı Höyük, Aksaray, Turkey, 1–2: striations, polish and chipping scars on the perforation edge (45×magnification), 3: a carnelian 'butterfly' bead with perfectly aligned cylindrical perforations (8×magnification), 4: a carnelian 'butterfly' bead with well-aligned but slightly slanted perforations (not scaled), 5: stages of perforation indicating how the bead-maker slanted the tool in each step during the drilling process (20×magnification), 6: a sub-conical perforation with drilling striations and polish (16×magnification) (silicone moulds taken from the inside of the perforations) (Photos by Sera Yelözer)

straight manner whereas during the drilling of the second perforation, the maker slanted the tool four times to meet the first perforation tube (Fig. 3.5). In a carnelian 'butterfly' bead group found with an adult female burial, different motions were

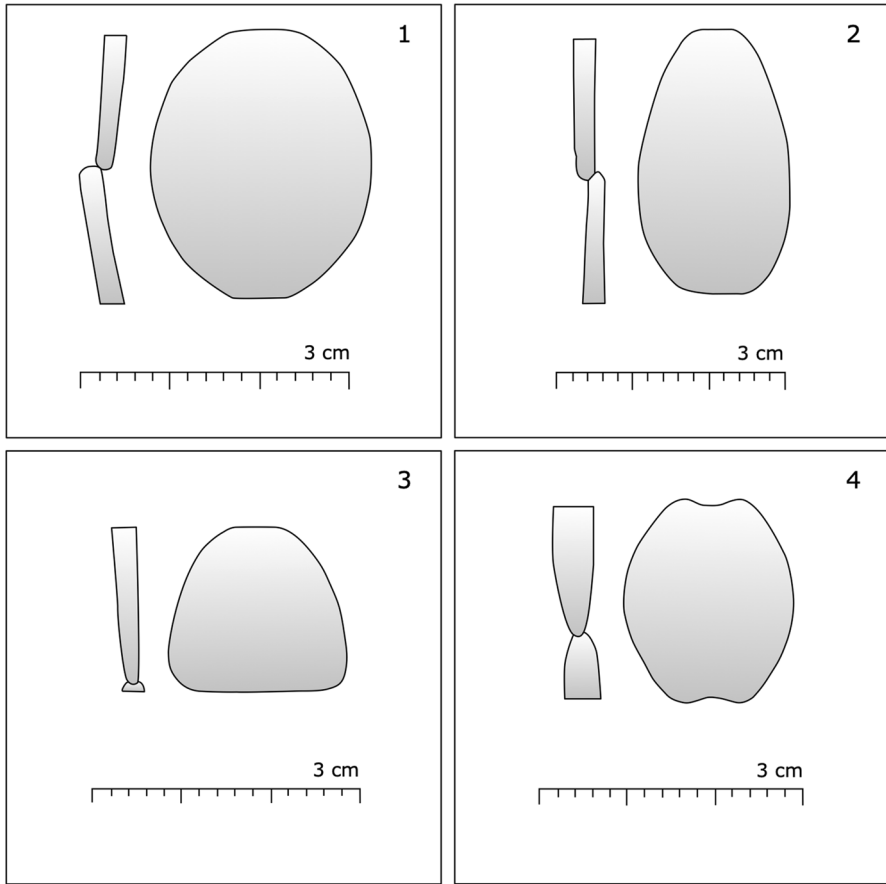


Fig. 4 Schematised drawing of different drilling profiles, 1: slanted, overlapping, cylindrical, 2: straight, overlapping, cylindrical, 3: well-aligned, sub-cylindrical, 4: well-aligned, sub-conical (Modified from Yelözer & Alarashi, 2021)

applied to perforate each bead. One was drilled with a slanted motion (Fig. 4.1); another was drilled straighter (Fig. 4.2), both resulting in overlapping tubes, while the third example has one long and one short sub-cylindrical drilling profile that was well-aligned (Fig. 4.3). Another carnelian bead, belonging to another bead group found with an adult male burial has well-aligned sub-conical drilling profiles (Fig. 4.4; see also Yelözer & Alarashi, 2021; for sex and age identifications of the human remains, see Erdal, 2018; Özbek, 1994). These differences attest to the difficulties each maker encountered during the perforation process and the different tools used, as well as motions and gestures applied as a result of adaptation through different decision-making processes.

The life histories of most of the ‘butterfly’ beads at Aşıklı Höyük ended in funerary contexts. In this story, the ‘butterfly’ beads were combined with other stone beads of different production technologies into composite ornaments, and some

individuals (both adults and sub-adults with no biases by sex or age) were buried with these (Yelözer, 2018). The lack of evidence in favour of their on-site production suggests that at least some of these individuals were at the other end of the chain, acquiring or importing these beads through some form of exchange (*e.g.*, barter, gift-giving or trade). In this regard, we can argue the mediatorship of these beads in creating relations between potentially different individuals that participated in their production, acquisition, use and deposition. At Aşıklı Höyük, these beads testify to the expansion of supra-regional exchange networks during the 8th millennium BCE (Yelözer, 2018) but at the same time, their interment in human burials relates to ‘how ornaments were deployed in social communication’ between individuals (Stiner et al., 2021; see also Kuhn & Stiner, 2007). In this sense, regardless of the degree of skill and efficiency in their production, these beads found further meaning in circulation (*sensu* Appadurai, 1986) that actualized the makers, users and as objects (see Thomas, 2021 for a discussion of how ornaments and individuals co-create each other simultaneously with social roles and relations from archaeological and ethnographic perspectives).

In most of these cases, specific tasks, some of which required considerable skill, can be attributed to certain members of communities. From these, the choice of gesture — which can be culturally derived as much as practical — and the effect of material and skill combined with the range of possible gestures that can be employed by the maker (Sigaut, 2011), can sometimes be teased out. Unfortunately, in Neolithic contexts, this aspect of interpretation usually relies less on our understanding of human interaction with the material in question and more on the parameters set by the qualities of the material and tools used at the time. Within these actions are also encompassed the expectations of a person or community, built through the *habitus* relating to the particular product and situation (Bourdieu, 1977). There is often no pragmatic explanation for why choices were made, and in many cases, difficulty was built into the making process, as is the case with both ‘butterfly’ beads and stone bracelets. The interpretation of human actions in Neolithic ornament making is therefore heavily circumscribed by the nature of the available evidence. Building a human-centred narrative around these various forms of production data depends on expectations of interpretation, including potential generalisations (as at Franchthi, Perlès & Pion, 2020 and in stone bracelet production, Martinez-Sevilla et al., 2020), and on the perspective of those doing the interpreting.

Managing Expectations, Past and Present

While the process of making is often discussed based on archaeological assemblages as described above, makers, thought processes, decisions, social norms and expectations — agency and actions — rarely find a place in interpretation of Neolithic ornamentation. Dobres and Hoffman (1994, p. 227) have described as a last resort the use of agency and social conditions in the interpretation of technology and production, while form and function take centre stage. The basic unit of ornament studies on which classification, comparison and interpretation are founded, no matter where in the world or relating to what period of the past, is the typology

and its accompanying vocabulary, stretched and reshaped to fit many different circumstances. Typology inevitably creates categories based on modern perceptions of form and function, unavoidably detracting from, or negating, past perceptions of ornaments or the ideas that lay behind them. Typological categories are often so indistinct as to be defined only by arbitrary measurements or proportions rather than statistically evidenced differences (perhaps a legacy of Beck's, 1928 initial efforts in this field). However, this system in turn defines how we as archaeologists in the present day perceive and interpret the world (Costin, 2007, pp. 144–145).

Similarly, the language used in ornament studies — access and availability, procurement, production, specialisation, skill, apprenticeship, full/part time and the acceptance of degrees of knowledge and specialisation in our discussion of various levels of skill — forms the basis for interpretation and knowledge building (*e.g.*, Micheli, 2012b; Ridout-Sharpe, 2015; Wright & Garrard, 2003). Each of these terms relates to economic conditions, which are used to interpret likely decision-making processes in the past. The idea of efficiency has loomed over interpretations of past activities (*e.g.*, local versus exotic, Wright & Garrard, 2003, p. 281), driving assumptions that decisions were based on ease of achieving a desired result, but this likely fails to coincide with the preoccupations of the past when leisure time, be it daily or seasonal, was in more abundance than the modern expectation of busyness allows (Graeber & Wengrow, 2021; Sahlins, 1972).

The tension between economic considerations, typology and object biography is well illustrated by Skeates' (1995) consideration of the prehistoric axe pendants of Italy, Sicily, Malta and Sardinia. Axe pendants were made from small axes or adzes that were perforated through the butt end to allow them to be suspended, the process of conversion was not always successful and there were problems executing the perforation in many cases (Skeates, 1995, p. 285). The process was a transformation from a tool to an item associated with the body by suspension and involved the items in question in a series of different actions, presumably carried out at temporally distinct points and probably places. Skeates (1995, p. 279) interprets these as items with 'cumulative life histories' to which different meanings were attributed by different people during the course of their circulation. Although it is clear that these started as tools with a distinctive practical function, the interpretation of the subsequent transformation process and its meaning tends towards belief systems or associated powers (Skeates, 1995, p. 283), encompassing properties not physical but rather socially and spiritually attributed. Skeates' model is predicated on the axes reaching the end of their tool-lives, possibly as 'terminal commodities' (Skeates, 1995, p. 297), thereby tying them still to economic behaviour. Despite this apparent practicality, suggested interpretations of the perforated axes are all related to amuletic properties. It is suggested that the axes may have taken on their own personalities through the course of their life histories or become inextricably, inalienably linked to certain people (Skeates, 1995, p. 287; see also Chapman, 2013) and that they may also have been revered and curated within certain contexts, based on ethnographic examples. While this is difficult to evidence for prehistoric assemblages, the breaking of the human-object boundaries in interpretation is an important step towards moving away from the practical thinking that has dominated the discussion. The use of the word amulet, although widespread, is problematic in the lack of evidence for

its reflection of past thought processes (Baysal, 2020, p. 4), and it can lead to some highly speculative interpretations (*e.g.*, Skeates, 1995, p. 290).

The axe pendants show shared ideas, although not completely codified sets of practice, and the importance of time in the understanding of some artefacts, both in the past and present, where history and changing form were part of the objects, their relationships and interactions in which the agency of the objects themselves took centre stage. The idea of the agency of technology, the linking of social choices to technological actions, was relatively late to arrive in archaeology but has done much to enliven the dry procedural approach to past activities. The recognition that ‘pre-historic production was a meaningful and socially negotiated set of material-based *practices*’ (Dobres & Hoffman, 1994, p. 213), as highlighted in the above example and, as Dobres and Hoffman suggest, the varying contributions of participants at a micro scale on a case-by-case basis, offers more nuance. Such an approach advocates building from the micro to the macro scale, of which each small action formed a part. Although generalisations have often been framed in terms of specialisation and the identification of repeated and organised actions as described in the previous section, talking about production in all its aspects rather than focussing on specialisation, and doing so on a case-by-case basis (Costin, 2007, p. 150) allows a move away from the emphasis on systems and generalisation. Focusing on the individual maker rather than the individual consumer (Smith, 2007) provides a micro-picture of skill, knowledge and decision-making, including how typology or form was understood in the past.

The difficulty of isolating the individual and their actions is illustrated by examples in which the association between maker and product might be considered irrefutable, yet ambiguity remains. In the case an older female with a group of unperforated imitation red deer canine teeth (Russell, 2005, p. 355) at Çatalhöyük (Building 17, 5169, Hamilton, 2005b, p. 303), the maker appears to have been buried with her own handiwork in the form of unfinished products. This type of imitation tooth is known as an item of ornamentation and was made to replicate the deer teeth that were themselves used as ornaments, presumably in association with hunting activities (Choyke, 2001). Were this woman’s items intended to be perforated and used as beads later, as is usually the case? If this is so, she can be interpreted as the probable maker. Alternatively, this collection of items may have been used in this form as an amulet, as suggested by Hamilton (2005b, p. 303), or even as an offering made in death. In the layer above the burial of the older female is another burial (Hamilton, 2005a, p. 331; Russell, 2005, p. 355), this time of a child with many finished imitation deer canine beads. This adds weight to the argument that these beads, and their manufacture, may have had significance in this location or been part of the activities routinely practised within the household, meaning that they were temporally diverse, spatially specific and associated with multiple individuals, although the exact nature of the human-ornament relationship is unclear.

The intentionality of the individual maker is approached through the medium of gesture, missing in the above example from Çatalhöyük, and the assessment of the levels of knowledge and skill needed to carry out a task in a certain way making a direct equation between quality of gesture and experience of the person carrying out the action (Rivero, 2016). Here lies danger of conflating intentionality with the assumption that

the aim of all makers was to be highly skilled, thereby potentially confusing cause and effect in interpretation (Rivero, 2016, p. 95; see also the Cambay example above). The difference in skill and know-how according to material class likely indicates attitudes and attributions of importance, or need, to different tasks rather than levels of skill per se. Indeed, looking at the producers themselves as social products (Dobres, 2000, p. 127) changes this perspective entirely, refocusing attention on the structuring or organisation of activities, and expectations surrounding them. Within the scope of skill and gesture, some examples such as Harappan carnelian bead production and its modern ethnographic counterparts (Kenoyer et al., 1991; Vidale et al., 1991) have had a disproportionate influence on the interpretation of ornament production. The concept of prestige technologies has undoubtedly continued to affect the way that personal ornaments have been treated by archaeologists (Hayden, 1998) as have the ideas of efficiency and uncontrollable external factors. The proxies that are chosen to measure skill, for example drilling precision or efficiency (Groman-Yaroslavski & Bar-Yosef Mayer, 2015), might have been developed and passed on for a variety of reasons and in a number of different ways. They may also show less standardisation and more individual decision-making than is often assumed, as in the above case of ‘butterfly’ beads at Aşıklı Höyük. Research on ornament production has emphasised the organisation of production and its repeatability, including reliance on certain techniques and skill sets, again relying on the form (typology) as the defining factor of each activity (*e.g.*, Groman-Yaroslavski & Bar-Yosef Mayer, 2015; Gurova et al., 2013; Kenoyer et al., 1991; Vidale et al., 1991). While this illustrates industrial scale production, it masks the individual input that might be more appropriate to early assemblages characterised by variation rather than standardisation.

New perspectives that consider past realities, including non-standardised behaviour and non-economic models, rely on challenging modern perceptions of worth, skill, form and intention, such that before starting to look at the past, the effect of our own experiences and senses (Hamilakis, 2002, p. 127) should be calculated. Capturing individual experience and ephemerality and allowing interpretations not to fit a general model but instead to value individual, idiosyncratic experience require a different approach to classification, form, function and time. Skill and the proxies chosen to characterise skill, for example quality of finish, must be acknowledged as choices, probably socially structured according to requirements and ideas now lost to us, not as the pinnacle of human achievement at the time. Below, we explore some further examples of ornament biographies from the Turkish Neolithic to see how perceptions of objects now, perceptions of them in the past and how they were and are experienced can be used to structure new and personal accounts about expectations of individual makers and users.

Characterising Maker/s

Initial Actions

In many cases, and particularly in early Neolithic examples, there is a question about the degree to which ornaments were intended to be visible negotiating tools

of identity or personal items that were largely hidden from view, possibly with apotropaic, medicinal or even magical properties (see Smith, 2007, p. 429 for comparable example; Baysal, 2020). This raises the question of the role of makers in the community, whether they be artisans, craftspeople, guardians of technological knowledge or facilitators of object agency and human-object relationships. Arnold (2012, p. 281) shows that, in the case of hunter-gatherer Chumash shell bead production, households hosted specialists, and each household was unique in how production was carried out. The difference between idiosyncratic decision-making and deliberate style among habitual producers and the presence of those of different status within the production process can sometimes be identified archaeologically, as can deliberate individual interpretations of a shared idea, although evidence is somewhat rare.

Having spent much time thinking about what craft activities and specialisations would look like in Neolithic contexts, idiosyncrasies and standardisation are central to our research. A beadwork item at Yumuktepe, a multi-period settlement mound on Turkey's eastern Mediterranean coast (Fig. 1) (Baysal, 2016; Caneva, 2010, 2012), gave an unusual opportunity to identify the work of different individuals collaborating to produce a single composite ornament piece. A flat bead item, made entirely from small stone disc beads threaded together, had been left in a large circular basket clearly recognisable from its phytolith remains (Fig. 5 left). The basket and beads were never recovered from this location, within the habitation area, where they had been left around 5800 cal BCE. While, in the absence of its organic components, it is not clear what this beaded item originally was — jewellery, or clothing decoration, perhaps even a beaded bag — the small beads themselves tell an interesting story. Two colours of disc bead were used, red and white (both with tonal variations), and when viewed from a distance, the beads all appear very similar in form and size, combining to make a uniform composite piece with a bichrome pattern (Fig. 5 right). On closer inspection, however, as well as showing slight variations in colour, the beads display different characteristics of manufacture in their drilling, shaping and surface finish.

Among the red disc beads, which are made from soft limestone and were therefore relatively easy to manufacture, several groups that conform to different sets of characteristics can be defined (Baysal, 2016, Figs. 6 and 7). Encapsulated within these groups are perhaps not only different techniques used in the making process, but also levels of skill or personal ideas of what constituted an acceptable version of this bead 'type' among those who were engaged in its manufacture. One group of the beads is not the simple discs that they appear to be when strung, but instead is square in form, with four distinct flat sides and slightly curved corners (Fig. 6 bottom row). This indicates a significantly different production technique being used by at least one maker to produce a standard, albeit idiosyncratic, product shaped according to their own ideas. Meanwhile, amid the conventional round disc forms, there is variation in technique and quality of finish. One group of the beads stands out for its particularly neat manufacture and symmetrical form, marginally larger size, characteristic drilling with a slight bevel in the perforation and surface lustre (Fig. 6 top row). These beads might be attributed to the most skilled of the makers whose work is present in the composite item, or



Fig. 5 Composite stone disc bead item (right) and basket in which it was found (left), Yumuktepe, Mersin, Turkey (Photos by Emma L Baysal)

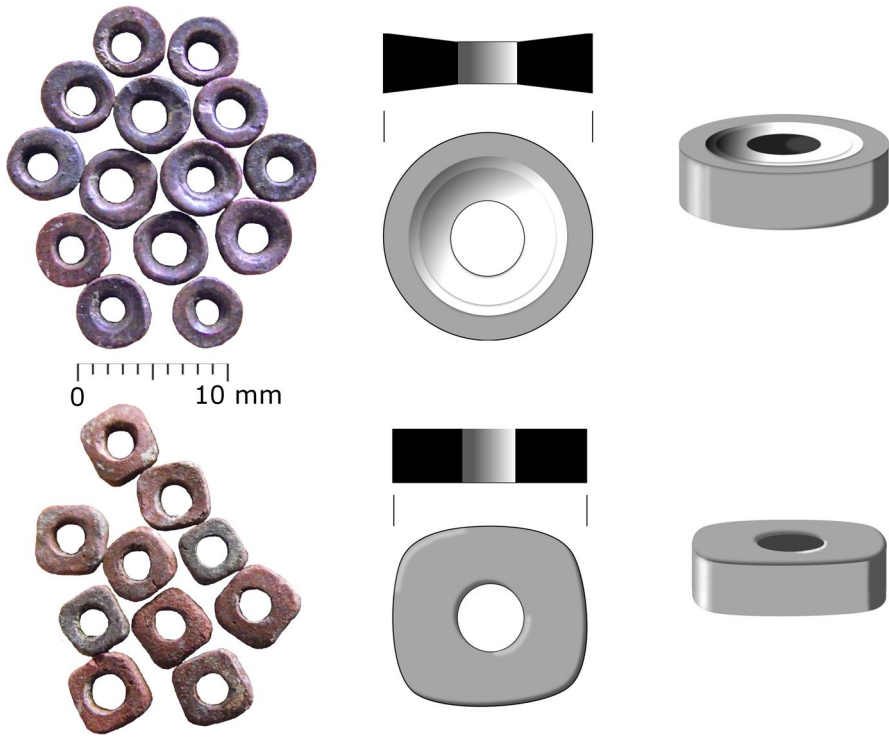


Fig. 6 Disc beads from composite bead item, Yumuktepe, Mersin, Turkey. Top row: exceptionally well-made beads of round form. Bottom row: square ‘discs’ (Photos by Emma L Baysal)

alternatively to one person within a skilled group who decided to invest more time and their own personal techniques in the making of each bead. Meanwhile, although their features are not quite as distinct as the above examples, further groupings can be discerned by certain actions such as a consistent way of shaping or abrading the outer edge that caused less pronounced, but nonetheless visible, faceting. Each set of characteristic actions distinguishes the hand of a different individual and most of the total 1500 beads can be attributed to one or another of these groups.

The people who were engaged in the making of these beads were effectively participating in a shared idea and transforming it through their own personal decisions and actions into practice, in order to participate in the larger whole, or be part of a community of practice with its own collective agency (Dobres, 2000, p. 133). The individual makers are therefore part of something much bigger, not only their own community and its shared set of ideas, but also the desire for the separate items and for the complete finished item or items, the acknowledgement of a specific shared need or desire and the wider social implications of such a requirement, ‘woven into webs of preexisting social and material conditions, rules, values, hierarchies of knowledge, demands and expectations’ (Dobres,



Fig. 7 Beads from Boncuklu Höyük, Konya, Turkey, 1: unsuccessfully drilled pebble with detail of partial perforation, 2: badly broken lozenge shaped bead with detail of post-breakage edge smoothing, 3: broken polished lozenge shaped bead with detail of considerable post-breakage edge smoothing, 4: broken barrel/lozenge shaped bead with detail of post-breakage edge smoothing (Photos by Emma L Baysal)

2000, p. 129). This does not imply that there was necessarily direct collaboration between those who made the beads, it is possible that the ‘idea’ of each type of bead existed in different households or communities that each produced the items

according to their skillsets and experience to a level of conformity that allowed the products to be used together when required. Indeed, the temporality of the item is not known, and it may have been constructed from repurposed beads that had previously belonged in different groups, in which case the shared ‘bead idea’ still stands, as indicated by the choice to place them all together with equivalence. However, in this scenario, the times at which thoughts and actions occurred could be re-considered.

A situation in which individual work can be identified outside of a production context is unusual in an archaeological site of this date or earlier. The individual decision-making within a group context demonstrated by the example is important, although it is unclear to what extent it might be more widely applied, or the degree to which it allows the identification of those involved in the process, rather than merely the differences between their actions. As a result of its contextual limitations, this data and its interpretation do little to advance our knowledge about the household or settlement level economy of the time. Although in creating a window onto a very specific situation at Yumuktepe, the contribution to wider archaeological knowledge of ornamentation practices at the time might be considered quite modest. The most important is the information it gives us about the perceptions of the typology of the disc bead in the past. This type is traditionally classified by archaeologists according to various characteristics including size, proportions, perforation method and surface finishing (see for example Beck’s, 1928 classification system); however, here, we see that perception of the finished composite item or items was likely more important than the specifics of any of these considerations. Thus, present and past mental templates of the disc types are shown to vary considerably.

Moving to the question of what different degrees of skill, as opposed to decision-making regarding quality, might look like, artefacts that might relate to production must first be identified and then the concept of practice — aimed at gaining skill — is defined. Arnold (2012, p. 286) identifies unusually perforated bead examples, where multiple perforations were made in a location normally associated with only one, as a potential marker of practice taking place. In the small 9th–8th millennium BCE early Neolithic community at Boncuklu Höyük, close to the later Neolithic site of Çatalhöyük in the Konya Plain in Central Turkey (Fig. 1) (Baird et al., 2012; Baysal, 2013a), there is evidence for the production of some types of stone beads. Most are simple, small objects involving processes of perforation and shaping to produce disc forms, as in the above example. Some beads abandoned during production show clearly the action of a maker, who made several of the tiny ornaments together, from the same material, thereby replicating the same characteristic production marks in each (Baysal, 2013a, p. 10). Faceting in the surface abrasion is visible to such an extent that the beads can still be matched with each other in the same formation in which they were originally shaped, probably threaded onto a stick or string for abrasion, before being lost under the matting on a house floor. This example allows us to get unusually close to a single maker but is not replicated at the site so cannot be extrapolated to a wider set of technological preferences or local techniques.

In the same assemblage are several pebbles, collected from local streams or rivers during activity around the site, which carry evidence for attempts at perforation (Baysal, 2013a, Fig. 11). The drilling profiles produced by these attempts are

significantly different to those seen in other examples of on-site manufacture, being wider, more conical and much more uneven in shape (Fig. 7.1), with prominent and uneven ridges indicating slow drilling, probably with more than one stone drill bit of different sizes. In most cases, these attempts at perforation were unsuccessful and were abandoned part way through, leaving a wide, uneven, u-shaped pit in the surface of the stone as in Fig. 7.1. Another attempt at perforation was then made in a different area of the pebble surface, despite the potential aesthetic quality of the item having already been spoiled. These seem not to be wasters, the choice of different raw material as well as the unusually rough drilling technique do not match other beads found at the site. Although the site is small, the evidence for better quality, on site production, as in the above example of lost beads, shows that the knowledge and skill for good quality bead production was present within the community. The drilling of already ‘doomed’ pieces indicates an activity not linked to a usable outcome (see Arnold, 2012, p. 301), so these can be characterised as either practice or experimental pieces, especially in light of the slow, uneven and ultimately unsuccessful drilling technique. The choice of relatively hard materials is striking, when much softer rocks such as limestone, infinitely more suitable for a beginner, or someone wanting to practice, were certainly available in the vicinity around the edges of the Konya Plain. It is possible that the stones in question were associated with other activities — it is known from ethnographic evidence that pebbles of different colours or shapes are sometimes considered to have properties, either apotropaic or healing (Popper-Giveon et al., 2014). In this case, these ‘unsuccessful’ items might represent a different set of practices only tangentially related to ‘normal’ ornamentation at the site and possibly carried out by different members of the community, with different skill sets, within a different frame of reference.

Ongoing Making-Use Processes

While the above examples help us understand how some beads might have been perceived in the past, the long-term biographies of ornaments, and particularly the longevity of some items, have been identified as key aspects of some structured ornamentation practices (Chapman, 2013; Ifantidis, 2011; Ifantidis & Papageorgiou, 2011; Martínez-Sevilla, 2019) and can offer useful information on attitudes to them through time and not just at point of manufacture. In addition, individual cases show that expedient adaptation, not conforming to a particular set of expectations, was regularly practised in cases where ornaments were broken by accident or through wear. Such recycling of broken ornaments was a common phenomenon in the Turkish Neolithic. The perforations of beads were often fragile and liable to be broken in which case, the rough or sharp edges were smoothed off and, in many instances, adaptations were made allowing the item to be re-suspended and thereby continue in use (Baysal, 2013a, p. 8). The contrast between production and recycling contexts is important in such cases. Items that were recycled were usually larger beads or bracelets, making them inherently easier to repair or adapt. They were more difficult to produce in the first instance, requiring a skilled or practiced craftsman, and therefore probably of more value, in terms of replaceability, to those who owned or

used them. In some cases, a new perforation was not made and the broken item, with its edges smoothed, was looked after within a habitation context. In each of these scenarios, at least two levels of skill or experience can be associated with separate episodes of activity carried out by different individuals and that almost certainly took place at different locations and were temporally and spatially removed from one another.

The contrast between original and adapted forms was an expected part of the life of some ornaments, following a repeated pattern of activity, knowledge of which was shared by different makers and users. A bead from Suluin Cave near Antalya on the south coast of Turkey, dated 6000–5800 BCE (Fig. 1) (Taşkıran et al., 2016), progressed through several stages of form and function. The bead was originally a large flat ‘butterfly’ form (Fig. 8), which was probably made somewhere in the middle or upper Euphrates region by a skilled craftsman capable of achieving the long perforation required by this form (Alarashi, 2016, p. 507; Coşkun, 2008; see also above). The bead made its way west to Suluin, perhaps directly or alternatively by trade, exchange or gift giving, maybe via other places and owners on the way and over an indeterminate amount of time. Either before, during or after its journey, the bead was used and worn extensively and at some stage, it broke along the length of its perforation (Fig. 9.1–2). It is possible that only half the bead arrived at Suluin. The half that has been found was adapted for further use as a bead; it is not known what happened to the other half.

The broken edges of the half bead were smoothed, and this was followed by two new episodes of perforation. One large and untidy hole was made through the body of the half bead and was used for some time, evidenced by wear around its edges (Fig. 9.3). This secondary hole broke, leaving another large piece missing and again changing the form of the bead significantly (Fig. 9.4). A further two new

Fig. 8 Adapted ‘butterfly’ bead from Suluin Cave, Antalya, Turkey with reconstruction of original appearance (Photo by Emma L Baysal)



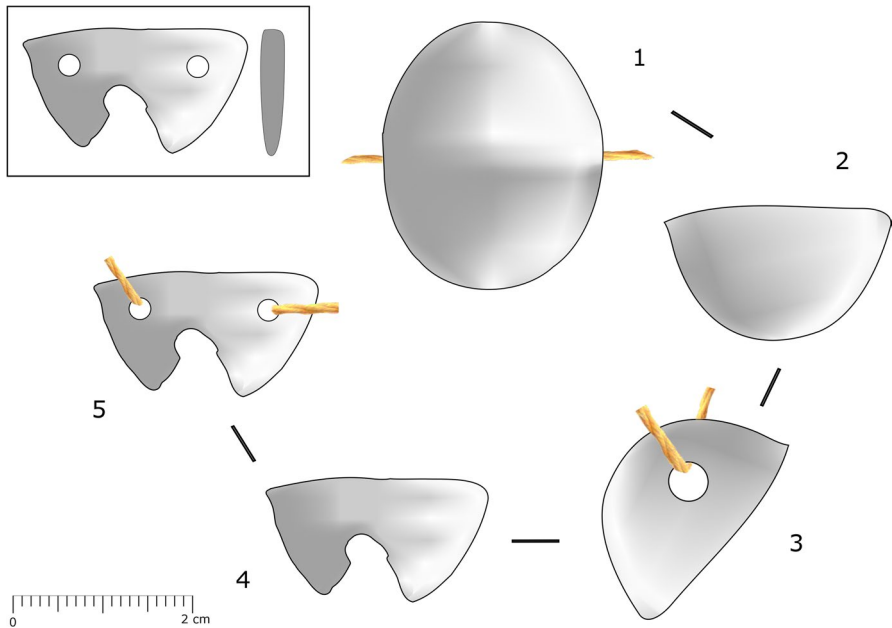


Fig. 9 Stages of adaptation of a 'butterfly' bead from Suluin Cave, Antalya, Turkey (Fig. 8), 1: original form and reconstruction of suspension method, 2: broken along perforation, 3: first re-perforation and suggested suspension method, 4: re-perforation broken, 5: second set of two re-perforations and suggested methods of suspension for the final form

perforations were made; their symmetrical alignment and similar perforation size and technique (Fig. 9.5) indicate that they were made at the same time. These new perforations are, again, different in character, roughly made and asymmetrical, with wide bevelling but smaller than the previous secondary broken perforation. Similarly, changing the quality of the bead, and bringing a third method of suspension, they also reformat the way that it could be used by adding a new symmetry (Fig. 9.5 suggested stringing). Other examples of similarly adapted 'butterfly' beads with double perforations through a half-bead from different sites (*e.g.*, Mezraa Teleilat in southeast Turkey, Özdoğan, 2011, p. 258, Fig. 65) indicate that this process, or variations thereupon, was carried out repeatedly. Each of these adapted items passed through the hands of different makers, each of whom used distinctive techniques and tools, leaving evidence of their individual actions on the item. In the Suluin example, the bead assuredly passed through more than one stage of 'making' and was likely in the hands of more than two makers. Different levels of skill were expected of these makers; adaptations do not display the same level of quality that was apparently necessary for initial production, perhaps indicating that these secondary/tertiary tasks were not carried out by regular bead-makers.

A similar situation applies to both single piece marble annulets (bracelets) and their marine shell counterparts (*Spondylus* sp. and *Glycymeris* sp.), which are a widespread ornament form of the Neolithic (Martínez-Sevilla et al., 2021 and references therein) that was consistently associated with a set of recycling or adaptation

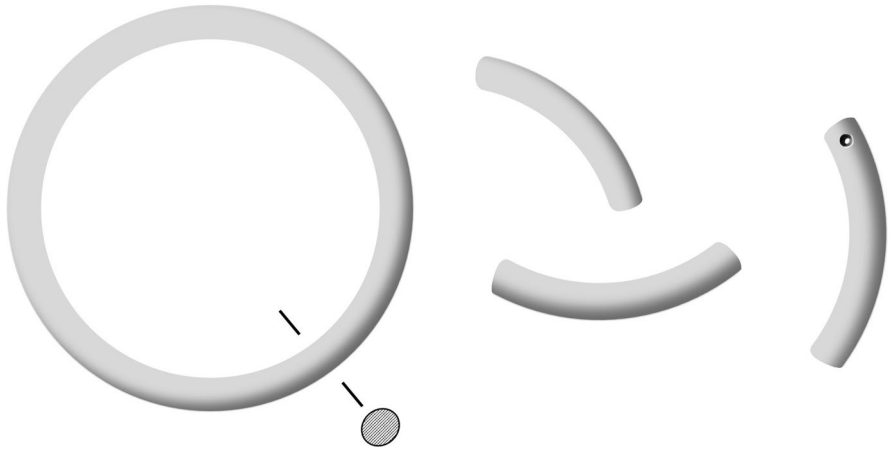


Fig. 10 Schematised version of stone/shell annulet breakage and perforation process

processes. This involved breakage of the bracelet — accidental or deliberate — followed by the perforation of bracelet pieces to enable their continued use on the body in a new format, either tied round a wrist or suspended as a pendant (Erim-Özdoğan, 2011, 2011; Ifantidis & Papageorgiou, 2011) (Fig. 10). In some cases, a complete annulet could be ‘articulated’ when broken into two pieces and re-affixed with organic ties (Martínez-Sevilla, 2019; Fig. 6; Mellaart, 1970, p. 161). As in the previous example, skill levels of makers and adaptors vary, as do the techniques employed. Bracelet making is a long, complex and risky process requiring practice and knowledge and with a high attrition rate during production evidenced in wastage at workshop areas (Baysal et al., 2015). The quality of finished bracelets, particularly those made of stone, is usually consistent and high, with attention paid to symmetry and surface finish (for examples see Martínez-Sevilla et al., 2021). The adaptation process of broken bracelet pieces to new uses did not require the same set of skills, knowledge of tools or indeed the same amount of time, as the initial production process — anyone with a drill and abrader would have been able to complete the process. Again, the making, appearance and use of the item, as well as the ways that it could be interacted with, were in the hands of several people and were a diachronic, dynamic development process involving interactions and decision-making. A similar set of practices, with the expectation of multiple makers, was carried out at sites across southwest Asia and the Aegean, eventually moving with Neolithic groups across the Mediterranean basin (Martínez-Sevilla et al., 2021).

Both the above examples give an idea of the temporal and spatial spread of ideas and expectations relating to the life course of ornaments, their accumulated biographies and the expectations placed on makers at different stages in the process. In some types of ornament, production was not intended to be a single event and, as in both the ‘butterfly’ bead and bracelet examples, the items themselves were not necessarily considered to be of fixed form. Within this framework, each example is unique in the way that it was treated, and each biography is therefore also exclusive to the ornament in question, although they might generally follow the trajectory of

a ‘typical life’ (Joy, 2009, p. 545). In these cases, constructing typology based on a single stage of artefact form fundamentally misses this transience or fluidity of shape, symmetry and use choices and disengages some of the makers, as well as their ideas and actions, from the process of archaeological interpretation.

Less structured adaptations of broken ornaments were commonplace among those items large enough to be repaired. As with the above examples, these actions changed the form and function of the ornaments and did not require as high a level of skill as initial production. The adaptations did not always involve the continuing use of the item as an ornament, in some cases edges of broken perforations were smoothed and the former ornament may have been carried or stored. In other cases, the beads were reshaped or reperforated as necessary, thereby changing shape and symmetry but allowing continuation in use as an ornament (Fig. 7.2–4). At Boncuklu Höyük, beads were used conservatively, often being found singly in burials, and the preservation of broken items may have related to this small-scale consumption and deposition, as well as potentially to the restricted availability of larger beads at the site. Of the 17 large (non-disc) beads so far recorded at the site, five had been subject to adaptations through the course of their lives (see also Baysal, 2013a, 2013b, p. 11). Likewise, at Suluin, of a total of 20 large broken beads, five were adapted on one or more occasions.

This window onto attitudes towards artefacts shows that items probably broken accidentally rather than deliberately, even those no longer employed for their original use, retained importance. It is impossible to define the thought processes behind the decisions that were made, as we do not fully understand the prehistoric use of beads, and the thought processes that lay behind them, beyond their common association with the human body. Later archaeological as well as ethnographic evidence indicates far more complex materialities of ornaments, extending far beyond readable symbolism, involving belief and practice that would be difficult to identify archaeologically (Abu-Rabia, 2005; Dunham, 1993; Popper-Giveon et al., 2014) exemplified well by the modern-day use of the evil eye bead. The process of these artefacts’ biographies (Chapman, 2013; Gosden & Marshall, 1999; Joy, 2009; Kopytoff, 1986) might have taken several different paths involving more, or less, intervention and interaction with no guarantee of the final form and in all cases, a continuing possibility of discard along the way.

Each of the artefacts in the above examples represent palimpsests of knowledge and possibly also memory (see Skeates, 2010 on mnemonic devices) in cases where adaptations were made and the production process, or a process of coming-into-being was extended through the life of the artefact to include modifications. The consistently different level of skill displayed by the secondary and tertiary makers acknowledges that the same level of knowledge, skill, practice or intention of outcome was not possessed by, or expected of, all who physically interacted with the objects. It is likely therefore that the artefacts underwent a categorical change as they passed beyond their primary phase and came into possession of a history of which their adaptation was part. The history was not masked during processes of adaptation or recycling and would have been both visible and tangible to those interacting with the ornaments. In some cases, geographical distance meant the original maker would not have seen how the artefact’s history progressed; however, the adapting

secondary or tertiary makers would always have been aware of the actions of the original maker as they interacted with the item. Several of the above examples show adaptation made with less skill or attention to detail than exhibited by the original maker. Deliberate prolongation of use life indicates not only respect for the object itself but also for its past and presumably for its maker and the effort involved in the making process. Implied is also an acknowledgement that the probably lesser-skilled repairer/adaptor either could not, or did not need to, replicate the quality achieved by the original maker and that the maker's product was to be respected or revered by ensuring its continuing use in an homage to quality.

Conclusion

In the brief examples given above, individual ornament-makers are identifiable in several different aspects of Neolithic ornamentation practices, including in cases where production areas have not been identified. Micro-scale intra-assemblage variations in production practices and techniques, as well as a long view of ornament biography, reveal different skill levels, expectations surrounding various processes and attitudes towards the life histories of some ornament types, including perhaps their death and reinvention (Joy, 2009). The above examples encompass different individuals either working towards a single goal, or within an environment of shared labour and group support in which the line between individual and collective action is blurred. Where a large group of ornaments used contemporaneously can be compared in detail, the actions of different makers are identifiable provided they had individual quirks in style, technique or expectation as at Yumuktepe. Furthermore, the different conceptualizations of a single artefact 'type' by those engaged in its production and the degree to which these variations could be considered a component of the same act are instructive in terms of how classification might be reconsidered by archaeologists.

The structured alteration of certain types of ornament, and the codified practices, in which different makers and often different locations were involved in the controlled evolving biographies of individual items, encompassed an implicit need for more than one maker, 'multiple authors' (Skeates, 1995, p. 296), and included expectations of different skill levels or types of practice at different stages of the process. Meanwhile, the unstructured adaptation of larger ornaments broken through long-term use shows the contrast in skill or effort between the original maker and the adaptor/ secondary maker, who was not part of a planned or predictable process. We also learn from these examples of decision making about items that were considered important enough to have their use-life extended. That this did not always involve continuation in use as an ornament suggests a set of values including history, ownership, identity or perceived properties of the materials or their uses that led to their active curation within the community. The importance of the aesthetic — typological — qualities of different ornaments is called into question by each of these examples, through both differing interpretations of processes and an apparent disregard for continuity of symmetry. Asymmetry, changed symmetry, mending of minor chips and breaks and obvious signs of surface wear in beads at Boncuklu and Suluin

all show that to accrue the levels of wear that have been documented, some items of hard stone were actively used for a considerable length of time.

In each of the above cases, artefacts have complex visible biographies, in terms of both their physical properties and their interactions with human makers and users as well as much more that the archaeological record does not allow us to see. These biographies are not well served by traditional static, reductive typologies. In the case of Yumuktepe, what might superficially be considered a single-bead type harbours physically measurable differences that document different approaches, thought processes, time use and possibly skill levels or experience. Through the carnelian ‘butterfly’ beads, the choices and adaptability of individual makers — who probably had a degree of experience in their production — can be approached, while in the adapted ‘butterfly’ beads, at least two different levels of skill or expertise, and sometimes more, were part of the apparently codified process. Rather than relating to apprenticeship, this is dependent on variables of both time and location. Within these examples, the question of knowledge transfer is tied to personal interpretation of a shared idea, as at Yumuktepe, and in some cases to temporally distinct activities by different people participating independently in different stages of the same process, each adding their own marks of skill and interpretation. Within this mixture of the personal and ephemeral, encompassing individual preferences and decisions, knowledge transfer is not uniform, and perception of norms is individualised within parameters of acceptability. This is likely true for most examples of Neolithic high-volume production of ornaments in which household or small-scale community-based making was the norm. Ideas of standardisation can be formulated according to this understanding of the individual within a group, accounting for scenarios which, of necessity, involve an artisanal identity that was, ‘idiosyncratic, culturally-specific and historically contingent’ (Costin, 1998, p. 7).

Using such examples as a basis for accepting the interpretation of idiosyncrasies and moving away from systemic thinking and the expectation of conformity across different examples would likely lead to changes in the path of interpretation, incorporating more personal dynamics and less generalisation of wider standardised systems. While these beads and bracelets might have been visual communicators, they were sensory objects that were touched and interacted with physically on multiple occasions both during and after production, and that had complex lives in different forms with different aesthetic and physical manifestations. Their long biographies encompass timespans over which, ‘...the sensory horizon of memory can be dispersed in the surroundings, drawing together objects and places and, of course, other bodies’ (Hamilakis, 2002, p. 124). Bringing the personal and dynamic to the forefront, would allow a final break with deterministic economic models inalienably linked to ideas of developing hierarchies (Hamilakis, 2002, pp. 121–122). A different perspective on comparable groups of items, particularly when temporally and spatially closely related, or a biographical viewpoint that situates the object within a timespan rather than a moment, can, as in these examples, radically change artefacts from objectively the same to quite distinct. Although extrapolation or generalisation might not be possible in most cases, individual people, who interacted with personal ornaments through the course of their lives, and the relative relationships between their ideas and experience, can have a valuable place in assemblage interpretation.

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Data Availability Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Declarations

Conflict of Interest The authors declare no competing interests.

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