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Toward a Comparative Analysis of the Facial and Bodily Representation of Anthropomorphic Artifacts

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How art and technology connect mind, body, and society is one of the key issues of the Out of Eurasia project. In order to investigate how people make things and things make people, it is necessary to undertake an integrative analysis of "art" as the technological aspect which extends human physical functions, along with the artistic aspect which manipulates people's minds by evoking symbolic meanings and engaging emotion. This project aims to elucidate the nature of the generation and transformation of "art" in the processes of the development of civilizations. Through comparative analysis of actual cases from the Japanese Archipelago, Mesoamerica, the Andes, and Oceania, we hope to examine how the two aspects of art are integrated through the body and how they are related to the transformation of society and culture. A comparative analysis of anthropomorphic artefacts is one of the core research projects, as they are a rich source of information about technology, identity, gender, and social structure. Mesoamerica and the Japanese Archipelago are two of the areas where the production of prehistoric anthropomorphic figurines was prominent. I briefly discuss similarities and differences between the Pre-Classic/Formative Mesoamerican figurines and the Jōmon figurines as a starting point for further comparative research.

Uno de los temas clave del proyecto "Fuera de Eurasia" es cómo el arte y la tecnología conectan la mente, el cuerpo y la sociedad. En la investigación de cómo las personas hacen cosas y las cosas hacen a las personas, es necesario emprender un análisis integrador del "arte" como el aspecto tecnológico que extiende las funciones físicas humanas, junto con el aspecto artístico que manipula la mente de las personas al evocar significados simbólicos y comprometer emoción. Este proyecto tiene como objetivo esclarecer la naturaleza de la generación y transformación del "arte" en el proceso del desarrollo de las civilizaciones. Mediante el análisis comparativo de casos reales del archipiélago japonés, Mesoamérica, los Andes y Oceanía, esperamos examinar cómo los dos aspectos del arte se integran a través del cuerpo y cómo se relacionan con la transformación de la sociedad y la cultura. Un análisis comparativo de los objetos antropomórficos es uno de los proyectos centrales de investigación, ya que son una rica fuente de información sobre tecnología, identidad, género y estructura social. Mesoamérica y el archipiélago japonés son dos de las áreas donde la producción de figurillas antropomorfas prehistóricas fue prominente. Discuto brevemente las similitudes y diferencias entre las figurillas mesoamericanas preclásicas / formativas y las figurillas de Jōmon como punto de partida para futuras investigaciones comparativas.

How art and technology connect mind, body, and society is one of the key issues of the "Out of Eurasia" project. The development of a sophisticated artistic style was among the ten archaeological criteria of civilization proposed by Vere Gordon Childe (1950). It sounds intuitively right when you think about a number of complex, state-level societies, such as the Old Kingdom of Egypt, the Shang Dynasty of China, or the Classic-period Maya. However, criteria concerning art are not common among more recent lists of the criteria of civilization, which refer instead to highly developed handicraft specialization (Adams, 1966; Kradin, 2006; Renfrew, 1972). While handicraft specialization certainly covers an important part of art/technology, the emotional, cognitive, and meaningful power of artifacts often fails to garner sufficient attention. The inseparable relationship between artifacts and humans has been actively debated in archaeology with theoretical concepts such as phenomenology, materiality, and entanglement (e.g., Hodder, 2012, Ingold, 2007, Thomas, 2006). In order to investigate how people make things and things make people, it is necessary to conduct an integrative analysis of "art" as the technological aspect that extends human physical functions, in addition to the artistic aspect that manipulates people's mind by evoking symbolic meanings and engaging emotion. Hereafter in this article, the word art is used to mean both aspects.

A distinction between art and technology has often been assumed in the analysis of material culture: Technology is for making useful tools, while art is for making beautiful or meaningful things. However, the English word "art" is derived from the Latin *ars*, which corresponds to the Greek *techne*, meaning skill or technology. This is not surprising as we surely feel beauty in even functional artifacts if they are produced with excellent skill, such as finely made bifacial spear points. Sophisticated skill is one of the factors which moves our mind, and you can recognize it not only by observing the process of production but also by looking at the products. Additionally, skill is acquired through practice which engages both body and mind.

The creation of visual symbolic images has often been considered as a typical example of art, being different from the production of functional tools. Nevertheless, it involves both physical and cognitive processes that have evolved as biological adaptation, as the visual symbolism seems to have derived from our ancestral capacity to attribute meanings to visual images, such as animal foot prints (Mithen, 1996b). In addition, creation of art usually involves the utilization of one or more materials, taken from the natural world, such as stone, clay, and metal. Thus, the production and appreciation of art are widely embedded in our body, mind, and the world around us.

This project aims to elucidate the nature of the generation and transformation of "art" in the processes of the development of civilizations. Through comparative analysis of actual cases from the Japanese Archipelago, Mesoamerica, the Andes and Oceania, we hope to examine how the two aspects of art are integrated through the body and how they are related to the transformation of society and culture.

Significance of Anthropomorphic Artifacts

A comparative analysis of anthropomorphic artifacts is one of our core research projects, as they are a rich source of information about technology, identity, gender, and social structure. "The human body has provided a model for conceptualizing and categorizing the organization of natural, social, and cosmic spaces" (Rice, 2019, p.5) .

Anthropomorphic things are generally appealing to us because they are at the nexus of two kinds of cognitive domains: Social and technical (Figure 6.1). Although there are significant disagreements on the definition and understanding of cognitive domains or modules, it is safe

to say that a number of innate domain-specific systems that have evolved in the course of human evolution are at the basis of our cognition and behavior (Hirschfeld Gelman, 1994; Mithen, 1996a). Social cognition is an essential domain which significantly evolved in the genus *Homo*. Social cognition consists of a number of skills including, but not limited to, recognition of social relationships and communication signals, such as facial expressions, and understanding other's intentions. Our brain has neural systems for such skills which are activated when we see people, and the same system may be engaged when we see anthropomorphic artifacts. At the same time, if you recognize that the figurine is an artifact, it also activates the domain for technological cognition: You recognize that the object was made by some other person, you can appreciate how well or poorly it was made, and you may be able to read the intention of the person who made it. If you were experienced in making figurines, you would be able to judge technical details from the observation of the item and may also sympathize with the bodily movements of the maker.

Thus, anthropomorphic artifacts have a unique potential as a research subject with multi-layered, complex meanings. And we may be able to further consider that production of certain kinds of figurines actually affected social cognition within the society.

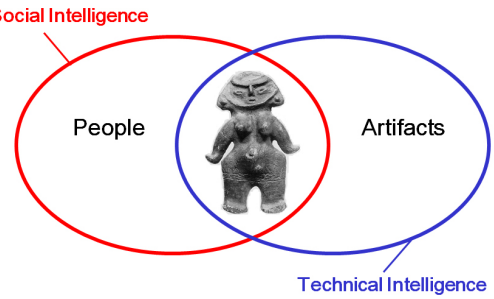
Comparative Analysis of Clay Figurines

Production of clay figurines is widely seen in early agricultural societies across the world, and traditionally dominant research perspectives have focused on their universal feature of femaleness (e.g., Gimbutas, 1991). That figurines tend to be found as fragments from domestic contexts has also attracted researchers' attention (Chapman 2000; Lesure, 2011). Comparative analysis of figurines focusing on their universal features has been criticized for its failure to properly interpret their representational and contextual diversity. We therefore need comparative research that focuses on that diversity, and how these figurines were integrated into the transformation of the world.

An important aspect of the anthropomorphic figurines is that their representation is not a carbon copy of reality. The creation of anthropomorphic figurines is one of the unique features of *Homo sapiens*. The earliest undisputed representation of human form is the Venus of Hohle Fels, which could date back to 40,000 years ago (Conard, 2009). The Lion Man figure of the Hohlenstein-Stadel is contemporary to, or even earlier than, the Hohle Fels figurine. It should be noted that neither of these earliest examples is a realistic representation of human form; the breasts, stomach and vulva are exaggerated, while the head and feet are minimized on the Hohle Fels figurine, and the Hohlenstein-Stadel example has a lion's head on a human body. It is fascinating that these early examples clearly deviate from actual human form. Human representations reflect the cognitive traits and schema of the person who makes them (see the chapter by Saito in this volume). Thus the features of anthropomorphic figurines can provide us with clues for understanding how humans recognize other humans.We therefore need a theoretical standard to interpret particular features of the figurines in order to go beyond arbitrary, ad hoc interpretation.

Figure 6.1.

Anthropomorphic artifact at the nexus of two cognitive domains.



Among many possible factors that cause the deviation from reality is the peak shift effect (Ramachandran & Hirstein, 1999). The concept of peak shift comes from a well-known principle in animal discrimination learning. If a rat is taught to discriminate a square from a rectangle and is rewarded for responding to the rectangle, it will soon learn to respond more frequently to the rectangle, and the rat's response soon becomes greater to rectangles that are longer than the original stimulus.

Selective accentuation of the female form—attributes that allow one to discriminate it from a male figure—can be more evocative and appealing than realistic representation, as "supernormal stimuli" "excite form areas in the brain more strongly than natural stimuli" (p. 39). Referring to the bronze figure of the Goddess Parvati as a caricature of the female form, Ramachandran and Hirstein argue that the artist has chosen to amplify the "very essence" of being feminine by moving the image even further along toward the feminine end of the female/male spectrum. They even suggests that this may be applied to the Palaeolithic Venus "fertility" figures.

In reality, the super-feminine type is not the majority among Jōmon figurines. Therefore the peak shift effect in terms of sexual features does not seem to provide a useful model for the comparative analysis of figurines. From an anthropological perspective, we need to be mindful that the concept of women/men or feminine/masculine varies across cultures. However, if we take the peak shift effect in wider sense, we notice other kinds of "selective accentuation" on figurines, such as extremely large eyes. We may be able to build a database of when and how such selective accentuation occurred in each region/period, and then analyze their correlation to socio-cultural factors.

Facial cognition is another candidate to inform our theoretical standard for comparing these very different datasets. Depiction of the face is important and a specific part of our brain is devoted to facial cognition; additionally, cognitive processing can be automatically activated when we see anything that looks like a face. It is not always easy to differentiate universal cognitive processes from culturally specific processes, but facial cognition is one of those processes that has been proven to be quite universal through numerous scientific studies conducted in the more than one hundred years since its first proposal by Charles Darwin (Darwin, 1872). Darwin's idea of universality in facial expression has been supported by many cases and examinations (Eibl-Eibesfeldt, 1970; Ekman, 1973).

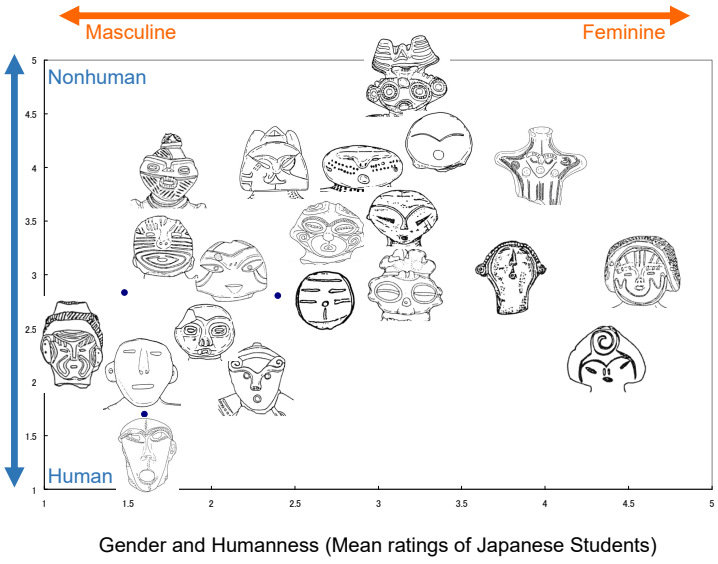
While the universality of facial cognition has been studied on actual human faces, little research has been done on the faces of anthropomorphic objects. Our experimental research showed that we see the faces of figurines as we see the faces of real people (Matsumoto & Kawabata, 2010). In our experiment, 30 drawings of the faces of Jōmon figurines were shown for 30 seconds each on a computer screen, and subjects were asked to rate six basic emotions (anger, surprise, fear, happiness, disgust and sadness) and five general impressions (including feminine/masculine and human/nonhuman) for each face. 32 Japanese students and 17 non-Japanese students took part in the experiment.

It is interesting that, although many figurines are recognized as representing women based on their bodily features, in terms of facial impression, most of them tend to be regarded as masculine except for a few cases. It also shows that the faces that don't look human cannot be gendered consistently. The results of masculine-feminine and human-nonhuman impressions were similar between Japanese students and non-Japanese students, indicating that gender identification and the rating of humanness can be more robust and cross-cultural universals compared with subtle emotion readings (Figure 6.2).

The results show that there are certain common perceptions of figurine faces, however unrealistic they are,

Figure 6.2.

The result of masculine-feminine and human-nonhuman impressions of the Jōmon figurine faces.



Note. Two samples on the far left and far right are taken from anthropomorphic burial jars of the Yayoi period, representing male and female respectively. Not all samples are shown on the graph due to space limitations. See Matsumoto and Kawabata (2010) for details.

based on our innate facial cognition system. Thus, although we cannot directly infer how Jōmon people perceived the figurine faces, we may be able to suggestthat some figurines activate the emotion reading process more than others. Such differences are likely to be related to the function and meaning of the figurines.

At the same time, the results make us more conscious and specific about the differences in perception between people of various cultural backgrounds. This is also an important aspect of this study in regard to understanding the nature of archaeological description and discussion in a globalized archaeology.

While culture-dependent variability is an essential aspect of human cognition, certain universality does exist. The cognition of facial features and reading emotions are known to be a relatively robust innate system which has a long evolutionary basis. Comparing the facial and bodily features of clay figurines will clarify if there is any universal nature in the context and background of their production. We can then investigate how differences in their representation are related to the construction of a particular niche or mind-matter interactive sphere in each region.

Comparing the Figurines from Mesoamerica and the Japanese Archipelago

Mesoamerica and the Japanese Archipelago are two of the areas where the production of prehistoric anthropomorphic figurines was prominent. There has been a long, rich history of research concerning the figurines of each area. Typological classification was dominant in the early stages in both areas, but various theoretical approaches have activated new research avenues for Mesoamerican figurines in recent years (e.g., Halperin et al., 2009; Joyce, 2003; Lesure 2011; Marcus, 2019; Rice, 2019). Their arguments on symbolism, agency, identity, practice, and gender provide us with a sound foundation

for our comparative analysis. Although they are widely different data sets in terms of chronology, social context, economic back ground, production techniques, and representation, a systematic comparison should provide us with many new insights about the meaning behind their similarities and differences.

Roughly speaking, figurines of both areas fit into the universal scheme that figurines appeared in village societies preceding the rise of cities and civilizations (Rice, 2019, p.6). In terms of dates, anthropomorphic clay figurines appeared much earlier in Japan. One of the earliest examples is from the Aidani-kumahara site in Shiga Prefecture and belongs to the latter half of the Incipient Jōmon period (Figure 6.3). The figurine was found from one of the large pit houses. AMS dating of carbon samples taken from the surface of pottery sherds found from the pit house indicates that the figurine dates to around 11,000 cal BC (Matsumuro & Shigeta, 2014). The number of Incipient Jōmon figurines is small with only one or two pieces from a single site. It should be noted that the figurines are found from settlement sites with pit house structures when the dominant life style of the period was foraging (Matsumoto, 2011). Figurines were made through the Jōmon period, but declined when wet rice cultivation spread in the following Yayoi period (800 BC–AD 250). In Mesoamerica, on the other hand, clay anthropomorphic figurines appear around 2500 BC and flourished in the Pre-Classic/Formative period (1500 BC–AD 250).

Figure 6.3.

Figurine from the Aidanikumahara site, Shiga Prefecture. Incipient Jōmon-Period (c. 11,000 cal BC).

Shiga Prefectural Archaeological Center. Photograph by Satoru Nakazono.

Although it is beyond my ability to grasp the details of all the Mesoamerican figurines, I conducted a tentative examination of similarities and differences between the Pre-Classic/Formative Mesoamerican figurines and the Jōmon figurines as a starting point for further comparative research.

Like many other examples of figurines throughout the world, the earliest examples from these two regions are small, solid figurines and many of them have female features such as breasts. Figurines from the Incipient Jōmon to the Early Jōmon Period (5000–3300 cal. BC) lack representation of heads, faces, arms, and legs. Representation of these features appear from the Middle Jōmon Period (3300–2400 cal. BC). The oldest Mesoamerican figurine (2300 ±110) from Zohapilco also lacks a head and arms, while another figurine found from an upper layer of the same site has eyes, a nose, and arms (Marcus, 2019). The torso-centric tendency seems to be common, although further examination of the materials is required. An interesting difference in the emergence process is that figurines appeared prior to pottery in Mesoamerica, while pottery precedes figurines by about 4000 years in Japan.

Larger, hollow figurines appear in later phases, while the production of solid figurines can be seen over an extended period in both areas, and stylistic variation in the representation of the face, body, hair, ornaments, and clothes increases in relation to increasing population size and developing social complexity. It is also common that a majority of the figurines are found scattered as fragments from domestic contexts, with some exceptional

cases buried whole. An interesting difference is the unique development of mold-made figurines and effigy musical instruments in Mesoamerica. In Japan, on the other hand, mold-made figurines appeared only in modern times, and anthropomorphic musical instruments are rare. Some hollow figurines with a stone or clay ball inside have been found and are considered to be bells, but they make only a soft sound. Difference in the representation of facial and bodily features is also intriguing. For example, representation of pupils is rare in Japan but popular in Mesoamerica. Eyes with pupils and eyes without them leave very different impressions on the viewer. In addition, Mesoamerican figurine faces look more realistic than those of the Jōmon figurines in general (Figure 6.4).

Figure 6.4.

An example of a highly stylized Jōmon figurine from the Hirohata shell midden, Ibaraki Prefecture. Latter phase of the Late Jōmon Period (c. 1300 cal BC). H.14.2cm. Okayama University Archaeologycal Museum. Photograph by author.

Prospects

Through archaeological, anthropological, and psychological analyses of the phenomenon by which the environment is humanized, and humans are artificialized through art, I hope to clarify the historical process by which unique social realities are formed. In addition to the anthropomorphic artifacts discussed here, pottery making, metal working, lacquer production, tattooing, and development of patterns and designs are to be investigated by our research group. In order to examine how culture is produced through the interaction of mind and matter, we need a perspective that places the focus on the human body and behavior. Avoiding both biological determinism and extreme cultural relativism, we strive to overcome the dualistic mind-body and mind-matter frameworks that have formed the basis of modern science. Through close transdisciplinary collaborations and the utilization of various technologies such as 3D modeling and XRF analysis, we will explore "art" as an extension of both body and mind in order to clarify how material culture exerts its force on us.

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