The Visual Perception of Deities from the Palaeolithic to the Present

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Faces of Gods

By

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Rudolf Simek and Sirpa Aalto

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In 2018, at the Saga Conference in Reykjavik, I suggested to long-term colleagues Sirpa Aalto and Rudolf Simek that we might investigate how religions, which had relevance for the Western World, conceptualized and represented their Gods visually. Both generously agreed to contribute their profound expertise to this book.

We were lucky to be joined also by clinical psychologist Uta Herzog, who proposed to explore possible psychological reasons for humans creating images of their deities.

Gabrielle Singleton's expert proof reading and valuable feedback ensured that grammar, spelling, and punctuation were correct.

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Peter Hupfauf

PREFACE

This book focuses on representations of deities from the past to the present in Europe. Historical/social aspects, in this case, are secondary. However, it is important to explain to which religion a god belongs, and where and how this faith emerged. This is why detailed information is examined and the results brought together within a comprehensible format. Religions discussed are that of the Upper Palaeolithic period and the proto-Indo-European; Vedic mythology; Judaism; the Cretan, Minoan, Mycenaean, Hellenic Greek, Etruscan, Roman, Celtic, and Germanic religions; Christianity and Islam; and the Sámi indigenous religion.

Here are investigated deities who were and are worshipped in Europe, even if a particular religion originated outside Europe. Of prime importance here is how the people of Europe and encircling areas visualised their deities. The oldest known religious figurines are from the Upper Palaeolithic period, the third and last subdivision of the Palaeolithic or Stone Age, approximately between 50,000 and 10,000 years ago.

It appears to be agreed that a proto-Indo-European religion introduced an appreciation of the divine into Europe. One of the initial sources may be the Vedic mythology.

The oldest depictions represent females and are now called Venus figurines. The majority of these date to the Gravettian period (26,000-21,000 BC). However, the Venus of Hohle Fels is about 35,000 years old.

Sumer had the earliest known state religion, in the third millennium BC. During the second millennium, organised religion emerged in urban civilisation.

Cretan civilisation flourished from 2800 to 1,100 BC. Poseidon is said to have been their main god; however, in Cretan art he was never depicted as resembling a human. Female figures, however, known as the ‘Great Mother’ have been unearthed. The Great Mother was worshipped continuously in Asia Minor from 7,000 BC until the fall of the Roman Empire.

The Hittite religion was practised from approximately 1,600 to 1,180 BC in the area which is now Turkey. Hittite deities were often depicted standing on the backs of their animals or may have been identifiable by their animal form.

The oldest Greek temples date back to 800 BC and were built to house images of the goddess Hera. According to Jones and Pennick, Hera's original cult image was at Samos a plank and at Argos a pillar. During the second millennium BC the early culture matured into the Mycenean civilisation. The Hellenic Greek religion spread widely due to colonisation and trade.

It is interesting that fragments of the poems by the classical Greek philosopher Xenophanes of Colophon (570-475 BC) state "if cattle and horses and lions had hands or could paint with their hands and create works such as men do . . . [they] also would depict the gods' shapes and make their bodies of such a sort as the form they themselves have".

Jews have been present in Greece since at least the fourth century BC. The oldest and the most characteristic Jewish group that has inhabited Greece are the Romaniotes.

The Etruscan civilisation emerged in about 800 BC in the area of today's Tuscany, Western Umbria, and Lazio. Its religious belief stems from the Iron Age Villanovan culture, with its influences from the mythology of ancient Greece and Phoenicia.

Celtic Paganism is a religious belief practised between 500 BC and 500 AD in Europe. Because the Celtic region was widespread, with varied geography, several differences between the deities in western and in eastern Europe (and in between) can be identified, though some loose structural similarities are recognisable. The Celtic pantheon also shows elements from Greco-Roman ethnography and epigraphy.

As Iceland officially became Christian in about 1000 AD, it would have taken at least a hundred years to convince all the population to adopt the new faith. In the 13th century the poetic Edda, a collection of much earlier oral literature, was written down and, together with the 13th century's prose Edda by Snorri Sturluson, is a main source of information regarding Old Norse mythology.

Gaius Julius Caesar (100-44 BC) was a Roman politician and general and played an important role in the fall of the Roman republic and the rise of the Roman Empire. Caesar's nephew Augustus became the first Emperor of Rome, ruling from 27 BC to 14 AD. Rome's pantheon was largely adopted from that of Greece, because of the presence of Greeks on the Italian peninsula. However, its religion also included the ancestral ethnic religion of the region. A significant influence in the Roman religion also came from the Etruscans.

The military leader and politician Gnaeus Pompeius Magnus (106-48 BC) established the Roman province of Syria and conquered Jerusalem in 63 BC. Under Julius Caesar, Judaism became officially recognised as a legal religion. A Jewish community is recorded to have existed in Rome at least since the 1st century BC. At the commencement of the reign of Augustus there were over 7,000 Jews in Rome. At around 130 AD Christianity developed from Second Temple Judaism and in 313 AD Constantine and Licinius issued the 'Edict of Milan' giving official recognition to Christianity as a legal religion. In 380 AD, Christianity became the state religion of the Roman Empire.

Islam is believed to have originated during the 7th century AD in Mecca in Saudi Arabia. Like Christianity, Islam derived from Judaism. Judaism, Christianity, and Islam share a common origin in the Middle East through Abraham, the common patriarch of the three Abrahamic religions. In the 8th century AD the Umayyad Islamic caliphate reached from Iberia (today's Spain) in the west to the Indus River in the east. Cordoba became the capital of the caliphate. A civil war between the descendants of the last caliph, Hisham II, led to the disintegration of the caliphate in 1031 AD.

Judaism, Christianity, and Islam are still practised in Europe and elsewhere today, and contemporary images of the Christian god are to be seen. However, in Islam, images other than ornaments are not allowed to be created and Allah is represented in the form of calligraphy. Similarly, in Judaism Yahweh is not visualised, being regarded as an unimaginable being.

Finnish indigenous religion has many similarities to those from neighbouring cultures such as the Germanic, Norse, and Baltic. However, due to the Uralic and Finnic culture, distinct differences also are recognisable.

Like most Arctic and Subarctic culture complexes, Sámi spirituality was traditionally natural and shamanic. The forces of nature were the deities and spirits that ruled every important aspect of nature and of Sámi lives. Animals, plants, and even inanimate objects had a soul. Offerings and sacrifices were made at holy natural or human-built sites in the land. Through a type of singsong chant called the joik, Sámi conveyed legends and expressed their spirituality.

Time line

Venus figurines	29000 BC	Venus figurines are Upper Paleolithic statuettes portraying women.
Indus Valley Culture	7000 BC	Between 1500 BC and c.500 BC the Vedic period emerged.
Sumerians	4500 BC	By 1800 BC the Sumerians were eventually absorbed into the Akkadian (Assyro-Babylonian) population.
Cretans	2800 BC	The Minoan civilisation was an Aegean Bronze Age civilisation on the island of Crete and other Aegean islands between 2600 to 1100 BC. It preceded the Mycenaean civilisation.
Assyrians	2500 BC	A civilisation in Mesopopotania, today's Iraq, Iran, Syria.
Canaanites	2000 BC	The state of Canaan fell apart in 1300 BC when Israel emerged.
Germanic Peoples	2000 BC	Germania was the Roman term for the geographical region in north-central Europe inhabited mainly by Germanic peoples.
Babylonians	1900 BC	A kingdom in Mesopopotania from the 18th to 6th centuries BC.
Vedic Indians	1500 BC	Between 1500 BC and c.500 BC the Vedic period emerged at the Indus Valley.
Hebrews	1300 BC	Israel emerged in the last decades of the 13th century BC, when the structure of the Canaanite state fell apart.
Greeks	1200 BC	In about 1200 BC the Dorians invaded Mycenaean land and occupied all of the peninsula, except Attica.
Etruscans	800 BC	Etruscan culture emerged in the beginning of the 8th century BC. By the beginning of the 1st century BC, Rome had annexed all Etruscan territory.
Celts	700 BC	Celtic lands ranged north of the Alps from Britain in the west to Asia Minor in the east. The northern border reached today's Holland, north Germany, and Poland. In the south Celts settled in north Italy. In about 50 AD the Romans conquered Celtic continental Europe.
Romans	500 BC	In about 625 BC only a few wattle and daub huts existed where Rome would later be built. The Western Roman Empire fell in 476 AD.
Christians	50 AD	Christianity developed from Judaism in Judea and began in the middle of the 1st century AD after the destruction of the Second Temple in Jerusalem.
Muslims	600 AD	Mohamed (c.570 – 632 AD), the founder of Islam was born in Mecca.
Sámi cultures	8000 BC	A European indigenious culture still inhabiting arctic and subartic regions.

INTRODUCTION

WHY DOES GOD NEED REPRESENTATION?

UTA HERZOG

This question is, of course, tongue-in-cheek. It should read the other way around: "Why do humans need a representation of God?"

The chapters of the book you are about to read aim at providing an overview of the way the divine was represented by the various cultures which influenced religion in the European region. There is considerable variation in formal aspects of these representations such as level of abstraction, embellishment, stylization, ornament, inclusion of symbols, etc. But no matter what the shape is, the divine is deliberately crafted to be materially manifest. We have to assume that there is a profound need in humans to create such representations.

In this introduction I will discuss this need from a psychological perspective. The term "divine" will be used broadly to apply to any deities or supernatural entities. My discussion will largely sidestep the relationship between humans and the divine itself - a vast topic - and I will primarily focus on the role and function of its material representation. For this purpose I first review some of the salient aspects of both the physical and the functional aspects of thinking and "sense-making". I will then consider interactional and social aspects.

Since the second half of the twentieth century psychology has matured as a science as positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) enabled direct observation of neurological processes within living human brains. As a consequence many traditional theories are now being re-examined while new findings are inspiring paradigmatic shifts. The evolution of artificial intelligence (AI) has further provided new impulses for ongoing study. High quality research is now proliferating despite the considerable cost of the new technologies. As much as possible I will draw on such research in the following discussion. Caution is, of course, required in extrapolating research on contemporary

humans to the functioning of our distant ancestors. But psychology has established that we share considerable functionality with primates and other species (rats have traditionally been popular in psychological research as they are intelligent and social). Nevertheless, drawing conclusions will unavoidably be speculative to some extent.

For me, as a clinical psychologist and sometime academic, one thing has been self-evident: the need to make sense of the world, and what happens in it, has always been a central and a powerful motivator for humans. My central assumption in this introduction is that external representations of the divine somehow meet this need.

The Biological Basis

Human "sense-making" needs to translate the external world into useful data for ongoing use. The processes involved are complex and simplification is not always possible.

Broadly, "the equipment" with which we experience the world consists of neurons (nerve cells), their bundled pathways (nerves), and the projection areas of the cerebral cortex (the relatively thin surface of the brain). Neurons relay information through both electrical impulses and chemical transmission. Within the brain a number of internal structures have regulatory and feedback functions, and pathways known as "white matter" cross-connect various cortical areas like information highways.

Functionally the "equipment" is divided into the domains of sensation, perception - both often combined as "sensory perception" - and cognition. The ability to structure and organize sensory and perceptive information is built into our nervous system from birth - possibly before - but practice and learning are essential to optimize these abilities and evolve mature thinking or "cognitive processing".

So what exactly happens to the data, how are they picked up, transported and used? I will here use visual perception - the act of seeing - as an example of how sensory perception works in general.

Seeing begins when light strikes the eye. The light's intensity is controlled through the pupil's narrowing or widening and the image is focused by the flexible lens, which bundles the light, inverts the image, and projects it on to the retina at the back of the eye. In the retina a number of specialized receptor cells convert light into nerve impulses. The impulses are collated

by other specialized cells and sent on through the optic nerve to arrive eventually in the visual cortex, a dedicated area at the back of the brain. This is a typical "bottom-up" sensory process. But even this seemingly straightforward operation is beset by complexity from the very beginning.

As soon as the visual system is stimulated something common to all perceptual processes occurs: some data are excluded, while other data are selected. That principle affects all aspects and levels of sensory perception. Human vision is sensitive to only a narrow bandwidth of the electromagnetic wave spectrum. And as soon as light is projected on to the retina 6 different types of cells - some with several functions, some with functional sub-categories - refine the data (for a concise summary see Khan *et al.*, 2011).

As the "data" are relayed to the cortex some details - e.g. colour, orientation, direction - are encoded and meaningfully associated with each other. And as soon as impulses arrive in the visual cortex they are optimized towards potential action (James & Bose, 2011).

But the information does not travel in just one direction. Neuronal "tracks" connect sideways and are impacted by associated pathways and feedback loops (Craighero *et al.*, 1999). The end product is a filtered and assembled "percept", a unit extracted and abstracted from a multitude of stimuli. It arrives ready to be utilized in the vast and complex machinations of the thinking processes we call cognition.

Initially it was assumed that perception and cognition are organized in a hierarchical fashion. Metaphorically we may think of the roots of a plant, which absorb water and nutrients and carry these to the end of stems - so that the flowers of reason may blossom. But the reality is a lot more complex.

While perceptual information is filtered and refined on its way "up" to the cortex, it is also impacted by "top-down" processes. This term refers to multiple interactions of messages which originate not just from different function-specific areas of the cortex, but also from the frontal "thinking" part of the brain, which houses previous learning, expectations, context, and so on.

A very basic example of top-down processing is the impulse to see something, prompted by an unexpected sound, which is registered by another sense-organ, the ear. The sound results in an orienting response: body, head, and eyes turn towards the source of it. The eyes' lenses adjust

focus for clarity based on information concerning the estimated distance of the object. The object or event is then "perceived".

But even without any intent or orienting, the visual system creates top-down guiding priciples: it maintains colour under different light conditions (a factor often confounding novice photographers), creates depth perception (which is entirely constructed), and enables the deciphering of words from fragmented or partially obscured text, to name just some examples. There is an array of factors involved in top-down processing, including the intriguing and much debated Gestalt principles, which, in the broadest sense, assist with perceiving unified shapes.

Many top-down factors guiding visual perception are shaped by experience and history, as well as cultural influences. The way an individual sees an object is therefore unique and different from any other individual's. The brain "constructs our perception of the world not necessarily in accordance with the physical stimulation, but rather as it infers things to be intrinsically" (Schlegel *et al.*, 2015, p. 441). But, whatever the complexities, sensory perception ultimately provides data which can be utilized in cognitive processing.

Cognitive processing is a term encompassing many activities within the brain. The psychology of cognition is a vast, complex, and often controversial, field of inquiry. I will attempt to distil some of the aspects which I consider relevant for this introduction, although there are limits to condensing even the focal issues.

Functional Components

The term cognition is derived from the Latin word "cognoscere" - to learn, recognize, know - and is used by psychologists to refer to a number of mental processes, such as attending, learning, remembering, reasoning, decision making, problem solving, etc. What these processes have in common is that they are assumed to occur exclusively within the brain.

For cognitive processes to happen in a sense-making fashion the outside world must be conveyed to inside representations, and these need to be ordered and arranged to be of use.

The organization of internal representations is assumed to take place in the form of "concepts" or "schemata". A concept is "a word or idea that represents a class of objects or events" (Coon, 1986, p. 262) while a schema

is defined as "any broad organizing principle for making sense of one's life experiences" (Young *et al.*, 2003, p. 7). Both definitions imply an integration of detail, and a hierarchical structuring of this detail, to enable efficient storage within a single signifier. This capacity is widely regarded as "one of the hallmarks of human cognition. In many domains - including language, music, problem solving, action-sequencing, and spatial navigation - humans organize basic elements into higher-order groupings and structures" (Martins *et al*., 2014, p. 300).

As concepts and schemata are acquired through exploration and learning, their complexity increases. Detail is subsumed, cross-connected, and categorized. Specific features indicating similarity are grouped, differences delineate clusters of attributes from those of other concepts or schemata. Hierarchical organization of units into groups, or classes, results in higher order ("meta") concepts/schemata.

The Outer World becomes an Elaborate Inner World

By internally representing the outside world we are liberated from it. We can manipulate it inside our brains. We can anticipate, simulate, speculate, hypothesize, theorize, examine, question, and dream. We can take this inner world apart and re-assemble it without lifting a finger. Within the dark cavern of each human skull a whole universe can be created (or, for some contemporary physicists, an infinite number of universes). Importantly, internal representations do not need to be matched by outside reality. Last, but not least we can impose the products of these inner activities on to the real world.

For most of its existence the discipline of psychology had firmly assumed that the journey from body to brain transforms information from concrete (sensory) to abstract (symbolic or semantic) and that cognition consists of rational, logical, and ordered symbolic processes, disconnected from sensory, motoric, and emotional signals.

But humans seem to persist with irrational and illogical ways of acting and thinking. Over many decades therapists have struggled to return their patients to a state of reason, often with limited success. However, it was not the frustration of clinical outcomes but neurological research which has led to a significant re-appraisal of cognition in recent years. It is now becoming increasingly evident that thinking is much more than some kind of tidy symbol-arranging inside the brain.

Embodied (or Grounded) Cognition

Thanks to the new technologies a wealth of recent research has demonstrated that sensory and motoric areas of the brain are inter- and cross-connected during different mental activities, and that much of language processing is accompanied by such interactive neural firing patterns (for a review see Gjelsvik *et al.*, 2018). As well, the work of Damasio and associates, and others (reviewed by Nieto *et al.*, 2009), has demonstrated the importance of emotional involvement for rational decision making. Some results are intriguingly "irrational": carrying a weighted backpack changes estimated distance (Proffitt *et al.*, 2003), smelling something unpleasant results in more severe moral judgements (Schnall *et al.,* 2008), ingesting a food supplement affects charitable donating (Steenbergen *et al.*, 2015).

As neurological activity maps (e.g. Jouen *et al.*, 2018; Oosterwijk *et al.*, 2012) demonstrate, the coupling of cognitive processes with emotional, sensory, and motor signalling extends to the highest levels of thinking, previously regarded as abstracted.

A new, integrative, paradigm of cognition and cognitive processing is emerging (Lindquist *et al.*, 2012; Pessoa, 2008). Theories of "embodied" or "grounded" cognition postulate that thinking is not just closely associated with sensing, feeling, and acting, but that such interactions are essential for the effective functioning of thought processes (Wilson & Foglia, 2017).

Internal representations are therefore not static imprints of "facts", but are responsive to incoming motor-sensory and emotional information (Markman & Dietrich, 2000) as well as internal impulses. Cognition is an "open system" (von Bertalanffy, 1968). The implication is therefore that internal representations are functionally adaptive - but at the cost of being unstable.

Grounding of cognition has been demonstrated to be extensive, and there are some claims that it is all-encompassing. But it is more likely that a dual - abstracted and embodied - system exists (Jouen *et al.*, 2018; Sakreida *et al.*, 2013).

There is no doubt that abstract reasoning has benefitted humanity by enabling rigorous scientific reasoning, astonishing feats of engineering and architecture, and advanced understanding of natural events and phenomena.

But there may be a downside. Gjelsvik *et al.* (2018), in an extensive review of research literature, demonstrated that persistent abstracted thinking states are frequently associated with pathology, and that therapeutic interventions which facilitate experiential "grounding" are clinically effective in counteracting such pathology.

Similar to that of other creatures the human brain has evolved to assess and integrate incoming data continuously to optimize survival and thriving. Over-activity in abstracted thinking, which takes attention away from embodied cues, may result in a state of imbalance - or even "secondary sensory deprivation"- causing distress. If that were the case then creating or viewing a tangible representation of the abstraction may have a recalibrating effect.

At this point I would like to engage in some speculation. What kind of early abstractions are likely to have occurred during the evolution of humans? One of the earliest abstract concepts is likely to have been that of "time".

Time can be inferred only from observed events - movement of shadows, day and night rhythm, change of seasons, the process of ageing, etc. And yet, for many humans it would have been vital to adjust to the passage of time, as the environment changed between lean and abundant, testing and benign. With changes in seasons food sources appeared or disappeared, and weather became challenging or agreeable. The notion of time would have afforded humans a degree of control over their environment by enabling them to predict and prepare.

Naturally humans would have read the changes occurring in nature and used environmental cues to anchor their planning and decision-making. Nomadic peoples continue to do so. But once humans became sedentary with the arrival of agricultural practices - and their associated benefits and costs - getting the timing right for sowing, planting, and harvesting became essential. The passage of such a long time as a year requires multimodal deduction from experiential data. And, to complicate matters, human working memory, "the sketchpad of conscious thought" (Miller *et al.,* 2018, p. 463), has comparatively narrow capacity (Cowan, 2014). There is a finite number of "chunks" which can be stored, and the length of time they can be held is limited, despite - or, perhaps, because - working memory operates with extensive links to various cortical areas (Lara & Wallis, 2015). Creating an external representation for not only the passage of time but the rhythm of seasons would therefore have been immensely

valuable to ensure not just surviving but thriving. The exalted position of early calendric devices in various cultures is evident in their being carefully crafted with considerable time, effort, and valuable materials.

Cognitive Dissonance and the Construct of the Divine

Similar to "time", the divine is, from a cognitive point of view, another complex abstraction, a derived construct. But how were humans motivated to arrive at such a deduction? While there is some speculation on the adaptive function of superstitious beliefs (Crăciun, 2018) Festinger's theory of cognitive dissonance (1957) offers a more reliable explanation. The theory postulates that an internal state of dissonance is created when cognitions contradict each other. Such a state is regarded as a powerful motivator to reduce resulting discomfort by adjusting thinking and/or acting. Evidence for this theory has been substantial, including recent neurological findings (van Veen *et al.*, 2009; Harmon-Jones *et al.;* 2015, Gray *et al.*, 2013). The brain is primarily a problem-solving organ and, as such, appears not to tolerate an unsolved problem well. There are several effective strategies for reducing the discomfort of dissonance and one of them is to develop an over-arching meta-concept capable of accommodating conflicting data. If that can be achieved even contradictory information makes sense.

No matter how skilled humans became at foreseeing events, there always was - and still is - the unknown. Earthquakes, volcanic eruptions, asteroids, unseasonal events, previously unknown illnesses, all defied predictive powers and endangered survival on many occasions during human history. The urge to make sense of, to predict, somehow to control, these threats would have been considerable. Survival depended on it - and still does.

The assumption that higher powers were at work - which they were - would appear logical and natural. But the deified conceptualisation of such powers needed to match the known world which early humans inhabited. This world is assumed to have been deeply embodied and primarily relational (Halton, 2014) involving other humans, creatures, plants, the landscape, and celestial objects, all of which were encountered at a sensory level and were often relevant to survival. As with the concept of time, humans required an abstract construct to make sense of their experiential data. But in this case the construct needed to accommodate conflicting information as well as fit a relational world view, in which interaction and contact were central. I will discuss this aspect in more detail below but

first I will summarize the noteworthy features of cognition established so far:

1) cognition encompasses a range of internal processes which, neurologically, are interlinked and cross-referenced with motoric, sensory, and emotional data.
2) cognitive constructs are flexible, open to new information, and therefore intrinsically unstable, as well as idiosyncratic.
3) functional cognition appears to be associated with sensory, motoric, and emotional grounding which may also facilitate a state of internal equilibrium.
4) short term memory is limited in volume and length of time
5) persistent abstraction may challenge internal equilibrium and create discomfort.
6) conflicting information creates discomfort.

Primacy of Social Connectedness and Interaction

Now I would like to turn to another consideration relevant for this discussion: the need of humans to relate, interact, and communicate with each other. Humans are social creatures. We never had the fangs, claws, or speed to make it alone in the wild. Our survival has always depended on co-operation with others, and we have evolved accordingly.

While Spitz was not the first to study the issue, his observation (1945, 1946), that persistent emotional neglect of infants leads to significant physical and psychological retardation and even death, inspired widespread research. His findings made it clear that social contact is fundamental to survival, a view subsequently cemented by further investigations.

The ability of an infant to survive is not simply reliant on signalling distress and activating care provision through crying. It is equally supported through establishing and maintaining close contact with adults.

Research has shown that newborns display a preference for faces and face-like arrangements, despite their largely immature cortical connections (Johnson, 2005). Young babies become uncomfortable with "still" (un-animated) faces (Sravish *et al*., 2013). At about 4 months of age infants can track the gaze of others (Johnson *et al*., 2005), from 6 months they show preference for adults who help others (Hamlin *et al.,* 2007), and one-year-olds can infer intent from observation (Falck-Ytter *et al*., 2007). From the very start of life humans are alert to the presence and actions of others,

and as we grow and develop the quality of interaction we experience shapes who we are.

Bowlby's (1969) attachment theory postulates that humans possess an innate behavioural system primed to elicit care-giving behaviour, and that feedback from caregivers gradually builds an inner "working model" of how to relate to others. Over time this model shapes an individual's "attachment style".

Four such styles have been delineated (Ainsworth *et al.*, 1978), with only one - secure attachment - regarded as functional. Significant aberration or disruption from this functional model is causally associated with a range of physical, psychological, and interpersonal problems (Bosmans, 2016; Junewitz & Billick, 2018). As children mature social isolation, rejection, and ostracism engender adverse states such as depression (Allen & Badcock, 2003) and physical aggression (Twenge *et al*., 2001), while adequate social connectedness is associated with wellbeing (Arslan, 2018). These behavioural findings have been matched by recent studies in neuroscience which demonstrate that numerous interconnected brain structures prime humans for social interaction.

The discovery of "mirror neurons", first in primates and later in humans (di Pellegrino *et al.*, 1992; Gallese *et al.*, 1996; Rizzolatti *et al.*, 1996) revolutionized the understanding of interpersonal and social functioning and inspired a flurry of research activity (see reviews by Cook *et al.*, 2012 and Rizzolatti & Sinigaglia, 2016). "Mirror neurons are a distinct class of neurons that discharge both when individuals perform a given motor act and when individuals observe another person performing a motor act with a similar goal... they may provide a route to knowledge of others" (Rizzolatti & Sinigaglia, 2016, p. 757) which the authors term "an understanding from the inside" (*ibid.*, p. 763). Such an understanding enables not just empathic responses which strengthen bonds and cultivate allies, it also facilitates predictive reasoning, thereby empowering individuals to be pro-active, especially in a self-protective manner. Mirror neurons are not only widely distributed in cortical areas, they are cross-connected, forming an integrated system (Molenberghs et *al.*, 2012).

From the moment of birth the world of humans is a world of "others". Interaction is needed for survival and the capacity for it is hardwired (Simpson *et al.*, 2014). Consistent with Bowlby's (1969) theory recent evidence substantiates the formative role of interaction in shaping innate ability (Del Giudice *et al.*, 2009; Cook *et al.*, 2014). In their ‘‘Interactive

Brain Hypothesis'' Di Paolo and De Jaegher (2012) postulate that interactive experience and skills enable the development of social brain functions in an analogous manner.

In an extensive review of findings Hari *et al.*, (2015) hypothesize that social interaction may be not only of central but of primary relevance to human brain function, a position consistent with Dunbar's (2007) social brain hypothesis.

The evidence demonstrates that the human brain is neurologically primed to process information within a relational framework.

Anthropomorphization

Anthropologists have long speculated that our species conceptualized the world as a system of relationships (e.g. Mithen, 1996). It is hardly surprising, therefore, that non-human organisms and inanimate objects are integrated into that world-view and are often regarded as possessing human capacities - such as emotions, intent, rational thinking, self-reflection, etc. This phenomenon, referred to as anthropomorphism, is common (Serpell, 2003), should be regarded as grounded in interaction (Airenti, 2018), and is likely to be a functional extension of human mirroring (Gazzola *et al.*, 2007).

We implicitly assume that a presumed "other" can be related to in ways appropriate to humans. The "other" is assumed to observe, evaluate, and judge us, act and feel in certain ways towards us, and may also be held responsible for its actions (Waytz *et al*., 2014).

There is considerable evidence that anthropomorphization changes the way humans behave: individuals automatically align their behaviour to fit with the ascribed personality of anthropomorphized animals (Chartrand *et al.*, 2008), users of machines with a human-like interface feel less stressed (Luczak *et al.*, 2003), more engaged (Kiesler *et al.*, 2008), and find them easier to use (Iwata *et al.*, 1999). Consistent with this, anthropomorphization has been shown to enhance motivation (Tan, 2014) which is in line with the assumption that the mirror neuron system at least partially meets a need for control ("effectance motivation") (Epley *et al.*, 2007, Waytz *et al.*, 2010 a). Anthropomorphizing appears to have a range of functions: making sense of uncertain environments (Waytz *et al*., 2010a), gaining a sense of mastery (Tan, 2014), enhancing co-operativeness (Haley & Fessler, 2005), and facilitating social connectedness (Waytz *et al.*, 2010b,

Epley *et al.*, 2007).

Relating is central to human experience. Consequently, any hypothesized supernatural power needs to be anthropomorphized at least to some degree, so a relationship can be established and nurtured. A purely internal conceptualization of the supernatural encompasses a range of experiential data, and these may at times be conflicting. The resulting cognitive load taxes both working and long-term memory, and induces complex internal feedback and cross-referencing processes. If abstracted only, such a conceptualization may over time produce ongoing discomfort. "Anchoring" through external representation on the other hand provides stabilization, while representing the "other". It is therefore hardly surprising that humans used the creatures and features they encountered in their environment to ground such hypothetical constructs as "divine powers".

Early hunters and gatherers appear to have relied on naturally occurring representations, perhaps imbuing animals with additional powers or detecting being-like features in natural formations. As Aalto outlines in Chapter 14, the Sámi people traditionally referred to a range of environmental cues in attributing spirit. We know also that members of the oldest surviving civilization - traditional Indigenous Australians - associate spiritual "ancestor beings" with animals, geological features, and sometimes celestial bodies (Mithen, 1996).

But at some stage humans discovered that they could produce external representations.

The Significance of External Representations

The term "external representation" (ER) is defined here as a deliberate material construct which signifies a mental object or process. ERs can encompass a range of manifestations, including symbols, written words, diagrams, pictures, models, and artefacts. More contemporary forms are films and digital simulations. ERs can be singular and simple, or assembled and complex, with varying levels of possible interactivity.

It appears that the earliest ER - markings on a 30cm bone fragment from a large mammal found near Bilzingsleben in Germany - dates back at least 280,000, perhaps even 400,000, years (Schwarcz, 2007). The rhythmically jagged parallel lines are regarded as intentional engravings and are possibly the earliest *objects d'art* (Haidle & Pawlik, 2010). While no one

can know what these lines signify, they may be the earliest known example of external encoding.

The majority of early ERs have, however, been dated to around 30,000 to 40,000 years ago (Renfrew, 2008). There has been some speculation that the widespread use of ERs from that time onwards enabled humans to potentiate their thinking processes and radically altered the way our species progressed (Mithen, 1996).

Indeed, contemporary researchers specializing in cognitive processing concur that ERs have a significant impact on cognitive processes as they function like brain extensions, which can be directly used for thinking, even eliminating the need for internal representation (Zhang & Wang, 2009). Through the creation and utilization of ERs the brain is no longer confined to interacting with itself and its internal representations of the world.

Consider this straightforward example: the multiplication of 7658 x 3142. This operation is, of course, possible to perform mentally. But it requires considerable time, effort, concentration, and memory storage. It is much more efficient to record the required operations on a piece of paper.

So what is different when pen and paper are used in this instance? Basically, short term memory is minimally taxed, while concentration and attention are enhanced. In addition the required operations are visible in a structured and ordered format. And in the context of the above account of grounded cognition, the writing of numbers at every step anchors thoughts both on a sensory (visual) and motoric (hand movements) level. But most importantly thinking itself is changed from a purely internal process to an internal-and-external interaction.

The effects of ERs have been predominantly investigated in education and educational psychology where the exploration of their differential benefits to teaching has a long-standing tradition (Cook, 2012; Schonborn, 2010). A comparative paucity of research seems apparent in psychology which is somewhat surprising as ERs are considered as valuable, if not essential, tools for thinking and learning.

Tool use itself has also been demonstrated to change not only cognitive processes but also the way the body is internally represented (for a review see Maravita & Iriki, 2004). Tool use, especially expert tool use, changes the way actions are carried out mentally as well as physically (Baber *et al*., 2014). External objects, like artificial limbs, can become "embodied" in

that they are experienced as an extension of the body (Schettler *et al*., 2019), a phenomenon which highlights the capacity of humans to integrate external material reality into an internal sense of self.

Similarly, ERs as tools for thinking can modify neurological pathways. Schlegel *et al.*, (2015) established that 3 months of art training changed the neural processing of perception and action, and resulted in reorganization of prefrontal white matter. The prefrontal cortex is associated with many complex behaviours involving goal setting and planning as well as imagining future events. ERs like symbols are widely used to convey information and guide behaviour (McDougall *et al*., 1999), and diagrams are helpful in a variety of mental processes (Heiser, 2004). ERs not only substantially affect and enhance thinking and problem solving (Zhang, 1997; Zhang & Wang, 2009; Múñez *et al.*, 2013), they are regarded as essential for some cognitive processes, as they potentiate the thinking process to "allow us to think the previously unthinkable" (Kirsh, 2010, p. 441).

Intriguing perspectives have also emerged from the exploration of model-building with interactive technology in scientific endeavours. Despite being contemporary, research in this area allows for extrapolation on general principles of the relationship between mind and model. Chandrasekharan & Nersessian (2015) conclude that repeated interaction with an ER gives rise to a coupling with mental processes by creating an "external imagination" (p. 34). This coupling "changes what is available to the mind and what it can do with it" (p. 39). The internal processing becomes an interaction with the external representation of the internal processing, which in turn allows for an awareness - not just of both "parties" to that interaction, but of the interaction itself.

As tool use expands the action space, ERs expand the imagination space and thereby facilitate innovation. Architects assemble models of buildings, biologists create diagrams, physicists construct formulas: in creating ERs to represent their thinking, these professionals can inspect, evaluate, and modify the product of their cognitive labours, fine-tuning and optimizing the outcome.

In summary, the wide-ranging function of ERs on an individual level are as follows:

1) reduction of work load on short, working, and long-term memory
2) provision of perceptual structure and stability

3) grounding of abstracted cognition on a sensory and motoric level
4) facilitation of reflective examination of the mental construct.

The Interactional Impact of a Divine Representation

Let me now integrate the main aspects discussed above and speculate how the creation of an ER of the divine can impact at an individual, interactive, and social level. As a vehicle I will use a - somewhat naïve - hypothetical journey back in time through a few thousand years:

One day, as I am exploring territory close to my shelter I may chance upon a curiously shaped rock which I perceive to resemble a person. It is the right size to carry, and if the person matters to me I may take it back to shelter so I can work the rock to increase likeness. As I chip away, I reflect on details of the original and compare this with the rock's emerging shape. My attention moves from one to the other while, at the same time, I appraise the effectiveness of my tool use and the rock's material qualities. This ongoing working and reflecting creates a feedback system which regulates what I perceive, think, and do.

If I believe that the shape of the rock resembles my concept of the divine - perhaps even that the rock's original shape was due to the divine inhabiting it - I may conclude that the entity reveals itself as I work the rock. Through my work I enter a relationship with it, and my interaction with it may - to my mind - uncover the nature of this relationship.

There is a famous quote attributed to the Renaissance sculptor Michelangelo Buonarotti: "In every block of marble I see a statue as plain as though it stood before me, shaped and perfect in attitude and action. I have only to hew away the rough walls that imprison the lovely apparition to reveal it to the other eyes as mine see it."[1]

Regardless of whether the artist actually uttered these words, the statement fittingly highlights the conceptualization of not just the creative process but the reflective engagement with an ER.

Let's return to my hypothetical rock-sculpture. Due to my disposition to anthropomorphize when I first encountered the original rock, and especially once I complete the figure, it is not just a representation but a material "other" to me. It satisfies my need to have manifest evidence for

[1] https://www.michelangelo-gallery.com/michelangelo-quotes.aspx

my "hypothesis" of a supernatural power, and becomes the carrier of the various qualities which I believe the deity possesses. It also provides me with a relational "other" with whom I can - at least in my mind - communicate. There is good evidence that lonely individuals tend to anthropomorphize more, and thus the presence of a human-like object may have a soothing and reassuring effect (Epley *et al.*, 2008; Feng, 2016; Letheren *et al.*, 2016).

Unsurprisingly, representations of the divine often resemble humans and are at times organized in dynastic family structures, particularly evident in the case of Roman and Greek deities (Hupfauf, Chapters 7 & 9). Even the Germanic, formally basic and stylized, god- representations appear just as fit for the purpose (Simek, Chapter 11). Humans do not need a lot of sophisticated detail to anthropomorphize an object.

However, god-representations cannot resemble real humans too closely, as the divine is by definition non-human. There is a paradox here, which may go some way to explain the fact that the divine is variously represented resembling the human form but in an abstracted, or stylized, or strikingly idealized, manner, or with incorporated animal features.

In addition to the benefits already mentioned on an individual level an anthropomorphized ER:

1) represents a relational "other"
2) reassures not only through sensory grounding, but also through providing "company".

The Social Impact of a Divine Representation

So, what happens to my statue once it is completed? As I live in a tight-knit group my work has not gone unnoticed. Others will inspect and appraise it, and exchange commentary with me and each other. They may suggest improvements or participate in the manufacture. This is another major feature of ERs: in making the invisible visible an ER can be related to by others. Its qualities can be examined, evaluated, and consensually validated. The individual mental construct becomes common property.

If my fellow humans accept the way I have represented the divine it is likely that my statue becomes a relational "other" to them. As such it provides not just a stable tangible point of reference for a shared belief - it will also need to be integrated somehow into the community, in a fashion

befitting its superior status. It may be given a special place, a "dwelling" may be constructed for it. As well, appropriate rules for worship and rituals, and perhaps particular tasks for some individuals, need to be worked out. In short, my community has to invest time and effort organizing itself to optimize the collective relationship with the divine ER. That, in itself, is likely also to affect the way we interact with each other.

There is a growing interest in the concept of "socially distributed cognition" which investigates the effect of social interaction around tasks and representations. Chandrasekharan & Nersessian's article (2015) mentioned above focused on computer-simulated science modelling in the form of an interactive game. Despite the players of the game being naïve to the scientific context, their collaborative output spawned convincing results and several scientific publications. Not only did the game function as a mental tool - just like any ER, potentially - but the authors assert that it facilitated the emergence of "collaboration ecosystems" (p. 33).

While being contemporary, this research highlights the dramatic potential of collective human interaction with ERs. Perhaps the first ERs, especially those of the divine, once had a similarly galvanizing impact on groups of early humans.

In summary, at an interactional and social level ERs of the divine can:

1) enable shared reflection, examination, and validation of concepts
2) promote an interactive processing of concepts
3) constitute a relational "other" for individuals and the collective
4) alter the organizational functioning of a group
5) facilitate innovation.

What overall effect is my statue likely to have on my community? The material "presence" of the deity is not just going to change organizational characteristics of the group. There are likely to be changes in the way we act and interact with each other. The earlier acceptance of the ER as a valid representation of the divine required a degree of consensus, and this is likely to increase through synchronized "interaction" with it. While shared rituals centring on the representation affirm a sense of togetherness, the process can also demarcate one group from another.

In addition, the impact of having an anthropomorphized deity at close range will increase a sense of being scrutinized. As discussed previously an anthropomorphized "other" is assumed to able to observe and judge

behaviour, and to have feelings. Even anthropomorphized animals automatically change the way humans behave (Chartrand *et al.*, 2008). The assumed presence of an anthropomorphized deity appears also to enhance prosocial behaviour (Norenzayan & Shariff, 2008) and increase morality (Morewedge & Clear, 2008). To put it simply, we are all more likely to display our best behaviour - at least, while we assume ourselves to be under observation…

But there is more: a manufactured god-representation overcomes the constraint of the divine's requiring association with naturally occurring geological features, objects, or organisms. A divine ER can be transported and reproduced, becoming potentially accessible to more individuals. Small-scale replicas may be carried and worn as amulets, allowing private communion with the deity. Such artefacts can assist in identification of individuals with a specific group even when they are absent from the cohort.

Last, but not least, an ER fashioned from durable material supports transgenerational persistence of beliefs, rituals, values, and codes of behaviour, and in this way promotes enduring cultural stability.

The eminent archaeologist Colin Renfrew (2008) asserts that the human brain has physiologically remained largely unchanged for the past 60,000 years while the evolution of complex civilization is evident over only the past 10,000 years or so. He proposes that the answer to this "sapient paradox" may be found by examining the ways humans have interacted with the material world. I would submit that it is the interaction with manufactured symbolic elements of the material world - namely ERs - which facilitated cultural evolution.

For an individual human an ER adds a stabilizing and extending element to cognition. For a group an ER of the divine contributes to interpersonal, social, and cultural stabilization and extension.

Before concluding I would like to recapitulate the main points of my discussion as follows:

1) human thinking and "sense-making" consist of internal processes which are largely coupled with sensory-motor and emotional impulses
2) internal representations exist within an open system which is adaptively receptive to new information
3) individual internal representations are idiosyncratic and unstable