

Functional Creativity

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The prominent writer and poet Oscar Wilde once said, “All art is quite useless.” In a literal sense, of course, art does not serve a utilitarian but aesthetic function. Artwork cannot feed an impoverished country or solve a worldwide issue, and it reflects subjective life experiences of the artist instead of life itself. Why then has art flourished as an integral aspect of humanity for tens of thousands of years? What evolutionary function, if any, did creativity serve for prehistoric hominids? Although perhaps unanswerable, these questions invite further contemplation of the dynamic connections between physical brain structure and human consciousness. Anthropologists have theorized ways in which specific brain adaptations gave prehistoric humanoids the evolutionary “edge” over other non-*Homo* species, and all agree that the rise of a conscious brain directly led to the formation of creative thought. However, as Robert Solso, an influential Russian psychologist, argues, “A serendipitous side effect of a complex brain capable of imagery and symbolic representation was the human tendency to search for understanding of the world and all things therein” (41). The ability to interpret abstract symbols created a world in which those that possessed creative skills—the advanced toolmaker, the resourceful leader, and the talented cave painter—gained a selective advantage over others. While creative thought may require consciousness, creativity did not emerge only after humans achieved biological evolution but, over time, became a necessary ingredient for it.

Although creative activities serve leisurely rather than survival purposes today, creativity remains one of the few human universals regardless of any society’s political, economic, or

technological achievement. Creativity also has deep roots in mankind's ancestral past, as painted beads dating back 60,000 years ago act as one of the earliest physical markers of mankind.

However, from an evolutionary point of view, the fact that something so integral to humanity serves absolutely no functional purpose (as opposed to the evolution of the thumb or femur) does not make sense. Creativity requires a copious amount of time, psychological and physical energy, and material resources that, evolutionarily speaking, might be better spent on biologically-important activities such as sex, finding and consuming food, and creating social networks. Even so, Ellen Dissanayake, an internationally recognized anthropologist known for her work on art and culture, argues that "especially in small-scale or subsistence societies, art behavior consumes resources far beyond what one would expect for an unimportant activity. A trait, activity, or behavior meeting these requirements is a candidate for being considered adaptive" (4). Similarly, Robert Solso acknowledges that "the evolution of a computational brain...is functionally equivalent to the transmutation of more obvious physical structures such as binocular vision, an opposing thumb, and bipedalism" (24). Both Dissanayake and Solso argue that mankind's evolutionary success relied upon physiological and conscious adaptations in the brain.

Though commonly referred to as "the survival of the fittest", this popular term greatly skews the true complexity of natural selection as first described in Charles Darwin's book, *On the Origin of Species*. Before 1859, the common belief held that the Earth was static, fossils were mere decades old, biological species remained unchanged over time, and human beings were at the "top" of creation (Zihlman 1-3). However, Darwin observed layers of coral sediments in the Cape Verde Islands and "became convinced of the newly emerging idea in geology that the earth is dynamic and changing, not static and fixed" (1-1). Furthermore, Darwin observed the

“artificial selection” process of dog breeding and hypothesized that a similar “natural selection” process could, over time, produce the variety of living species found on earth. Because Darwin emphasized that natural selection occurs through multiple non-linear mechanisms, contemporary anthropologists strongly believe that human consciousness did not simply emerge but evolved unevenly through multiple species, reaching its current state about 60,000-30,000 years ago (Solso 25).¹

While the human brain evolved over the course of billions of years, the earliest evidence of physical art dates back only 60,000-30,000 years ago. However, structural brain changes that allowed for consciousness—complex problem solving, tool building, social order and effective oral communication—occurred much earlier, around 120,000 years ago (Solso 41).² Ergo, if creativity simply relies upon consciousness, why didn’t it manifest as art until 60,000 years *after* major adaptations in brain structure? To understand the relationship between the physical brain, consciousness and creativity, one must first understand the adaptive basis of the modern human brain. Both anthropologists and psychologists organize the evolution of human cognition into four stages: the *episodic* of primates, the *mimetic* of early hominids, the *mythic* of sapient humans, and the *theoretic* of modern man (Solso 49). While all four stages describe major cognitive adaptations, only the *mimetic*, *mythic*, and *theoretic* stages exclusively involve human cognition. Mimesis differentiates chimp and human cognition; according to Merlin Donald of Queen’s University, mimesis “enabled early hominids to refine many skills, including cutting, throwing, manufacturing tools, and making intentional vocal sounds. It rests on the ability to produce conscious, self-initiated, representational acts that are intentional but

¹ Traces of consciousness as it appears in modern *Homo Sapiens* also briefly appears in other *Homo* species such as *Australopithecus*, *Homo Neanderthalis* and *Homo Heidelbergensis*. For the purposes of this research paper, however, I combine all species under the *Homo* genus into one and instead focus on the differences between *Homo* species and other mammalian and non-mammalian species.

² *Homo Erectus* lived between 1.8 million and 300,000 years ago and initially had a brain size of 900 cc, which then grew to around the size of a modern human brain, around 1200 cc. *Erectus* carved stone tools and learned how to cook food. *Homo Neanderthalis* lived in Europe and the Middle East around 150,000 to 35,000 years ago, and the species is most commonly credited with the explosion of cave art in France and other parts of Europe during that time. While *Homo Sapiens* did not evolve from Neanderthals, genetic evidence proves the two species share a common ancestor around 600,000 years ago—Neanderthal fossils have been found in Europe and date far before modern *Homo Sapiens* left Africa.

not linguistic”(49). The significance of the shift from primate to hominid consciousness lies in the fact that primates perceive events in an extremely sporadic manner (their brain does not allow for the same level of memory and symbolic attachment of life events)—with the evolution of mimesis came the improved ability to communicate with gestures. While it remains impossible to know whether mimesis alone allowed gestural communication or if the need to effectively communicate with others led to the evolution of mimesis, it played a critical role in the communication of creative thought; body decoration via flowers, pendants, beads and body paint, demonstrates the earliest form of both creative thought and non-linguistic communication.

The transition between the *mimetic* and *theoretic* stage represents the most important cognitive transition in human history, revolving around the evolution of complex oral communication and abstract representation. While most psychologists and anthropologists agree that modern humanity could not exist without language, communicating symbolic thought occurs through language as well as art—both of which could not exist without the cognitive ability to think “outside of the box.” The corpus callosum, composed of 250 million nerve fibers, connects the two cerebral hemispheres and exists exclusively in humans (Zilhman 1-4). During the 1960’s, neurologist Roger Sperry proved the specialization of cerebral hemispheres (the left in language ability, the right in spatial perception and logic) after cutting the corpus callosum in epileptic patients. Resulting in a loss of communication between the left and right hemispheres, each half of the brain became completely unaware of information processed by the other half (5-

30). After the word “horse” was projected onto a patient’s left visual field, he denied having seen anything due to the inability of the “speechless” right brain to tell the verbal left brain what it processed. However, after asking the patient to draw a picture of the “unseen” word, he could draw it with his non-dominant left hand. Furthermore, he drew the horse but still denied ever seeing anything! Further examination revealed art’s ability to express cognitive sensations and images which cannot be expressed through language. As Adrienne Zihlman, a professor of anthropology at University of California, Santa Cruz, observes, “Since so many of the crucial experiences in our life—birth, nursing, learning to walk—preceded our acquisition of language, we can see why conscious memories of these formative events are hard to retrieve, and why art often achieves insights that elude logical analysis” (5-30). Sperry’s split-brain procedure explicitly demonstrates that linguistic ability relies upon the ability to symbolically interpret the outside world. Therefore, though impossible to know for certain, the ability to verbally communicate complex thoughts probably did not simply emerge after the brain evolved; rather, the brain’s higher capacity for complex thought allowed early hominids to symbolically perceive the outside world, and in turn, it evolved further to allow for communication between the speechless creative right brain and the verbal linguistic left brain.

While Sperry’s experiment transformed modern understanding of the cognitive basis for symbolic thought, another approach to understanding adaptive functions of human creativity lies in what archaeologists call middle-range theory. Middle-range theory describes the process in which archaeologists construct relational arguments to successfully link dynamic actions in the past with their material correlates in the present (Habicht-Mauche 2/2/10). Because we cannot observe early hominids verbally communicate or paint on cave walls, we can never truly know what provoked verbal communication or why early hominids drew pictures on cave walls.

However, by constructing “if...then...” hypothesis (for example, *if* prehistoric animal pictures served to promote a successful hunt, *then* the animal species in the paintings should match the bones found in and around the cave), archaeologists construct arguments based on the strength of their observations and analogies (2/2/10). Three main theories that attempt to explain *why* early humans painted on cave walls are the: 1.) *art-for-art’s-sake*, 2.) *structuralism*, and 3.) *Shamanic* theories. Many nineteenth-century scholars viewed Upper Paleolithic cave art through the 1.) *art-for-art’s-sake* perspective, which argued that the animals simply served as artistic expressions of what early humans encountered in nature. In accordance with this perspective, other nineteenth-century anthropologists believed that cave art expressed sympathetic magic; the images were thought to promote the fertility of game animals and the hunt. However, the *art-for-art’s-sake* approach to Upper Paleolithic cave art failed to explain why the artists chose such remote locations (many paintings exist in extremely narrow passageways and chambers) or why many bones recovered in the caves belong to reindeer whereas bison and horse are the predominant animals on cave walls (Thomas & Kelly 260). While the *art-for-art’s-sake* approach assumes the paintings serve literal instead of symbolic purposes, the 2.) *structuralism* approach argues that humans understand nature through opposites.

French archaeologist André Leroi-Gourhan (1911-

Upper Paleolithic art of bulls and horses from the Cave of Lascaux in France. These pictures clearly depict different painting styles and materials—carbon-14 dating proves that this wall was used by many different people over an extended period of time. These specific paintings date back to 15,000-10,000 B.C.E.



1986) argued that Upper Paleolithic cave art depicted male and female oppositions. He categorized animal pictures into small and large herbivores, rare species and dangerous animals, assigned the categories into male and female, and investigated caves for patterning in the placement of images. He eventually concluded that caves functioned as “a place where Upper Paleolithic people dealt with the oppositions and contradictions that, according to structuralist thinking, are the inevitable consequences of thinking as a human” (261). However, Leroi-Gourhan’s analysis drew upon his own culture rather than that of the prehistoric people to whom these pictures possibly meant something (262). While it remains impossible to prove Leroi-Gourhan’s analysis wrong, it also remains impossible to prove his analysis right.

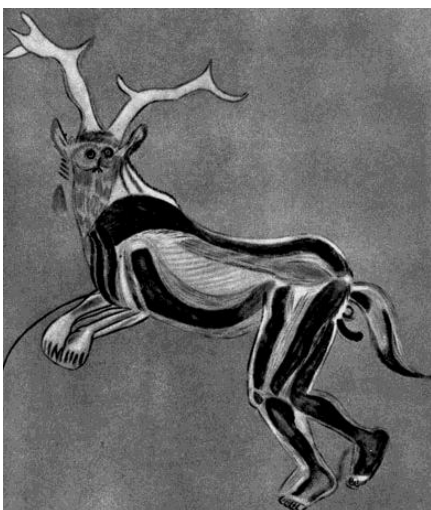
Unlike the previous perspectives, David Lewis-Williams argued that Upper Paleolithic cave art serves as evidence of shamanic trances. Lewis-Williams did not infer symbolic meanings from the paintings; rather, he utilized middle-range theory to conclude that art found in Lascaux cave reflects an effort to understand altered states of consciousness. He first observed that many hunter-gatherer societies practice a form of religion that involves shamans, who claim

to access the supernatural world through trances. He referred to cross-cultural neurological research conducted on individuals in trances which determined that trances invoke three states of altered consciousness—each state has a very distinct visual property, such as dots, grids, and zigzags. Because these visual effects result from specific brain structures, Lewis-Williams utilized the theory of uniformitarianism, a major component of middle-range research, into his argument. Assuming that those whom produced cave art possessed the same brain as modern humans, Lewis-Williams argued that we should be able to relate images in prehistoric art with specific trance stages as discovered in modern humans. Cave art was probably not produced while the artist was in a trance due to the inaccessible location, but Lewis-Williams believed that prehistoric people projected visions from trances onto cave walls in an attempt to *understand* the images produced by their newly-evolved brain. However, the question remained as to why paintings often appear in inaccessible locations. Shamans in hunting and gathering cultures commonly describe a powerful yet permeable membrane between themselves and the spirit world; Lewis-Williams argued that “by mimicking the vortex of trance, caves are the closest a person could come to the spirit world” (266). In Lascaux, footprints preserved for nearly 25,000 years reveal an interesting pattern—only large, likely masculine, footprints appear in deep trenches of the cave while slender, likely feminine, footprints appear in larger chambers. This suggests larger chambers were used for communal rituals or a place where people sought assistance from an underground spirit world (265). The spiritual atmosphere in Paleolithic caves echoes the tendency for creativity in small-scale societies to emerge as

Though rare in Upper Paleolithic art, occasional animal paintings take on human characteristics, such as this “dancing witch deer” from Trois Freres cave in France. Lewis-Williams argued that these anthropomorphic drawings record the last stage in trances, where the observer was unable to see the difference between themselves and the animals around them.

rituals—expressed through dress, music, visual enhancement of self or surroundings, poeticized language, and dramatic presentation. Most anthropologists agree that ritual ceremonies occur in times of uncertainty and anxiety due to the ability of coordinated voices and body movements to reduce tension (Dissanayake 9). Therefore, I believe that rituals played a critical role in the lives of prehistoric people and diminished the anxiety that accompanies an improved perception of undemocratic nature.

Although we do not currently live in a Pleistocene environment, the psychological needs that arose from it continue to affect daily modern life. Ceremonies foster a sense of community and usually clarify an individual's role in the community. Our need to belong shows in the universal mother-infant bond and later through friendships and neighborhood communities. Ceremonies also provide a way for people to make ordinary things, like cave walls or a dance, symbolize the extraordinary. This need to make the ordinary into the extraordinary appears in mother-infant bonds; every mother communicates with her infant through repetitive patterns of words and phrases, exaggerated movements and rhythmic song (16). Through mothers' exaggerated facial expressions, babies learn to mimic facial expressions that accompany various



emotions. Furthermore, the mother-infant dynamic single-handedly contributes to proper emotional and cognitive development as well as behavioral self-regulation, socialization, and language learning (18). Due the commonalities between mother-infant communication and ceremonial rituals, many anthropologists believe that both evolved to reduce tension and stress.

Every human being possesses the adaptive ability to explore and create the environment. Unfortunately, traditional Western “art for art’s sake” theories contribute to the belief that art serves no societal purpose—which justifies, for example, the decreasing funds for art programs in schools. If the modern mind adapted to a Pleistocene environment, educational systems that demand children sit still for six hours a day do absolutely nothing to nurture the skills that contributed to our survival as a species. The arts promote connections between objects and their potential for symbolic meaning, which allows children to discover countless connections between themselves and nature. Although art satisfied needs in intimate, commonly mislabeled “primitive” societies, establishing connections remains neglected in our technologically complex society. While we live in a completely different world from our prehistoric ancestors, perhaps the theory that creativity played a major role in our emotional and biological survival can change our society from one plagued with consumerism to one enriched with the kind of imagination that defies time management and report cards—the imagination that emerged over 200,000 years to form the very essence of humanity.

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