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Playing with pattern. Aesthetic communication as distributed cognition

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Abstract. This article's main thesis is that aesthetic communication has evolved from animal social play to forms of extraordinary complexity such as traditional arts, helping to preserve and transfer survival oriented information in a preverbal, or embodied form. Following this line of argument, aesthetic communication provides the basis for an adaptive modeling of reality wherein the agents engaged simulate potential exchanges and outcomes with factual or fictive entities, further enhancing – by proxy – their ability to predict and adapt to natural and intentional contingencies. By means of aesthetic communication human cognition has become distributed, i.e. off-loaded in the practices, customs and emotional templates readily available in culture. In this light, the decline of traditional societies and the isolation of art practices that results from it, are to be considered subjects of scientific concern in addressing the societal and ecological crisis we confront today.

Keywords. Evolutionary aesthetics, animal play, cybernetics, cultural evolution, epistemology.

*The ultimate paradox may be that
play can only be understood through itself.*

Burghardt (2005): 405

One of the first things that strike us about art is its costliness. Whether we stand in front of Lascaux; Hagia Sophia; the sand mandalas of Tibetan monks, a Bach chorale, or the elaborate body paintings for the initiation passage of the Selk'nam people, we respond to this elaborateness with a sense of wonder. Where does the magnificence of it all come from? What is the payoff of such sophisticated patterns of behavior? As George Bataille (1949) once said, «art is an occasion of destruction of wealth»¹. Art is time consum-

¹ Bataille was probably developing an idea advanced by Marcel Mauss (1925) in his essay *The gift*, that examines the practice of potlatch by indigenous tribes of northwest America. The potlatch consists in a gift-giving feast in

ing, effort taking, and seemingly doesn't produce any consumable goods. In evolutionary orthodoxy there's an implicit law of economics at work. Behavior that's replicated over the eons must of necessity increase the survival fitness either of the individual, the group, or the species. Thus, any question regarding the origins of art, seems impossible without considering a proper evolutionary perspective, one that embraces the phylogeny of human behavior and offers a comprehensive account of how the arts may or may not contribute to the overall survival fitness of our species. An anthropological perspective is also a necessary complement for this kind of research. Art is a cultural phenomenon, and although it would be easier to talk about art in general and move forward within the safe premises of western art and theory, from a biological standpoint this narrowness is inadvisable, to say the least. Regardless of what we consider high or low art expressions, if we are to propose a working hypothesis on the origins and adaptive value of art, it needs to be falsifiable within the vast spectrum of cultures and peoples that have been reported by field researchers all over the world. It would also be sensible to listen to what artists, poets, philosophers, and aesthetes have to say about the matter. Although the introspective method has been systematically discredited by contemporary academia, people who have devoted their entire life to the practice and theory of art have developed a sophisticated vocabulary, along with subtle emotional responses to the phenomenon under scrutiny. To deliberately neglect this evidence is to suppress any chance of dialogue between the natural sciences and humanities, thus severing our hypothesis from general validity. The passage between these divergent disciplines is harsh, but it's a passage one needs to traverse back and forth, in order to wind up with a sufficiently robust theory. In the next pages we are about to present an overview of findings in various fields of

which a chieftain challenges or responds to another chieftain either by giving away or destroying his wealth. The greater the wealth destroyed in the feast, the higher the status attained by the chieftain.

study, such as animal behavior, cybernetics, cognitive science, ecology and evolutionary aesthetics. Considered as a whole, this article offers an evolutionary account on of the origins and adaptive value of art.

COSTLINESS OF ART AND PLAY

As we have already mentioned, one conspicuous feature of art's manifold expressions is its costliness. Not only from a pedestrian approach to the arts does this costliness perplex us, but also from an evolutionary frame of inquiry, where the biological costs of artistic behavior might seem unjustified in the absence of any solid benefits. Bearing this in mind, one should ask if we happen to know about any other behavior in the animal kingdom whose costs apparently exceed its benefits, which is time consuming and has patterned and recognizable features that distinguish it from the repertoire of the species' typical behavior. Certainly, our best candidate would be animal play². Burghardt (2005) defines five ethological criteria for the recognition of animal play. For the sake of convenience, we present them at length to be consulted further in the development of this article.

1. *Limited immediate function: behavior is directed toward stimuli that do not contribute to current survival.*
2. *Endogenous component: behavior*

² We will refer to non-human animal behavior or non-human animal play behavior throughout the paper boldly as *animal behavior* and *animal play*. There are at least two good reasons for abridging this convention. The first is, there's no longer controversy in referring to the human species as part of the animal kingdom, so when speaking of *animal behavior* or *animal play behavior* as distinct phenomena from human behavior or human play, it should be stressed that we are acknowledging commonalities as well as differences with the human species-specific repertoire. The second reason is formal. As the paper provides a brief historical account on the subject of animal play, most of the quotations are foreign to the subtleties of contemporary conventions. If adhering to the *non-human animal* convention could probably lead some readers to confusion, we rather risk a little anachronism for the sake of transparency.

is spontaneous, voluntary, intentional, pleasurable (and) rewarding. 3. Structural or temporal difference: behavior involves patterns with modified form, sequencing, or targeting. 4. Repeated performance: behavior is performed repeatedly in a similar, but not rigidly stereotyped form, during at least a portion of the animal's ontogeny. 5. Relaxed field: behavior takes place when the animal is adequately fed, healthy, and free from stress. (Burghardt [2005]: 71-77)

Burghardt's work is a splendid synthesis of almost a century of research dedicated to the subject of animal play, but what's particularly interesting for our study is that it provides a comprehensive approach to behavior allowing for a seamless transition from animal to human play. Taking a glance at the costliest and most patterned exemplars of each tradition and testing them against Burghardt's five criteria, the omnipresence of play in human culture would be hard to contend with. The analogy between play and the costly products of culture such as religion and the arts is not a recent one. It was Huizinga (1938) in his seminal book, *Homo Ludens* who first undertook an attempt to interpret the vast field of human culture in the light of play. «According to Huizinga, play is the ultimate source of virtually all cultural systems: myth and ritual, law, poetry, wisdom, and science» (Bellah [2011]: 76). If that weren't enough, he even speculated that play had something crucial to do with the emergence of mind, and in this respect he was at least two decades ahead of the incipient study of cybernetics.

But in acknowledging play you acknowledge mind, for whatever else play is, it is not matter. Even in the animal world it bursts the bounds of the physically existent. From the point of view of a world wholly determined by the operation of blind forces, play would be altogether superfluous. Play only becomes possible, thinkable and understandable when an influx of mind breaks down the absolute determinism of the cosmos. (Huizinga, [1938]: 3)

Huizinga's argument is deeply indebted to the *Letters on the aesthetic education of man*, a pioneer work by the German poet Friedrich Schiller

(1795). «(Man) is only completely a man when he plays» says Schiller. For modern thinkers such as Schiller, Baumgartner, or Kant himself, who were highly concerned with ideas regarding human moral dignity and ultimate purpose, aesthetic phenomena were paramount instances of freedom as opposed to natural determinism. Taking pleasure in the arts, whether musical, representational or visual; devoting one's time and genius to the play of pure reason or the quest for a transcendent truth; all of them require a uniquely human disinterestedness. This predilection of modern thinkers with the costly products of human culture as having something to do with moral dignity is reminiscent of the classical notion of *arête* (ἀρετή), an attribute of the Greek aristocracy that consisted in showing one's excellence in various disciplines, particularly those that conspicuously produced no goods and were solely aimed at the refinement of body and spirit (Jaeger, [1947]: 421). Evidently, the *Letters* draw a lot from this source, and the text as a whole could be read as a sort of renewed *paidéia* (παιδεία), but Schiller does not stop here, and goes on to propose a play instinct that he discovers in the whole of nature.

It is true that Nature has given even to creatures without reason more than the bare necessities of existence, and shed a glimmer of freedom even into the darkness of animal life. With what enjoyment of life do insects swarm in the sunbeam; and it is certainly not the cry of desire that we hear in the melodious warbling of the songbird. (...) An animal may be said to be at work, when the stimulus to activity is some lack; it may be said to be at play, when the stimulus is sheer plenitude of vitality, when superabundance of life is its own incentive to action. (Schiller [1795]:207)

Before we drift away to humanities for good, it would be advisable to draw from here a connection with the natural sciences. In fact, Schiller's ideas, though seldom credited, were very influential in the beginnings of play theory. It was Herbert Spencer (1855) who first observed from a naturalist point of view that «once an animal no longer had to expend all its energy on survival, the surplus could be released in play» and else-

where he likens play with aesthetic activities by affirming that they «neither subserve, in any direct way, the processes conducive to life» (Spencer [1855]: 627). So we find Spencer suspect not only of forgetting the source of his valuable insights, but contrary to evolutionary orthodoxy, advocating a somewhat paradoxical definition of animal play, in which he denies play – and aesthetic activities – any survival benefit, leaving the costliness of the behavior unexplained. The so called *Surplus Energy Theory*, ignited a long lasting debate around whether or not play serves a biological function either immediate or delayed that would account for its costliness (Groos [1898]; Power [2000]), what conditions had to be met before engaging in playful behavior (Craig [1918]; Bally [1945]; Burghardt [2005]), or why it is self-reinforcing – i.e. pleasurable – for participants and onlookers. Truth be told, we haven't yet arrived at a conclusive explanation for any of these problems, but as we carefully gather observations and draw valuable insights from models that have proven predictive across taxa, the analogy between animal and human play becomes an ever more compelling one and so do our chances for presenting a plausible account of the origins and adaptive value of art as a human form of play.

So far we have pinpointed strong analogies between the costliness and elaborateness of both play and the arts. Could we stress the analogy even further? Burghardt's (2005) *Surplus Resource Theory* (SRT) provides a useful and integrative model to understand which factors underlie the emergence of play. Variables in the animal's Ontogeny; Energetics; Psychology/Sociality and Ecology are all to be considered as having a strong influence in the playfulness of the species under study. What should be noted for our current survey is that the ubiquity of play in human culture could hardly be explained as a mere by-product of evolution. Since the beginnings of archaic societies, art, ritual, and costly elaborateness have played a role in modeling our now highly domesticated environment, operating a positive feedback loop in cultural evolution. What Burghardt's SRT model predicts is that not only does play benefit from a surplus of resources,

it is also instrumental to the replication of precisely that kind of environment.

We now recognize that play can be viewed as both a product and cause of evolutionary change; that is, playful activities may be a source of enhanced behavioral and mental functioning as well as a by-product or remnant of prior evolutionary events. (Burghardt [2005]: 121)

If Burghardt's claim has some ground, we should direct our efforts at understanding not only where play originates and how we inherited it, but most importantly how play modifies the human mind as our evolutionary tool par excellence. What we are about to attempt in the next pages is to provide a framework that allows us to address this play/mind problem within the larger scope of evolutionary epistemology.

PATTERN: A FIGHT AGAINST ENTROPY

As the early study of cybernetics teaches us, complex systems survive in an environment of high uncertainty by signal redundancy and feedback self-regulation. Complex systems are by definition emergences out of the interaction of simpler units; bodies from cells; self-regulatory artifacts made from physical parts; learning systems made out from carbon or silicon based circuitry. In this light, living systems, societies, minds and viruses, all emerge as order and pattern against chaos and entropy.

We are immersed in a life in which the world as a whole obeys the second law of thermodynamics: confusion increases and order decreases. Yet, as we have seen, the second law of thermodynamics, while it may be a valid statement about the whole of a closed system, is definitely not valid concerning a non-isolated part of it. There are local and temporary islands of decreasing entropy in a world in which the entropy as a whole tends to increase, and the existence of these islands enables some of us to assert the existence of progress. [...] Remember that we ourselves constitute such an island of decreasing entropy, and that we live amongst other such islands. (Wiener [1950]: 40)

If it weren't for these "islands of decreasing entropy", life on Earth would not be possible. The process of adaptation presupposes that an information feedback is taking place between the species and its environment. We can portray adaptation as a feedback that allows a species to be *informed* or modified by environmental conditions, so that an instrumental, albeit unconscious knowledge about its surroundings, can be stored and replicated by the reproduction of its genetic pool. By way of example: «A shark is beautifully shaped for locomotion in water, but the genome of the shark surely does not contain direct information about hydrodynamics. Rather, the genome is supposed to contain information or instructions, which are the complement of hydrodynamics» (Bateson [1972]: 134). Far from having discovered principles that underlie physical phenomena, the process of natural selection has attained a precise match between organism and environment by pure statistical means. Anatomical specialization as a result of natural selection takes many generations to be shaped to the environmental demands. Conversely, as anatomical specialization decreases and brains achieve representational power – which can also be expressed as neural specialization – the process of adaptation becomes faster and suppler, taking place within the ontogeny of the individual. We call this adaptation learning proper. To anticipate and predict pattern accurately is what learning systems are all about. Our brains are modeled to recognize and expect pattern and regularity in our surroundings and continuously adjust their policies to actual contingencies. The information feedback we call natural selection has not been replaced by any means; it has been pushed to a new level of emergence that is mental instead of physical. So in a fundamental sense, there's a homology between life and learning; both can be described as information coupling that exerts selective control over variability, replicating what's useful and discarding what's not.

Plotkin and his colleagues (1982, 1987, 1988) [...] have examined the basic assumptions of evolutionary theory as applied to intelligence. [...] Intelligence, in

this context, becomes much more than the capacity and skill of one individual mind. Rather, it includes the entire knowledge-structure of the species, as it is stored across the various levels available to the multilevel evolutionary process. Variation is generated at all four levels; the variants are tested, and the successful variants are selected and then regenerated. (Donald [1991]: 158)

If variation and selection are to be considered as learning either in the biological or behavioral levels, we can draw a continuous axis that goes from the phylogenetic development – as expressed in anatomical features of the fossil record – to the ontogenetic process of adaptation, which involves the expression of innate or acquired behavior – learning in its common usage –. We could even stress the axis further, to include cultural systems with their instances of variation and replication and make them too, subject to the same axioms of evolution. It should be stressed that human minds are never confined to the ontogenetic level, but keep developing by means of cultural transmission. The patterned practices that a culture bears witness to, are not strictly speaking inventions of individual minds but the outcomes of a distributed cognition system that is meant «to decrease entropy and increase the predictability of experience» (Hutchins [2013]: 13). According to the distributed cognition framework, human learning is based on knowledge structures not fully confined to individual brain activity, but distributed across individuals, artifacts, and culturally transmitted practices. For example, when solving an arithmetical problem, one individual may rely on formulas learned from tradition, or when opening a can with a can-opener, the problem solving process is partially off-loaded by means of a tool. In both examples, solutions are implicit and inherent to the problem design and cognition is to be characterized as an interaction or affordance between individuals and their culturally mediated environments. In much the same way, we would like to argue that art expressions should be considered as knowledge structures whose role is to provide a shared cognition system while at the same time

off-loading resources of individual cognition in ready-made artifacts and templates, upon which individuals can reduce uncertainty and re-elaborate creatively according to actual contingencies.

It might be contended that cultural transmission heavily relies on the invention of writing or what Merlin Donald (1991) has aptly called an External Symbolic System. It's probably true that the use of symbols that could be stored outside human brains –e.g. written language– has rapidly enhanced the possibilities of cultural transmission and replication. In point of fact, this is the view advocated by Clark and Chalmers (1998) in what they call *Extended cognition*. However it is also true that literacy is a relatively recent innovation in human evolution – only the last five thousand years out of a roughly one hundred thousand years of history. Long before there were any means of encapsulating knowledge in external symbolic systems, human beings were replicating their cultural environments effectively, sometimes for many hundreds of years. Evidence of prehistoric early hominid stone tools and traditional tool making dated as old as 3.3 million years of age (Harmand et al, [2015]), provide strong evidence that a form of cultural transmission was taking place long before our species made its apparition in the map. From genetics all the way up to cultural heritage, complex systems rely on information transfer strategies of which the human use of symbols is but the tip of the iceberg. So what was going on before written language, or even prior to language acquisition? How did the long lasting informational couplings we call cultures emerge and shape themselves over the centuries?

In Claude Lévi-Strauss's anthropological account (1964), culture is about transforming or incorporating into the human realm those wild elements of nature that would be otherwise dangerous to manipulate. The act of cooking, tool making, the rites of passage between infancy and adulthood, marriages, funerals, and so forth, are all carefully punctuated by pattern and costly elaboration. In pre-modern societies art is far from being an isolated activity; it's interwoven in all activities conducive to life, conveying important

messages about the agents' beliefs and concerns (Dissanayake [2000]). A recipe for preparing an otherwise poisonous root; a chant for propitiating supernatural agents before the construction of a boat; preparation of one's body by means of self-painting or entheogen consumption. Every human act bears the trace of a mind that does not extinguish completely as long as it is repeated according to custom or tradition. So great is the relevance attributed to these patterned elaborations, that if not performed correctly (i.e. according to tradition) they could easily lead to havoc and misfortune. In Huizinga's account:

The purpose of music and dance is to keep the world in its right course and to force Nature into benevolence towards man. The year's prosperity will depend on the right performance of sacred contests at the seasonal feasts. If these gatherings do not take place the crops will not ripen. (Huizinga [1938]: 14)

In this light, when embedded in tradition, arts are anything but superfluous. In a fundamental way they're aimed at giving pattern to exchanges with otherwise dangerous entities, either natural or supernatural, by replicating the age-old formulas of what makes a good living. Wiener's quotation at the beginning of this section reminds us that we as «such islands of decreasing entropy» are not surrounded by physical phenomena only, but our world is crowded with intentional agents, agents that expect and behave according to pattern, agents that depend on connecting with each other in their fight against entropy. By building a network of meaningful practices, that is, by distributing cognition across artifacts and inheritable patterns of behaviors, a culture claims a life of its own, in which no individual is alone to cope with disorder and uncertainty.

AESTHETIC COMMUNICATION

Making sense out of experience and communicating it to others reliably is at the very core of human culture. In the preceding section, we presented the reader with an informational approach

to artistic behavior, wherein patterned practices served to build a distributed cognition system, by means of which individuals could engage in real life problems and contingencies, off-loading some of their resources in templates, formulas, or instructions learnt by tradition. Following this line of argument, art production and the cognitive response to the arts must have been selected early in our species' development as a special form of social communication, rendering informational couplings, which language acquisition could not make totally superfluous. The now famous quote by choreographer Isadora Duncan «if I could tell you what it meant, there would be no point in dancing it» (Bateson [1972]: 137) boldly declares this fundamental irreducibility of human arts to the symbolic domain, and their right to be considered as an altogether different sort of communication; namely, aesthetic communication.

Aesthetic communication only takes place between intentional agents. Before we can properly declare the objective meaning of an aesthetic message, we can feel the intent the agent has ciphered in it. By glancing at the arrangement of its parts, we are acquainted with a physical or spiritual state of affairs (meaning) and an agent's state of mind when performing the behavior (emotion). If we can read the message properly, our cognitive response will be that of recognition. That is, the message contains recognizable features, which serve as a frame for aesthetic engagement between encoder and decoder. There is no aesthetic experience without a sort of intimacy, an intimacy that mirrors a mind's effort to attain order from chaos and participates in this never-ending task. Even in the contemplation of natural beauty, in its appreciation of order, balance or magnificence, our mind is not capable of withdrawing completely from the recognition of intent. This, among other things, has led the vast majority of cultures to believe through the ages, in supernatural agencies, either benevolent or merciless, and bears witness of the pervasiveness of what Daniel Dennett (2006) has aptly called the «intentional-stance». Aesthetic experience always betrays a message, that is, the willing expecta-

tion to communicate with one another. And that is precisely why aesthetic communication has played such a crucial role in shaping and replicating human culture. Traditional arts not only provide a way to formalize meaning and emotion by means of abstract structures, they actually allow communication to take place across the barriers of space and time. When a material outcome of art finds a support that outlives its agent, such as the case with Upper Paleolithic cave art, the physical attributes of form, color, movement and rhythm we perceive, bear traces of meaning and emotion that regain a life of its own. At an unconscious level, we could say that cave art functions in this example as an encoded message that delivers a specific set of cognitive instructions; a musical sheet nobody has ever taught us how to read, but which however we can play as expert interpreters.

Generally speaking, color is a power which directly influences the soul. Color is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand which plays, touching one key or another, to cause vibrations in the soul. (Kandinsky [1914]: 43)

How are meaning and emotion rendered by the aesthetic experience? First of all, the time and effort invested in the performance should bear witness to the importance of the matter at hand. It has been argued by Alcorta and Sosis (2005) that it is only by wasting resources, or what's known in ethology as *costly signaling*, that others can trust the message as honest and reliable. Secondly, the performance has to achieve order, which is, as we said before, emergence of pattern from simpler parts. Sounds, colors, movements should be arranged in rhythms, cadences and frequencies, so as to produce expectation, prediction, surprise or resolution. And thirdly, the performance must be permeated with deep emotion, in order to produce aesthetic engagement. We could hypothesize that these are three basic attributes of the arts, which are biologically rooted: *Costliness*, *Pattern*, and *Emotional attunement*. When the three of them coalesce what we get is aesthetic communication.

So far we have seen that aesthetic communication provides culture with a means to preserve and transfer non-symbolic information, encoding it in costly pattern; pattern that functions as a key stimuli that releases meaningful and emotional responses in their recipients, making them, too, agents of novel ways in which the successful pattern can be modified and reproduced. The work of art is never experienced as the sum of qualities of an external object, but as the embodiment of an *I – You* relationship, to use Buber's (1923) terminology. That's why the intimacy we find in the arts is experienced as a sort of resonance, or as Plato would have phrased it, as *remembering* (ἀνάμνησις) of an ideal form. As we will see further, aesthetic communication builds upon mirroring neural systems that have been developed by an array of social species. So the illusion of being identified with the author (Pseudo-Longinus [c. 1st ce. A.D]; Stravinsky [1940]) or the paradox of remembering a pattern when we are exposed to it for the first time, might not turn out to be so metaphysical after all.

AESTHETIC EMOTIONS IN PLAY AND THE ARTS

One of the three biologically rooted components that we mentioned earlier in this work is emotional response. Along with costliness and pattern, emotional response to the arts is one pervasive feature of the aesthetic experience. One cannot imagine a work of communal art that involves the effort of many individuals nor the attainment and recognition of order and beauty out of rough materials, without some kind of emotional involvement. We invest and engage in aesthetic communication because we care. As we emphasized before, intentionality is not just the corollary of a message, but the frame by which an otherwise totally accidental arrangement of sensitive parts becomes informative. When studying the arts, to neglect emotion would be to neglect the motivational context in which the behavior is embedded, which would rob the activity of any

meaning. Meaning, as we have shown above, is by necessity an inextricable part of what brains have evolved to construe out of experience. The time is ripe for our evolutionary account of the arts, to look into the phylogeny of emotions, answering what has been their role in shaping aesthetic communication in our social species.

Altriciality is probably one of the most distinctive traits of our species. We are born defenseless and depend completely in our caregivers for many years before we can be completely autonomous. Feeding, clothing, and shelter might be granted in a domesticated environment but, as we know, this hasn't been always the case. Since newborns cannot handle any kind of symbolic communication, there's a strong selective pressure in caregivers for emotional coupling. Is the newborn cold, hungry, bored or sleepy? If it weren't for emotional bonding the survival rate of newborns would drop, and so would the genes of unsympathetic caregivers.

During this time, infants and toddlers can develop, use, and rely on nonverbal, gestural, emotional signals to meet basic needs, interact, and communicate. These years provide continuous opportunities to learn and fine-tune the skills of emotional signaling; these skills will continue to be learned and refined during the course of life even after words and other symbols are mastered. (Greenspan, Shanker [2006]: 29)

Our species comes from a long phylogeny of social mammals in which this selection process has already taken place for over three hundred million years; no wonder we have developed specialized neural mechanisms for emotional tuning between babies and caregivers! It should be stressed, too, that these are the very same mechanisms at play when interacting with conspecifics. Joint attention, empathic response to fear, and learning by imitation, have all been selected for as exapted forms of emotional coupling. Despite the fact that emotions in other species are not always easy to identify, we can confront animal social play against Burghardt's second criterion and infer a high predominance of positive emotions with reinforcing characteristics. The absence of immediate survival benefits – Burghardt's first criterion

– further supports this inference. Social play is a special form of interaction in which the sensitive attributes of behavior – exaggerated movements, surprise, repetition, chance, resolution – become a source of pleasure for the players. The particular sequence – Burghardt’s third criterion – we find in playful behavior detaches itself from the species-typical repertoire, many times signaling the opposite of what it means in real life. A stronger individual might actually *self-handicap* to signal a weaker counterpart the interaction is «not as in real life». Dogs can take turns chasing each other, and bonobos will hang many feet over the ground relying completely in a partner’s hand as if vital risk weren’t an issue (Behncke [2015]). As the Surplus Resources Theory (SRT) predicts, social playfulness will increase according to the availability of resources in the environment. Burghardt’s fifth criterion establishes that the animal is adequately fed, healthy, and free from stress. In Craig’s (1918) terminology we would say that the animal is neither engaged in an appetitive nor a consummatory behavior, but is in a *relaxed field* (Bally [1945]). What’s interesting for the problem at hand is the fundamental difference between the emotional value of play and survival-driven behavior. Whilst a basic survival emotion such as fear, has been selected for a specific action course (fight or flight), playful emotions are intrinsic, freestanding, and respond to stimuli in a *detached* way, more concerned with the sensitive attributes of the performance and the agents at play than with the material outcomes of the sequence (i.e. consummatory behavior). Furthermore, social play presupposes that, up to a certain point, the agents involved share the same playful intent. It is not rare when dealing with signals that some of them should elicit consummatory behavior – as when the play-fights of dogs become too rough. That’s why the framing of play has to be periodically reestablished through emotional signaling. This explains why a basic emotion such as fear can be experienced as thrill, and fight or flight not as survival responses, but as punctuation in a sequence of joyful engagement between the players. The logical conclusion would be that during social

play, animals are sharing messages about the context of their engagement, a frame, or *meta-messages*, to use Bateson’s (1972) terminology.

At a neural level, the discovery of brain mirroring neural systems (Rizzolatti et al [2004]) has given some physiological ground to the shared intentionality hypothesis. Some social skills as joint attention, imitation behavior and goal prediction have been found to depend on a specific set of mirror neurons that fires both when performing and observing an action.

Our understanding of others as intentional agents does not exclusively depend on language, but also on the relational nature of action. In many situations we can directly grasp the meaning of other people’s basic actions thanks to the motor equivalence between what others do and what we can do. (Gallese [2017]: 44)

If mirror neural systems have played so critical a role in the development of social skills across taxa such as birds, rodents and primates, we surely can infer their activation in social play interactions, wherein context leans heavily on adequately assessing a counterpart’s intentionality. In this light, by the amount and variability of social play interactions we could predict a group’s ability to act and respond together to urgent environmental pressures. This leads us to what Burghardt calls *tertiary play process*, «play behavior that has gained a major, if not critical, role in modifying and enhancing behavioral abilities and fitness, including the development of innovation and creativity» (Burghardt [2005]: 119). Drawing on this hypothesis, Isabel Behncke (2015) has conducted a compelling fieldwork with a bonobo community living south of the Congo River in the DRC: «Playing with individuals of different sizes, personalities and sex requires learning about contextual-dependent behavior: with whom and when a bite is appropriate, a chase over a push, a gentle tickle rather than a stomping slap, and so on» (Behncke [2015]: 27).

If social play enhances emotional signaling that means it influences group cohesiveness. By sharing intentionality and emotions with others

in the relaxed field of social play, emotional reading would not only have gained accuracy but also led to the emergence of all kinds of new emotional subtleties that simply weren't there as innate responses to external stimuli. These findings begin to shed some light on the hitherto mysterious origin of human emotional expressivity. By learning to mimic non-voluntary emotional responses, and then playing with them by exaggerating or modifying the sequence of motor expression, human beings could for the first time share important information offline, namely, in absence of an environmental key stimuli, inaugurating what Merlin Donald (1991) calls *Mimetic Culture*. This is a momentous leap where social play, as seen across animal and human domains, enables the emergence of aesthetic emotions. We may now characterize aesthetic emotions as encompassing: 1. Empathy: the neural basis for emotional mirroring 2. Motivational autonomy: reframing the meaning of behavior outside a survival driven context and 3. Pleasure: positive emotional response, acting as a reinforcement mechanism for both brain restructuring processes and social bonding. In a deeper analysis, the aesthetic communication we find in play provides the basis for an adaptive modeling of reality wherein the agents simulate possible exchanges and outcomes, further enhancing –by proxy– their ability to predict and adapt to natural and intentional contingencies. If, as we have been arguing, culture depends on making sense of experience and providing a means by which this knowledge can be preserved, transferred, and re-elaborated, then aesthetic emotions must have had a pivotal role in the beginnings of human arts. Fear, anger or zest are emotions that, when aroused in their primary form, can only lead to action, but when deprived of their survival urgency and presented in a punctuated, patterned and meaningful manner, pave the way for the playful detachment so distinctive of aesthetic communication.

The visible traces of the creative gestures activate in the observer the specific motor areas controlling the execution of the same gestures. Beholders' eyes catch

not only information about the shape, direction and texture of the cuts or strokes; by means of embodied simulation they breach into the actual motor expression of the artist when creating the artwork. (Gallese [2017]: 45)

Hence we can see how aesthetic communication has evolved from animal social play to forms of extraordinary complexity such as deliberate art production for the purpose of cultural transmission; namely traditional art. Drawing from our inherited capabilities of costly signaling, pattern predilection, and emotional attunement, we can connect and extract valuable information from the readily available artifacts we find in our culture. As human beings, we participate throughout our development in this cultural scaffolding, and we probably never give it up completely. The extraordinary leaps in learning that we observe in a few years of a child's development rely in the acquisition of patterns readily available in the child's cultural environment. As newborns we wake into a patterned and meaningful world, during infancy we play with reality until we are able to deal with it, in adolescence we begin to grasp the moral values of our culture, and as adults we have the chance to exert them and deliver them to others. But across all life stages we depend on our cultural network of meaning to keep us in balance, to support us and to make sense of life's seeming disorder; birth, loss, failure, success, disappointment. We have learned how to express our emotions because we have shaped them into cultural templates; grieving, falling in love, forgiving, are all internalized memories of our cultural heritage. In an interesting hypothesis, John Pfeiffer (1981) refers to Upper Paleolithic cave art as part of larger multimodal experiences endowing the youngsters with the community's library during the rites of passage:

The richer the experience, that is, the more associations attached to it, the more widespread its "ripple" effect in the brain and its ultimate representation in the hierarchies and networks of memory. [...] Total sensory bombardment was essential when, in the absence of libraries, the brain itself had to serve as

library. The effort, which today goes into the preparation of books, the research and organization and style illustrations, went into the preparation of ceremonies during the Upper Paleolithic. (Pfeiffer [1982]: 220)

Cultural scaffolding never takes place without aesthetic communication. It needs to be played out, so to speak, making the child believe he has “created an object” that was already there (Winnicott [1971]). If it were possible to translate this kind of communication into a purely symbolic message without losing something essential there would be no point in *playing* it. The more we depend and confidently play within these networks of meaning, the richer our experience of the world becomes and so do our possibilities of living creatively. Once an aesthetic message becomes canonical (traditional), it begins to live in the minds of countless generations of hosts, activating patterns – by means of neural mirroring systems –, which in turn, are creatively modified and replicated as open source programming. An original work is never the achievement of a single or isolated mind, but of a distributed cognition system of themes, templates, recipes and canonical structures, which serve as basis for creative expression:

Every minister in every faith is like a jazz musician, keeping traditions alive by playing the beloved standards the way they are supposed to be played, but also incessantly gauging and deciding, slowing the pace or speeding up, deleting or adding another phrase to a prayer, mixing familiarity and novelty in just the right proportions to grab the minds and hearts of the listeners in attendance. (Dennett [2006]: 154)

This *transitional* template granted by aesthetic communication will probably not take us materially to the far reaches of space and time, as abstract reasoning and applied science sometimes claim, but in keeping its flame alive, at least we will not arrive there so empty-spirited as to be totally deaf to the music of the spheres which inspired our quest in the first place.

THE ILLUSION OF A CLOSURE

In this article, we have shown how aesthetic communication has had a crucial role in the scaffolding of mind allowing us to build a distributed cognition system we call our human world. We have proposed that art, as a human form of play behavior, is far from superfluous, and we have given several examples of its evolutionary payoffs. A question of great scientific interest is whether the aesthetic communication we find in the human arts still serves a purpose in our contemporary forms of cultural transmission. Huizinga (1935), Guénon (1945), Donald (1991), Dissanayake (2000), and Bellah (2011) have all shown special concern with the cultural drift we’re experiencing from the fading out of traditional societies. Having crossed the threshold of mythic culture, rites and ceremonies are no longer a universally legitimate commentary on human experience. Theory and criticism have replaced, maybe without return, the feasts, narratives and séances that used to keep the human world from falling apart. Analytical thought, with its development through technology, has had a pervasive effect in modern society; its supremacy is not only felt in media, education, government and production, but also in ethics, where it questions traditional values and aims to replace them with conventional or utilitarian principles. In this regard, art has become isolated, as some sort of luxury of the civilized world; or an «accursed share», to use Bataille’s (1949) image. Confronting this state of affairs, we must remember that, «the stability, resilience, or persistence of a practice depends on the network of relations to other practices within which it is embedded» (Hutchins [2013]: 13). If, as we have portrayed so far, aesthetic communication has had such a pivotal role in the evolution of our species, conveying informational couplings between human beings and the worlds we deal with, scientific effort should be aimed at understanding what kind of knowledge we jeopardize by building our society based on the sole value of profit and utility, and how this bias is acting in or against our benefit in the long run. If aesthetic communication

is to be considered, like Bateson (1972) thought, as a sort of «unconscious ecology», a pattern that connects islands of decreasing entropy, then the waning of art at the verge of ecological disaster begins to be a non-trivial matter. We would like to draw this article to its logical conclusion by quoting once again a man who saw that play was anything but superfluous. Huizinga's *In the Shadow of Tomorrow*, a work deeply concerned with the cultural disease of our times, contains a sentence which aptly synthesizes the message of our own essay: «If we are to preserve culture we must continue to create it» (Huizinga [1935]: 35).

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