

Narratives in Biodesign: between *poiesis* and *praxis* Raul Pinto ⁽¹⁾ y Pedro Maia ⁽²⁾

Abstract: Nature has unavoidably been present in human evolution, defining limits, capabilities, and imagination, or in other words, determining how and why we design. In this article, we intent to look at nature itself as a cultural pre-set narrative (or set of narratives) and, reflect on how these narratives influence design in two very distinct aspects. The first look is at nature's narratives related to *poiesis* and it's potential to generate emotional references. While the second, focuses on nature's narratives associated with its *praxis*, along with its procedural reference for design. As a conclusion we look for common and divergent points between this two approaches with the intent to contribute to a better understanding of how the idea of *Nature* influences design.

Keywords: Design - Nature - Biodesign - Narrative - *Poiesis* - *Praxis* - Nature-associated-narratives - Behaviours - Emotions

[Abstracts in spanish and portuguese at pages 116-117]

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1. Introduction

Nature, in and by itself does not design, although design is entirely defined by the on-going evolution of human's biogenesis and creativity, and by the continuing evolution of natural structures and materials.

All its complexity is leading design to experiment with different approaches and meanings regarding the relation between nature and the human-made. In this sense, nature can be a huge inspiration for developing biological narratives applied to the design process, inducing designers to create new stories.

Considering this, human beings can be described as storytelling creatures, which perceive the world and things through the construction of narratives to explain and interpret events both for themselves and for others (Sikes and Gale, 2006). Narratives, give humans the ability to extrapolate beyond reality, makes them dream or enchant through a universe of ideas or images, offering an alternative path to the "raw" and immediate reality.

We must, however, consider that, despite the ethereal character of metaphor and poetics, they decisively influence design of alternative universes, with an impact on human behavior, contributing to the intersection of the dimension of experience, emotion, and behavior with the design.

The following article crosses to different approaches on how nature-associated-narratives influence design and intends to contribute to the discussion on how these narratives actually impact our perception of Nature as an opposite to the cultural and physical human-made. One looks at narratives that have a connotation to the *poesies* (where nature's poetics and metaphors can be the basis in design approach). The other considers narratives associated to nature's *praxis* (where the practice is distinguishable from the theory) through the reflection on nature itself as an intertwining relation between process and matter.

This article has at moments two distinctive voices that is related to each author having a different approach to the subjects addressed and as a result, we believe that this fact, although stylistically unorthodox, contributes to a better presentation of the core subject—that narratives associated to Nature have a key influence on Design.

2. Nature's Poiesis

“The objects in our lives are more than mere material possessions. We take pride in them, not necessarily because we are showing our wealth or status, but because of the meaning they bring to our lives” (Norman, 2004, p. 6).

Humans, as Donald Norman (2004) says, develop attachments to things if they have a significant personal association, if pleasant moments are transferred to the mind. In this sense, relations with artifacts no longer take place in a purely technical and physical dimension, and it is necessary to configure new relational paradigms that are closer to emotional needs.

This intimate relationship between man and object results in the incorporation of emotional aspects, since, in line with Paul Virillio (2000), the object can be where the body is not, shaping new emotional relationships between object and society. Also, Vilém Flusser (2010) states that man's existential interest moves more and more from physical things to interests intangibles, such as memory or experience.

Considering that the interest of design for a long time was focused on the functional and technical capabilities of products, on issues of use or social functions (Burdeck, 1997), it is imperative to highlight the importance of semiotics in the definition of a new paradigm of communicative signs and meanings applied to the project in design, introducing important theoretical foundations for the discipline.

Semiotics, as a science, relates and analyzes communicative signals between individuals, constituted itself as one of the main disciplines that contributed to the development of design, through the incorporation of symbolic and cognitive values associated with a new generation of products in which perceptions, emotions and representations overlap with morphology and spatiality.

The new artifacts, full of technology and meanings, respond to a loss of sense of belonging, appealing to the cognitive senses of man. Now products interact, communicate, trigger emotions, induce experience, and promote new behaviors, uncovering the growing need to build new narratives, that is, to develop the ability to tell a story.

In this context, Flusser (2010) states that, the underway cultural revolution is occurring because we have gained the ability to design alternative worlds alongside the one we accept as acquired. Thus, it becomes necessary to deconstruct individual pre-established perceptions in the search for new meanings for existing realities. Erlhoff & Marshall (2008), in the same sense, refer to the need to dilute or broaden the ways of thinking, considering that in many cases the lack of specificity in design research can be an advantage, distinguishing it from the most conventional areas.

This essay tries to reflect this philosophy, with the purpose of interconnecting intangibilities, nature, and design, re-imagining the present and promoting new concepts, within the scope of the communication established between man and technology, or in technologically mediated relations. These interactions, under the spectrum of current technological trends, seem to demand new directions in the established relationships with nature, in the physical, social and symbolic domains.

2.1. (BIO) Metaphors and Narratives

“(...) Nature is, in itself, an uninterrupted fabric of words and marks, of narratives and characters, of speeches and forms” (Foucault, 1998, p. 95).

Considering the time of transformations we currently live in, where the digital medium, visible or invisible, is taken for granted and it's omnipresent in the fabric of our lives¹, it is important to highlight the relevance of form, structure and function for biological-inspired methodologies, while at the same time explore the incorporation of less material and physical approaches, associated with biological (non-human²) behaviors.

We recognize the possibility of physical, but also digital behaviors being inspired by nature, in an attempt to find points of contact with timeless archetypes of the human being. Considering the indispensable “dematerialization” of design, which places interaction and experience at the center of the man/technology binomial, it becomes necessary to interpret natural behaviors for later application in design. This way, we intend to promote a consistent and innovative cross between design and biology, by using the studies of existing behaviors in nature and aiming to speculate on new ways of communication with and through technological artifacts, as well as to enhance the appearance of new interactions, to intend to make them more fluid, imaginative and promoting new experiences.

Through nature we seek to enhance a different approach angle, one that promotes new metaphorical processes by introducing behavioral dimension not as a final goal of a design, but as a starting point, in the domain of the poetics and aesthetics applied to the design argument.

Based on this conceptual dimension, we follow Francisco Providência (2011) when he says that it is important to rescue poetics through design, based on the metaphorical model that will distinguish it from other design disciplines. This author goes back to the words of Aristotle when he assumes that he prefers poetics to history, since the former is receptive to a world of open possibilities, the latter being converted to the density of the past. Moreover, we must consider that, despite the ethereal character of metaphor and poetics, they are of interest to the field of design as strategies to build alternative worlds, translated into concrete final results that have an impact on human behavior. In this sense, we agree that poetics in design is a means of revealing the hidden truth and the anticipation of time. Meanwhile, it cannot be ignored that poetics are technical decisions, screws and constructive finishes, colors and details of the shape, or the shape itself (Providência, 2012).

2.2. Behaviors has holistic strategy

“(...) affirming that the design is located between the material and the ‘immaterial’ is not completely unreasonable” (Flusser, 2010, p. 20).

Behavior holds within itself a catalyst role of meanings and significant or, as Merleau-Ponty claims, “(...) the behavior is not a thing but it's not also an idea, is not a shell of a pure conscience. That is precisely what we meant by saying that it is a way” (1972, p. 138).

Our understanding of the importance of behavior in the human imagination, and consequently in the project culture in design, is reinforced by the idea of Kleber Del-Claro (2004), who states that the science of Animal Behavior can be defined as an exercise of human curiosity in trying to understand its own animal nature.

In this sense, the study and interpretation of intangible concepts or actions presents, due to their subjectivity, increased difficulties in their understanding and characterization, a fact that originates the need to define a systematization strategy applied to design.

In order to rehearse this approach, a taxonomy of biological behaviors (presented in the point tools for narratives) was built, in order to constitute, in the scope of design, as a useful instrument for the interpretation of these intangibilities.

In this context were identified the rituals of seduction and dating existing in nature, which, due to their fantasy, present themselves as potentially interesting for the construction of analogies and metaphors between the intangible biological universe and the way of interacting with or through technology.

“Seduction is where we least imagine it. It surprises us. Instigate us. It provokes us. Immaterial, it moves in time, dribbles morals, adapts to culture” (Guenoun, 2006, p. 9).

In nature, seduction can be observed when the peacock shows its plumage to attract a mate, or when humans flirt and interact to get to know each other more intimately. Seduction, as a timeless communicative system, is loaded with poetics and symbolism that, in its activity, manages to bring together the concepts of interaction, communication, action/reaction or emission and reception of signals, essential characteristics in the relationship between two parties and that can be of great interest to biological-inspired design.

In this context and inspired by the metaphors of Jean Baudrillard (1991), we emphasize the chameleonic and “invisible” aspect that the power of seduction represents, expressed in its simultaneous strength and vulnerability. Like Guenoun (2006), we consider seduction, as a circulating strategy, which establishes the interface with the natural world, and which, according to Kierkegaard (1979), is incorporated into the individual’s personality, inducing pleasure as the purpose of life, personally enjoying aesthetics, and aesthetically enjoying his own personality.

Translated into the context of design, we found, like Van Gorp and Adams (2012), that, in the man-product relationship, the senses attract attention and trigger the desire to approach, encourage and interact, working as seduction triggers, reinforcing the importance of promoting “seductive interactions” focused on aesthetic and emotional receptivity.

In this sense, we consider that seduction promotes contact and conversation. It is possible to say, as mentioned by Van Gorp and Adams, that interaction between humans and products can also be understood as a dialogue, with similarities to the ones existing in the interpersonal relations. The same thought is shared by Saari (2005 in Van Gorp and Adams, 2012), who writes about the possibility of interactions occurring in a dialogical or narrative form. In this sense, the importance of rescuing poetics through design should be based on the metaphorical model (Providência, 2012).

Rituals of seduction in nature

Nature is lavish in seduction strategies that resort to illusion through the senses. Some strategies are “honest”, others are not, as in the case of orchids, that seduce male insects by imitating the odor of female insects, guaranteeing this way its successful pollination.

One of the most ubiquitous ways we find in nature to deceive is camouflage, used by insects trying to look like leaves, moths imitating the patterns of tree barks, salamanders that resemble plants, snakes that mix with desert sand or squids that can change color to look like anything that exists around them. Even many animals that are unable to change their color can, for example, swell-up to look bigger, stronger, and healthier.

The imperative need to inform other animals led to the development of the most varied strategies, which are, in reality, ways of communicating, and which, with greater or lesser complexity, are transversal to all animals, because, as stated by Araújo and Lima (2002) “Any animal species has some form of communication, from a simple signal-stimulus that causes a pattern of behavior that is only instinctive, to extremely elaborate communicative processes such as vocalization” (p. 23).

The use of the senses assumes a preponderant role for communication and interaction with the other. These are innate skills, highly perfected and constantly evolving, which allow us to seek to fulfill the final will of the ritual’s performer, presenting itself as the communicative vehicle *par excellence* of the seduction strategy, being transversal to the most diverse rituals existing in nature as well as to the most diverse forms of communication and interaction.

Given that, we focus on the ancestral mystery of the communicative processes of seduction found in nature in the form of ritual, which often regulate the interrelations between two parties. These seduction rituals, like other behavioral types found in nature (e.g. hunting), are extremely rich processes, most of the time protocolled, and developed over thousands of years, which obey pre-determined procedures for a specific purpose. In the case of seduction, these actions induce contact and promote interactions, aiming, for the female to make an assessment of the potential candidate, or for male to convince the partner to mate, playing a decisive role for the evolution of the species through sexual selection. In this context, ornamentation, which represent a word full of meaning in the context of design, plays a decisive role in the propagation of signals, on the condition of each animal (healthier, stronger, faster, etc.).

Charles Darwin (2011), in his initial proposal of the theory of evolution, considered some traces of animals as “garbage”. However, in the course of his studies, he realized that ornamentation plays a preponderant role in sexual selection, because it is supposed to show (or deceive into believing in) the health and vigor of the animal, and, generally, the more vigorous the males, the better they are adapted to their roles in nature, and more likely to leave stronger offspring. He enforces that the possession of these special ornaments (e.g. deer horns, lion’s mane or rooster spurs), was often more important than the real vigor of the animal.



Figure 1. Examples of nature ornaments: deer's horns, lion's mane and peacock's tail.

We highlight the most cited example of ornamental magnificence in the animal world, the peacock's tail, that provides all the information that the female may desire, described by Adeline Loyau, *et al.* as one of the most complex colored ornaments among bird species (2007). This luxurious manifestation, demonstrated through its symmetry of scale in the feather pattern, and even in the concentric "eyes" of each of its feather, implies physical health for its ostentation and used in the ritual. In this light, being able to support such a great burden of feathers is also a sign of vigor and health. The enormous tail would be impossible to carry for a potential impostor, which, after channeling all his energy into a splendid tail, would suffer in the long run.

Other seduction strategy is the one that consists of a sequence of ritualized actions, characterized by harmony and aesthetic intensity, as seen, for example, in the behavior of seahorses. They change color, intertwine their tails and swim together during their courtship, caressing themselves with the tentacles, trying to decide if the pair is ideal for mating. Chameleons, being practically deaf, use a tactic to recognize their partners by communicating based on visual signs, shapes, colors and patterns (*See Figure 1*).

Continuing in the realm of land animals, the snails ritual consists of trying to "stab each other" with "darts of love" before copulating. The dart, which is shaped like a hypodermic needle, injects a hormone into the other snail, causing a change in its behavior, inducing it to copulate.

Moving on to the field of flying animals, we describe the butterfly's ritual. The male has an eight-step repertoire, that he needs to repeat in front of the female without flaws or exchanges, since only then the copulation happens.

The birds are, according to Stilwell (2012), "the great creatives in the strategies of attraction", and "present divine displays of singing, dazzling dance steps or acrobatic flights, among other revealed attributes" (p. 22). In this group of animals, we describe the frigate bird's ritual, which seduces through sound, image, and a kind of red inflatable in the chest

that, when fully inflated, attracts attention and gives indications to the females of their health condition.

Another bird worth mentioning is a bird of paradise. Its ritual consists of a superb choreography, where it is using graceful movements and spreading his tail and wings of vibrant colors, while flying and rotating acrobatically between tree's branches, and contorting its head on its back.

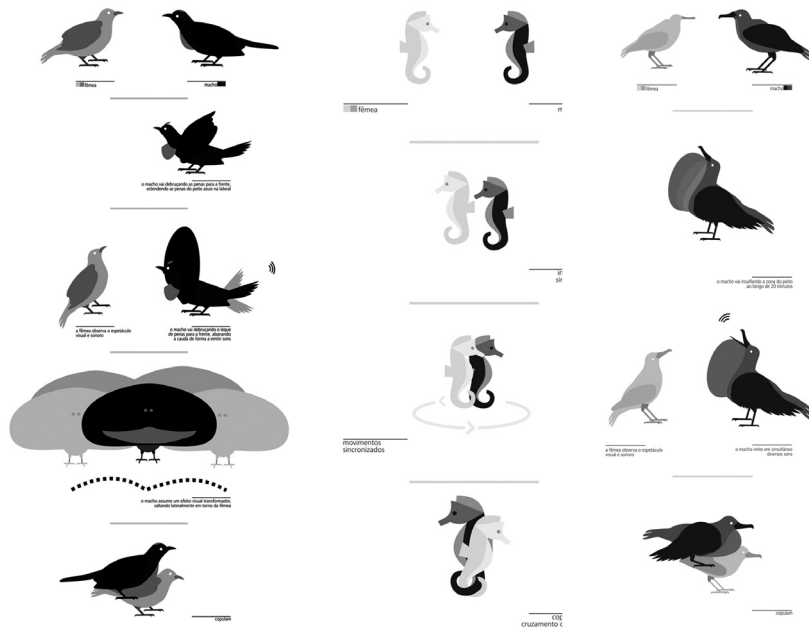


Figure 2: Examples of seduction behavior diagrams: bird of paradise, seahorses and frigate bird's (author's archive).

Seductive behaviors are an integral part of the human imagination, timeless, loaded with poetics, aesthetics, and symbolism, and in addition they still manage to bring together the concepts of communication, action/reaction, emission/reception of signals and interaction, essential characteristics in the relationship between two parts and which are presented with a lot of interest in the relationship between man and material and technological culture (See Figure 2).

2.3. Tools for Narratives

“The most innovative people seek the edges of their disciplines, looking for novel ways to think about what they already know” (Woolley-Barker, T., 2017, p. 155).

In this article we tried to focus essentially on argumentation about the possibility of building (bio)narratives based on biological behaviors of seduction. Thus, we do not dedicate much space to the description of the already carried out experiences that apply this vision. However, we understand that this document would not be complete without presenting, although succinctly, the materials generated by this approach and the respective first steps in its experimentation/application.

Based on the abundant universe of biological inspirations we rehearse the possibility of building an integrated and holistic view of the potentialities in non-human animal behaviors to develop intangible dimensions such as interaction, experience, behavior or emotion applied to design.

Since it is not possible, nor desirable, to hide the relevance of form and structure in behavior (e.g. silhouette, color or textures), we try to ensure that they do not assume the main, isolated role, but that they are diluted in the perception of the behavior itself, in time and space, promoting the appearance of more fantastical and poetic narrative universes.

In this way, through the lens of design, we developed a set of interpretive tools for the behavior of 20 animals (5 terrestrial, 5 aquatic and 10 flying), inspired by the six dimensions that contribute to the dynamic structure of the experience, identified by Nathan Shedroff (2001): Time/Duration; Interactivity; Intensity; Sensory and Cognitive Triggers.

Considering this, upon the collection and classification of each animal's ritual information, we developed a taxonomic grid. A general picture of the behaviors was constructed, which allows a global view of the selected animals and offers a comparative analysis between them. According to the criteria defined by the designer, this table helps to “filter” the examples with the greatest potential for application, depending on the problem to be solved (See *Figure 3*, p. 102).

The collected information was visually organized, in order to transmit the answers found for each point of the taxonomy objectively and clearly. With the same premise, a set of “cards of the behaviors” was designed, which in a visually and graphically appealing way synthesized the information from the taxonomy (See *Figure 4*, p. 103).

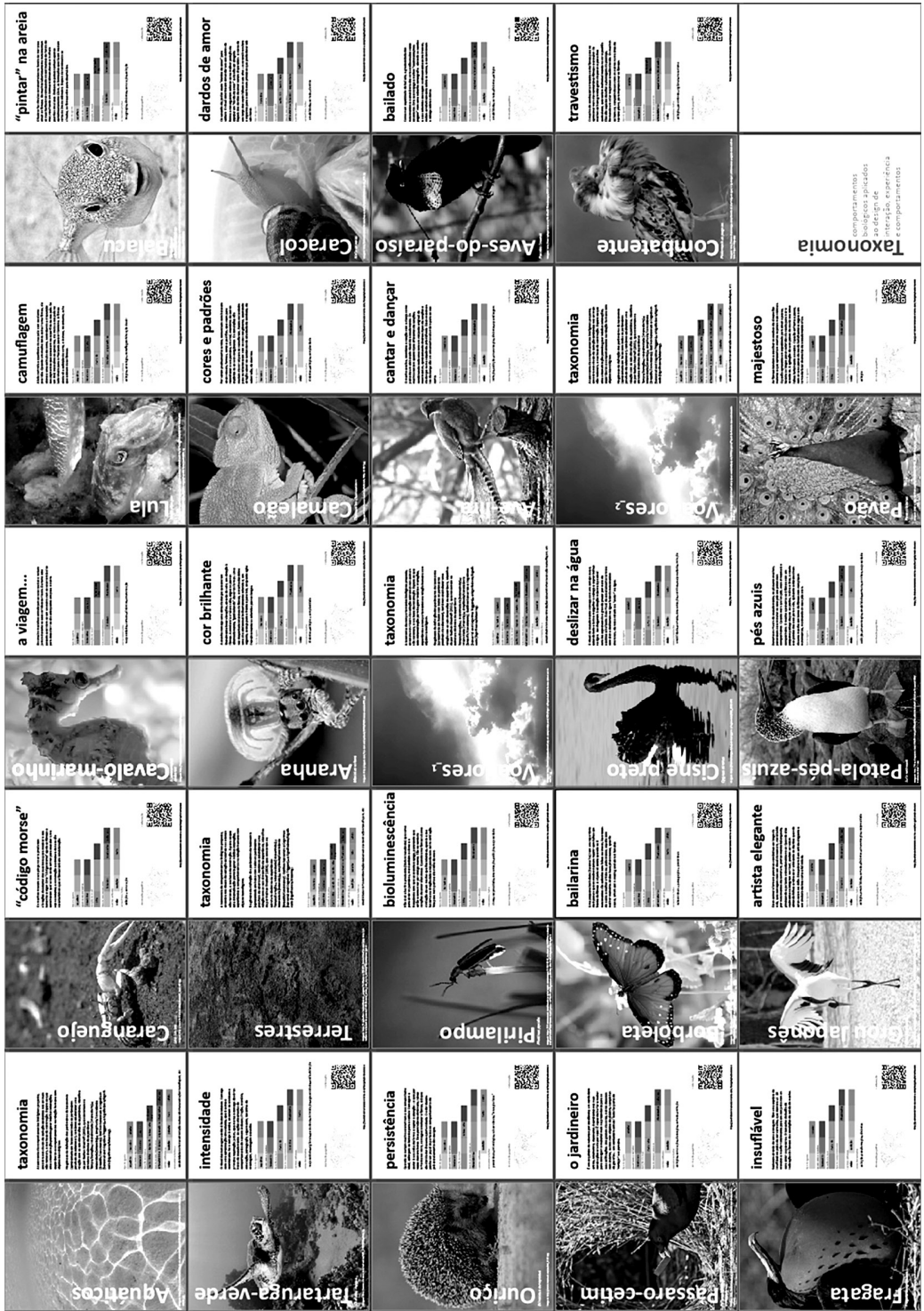


Figure 4. Cards of behaviours (author's archive).