

On the Origin of Art

A synthesis of Darwin, Harmon
and Pirsig

An Essay by
Wilko Schmidt-Dannert



fig.1- The Artist's Compass ^[19]

List Of Content

-	
Introduction	6
Chapter 1 - Into The Woods	7
1.2 The Artist's Compass	7
1.3 Dissecting a Compass	9
1.4 Enter: Quality	10
<i>Chapter 2 - Life and Evolution</i>	12
2.1 A Definition of Life	12
2.2 One More Process	14
2.3 Emergent Characteristics I	15
2.4 Emergent Characteristics II	15
2.5 Emergent Characteristics III	16
2.6 Emergent Characteristics IV	17
2.7 Following Principles	19
Chapter 3 - Back to Art	21
3.1 First a Summary	21
3.2 From Life to Art	23
3.3 The Assembly of a Compass	25
3.4 Sooo Many Needles	26
Chapter 4 - Implications	27
4.1 On Form	27
4.2 Of YoYos, Cycles, Circles and Helixes	29
4.3 On the Processes	31
4.4 A Balance of Values and Needles	33
4.5 Into the Woods Again, but with Shovels and Legos	33
Chapter 5 - A Definition of Art	35
5.2 On Intrinsic and Extrinsic Motivation	37
5.3 On the Value of Art	39
Chapter 6 - Art and Others	40
6.1 On the Inner Worlds	40
6.2 From Subject to Object to Subject.....	41
6.3 Perfect, Lossy Communication	42
6.4 Intuitive and Cognitive Values	44
Chapter 7 - The origin of Art	46
7.1 More than an Analogy	46
Acknowledgments	48
References	48

This Abstract, which I now publish, must necessarily be imperfect. I cannot here give references and authorities for my several statements; and I must trust to the reader reposing some confidence in my accuracy. No doubt errors will have crept in, though I hope I have always been cautious in trusting to good authorities alone. I can here give only the general conclusions at which I have arrived, with a few facts in illustration, but which, I hope, in most cases will suffice.

-
Charles Darwin,

from the introduction to "On the Origin of Species"^[23]

Introduction

-

In the way it came together, this essay is as much about the things I found out as it is documenting the journey that got me there.

This journey started during my masters at the HKU University of the Arts, Music & Technology^[27], with a plan to create a guide filled with some tips and tricks to aid and maintain the creative process. I was planning to deliberately address young creatives from all disciplines at the point of transitioning into professionalism.

In preparation, I had listened to hours upon hours of podcasts and interviews of my favorite creators and was ready to pour their accumulated wisdom and experience into a slim 15 pages.

Then, while *actually* writing it, I noticed that I was slowly drifting away from that goal. Instead of moving towards it, my interest moved laterally, pushing me to deepen my understanding of the underlying concepts.

Along the way, already considerably off course, my supervisor advised me on reading a book by the American author Robert M. Pirsig that I coincidentally had already heard of before. I found it as an audiobook on YouTube, listened to it and became obsessed. The point at which Pirsig's ideas entered my thought process and the way in which they influenced the course of this piece are still clearly visible.

Before Pirsig, however, most of what I wanted to get at was inspired by the writer Dan Harmon. Aiming to simply compound his insights and teachings from different sources and combine them with those of other creators as well as my own, I set out and started writing the following chapter.

Chapter 1 - Into the Woods

-

One of the major challenges in discussing art and the creative process is to keep that discussion from becoming too theoretical and abstract. To circumvent this, I would like to utilize a metaphor that compares creating art to the navigation of unexplored territory.

Large parts of this analogy come from Dan Harmon, an American writer of screenplays and series, who said a great deal of very insightful things about the creative process.

He describes the artist as a forester, cartographer or explorer in an uncharted forest. His exact location and surroundings are unknown, even to him, but unlike a common traveler he is not fazed by this in the slightest; he is "lost" on purpose. His job isn't to get out of the woods, it is to walk through and explore this largely unknown territory, to live in and with it.^[1]

Several tools can be utilized to guide these explorations: Maps, travel guides, directions, words of advice and all sorts of hardware. In the following, we will focus our attention on an inconspicuous little item: the compass.

1.2 The Artist's Compass

-

Harmon repeatedly talks about the compass. It is a very limited but brilliant device. It can't tell you where you are, it can't tell you where you've been, nor where you should go. It has no clue as to where a stream, cliff or path might be, it just tells you where north is.^[2]

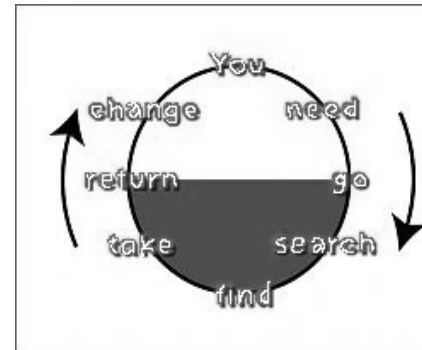
In his writing-centered storytelling world, this north is the story circle,^[3] a modified version of Joseph Campbell's monomyth, who described it in his 1949 book "The Hero With a Thousand Faces". According to Harmon, this structure is so universal and deeply engraved in our human brains and culture that he summarizes it simply as the shape of information that affects us.^[7] (see fig.2)

So far, I have found no engaging story that didn't resemble this story circle. Whenever I was enthralled by a story and compared its central plot points to the ones in Harmon's circle they would either match up or at least overlap significantly.

Apparently, there are a few exceptions in other cultures, for example, the Chinese story-form of "qǐ chéng zhuǎn hé", which is constructed around a central twist. However, the word "twist" may serve as an indication that these are just variations on the more fundamental structure of the story-cycle; many of the more popular examples follow it eventually.

In Chapter 4.1 I will discuss how insights gained during the research for this essay might explain these variations by expanding and refining the concept of the story-cycle.

If you're looking for Harmon's unabridged version, he makes a very good case for it on the Channel 101 website.^[18]



The most simplified version of Harmon's story-circle.^[13]

Each 8th of this cycle represents a new step as well as change in direction.

1. A character is in a zone of comfort,
2. But they want something.
3. They enter an unfamiliar situation,
4. Adapt to it,
5. Get what they wanted,
6. Pay a heavy price for it,
7. Then return to their familiar situation,
8. Having changed.

fig.2 - Dan Harmon's Story Circle^[14]

Important to note here is his advice on using this compass: Only use it to not circle the same tree and die. However, as soon as you feel you're chugging, put it away! Don't stare at your compass while walking, you'll walk into a tree.^[4]

Taken out of the analogy it means: As soon and as long your intuition tells you where to go: follow it, in most cases you'll like where you end up! Only use references when you need to orient yourself.

1.3 Dissecting a Compass

If we stray away from storytelling, however, the absence of a similar "compass" for other arts becomes increasingly obvious. Why would this be? Why should there be this amazingly helpful tool for writing stories but not for anything else?

I knew from personal experience that art in forms other than stories is able to move me and other people immensely, sometimes even *more* than a story could. Musical pieces without words or with little development, abstract paintings and sculptures, vague poems; they all obviously work but can't be explained or guided by the same story-model.

The longer I was looking into this, the less satisfied I became with the situation and decided to look for the underlying principles that make the compass work.

Harmon himself has gone a long way in that direction himself. In an interview with Pete Holmes (also a fan of Campbell's work), he explained his understanding of how his compass, the story-circle, works by describing the stories that other lifeforms would create.^[5]

An amoeba's story, he says, would go like this: "Once upon a time a fucker stuck to his shit and the end! Happily ever after forever!", which doesn't resemble a circle. The multi-cellular organism would expand that to: "Well once upon a time there was a little bit of change but then, you know... take it easy!".

Following time's arrow, each new and more advanced species would have a more interesting story to tell until we arrive at humanity's story: "Once upon a time things were the way they were but for this impulse, this white rabbit" (Step 1 and 2 in the story cycle, implicating the rest). He describes humanity as "a species that needs to change or it will die"^[6]

In humanity's quest for change and adaptation, he concludes, the story-circle is the shape of information that is best suited to human sensibilities. This implies that the story-circle is a codified version of life itself and human life in particular.

This would explain why it works so well: it literally is part of an evolutionary process, the central concept behind life as a whole and has been with humanity since its earliest, simplest forms could be used to our advantage.

1.4 Enter: Quality

In his groundbreaking 1974 book "Zen and the Art of Motorcycle Maintenance" the American author and philosopher Robert M. Pirsig, not an artist by trade or his own definition, arrives at a beautifully universal definition for art in pursuit of his concept of quality.

He argues that quality, as in: "highest quality", the central theme of his book, is the ultimate goal of life itself^[8] with art simply being high-quality endeavor.^[9]

This comes surprisingly close to a definition that I settled on a few years ago which states: "Art is whatever someone ends up with when doing his absolute best."

Pirsig goes even further and heightens quality to a monotheistic entity, the creator of subjects and objects^[10] but lost me there. His idea that quality was before everything and guided the creation of it seems far-fetched and unnecessary saturated with unlikely, unprovable concepts.

To me, it seems more likely that quality is what turned out to be the differentiating factor between "good", prosperous life and "bad", unsustainable ways of living. Quality, as we came to call it, is therefore linked to evolution; striving towards higher quality means striving towards a higher quality of life as a whole.

At the point in time when life started to exist, quality was the direction in which life separated from the inanimate world.

If true, this would beautifully integrate with Dan Harmon's theories about the origin of stories. It would also mean that the principle of the compass he used could be expanded to all other art forms since it implies that they share a single goal: quality, which in turn is a distilled, codified and evolved representation of life, while at the same time being part of it.

I would therefore argue that art has the best chance of affecting and moving people, and is the truest to its goal of quality, when it follows the direction, forms and ways of life.

Chapter 2 - Life and Evolution

2.1 A Definition of Life

Disclaimer: I am not a biologist by education. In order to prevent misinformation and factual inconsistencies, I had the following chapter checked by Claudia Schmidt-Dannert, a professor of biochemistry who is well-versed in this field as well as Than van Nispen tot Pannerden, a lecturer on Music & Biology at HKU.

If we accept the hypothesis that art is a codified depiction of life itself, what can that tell us and how can it lead to a compass for all arts?

Well, if art is a ciphered version of the factors that distinguish living from inanimate objects, finding and defining those factors is a logical first step.

As it stands, no single definition of life has been unanimously accepted so far. The best one I could find comes from NASA and was inspired by Carl Sagan. It states that: "Life is a self-sustaining (chemical) system capable of Darwinian evolution".^[1]

Darwinian evolution is the natural, continuous process of mutation, combination and selection leading to **adaptation**, enabled by the "almost" perfect transfer of an encoded blueprint for self-replication. The features necessary are: a finite life-span, reproduction, **preservation of information**, transmission of this information to the next generation and small **imperfections** in that transmission.

These features form a repeating sequence, a **cycle**, with the following five steps:

1. an organism has and preserves genetic information,
2. it passes this on to the next generation with occasional small mutations,
3. it dies, making room for its offspring,

4. the mutated members of the new generation have slightly altered attributes,
 5. **natural selection** determines which of these are advantageous to survival and these lead to a slightly higher chance of reproduction,
- ... rinse and repeat.

This process ultimately enables life to passively adapt to environmental factors and changes. For it to work there has to be a balance between preservation of information and mutation. If the replication was flawless, life could not evolve. Conversely, if there were too many mutations, evolution would become chaotic and run the risk of losing critical information.

Additionally, if the occasional mutations wouldn't be inheritable, life could only ever take one step, one mutation, and when that generation reproduces it would be lost again. The result, again, would be an inability to evolve.

The universe, bound by the laws of physics and being as vast, complex and ever-changing as it is, provides not only the conditions due to which life can exist but also those against which life has to prevail.

The resulting natural selection is not uniform in time and space but specific to each and every separate situation.

This set of conditions and processes, when all working together, creates the fundamental characteristic of life: **cyclic** (*helical* ^{Ch.4.2}), gradual, incremental adaptation.

In the last chapter of his legendarily groundbreaking 1859 publication "On the Origin of Species", Charles Darwin writes the following:

"These laws [of evolution], taken in the largest sense, being Growth with Reproduction; inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a

consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. [...] As natural selection acts solely by accumulating slight, successive, favorable variations, it can produce no great or sudden modification; it can act only by very short and slow steps. ^[21]

2.2 One More Process

-

In addition to mutation and selection, there is also a third sub-process of evolution: **combination**. By combining and mixing the genome of two individuals in the reproductive process, the variation of genetic information between generations can be drastically increased over just relying on spontaneous mutation or transmission errors.

Additionally, it is possible for multiple singular cells to physically band together and take on specialized functions within the group, giving rise to multi-cellular organisms.

Finally, once the organisms become able to "choose" their reproductive partner, this also represents an extension of the way in which natural selection works, since the perceived "quality" of such a partner is itself based on the advantageous attributes that have been shaped by natural selection.

The variations this process creates are therefore not entirely random, which hugely improves their efficiency in producing advantageous attributes.

2nd Disclaimer: Recent scientific findings strongly suggest that epigenetics (heritable phenotype changes not linked to the DNA sequence) also plays a role in evolution to an extent that is yet unknown. However, since it appears to work on significantly shorter time spans and does only seem to slightly modify instead of overthrow common genetic evolution, I will not address it specifically.

2.3 Emergent Characteristics I

-

Now that we have a definition of the fundamental processes and principles of life and evolution, we can take a look at the characteristics of life that emerge as a consequence.

The first one has its roots in the nature of the copying process: **unity**. Copies are by their definition similar to their original with a "perfect" copy being identical. Their resemblance of one another results in a general visible and functional unity that is evident in all life we know today.

Next, the small, random imperfections, called mutations, in the reproductive process lead to two closely related emergent characteristics: **novelty** and **diversity**.

The slight variations of the genetic material are new, compared to the old genome, and because these mutations are random, they naturally lead to a diversity of corresponding attributes between individual members of a group and between groups.

Most of these mutations, and thus their new attributes, are actually detrimental to survival, some are neutral and only a few are really advantageous in the face of natural selection. Therefore, the stability or **consistency** of the replication process is of the utmost importance, as every alteration bears a high risk of lowering fitness.

2.4 Emergent Characteristics II

-

Next is a pair of emergent characteristics that are on opposite ends of a scale: **simplicity** and **complexity**.

The simpler an organism is, the higher its possible rate of reproduction can be. Simple, single-celled organisms can therefore quickly grow in numbers which is the

key advantage for their survival. Based on the inherent robustness of their simple makeup, they waste little time and resources on elaboration and turn survival into a pure numbers game.

In contrast, more complex multi-cellular organisms can develop a multitude of protective and coping mechanisms to environmental forces, as well as abilities to use food sources that are impossible to access and/or process for simple organisms.

As an organism gets more complex, it requires an increasing number and diversity of chemical substances and compounds. This in turn means that the resources needed to sustain it also have to become more diverse and varied, leading those organisms to pursue this diversity in their nutrition.

This comes at a risk however, if a species becomes reliant on several different resources it can face extinction if one of that supplies changes faster than it can adapt. The **diversity** of the demand therefore has to be balanced against the dependability, reliability and **consistency** of the supply.

The fact that the world after 3.5 billion years of evolution is still inhabited by the simplest, as well as very complex organisms like ourselves, proves that both approaches are valid ways to survive the process of natural selection.

2.5 Emergent Characteristics III

-

Another pair of contrasting characteristics can be seen when we take a look how evolution shapes species on the spectrum of versatility.

On one end of the spectrum are specialist species which have adapted to a specific set of environmental circumstances or resources. On the other end are generalist species which can survive in a wide variety of environments and are able to utilize diverse resources.

The advantage of the specialist species lies in the high level of optimization that **specialization** enables. All attributes that are of no use in their specific environment can be discarded and don't have to be sustained, while those that *are* useful can be embellished. The result is a species that uses a specific environment or resource with maximum efficiency.

The advantage of generalists species lies in their **versatility**, if they go extinct in one area they can survive in another and when one of their food supplies runs out they can switch foods.

As with the last pair, the fact that we share our planet with species of both the generalist and specialist variety as well as many in between can be seen as proof of the validity of both approaches.

2.6 Emergent Characteristics IV

Finally, there is a second form of evolution itself, not anymore solely routed in the preservation of genetic information but knowledge. This form is called cultural evolution and can be witnessed not only in humans but in every organism that passes knowledge between individuals and from one generation to another. It marks a fundamental shift in the process of evolution from genetic memory to neuronal memory, an evolution of evolution as you will.

Knowledge about where water can be found, what is safe to eat and where is safe to hide, all help to increase the chance of survival. Passing on this knowledge to other members of a community as well as future generations is hugely advantageous.

As far as life goes, this is a fairly new process because it requires the facility to take in, process, memorize and transmit information that isn't part of the genome. These tasks are handled by the brain, which is itself subject to the evolutionary

process. Because of this, cultural evolution largely follows the same principles as the biological kind, since it runs on biologically evolved and evolving "hardware".

In his widely popular book "The Selfish Gene" (1976) the British evolutionary biologist Richard Dawkins created the term "meme" as the neuronal analog to the genetic term "gene", arguing that they indeed share a wide range of similar characteristics and "behaviors".^[22]

Harmon concluded that humans represent a special approach to this newest system of evolution by utilizing it to take adaptability to the next level.^[12] The universality of the story-cycle is one of the most prominent results of this inclination, being a literal imitation of the adaptation cycle of evolution, which is why it is so effective.

The flexibility of the human body and especially the human mind means they can adapt easily and quickly and feel rewarded for doing so. As a species humans are generalists but as individuals in a society, we often are specialists, a combination that is fairly unique to humans.

Overall it can be noted that life is constantly driven to survive and to further increase the chance of survival. One could say that it is inclined to be as different from not living as it can, which includes staying alive and making that as easy as possible.

It is important to note however, that evolution is not a guided or deliberate process and neither is natural selection. Evolutionary adaptation is the necessary and inevitable process that enables life to persist in a universe that is constantly changing.

The randomness inherent in this universe leads to many advantageous developments ceasing to exist because of unpredictable events, some detrimental traits being preserved for a lack of evolutionary pressure and some species reaching dead ends in their evolutionary development. Evolution is not, and should be not mistaken for an infallible system aiming for perfection or, in fact, aiming at all.

2.7 Following Principles

-

After having looked into the way evolution works, we have to look at how these objective biological processes, as well as cultural evolution, connect to our subjective reality.

This connection happens in our brains and is at the center of numerous scientific endeavors in the disciplines of neuroscience, neuro-biology, psychology as well as evolutionary biology.

In his later publications "Descent of Man" (1871) and "The Expression of the Emotions" (1872) Darwin himself took some steps to close the gap between these fields, which at the time all were in their infancy.

Unfortunately, even 150 years later, many crucial questions remain unanswered or hotly debated. Research in this area often requires enormous technical investments for medical imaging machines and deals with the most complex organ in known existence. Because of this, the actual processes inside the brain are only partially understood and subject to ongoing debates, without much indication of how much remains to be discovered.

Speaking in broad terms we can say that the brain has multiple interconnected neural networks that respond to external stimuli in accordance with its evolutionary programming and individual makeup. It utilizes numerous different combinations of these neural networks in order to guide its host in the right direction.

It is most likely that the processes behind all of the mental responses we have to any stimulus have been selected through evolution. The responses that led the host organism to engage in behavior that increased its chance of survival remained and got passed on with a higher probability than those that were unfavorable.

Since this evolutionary process has been going on for more than 3.5 billion years, a lot of which isn't documented, several stimuli we still respond to and/or the

way in which we respond are no longer compatible with our current state of living.

We end up with a long list of stimuli, some relevant, some irrelevant, some clearly beneficial and some we don't know the original purpose of. Some stimuli, for example the consumption of sugar, are somewhat outdated in a society in which sugar is easily obtained and these have to be offset by reason and discipline (which as many know can be quite a struggle).

Even though the overall function and working mechanisms of these neural systems apparently are the same for all members of a species and have similarities between species, the individual configuration of them is unique to every member. Also, since the primary function of the brain is to aid and accelerate adaption, lots of these responses are due to change over the lifespan of every individual organism.

This in turn plays into the diversity-characteristic of evolution and means that even though we are all humans, we get differentiating amounts of pleasure and gratification out of the same things. This is one of the reasons taste can differ so widely between even close friends; their inherited genes and brain-shaping life path are one of a kind and the response to stimuli is therefore also unique.

In 2022 the American record-producer and professor of musical cognition Susan Rogers published an excellent book on what she calls the "listener profile".^[24] In it, she carefully lays out all the dimensions of musical taste and preference as well as detailing how our brains respond to, and interact with music.

In taking what we learned about the theory of evolution as described by Darwin and Sagan and cultural evolution as discussed by Dawkins and combining that with the latest findings in neuroscience, we are slowly but surely becoming able to explain how our brains came to be able to process music.

In doing so, we might be able to find the through-line from genetic evolution to cultural evolution, via neuronal developments, to one of their most peculiar products: art.

Chapter 3 - Back to Art

3.1 First a Summary

At the end of chapter one, I argued that art has the best chance of affecting and moving people when it follows the direction, forms and ways of life.

Now that we know more about these as well as their influence on our subjective reality, we can take a look at how they inform our understanding of art. The hypothesis is that there are bound to be similarities in concepts and patterns that are reflected in both fields due to their linked origins.

In order to do that, we first need to extract, arrange and condense the attributes of life we discussed in the previous chapter.

It turns out that they can be separated into three categories:

A: Processes

B: Emergent Characteristics

C: Form

Within their categories, the processes and the emergent characteristics can be arranged in the order in which they developed in the course of evolution.

Interestingly, they appear to be organized in pairs of opposites, indicating that each of them represents a balance that has to be struck.

Once this is done, the resulting list looks like this:

A1: the process of **preserving information**

A2: the process of **imperfect reproduction** of information

A3: the process of **natural selection**

A4: the process of the (re)**combination** of information

A5: the emergent process of **adaptation**

B1 & B1a: the emergent characteristics of **unity vs. diversity**

B2 & B2a : the emergent characteristics of **consistency vs. novelty**

B3 & B3a : the emergent characteristics of **simplicity vs. complexity**

B4 & B4a : the emergent characteristics of **specificity vs. versatility**

C1: the **cyclic** (helical ^{Ch. 4.2}) form of life

3.2 From Life to Art

-

Now it becomes time to make the connection between the two fields.

The five processes (A1-A5) each have their analogue in art:

A1: the process of **preserving information**

corresponds to

A1': the **preservation** of the existing and the value of the **familiar**

A2: the process of **imperfect reproduction** of information

corresponds to

A2': the happy and unhappy **accidents** we make and other random events

A3: the process of **natural selection**

corresponds to

A3': the **selective** and reductive nature of the creative process

A4: the process of the (re)**combination** of information

corresponds to

A4': the **combination** of material, concepts and ideas from varied sources

A5: the emergent process of **adaptation**

corresponds to

A'5: the **adaptive** nature of art itself and the role of art in the **adaptive** process

Next are the emergent characteristics of life. These appear to directly correspond to the characteristics or attributes of art which can also be perceived as values:

B1 & B1a: the emergent characteristics of **unity** vs. **diversity**

corresponds to

B1' & B1a': the values of **unity** vs. **diversity**

B2 & B2a : the emergent characteristics of **consistency** vs. **novelty**

corresponds to

B2' & B2a' : the values of **consistency** vs. **novelty**

B3 & B3a : the emergent characteristics of **simplicity** vs. **complexity**

corresponds to

B3' & B3a' : the values of **simplicity** vs. **complexity**

B4 & B4a : the emergent characteristics of **specificity** vs. **versatility**

corresponds to

B4' & B4a' : the values of **specificity** vs. **versatility**

Finally, in terms of form:

C1: the **cyclic** (helical ^{Ch. 4.2}) form of life

corresponds to

C1': the **cyclic** (helical ^{Ch. 4.2}) form of art

Together, these appear to summarize the nature of art.

3.3 The Assembly of a Compass

Now back to our compass: Upon observing the items in our list it becomes apparent that the three basic categories (**A**, **B** and **C**) are correlated to different things in our forest metaphor. The processes (**A1'** - **A5'**) most closely resemble a minimalist exploration-guide while the form (**C1'**) acts as a rough depiction of what we are looking for.

The values (**B1'** - **B4a'**) which are arranged as polar opposites are most likely the magnetic field lines in our minds that guide the needles in our compass and, in turn, our exploration.

The fact that one always opposes the other should be a clear indication that these are not simply directions one follows to make good art. Following all of them is impossible and following only a single one is pretty pointless at most times, they are not goals but mere references and should only be used as such.

It's important to note that Harmon himself knows that these references do not eliminate I-don't-know-what-to-do-next or "stuckness" from the creative process.^[15]

In the woods, the compass doesn't tell you where you are, nor where to go or what you are looking for, you have to find that out, that is your job. It tells you: "That way is always north!", nothing else, helps you to not die circling the same tree.^[16] In the analogy of exploration, the compass is a tool for orienting yourself in a landscape of your own mind.

3.4 Sooo Many Needles

If we compare the instrument we now hold in our hands (see fig.1) with the one Harmon described, we notice that it is a lot more complex but also a lot more versatile. It now contains four needles, pointing in all kinds of directions, reacting to different kinds of fields but all ultimately guided by quality.

Inevitably, we have to realize that going in any direction from where we are, we will follow the direction of some needles while moving away from others. At each point in this world, it appears that quality takes on another form, finds another balance.

At any point, you can look at the compass and it will tell you about the directions you could go and how they relate to each other. With it, you can turn the vague feeling of "something ain't right yet" into a hypothesis on where to go in order to find what you are looking for. It can also tell you if you are still moving in the same direction you did the last time you checked.

Additionally, it now comes with a handy little guide in the lid, telling you about the ways (**A1'** - **A4'**) in which you can explore your surroundings and **A5'** telling you what the exploration itself is about and how it links to what you want to find. Lastly, the form (**C1'**) is like a vague sketch or outline of the thing we are looking for.

Chapter 4 - Implications

4.1 On Form

-

Let's examine the implications on form (C1') first. Before I thought my way through this, I noticed that all musical pieces seem to have the intro, main part, outro form and wondered if just the outro part on its own would make an interesting piece too. I made the piece, and it was indeed interesting, but little beyond cognitive curiosity; as a piece of music it wasn't very nice to listen to.

So far I have not found any piece that is independent of this basic cyclic form. It can be played with, like what I did, or for example by starting a song with the full chorus or letting it end without any outro. However, these variations and the reactions we have to them tend to ultimately emphasize the significance of the cyclic form, rather than present valid alternatives.

To see this form in greater detail, we need to understand the function this cycle serves. **A5**, and in turn **A5'**, come to our rescue and tell us what that function is: Adaptation. Life is defined by its capacity to adapt and the process of adaptation is cyclic in nature. In the following, I will therefore refer to it as the adaptation cycle.

Humanity, which is fully harnessing the speed advantage that cultural evolution provides, is by far the most familiar with this cycle. While species like amoebas only incrementally adapt to new conditions over the course of many generations, people can adapt countless times a day, which is why this is more natural and important to us than to any other species.

We can now take a look at its specific form, its nature and where it takes place. Let's focus on the where first, there is an interesting twist.

Intuitively one might expect the adaptation cycle to be represented in the piece of art itself. In the case of a story-circle, for example in the lyrics of a song, a poem or an episode of TV, that certainly can be the case. However, I found out that music that wasn't following a story-circle still could have an enormous impact on me and move me deeply. Furthermore, turning to the non-linear arts such as sculpture, architecture and painting which usually produce static outcomes, how could they possibly follow such a circle?

The answer to this question can be found in the life-art-analogy that is our compass. What is adapting to the changing conditions is the living organism. The subject adapts to the object and when that object is a piece of art, it *still* is the living being, the subject, that adapts.

When coming in contact with a piece of art, the adaptation cycle therefore takes place in the mind of the recipient. This cycle is functionally identical with the story-circle, in fact, it is exactly what the observer goes through when he is presented with a story.

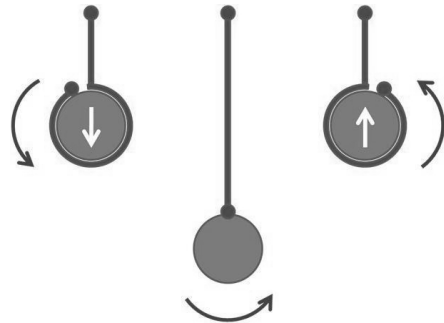
In total, there are three artistic adaptation cycles I can think of: the cycle of making art, the cycle of experiencing art and the literal (story-)cycle in the art itself. The latter is optional, and although it is highly effective, it's not strictly necessary; humans can be moved by many things that are not explicit story-circles.

This might also explain why stories that do *not* follow the story circle, or don't follow it *completely*, can also work. I hinted at this in Chapter 1.2. We can now argue that in those cases, the mind of the recipient is left with the task to complete the adaptive cycle, instead of being led all the way.

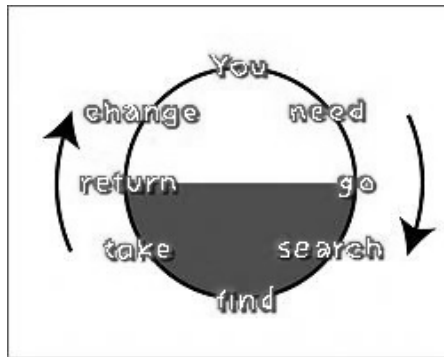
Rather than dismantling the significance of the story-circle, however, this new three-circle-theory allows us to expand on it. It opens up new concepts of storytelling while providing us with background knowledge we can use to guide this exploration.

4.2 Of YoYos, Cycles, Circles and Helixes

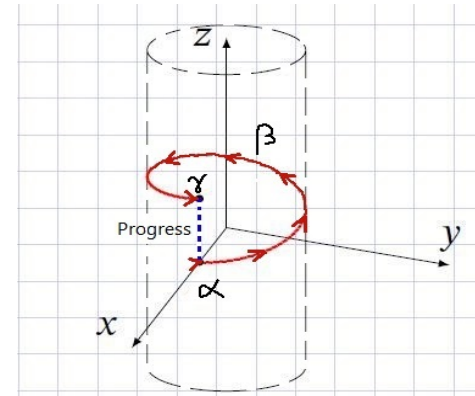
The most simple form of cyclic motion is a straight line, traveling from the starting point α to the far point β and back again. No progress, no net-motion is achieved, this is what Harmon calls a YoYo and it doesn't make for very compelling art.

fig.3 - The Motion of a YoYo ^[25]

He instead advocates a circle with 8 steps based on Campbell's "Hero's Journey" that he calls the story-circle.^[18] This adds lateral movement to the YoYo but curiously enough, one still ends up in the same place after completing it, something that Harmon, to my knowledge, never addressed. Even though the last segment in his story-circle is literally called "CHANGE"; it physically arrives at the start of the circle again.

fig.2 - Dan Harmon's Story Circle ^[14]

I was unhappy with this image and went looking for a more appropriate shape. What I came up with is a helix. (see fig.4) By adding a third dimension to the model, when you finish a loop of a circle on the x- and y-axis you are now in a new place on the z-axis, which is the net-movement, the progress that has been made. If you imagine the story cycle on a whiteboard, the story-helix moves in and out of the whiteboard's plane, towards or away from the observer in front of it.

fig.4 - The Adaptation Helix ^[20]

This geometric refinement of the cycle-concept has a number of pleasantly surprising consequences: it demonstrates how, in a shallow helix (almost a circle), almost all movements cancel each other out and only a small motion in the z-axis results. It shows that the actual progress is perpendicular to all of the motions in the x- and y-axis, a feeling we get all too often, but also clarifies that there is no other way from α to γ than around the circle and up the helix.

It also ties in neatly with how this cycle works in evolution. In biological evolution, the life-cycle of each individual is largely insignificant to the group, species, and even more to all life, but for the tiny amount of evolutionary progress that it can provide during that lifetime.

Fun fact: Both RNA and DNA are also helix-shaped, with DNA being a double helix.

4.3 On the Processes

-

Next, let's look at the processes (**A1'** - **A4'**). These tell us about the sorts of tools we have at our disposal to create art. According to these, all we can do is keep, reduce, make mistakes and combine. I have little doubt that all artistic goals can be and have been achieved with these processes.

The first realization this leads to is that none of these mechanics involves actual creation, which contradicts the common notion of an artist creating something from nothing.

I always had the feeling, along with some anecdotal evidence, that all I made and everything I saw other artists making was a (re)synthesis of pre-existing material and ideas. Numerous times a melody, a chord progression, a riff or a choice of words would seemingly come out of nowhere, only to reveal on closer inspection to be inspired by something I heard before.

The second surprising consequence is that mistakes, which most artists spend countless hours trying to minimize, account for one-fourth of all of the tools we have at our disposal.

This realization initially took me by surprise but ever since it first arose it's making more and more sense. Some of my best work has been the direct or partial result of some "mistake" I made, playing the wrong octave, hitting the wrong key, inserting the wrong effect.

While these "mistakes" *accidentally* introduce an element of randomness into our art, this randomness can also be utilized *deliberately* in order to discover something new. A prominent user of this approach is the composer John Cage who used it in pieces like "Music Of Change"(1951).

It has to be said though that pure randomness itself is pretty uninteresting to witness and not very appealing to most people, in fact, the opposite usually is the case.

Randomness comes from the domain of the inanimate universe and although it is a crucial part of evolution it only becomes a part of life through natural selection. Likewise, in art, it is only through the process of selection that it becomes appealing, aesthetic, moving, good.

This selection- and reduction process is central to all life and art and not only limited to filtering randomness but to all creative decisions. Reality is unbelievably vast and complex. Even the world in our mind, although already heavily filtered, selected and reduced from said reality, still is incredibly vast and complex. The number of options and combinations you have as an artist when making is absolutely staggering.

Pirsig writes about this: "The true work of the inventor consists of choosing among these combinations so as to eliminate the useless ones, or rather, to avoid the trouble of making them, and the rules that must guide the choice are extremely fine and delicate. It's almost impossible to state them precisely; they must be felt rather than formulated."^[17]

The last thing that arises as a consequence of this list of tools is the realization that the creative process needs material and inspiration from outside to work; we need stuff to combine. If nothing is actually created in the mind but rather just morphed and synthesized, supplying that mind with a healthy stream of new input is absolutely crucial and should be taken very seriously.

Creativity requires a mind that is saturated with material, ideas and concepts, or in one word: inspiration; if you want to draw an ace from your sleeve, you ought to put one in first!

4.4 A Balance of Values and Needles

The last category of analogs, (**B1'** - **B4a'**) is comprised of the attributes of art to which it owns its value, appeal and effect.

Since we already know that there are way too many needles to follow and since our compass is telling us that each of these is pointing in the direction of two different values, we can deduce that we will have to find a balance between these. Finding this balance naturally means making compromises and choosing directions, prioritizing some attributes over others.

Different distributions of the values in art are representative of different areas of the inner world we are exploring, and these larger areas are roughly equivalent to genres. For instance, we are likely to find minimalist art in close proximity to **B3'** - *simplicity* and avant-garde art in the direction of **B2a'** - *novelty*.

Of course, we have the ability to travel around and create art with our findings in all kinds of regions. As long as we can fit it together, all is well.

4.5 Into the Woods Again, but with Shovels and Legos

If we take these concepts back to our forest-analogy, the saturated mind is that forest. All the trees, paths, rivers, valleys, mountains, animals and plants you find have to exist first for you to discover them, you are not creating them.

As you wander around you will come across interesting, stimulating and new arrangements of elements that make up the scenery. Your genes and your unconscious mind put them all there for you to discover and doing so is deeply fulfilling.

Coming across unexpected paths and landmarks is a key part of this exploration. The curiosity to see what they are, where they lead and what they might mean and connect with is a valuable trait when it comes to making the best out of these seemingly random events.

Considering the nature of what the artist is looking for and how it is found, one might call him a prospector, a miner or a treasure hunter. In most cases, even though all this happens in his very own mind, what he is looking for is obscured from direct view and has to be brought to light. Having a sense of where searching and digging is prosperous is critically important and outside advice is not always helpful.

Once his shovel has revealed the desired material, digging deeper will likely reveal more, depending on how much was present in the first place. Once the source has run dry, another source has to be discovered.

For illustrating the process of actually *making* art, another metaphor might be suited even better. I'd wager that creative work in any medium is quite similar to building Legos. You can't do it without having the pieces in the first place and most of them come from previous sets. You can then set off and recreate these sets and models, or let your subconscious take them apart, file and link them in wondrous ways, throw away all the useless pieces and then build whatever comes to mind.

As with Legos, the space to build into is a minor concern, usually the restrictions are on the supply side. The number of pieces you have is limited, their variety is limited, your ability to remember where you put them is imperfect, and once you have used a piece it is used. Also, unless you are content with building the same model over and over (like some people seem to be), you are gonna need new ideas and pieces.

The Lego-analogy is also very helpful in visualizing how art can be used as a means of communication, more on that later.

Chapter 5 - A Definition of Art

Throughout the research and writing process I have constantly been discovering new, interesting and challenging concepts and ideas that have brought my old definition of art to its limits and beyond.

Each time my definition could not hold up to the diversity of artistic endeavors or would not be sharp enough to clearly exclude what isn't art I updated it. I would now like to present my definitions in their current state:

- I. Quality is the relation between life and inanimate existence.
- II. Evolved beings are able to perceive, pursue, and in some cases, refine quality.
- III. Art is quality that is refined by an evolved being.
- IV. The evaluation of quality is, to a certain extent, unique to each individual being.
- V. The value of art arises from its capacity to advance individual beings in the direction of quality.

According to this definition, quality is a fundamental property of the universe that enables life and can be refined into art by evolved beings.

For a while, I was wondering if this quality was the same as the apparent goal of life, which is survival. I came to the conclusion that this is not the case. Survival, I would argue, is only one specific point on the trajectory of quality, the point from which life becomes sustainable.

The quality-trajectory originates in the inanimate world, passes right through this point of survival, initiating life, and then continues into the unknown.

Art, as defined by Pirsig as high-quality endeavor^[9] or, in other words, a puristic pursuit of quality, is at the forefront of following this trajectory.

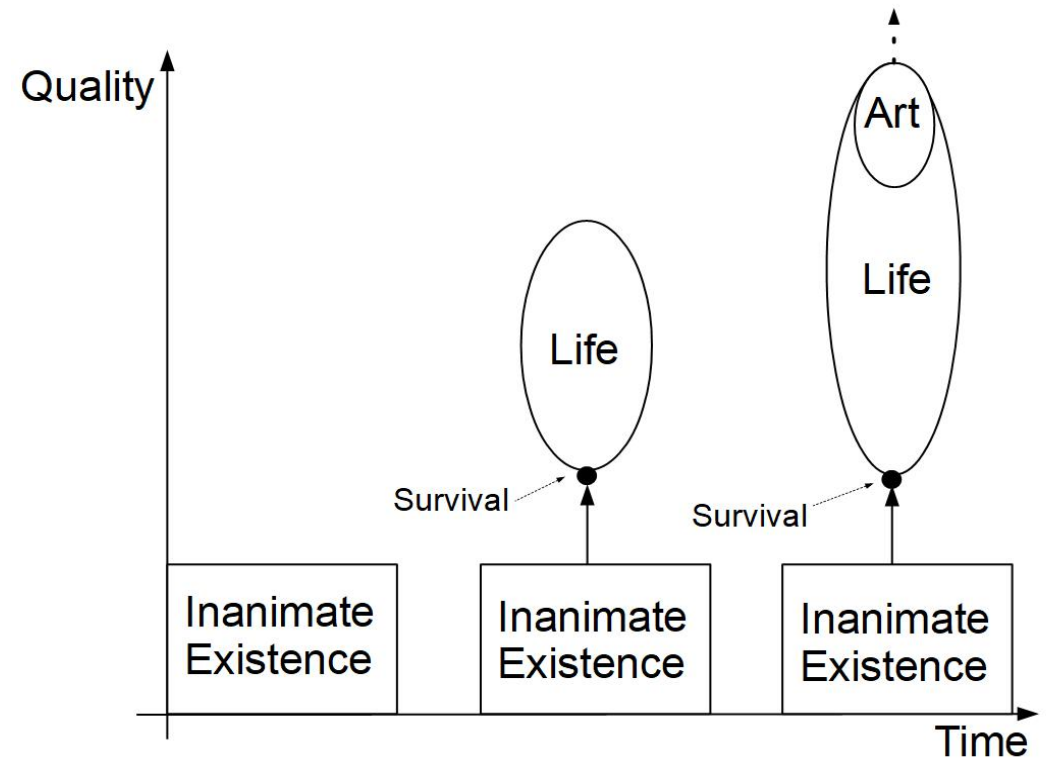


fig.5 - Life and Inanimate Existence

5.2 On Intrinsic and Extrinsic Motivation

-

What guides one in the pursuit of quality?

Originally, my definition included an additional point. This point made art exclusively linked to intrinsically motivated endeavors, meaning those solely based on organism-internal rewards and punishments.

I was of the opinion that art could only be achieved if it "moved" its creator in the direction of quality. At the time this used to fit nicely with opinions I held about what art should be, what constitutes an artist and how they ought to work. It fit my preference for self-reliance and provided an explanation for the many examples of failed attempts to create art and reach quality.

After some peculiar edge-cases and thinking this over multiple times however, it appears to be just an issue of guidance, of navigation as you will.

Two things arose that made me come to that conclusion:

1. How could someone make art, something of immense quality to others, seemingly by accident, without even noticing of being particularly "moved" himself?
2. How can intense play-testing make a game better, even if the changes made in reaction to the feedback go against the preferences of the games creator who supposedly is the artist in this scenario?

The answer lies in the individuality of quality. Wherever and whenever something life-made adds quality to the life of someone else, that is art. That means that very few man-made things are completely devoid of art while even fewer things are pure art, with the ratio being completely unique to each and every person. It would appear then that art can be seen as a spectrum, not as a binary category.

As a result, a piece of art might have a much greater value to someone that isn't the artist. It might even be specifically made to suit another persons sensibilities

more than its creator's.

However, intrinsic motivation, doing it the best you can because it feels right, and being "moved" towards quality in the process, likely is the safest way to know you are on the right track. As long as it moves you, it is art, at least to you. Since people always share at least some common ground (being human and all) there is a good chance someone else will connect to it in some form - more on that later.

As soon as this intrinsic motivation is mixed with extrinsic ones and it is used as a vehicle for other means (communication, satire, propaganda, advertisement, connection, income, influence, vanity, egotism, aid, fame, rivalry and such) this matter becomes much more complicated.

In psychology, the differentiation between intrinsic and extrinsic motivation is made based on where the "rewards" are coming from.^[26]

In the case of intrinsic motivation, these rewards are given out exclusively by the brain while the extrinsic variety involves external rewards, means to an end, such as food, praise, security and others. Obviously, our brain rewards us for most of those things too, conditioning us to engage in behavior that provides them. This means that most extrinsic motivations go hand in hand with intrinsic ones.

Primarily following extrinsic motivations bears the risk of pursuing something other than quality since we often have to rely on cognition, rather than intuition to pursue them. This also applies to making art for others. The complexity and uniqueness of the human mind, and the en- and decoding process, imply that the quality it gives the recipient can never be exactly known. As a result, the attempt to add quality to their lives might be ill-fated and appear directionless.

I personally have a strong preference for the personal and authentic kind of art which I perceive as honest and relatable. Even if it does not manage to move me in the same way it moves others or the artist himself, I nevertheless feel a connection to the person who created it. Conversely, I show strong negative reactions to any art I perceive to be dishonest, manipulative, fake, phony, or make-believe.

I believe that it was primarily this preference that led me to investigate intrinsic motivation as a discriminating factor in my art-definition.

Back to the question at the beginning, what *does* guide one in the direction of quality?

Quality is so deeply intertwined with life and so deeply woven into the fabric of our existence that it can usually be felt quite easily. Over the course of millions of years, it has evolved to be a human instinct. To follow this feeling, sense, intuition is what an artist does, usually his own but sometimes (as with play-testing) someone else's.

Besides that, art can also be created non-deliberate, by accident or as a byproduct, how it was conceived doesn't affect its value.

5.3 On the Value of Art

A little extension on definition V.

The way in which life advances in the direction of quality is through the process of evolutionary adaption in the form of the adaptation cycle. Art is a result of the cultural, information-based part of this process while also being a part of it.

Its function is to induce, aid and guide this adaptation cycle in its creator and recipient, and its value lies in its capacity to do so. It can be seen as a kind of evolutionary vehicle that moves or transports a person via the adaptation helix from α through β to γ . (fig.4)

Turning this definition around we can state that if a piece of art doesn't move you in the direction of quality, it is of no value to you. It might hold value for its creator and other recipients by moving them, but in your case it failed to do what it is supposed to.

Chapter 6 - Art and Others

6.1 On the Inner Worlds

It is hard to refute that communication and connection are the most common use cases of art in our lives. The power that art holds to "move" us, especially emotionally is awe-inspiring.

Armed now with our life-art-hypothesis we can attempt to explain why art is indeed able to move not only the artist himself, but also connect to- and move others in the first place.

It all kind of started 3.5 billion years ago.

Since the conception of life around that time, all living beings share certain strains of genetic material and were shaped by the world around them in an evolutionary process which led to all the species we know today, including us.

This means that even though we are perceptibly very different from one another and even more so from the animals, microbes and plants surrounding us, we actually share common ancestry. We also share, in degrees of relationship, a common history reflected in our genetic code, the bodies formed by it, the brains that reside in them and lastly, in degrees again, the knowledge and information we fill it with.

Art therefore begins with the world around us and how it formed us and our brains. The mind inside these brains is shaped not only by what is learned over the course of its life but also by its genetically predetermined structure and functioning.

This mind observes the reality around it through its senses and reduces its incomprehensible complexity and vastness into models, thoughts, impressions, and feelings of varying abstraction, all still shaped by its evolution-derived workings.

Since, apart from identical twins, the genetic makeup of every person is unique, and since the information that every individual's brain gets filled with and formed by is also unique, even with identical twins; no two inner worlds are ever identical.

6.2 From Subject to Object to Subject

The world in the mind can be seen as a unique, reduced and encoded image of reality. The artist explores this world, looks for and finds what moves, motivates and intrigues him and in a second process of reduction, association and imitation, making mistakes along the way, encodes it into a piece of art, a song perhaps.

With this, he turns fragments of his subjective world into an object, a piece of reality. In doing so, the artist goes through an adaptation cycle, ending in a different spot from where he started.

Now, when this song is experienced by a listener, it is being brought into the inner world of another person; it becomes subjective again. When this happens, a decoding process takes place, reducing, comparing and dividing it and, in an adaptation cycle, integrating it into the world in the recipient's mind. (see fig.6)

I use the words "encoding" and "decoding" because that appears to be what this effectively is. These terms become more accurate the more abstract the art gets.

In order to decode, you need to have some information on how the encoding was done; the more information you have, the more accurate it becomes. If you knew it all (if it was possible to know the entire mind of the creator) this process would be lossless and completely predictable, in reality it is not.

A common ground, common ways of en- and decoding, are necessary for art to be effective. Luckily, because of our collective history as a part of life, that common

ground is never zero. From there, individuals in increasingly close biological, societal and cultural proximity to each other share more and more experiences and familiarity. This allows them to decode their art with much greater detail and reward.

In our Lego-analogy, rather than just recognizing that Legos have been used, we "get" the shapes they form, we can decode some of the ideas expressed and recognize some of the individual pieces because they are somewhat familiar.

Prior exposure to similar material is a very important factor in regard to the value that art can provide. Values like nuances, specificity, originality, variety and change can almost exclusively be experienced when they are able to connect and interact with the Lego models and pieces in the recipient's mind.

It follows that the more similar the worlds in the mind of the artist and the recipient are, the more lossless the en- and decoding process gets.

6.3 Perfect, Lossy Communication

What is interesting about art, as opposed to other forms of information, is that a lossless en- and decoding is not necessary for it to work. A song without a word can make you think of a very specific person the artist never knew; a painting can give you immense pleasure and a sense of awe without you knowing why; even in its most literal form, a story, it can still move you in unexpected ways.

The abstraction is a key process here. By doing so, the artist strips a unique, personal experience of all the details and particularities that only apply to him and in the process, makes it more universal. He might feel grief over a dead uncle called Mike, but by abstracting that specific experience he reveals the emotion at the core which is way more universally felt.

In our Lego-analogy this is akin to not using "custom" pieces that only fit others

in his own world but instead building with universal ones that fit with many more parts and models. (see fig.6)

Lastly, I want to add that truly inspiring, "moving", even transformative experiences can occur when a person comes in contact with art that has been created by someone that is completely *unlike* him. These phenomena have always fascinated me, but for the longest time remained largely unexplained.

I now believe that one of the keys to this mystery lies in the similarities we have as humans in general, since our en- and decoding processes share a common evolutionary path. **B1a'**, **B2a'** and **B4a'**, the values of diversity, novelty and versatility come to mind. We evolved and grew to enjoy them.

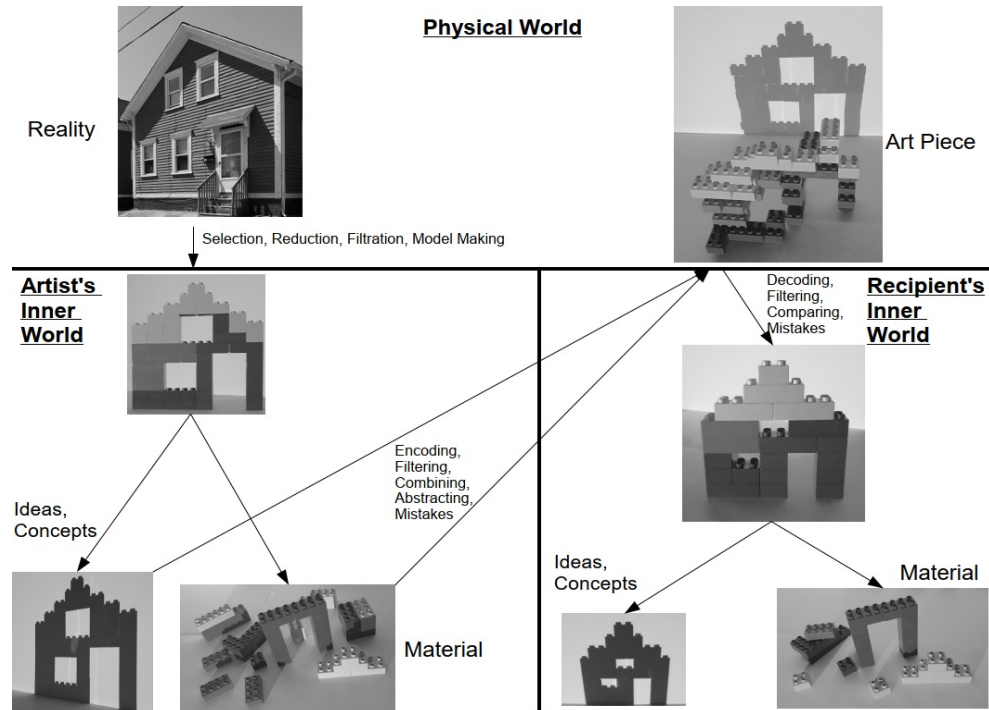


fig.6 - Art in the Mind

6.4 Intuitive and Cognitive Values

While writing this piece I came upon a series of communication-related questions I had been asking myself years earlier but was unable to answer: Should art be explained? Should an artist explain the what, how and why of his creation? Should you inform yourself before experiencing art? Does that make it better or worse? Should art work out of context?

I now believe to have the tools to answer these questions. That answers, I think, lie in a previously unmentioned distinction: the intuitive- versus the cognitive experience of art and the values each of them has.

Up until this point, I have been focusing solely on the intuitive kind. The information that fills our mind is filtered and en- and decoded mostly intuitively or unconsciously, which is why we can experience most art without thinking about it, and why art is so universal and powerful.

In addition to that, we can experience art via cognitive, conscious processes. We still get rewarded for moving in the direction of quality, only the means to get us there are now conscious, as are some of the rewards.

Both cognitive and intuitive processes are also part of making art, which leads to a constant balancing act between the two.

Because we are dealing with differences in the conscious domain, the most diverse area of the human experience, cognitive values lead to vastly different perceptions and value assessments from person to person.

Something being "clever" or "smart" boasts no value outside of the cognitive experience but is of high value to some people. Others couldn't care less about "smart" art but care for values like moral integrity or sentimentality.

The list of cognitive values that can be attributed to art is seemingly endless. Because of this, and because of the divisiveness these create as well as the

overwhelming amount of material already written on the subject, I will not get into this in any greater detail.

How about those questions at the start of this section then?

Based on what I wrote so far I would say that the cognitive value can add to the experience of art though it is not necessary. The intuitive values on the other hand are absolutely essential to art, they are a defining characteristic that emerges from the very nature of the creative process and its goal of quality.

Finally, I would like to add that cognitive appreciation can distract from- and even lessen intuitive values. By defining and confining the incredible multitude of possible experiences to one "correct" version, the imperfect en- and decoding process discussed earlier can be seriously disrupted.

In those cases, it is important to note that no artist can ever understand his doing completely and that what his art does in your mind is not only real and valuable but also no one's business.

Chapter 7 - The Origin of Art

7.1 More than an Analogy

Based on the ideas expressed and the theory we built upon them, if we take a close look at the nature of the relationship between life and art, it is not purely that of an analogy.

Because art is a part of life and would have no existence without it, the link between them is not one of superficial similarities but one of causality. A central characteristic of this link lies in the direction of quality that both of them move in.

This link has a lot of interesting implications and, in my eyes, has the potential to significantly increase our understanding of the nature of art. It provides an entirely rational explanation of art that, at the same time, includes all subjective experiences by using the concept of quality to define the relationship between the two. Chapters 4, 5 and 6 give us a first glimpse of what might be achieved with this new theory.

In addition, it also paints quite a beautiful picture of the history of art. Although the moment in which it was made for the first time is forever lost to history, we can make a number of assumptions based on our theory:

Firstly: Since art came from life, it can not have happened earlier than 3.5 billion years ago, at least not on earth.

Secondly, we defined art as quality that is refined by an evolved being. This requires not only the ability to identify quality and to pursue it by adaption but to manipulate the environment in a way that separates quality from non-quality.

I would argue that this ability is strongly correlated with the advent of higher

cognitive capabilities and can therefore only have existed after an organism developed the necessary neural structures. The point at which this was the case is hard to pinpoint but we can be fairly sure that it happened a couple of million, rather than a couple of billion years ago.

Once those two criteria had been met, art was naturally bound to happen and became more likely with every new, more mentally capable species.

Finally, some unassuming and clueless specimen at some point in time did something to the best of its abilities, changing the world around it a little bit to its liking and thereby accidentally stumbling in the direction of quality, because it inexplicably felt right.

That was the origin of art.

Acknowledgments

-

First off, I would like to express my gratitude towards my supervisor Eelco Grimm who gave me excellent guidance and bits of advice throughout the writing process as well as his trust and the freedom to experiment with ideas, form and language outside of strict standards. He is also to credit for the drive to publish this essay and therefore for you reading this.

Next, I would like to thank everyone that helped me to improve my writing and challenged my theory by giving me honest and open feedback; this essay would have been way less coherent without all of your work and dedication.

Special thanks to Claudia Schmidt-Dannert for fact-checking the biology-part, Than van Nispen tot Pannerden for his very involved feedback and to Otto Walter for providing me with excellent material on neuroscience.

Finally, I would like to thank all my amazing friends who managed to keep me in the realm of sanity while writing this and continuously infuse my life with so much quality; you guys are the best!

References

-

^[1] Harmon, D. (2018) Whiting Wongs Episode 19 - I Hate Writing, I Love Having Written, <https://starburns.audio/podcasts/whiting-wongs/>, 13 July 2022: 00:32:58

^[2] Harmon, D. (2018) Whiting Wongs Episode 19 - I Hate Writing, I Love Having Written, <https://starburns.audio/podcasts/whiting-wongs/>, 13 July 2022: 00:31:45

- ^[3] Harmon, D. (2018) Whiting Wongs Episode 19 - I Hate Writing, I Love Having Written, <https://starburns.audio/podcasts/whiting-wongs/>, 13 July 2022: 00:32:12
- ^[4] Harmon, D. (2018) Whiting Wongs Episode 19 - I Hate Writing, I Love Having Written, <https://starburns.audio/podcasts/whiting-wongs/>, 13 July 2022: 00:33:08
- ^[5] Harmon, D. (2015) You Made It Weird with Pete Holmes Episode 274 - Dan Harmon, <https://youmadeitweird.libsyn.com/dan-harmon>, 13 July 2022: 01:10:15
- ^[6] Harmon, D. (2015) You Made It Weird with Pete Holmes Episode 274 - Dan Harmon, <https://youmadeitweird.libsyn.com/dan-harmon>, 13 July 2022: 01:10:30
- ^[7] Harmon, D. (2015) You Made It Weird with Pete Holmes Episode 274 - Dan Harmon, <https://youmadeitweird.libsyn.com/dan-harmon>, 13 July 2022: 01:07:32
- ^[8] Pirsig, R. M. (1974) Zen And The Art Of Motorcycle Maintenance, Harper Perennial Modern Classics edition, New York: HarperCollins
- ^[9] Pirsig, R. M. (1974) Zen And The Art Of Motorcycle Maintenance, Harper Perennial Modern Classics edition, New York: HarperCollins, pp. 262
- ^[10] Pirsig, R. M. (1974) Zen And The Art Of Motorcycle Maintenance, Harper Perennial Modern Classics edition, New York: HarperCollins, pp. 242
- ^[11] Benner, S. A. (2010) Defining Life, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3005285/>, Astrobiology December 2010, 10 (10): 1021-1030, 13 July 2022
- ^[12] Harmon, D. (2015) You Made It Weird with Pete Holmes Episode 274 - Dan Harmon, <https://youmadeitweird.libsyn.com/dan-harmon>, 13 July 2022: 01:09:30
- ^[13] Harmon, D. (2009) Channel 101 Wiki - Story Structure 103 Let's Simplify Before Moving On, https://channel101.fandom.com/wiki/Story_Structure_103:_Let%27s_Simplify_Before_Moving_On, 13 July 2022
- ^[14] Harmon, D. (2009) Channel 101 Wiki - Story Structure 103 Let's Simplify Before Moving On, https://channel101.fandom.com/wiki/Story_Structure_103:_Let%27s_Simplify_Before_Moving_On, 13

July 2022

- ^[15] Harmon, D. (2015) You Made It Weird with Pete Holmes Episode 274 - Dan Harmon, <https://youmadeitweird.libsyn.com/dan-harmon>, 13 July 2022: 01:06:18
- ^[16] Harmon, D. (2018) Whiting Wongs Episode 19 - I Hate Writing, I Love Having Written, <https://starburns.audio/podcasts/whiting-wongs/>, 13 July 2022: 00:31:55
- ^[17] Pirsig, R. M. (1974) Zen And The Art Of Motorcycle Maintenance, Harper Perennial Modern Classics edition, New York: HarperCollins, pp. 272
- ^[18] Harmon, D. (2009) Channel 101 Wiki - Story Structure 101 Super Basic Shit, https://channel101.fandom.com/wiki/Story_Structure_101:_Super_Basic_Shit, 30 July 2022
- ^[19] Bernd Schmidt-Dannert, The Artist's Compass, 2022
- ^[20] Unknown Author - Helix, <https://i.stack.imgur.com/MzsIo.jpg>, (modified by Wilko Schmidt-Dannert), 2022
- ^[21] Darwin, Charles (1859) On the Origin of Species By Means of Natural Selection, (1st ed.), London: John Murray, p. 223
- ^[22] Dawkins, Richard (1979) The Selfish Gene, (30th Anniversary ed.), Oxford University Press
- ^[23] Darwin, Charles (1859) On the Origin of Species By Means of Natural Selection, (1st ed.), London: John Murray, p. 6
- ^[24] Rogers, Susan J. (2022) This is What it Sounds Like, (1st ed.), W. W. Norton Company
- ^[25] Ohare, Brews (2009) Toy_yo-yo, https://commons.wikimedia.org/wiki/File:Toy_yo-yo.JPG, 12 December 2022
- ^[26] Woolley, K., & Fishbach, A. (2017) When intrinsic motivation and immediate rewards overlap, https://www.researchgate.net/publication/324796860_When_intrinsic_motivation_and_immediate_rewards_overlap, 12 December 2022
- ^[27] www.hku.nl/onderzoek-en-innovatie/onderzoek/onderzoeksgebieden/technologie/muziekontwerp