

Pattern: Its Significance to the Living World

2004838

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Surface Pattern Design

Word count – 5,122

Lecturer - Julia Lockheart

Acknowledgements

I would like to begin by thanking Julia Lockheart, my dissertation supervisor for her support and guidance.

Additionally, I would like to thank my study support Eleri Richards, for her continuous support and encouragement not only through my essay writing but throughout my entire time studying at university.

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Pattern: Its Significance to the Living World

This essay will discuss the importance and reliance of pattern in the living world, from nature, the animal kingdom, humans, and design. The definition of pattern and how it alters in every field will show the adaptability of pattern, yet its rules and importance stay the same. This leads to question, what is pattern? Is it something man made, something that humans create with the choices they make day to day? Or rather engraved in the natural sequence of the world. And how do designers successfully use this in their work.

Firstly, the natural patterns in nature like the *Fibonacci Sequence* and other natural sequences like *The Theory of Evolution*, where pattern is the core to adapting and surviving will be discussed. This will lead to pattern recognition by humans and babies and how they unknowingly depend on it. Questioning why, the essay will research into why humans are dependent on it, which will lead to superstition and routine being discussed. Pattern is how animals communicate and survive and its use will be discussed using physical patterns on the appearance of an animal to the scientific way in which they communicate. The physical appearance of an animal will lead the essay into researching the scientific reason behind an animals print and how it is used for survival.

To further research the animal print, its significance and importance will be discussed how it is applied to the design industry. To follow, the influence of design on humans will be introduced and how it shapes their world from their appearance and social status. Following the significance of design, the use of the pattern design principles will be researched into when used by designers intentionally and unintentionally and how successful they are in the design industry. The essay will draw to a conclusion on

the overall influence of pattern design in everyday life, and how it is intentionally used by designers in their subject area to succeed in their chosen market.

Pattern decides the composition of human life and is applicable in every field. According to the Cambridge Dictionary (2023) pattern is a way that something is done, how it is organised and how it happens. However, in terms of surface pattern design, pattern is the composition of a design on a surface. A repeated motif on a piece of fabric for example would be a textiles surface pattern. Individuals are drawn to specific types of pattern design on clothing to express their personality which is disused later in the essay. Furthermore, this is arguably less of choice and more an instinct. Humans are instinctively creatures that follow pattern according to Gregory Bateson (1904-80), an anthropologist and social scientist. Suggesting that humans naturally recognise pattern and follow it in their day to day lives. They need to seek routine in life, often feel uncertain about change, and struggle to adjust in new surroundings. Routine is a component of pattern, having researched how routine plays a crucial role in wellbeing and survival, this is connected to the role of pattern in human behaviour. (Bateson, 1980). The essential need for routine is a natural form of 'programming' within the human mind. Programming is vital to a human's development as they speak, think, and learn through patterns. This suggest that humans are not only drawn to pattern by choice but programmed to identify systems and sequences, which are the basis of language, speech, and dialect.

When you pause to look around, you will see that we are always surrounded by pattern. In a chaotic world overloaded with sensory stimulation, observing the fundamental formations that shape our everyday lives can provide familiarity and calm. (Murray et al., 2015, pp.18, 30).

This is only the beginning in understanding why pattern is so significant in everyday life. It suggests that pattern is sought in daily life to attain tranquillity. It promotes a false sense of autonomy. As the world is full of 'sensory stimulation' recognising the patterns that surround humans is what brings the mentioned 'familiarity and calm'. Referring to aforementioned topic of routine patterns, the reasoning behind those seeking routine pattern is to provide order to their lives. This is due to when order is in place, the unavoidable seems avoidable. Though it could not happen as it could not possibly fit into routine, or the pattern that individuals follow in their daily lives. It is a basic survival tactic found in every living organism on the planet. This is an explanation as to why humans fill their lives with patterns in many areas and follow the patterns of routine, suggesting a form of control.

Further research into pattern in the living world observes that it is not an "astonishing coincidence peculiar to our lucky circumstance" but an "inevitable consequence of the laws of nature" (Murray et al., 2015, pp.14). This suggests that life is controlled by the pattern of nature in the living world, as opposed to decisions and choices people make. This makes life seem less of a result of the choices humans make and more of a result of the consequences of nature. Pattern is not only evident in human life with routine for example, but it also defines and influences every perspective on life and is evident in different discipline areas, from ecology, sociology, mathematics, science, and art. Pattern, however, is not a new concept. It is built into the structure that created the universe. Before there was a definition of pattern, humans were seeking it due to instinct whilst also looking for it. Recognising pattern is a way of dissecting the way the world works. In this instance, Galilei used geometrical patterns to research into what he considered as 'fundamental problems' in human existence, this method of research is also shown in Charles Darwin's Theory of Evolution.

A theory is an idea about how something in nature works that has gone through rigorous testing through observations and experiments designed to prove the idea right or wrong. (National Geographic Society, 2022).

Darwin's Theory of Evolution used pattern recognition for testing and observations (1859) through a "systematic study of the regularities and irregularities of the natural world, leading to his ground-breaking theory of evolution" (Murray et al., 2015, pp.31) Regularities are the basis of what creates a pattern and how patterns are measured. Darwin illustrates the connection between humans and animals using branching patterns methodically. Meaning that humans, animals, and microorganisms evolve and adapt to survive and thrive in their surroundings, and over time changing their traits. The living body with the strongest surviving traits would adapt and survive whilst the weaker would weaken and eventually die which would less frequently survive to pass them on. Similarly, to humans, the weaker genetics will less likely survive meaning a lower chance of them being passed through generations. This is where he illustrates the connection between species such as humans and animals using the study of patterns in their behaviour surviving and surroundings, documenting and researching them. Comparing the natural pattern of life in all living creatures, Darwin was able to discover the correlation between all living species.

Darwin's theory suggests that nature changes in due course to evolve in the natural pattern of its surroundings, to adapt and survive. This is yet another way pattern is evident in life, in elements that can be seen with the human eye down to microscopic atoms and cells, on which everything is built. Pattern is shown again to take its place

as an essential tool for understanding the science of the world and collecting knowledge (Murray et al., 2015). As well as in the living things, pattern can be seen in nature. An example of this is a snowflake.

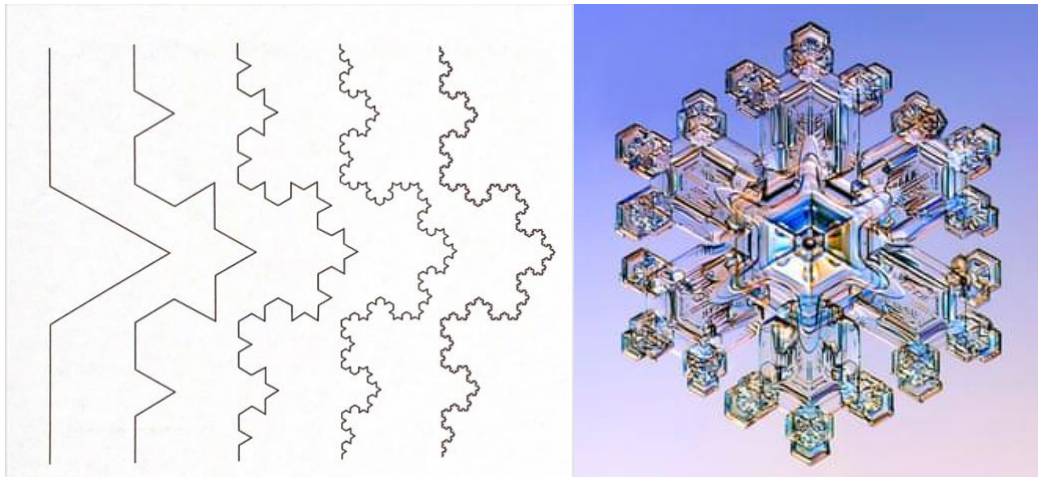


Figure 1. The complex fractal structure of the Koch snowflake is revealed by the application of simple mathematical rules.

Figure 2. A stellar dendrite snowflake

As seen in figure 1, the structural pattern in a snowflake consists of a simplistic mathematical sequence, which creates a pattern when observed under a microscope. This can be seen in figure 2 of a microscopic photograph of a snowflake, which cannot be seen by the human eye. This is one of many reoccurring mathematical patterns within nature.

Another example of a natural biological configuration is the Fibonacci sequence. This sequence is a mathematical equation where every number in the equation is generated by adding the two previous number together to create a recursive

sequence. As the numbers increase, the proportion between them draws nearer to 1:1.618, which is the golden ratio (Sautoy, 2022).



Figure 3. Aloe Pollyphyla

Figure 3 is an Aloe Pollyphyla, commonly known as an Aloe Vera plant. This as an example of the Fibonacci sequence in a plant. The leaves follow the sequence, the amount of each leaf adds up with the previous amount to create the amount of the next leaves in the spiral, when all are added up, the number of leaves amount to a number in the Fibonacci sequence. The Fibonacci sequence has been used in art & design to inspire The Golden Ratio (Sandford, 2013).

The golden ratio is a a series of rectangles that follow the spiral, which results in the said proportion (Sandford, 2013). A visual of the golden spiral is seen in figure (4) below.

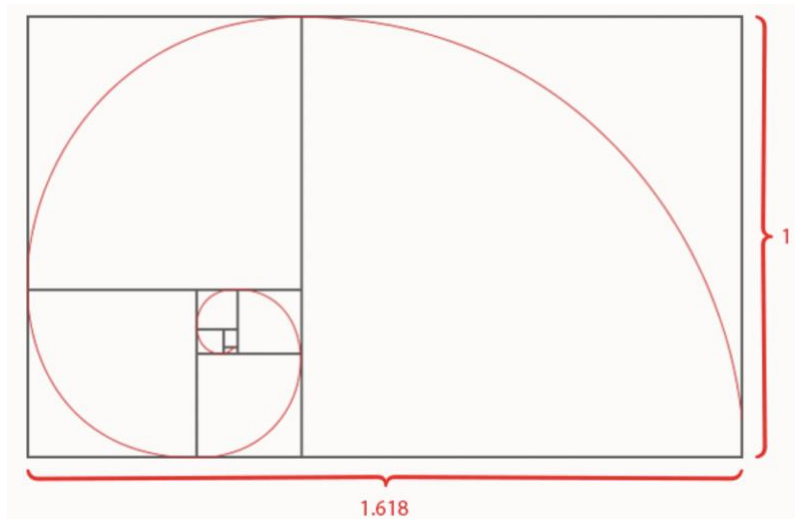


Figure 4, The Golden Ratio

The Golden Ratio is heavily used and influences the design industry, from graphic design, architecture, and art to create an aesthetic and effective design.

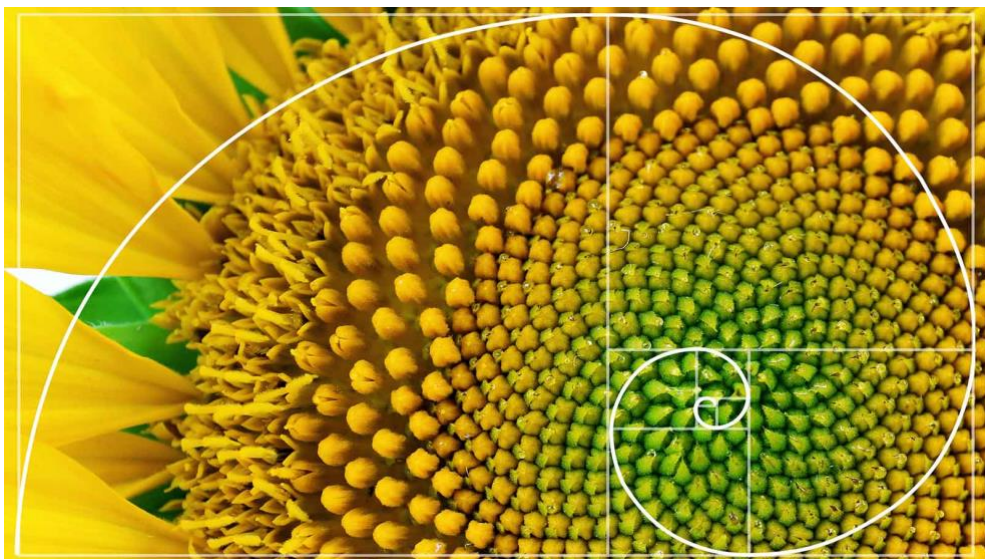


Figure 5, sunflower head showing the Fibonacci sequence

As well as the Aloe plant in figure 3, the sequence can be seen in the head of a sunflower. Art historians have found examples of the golden ratio in the *Mona Lisa* by Leonardo Da Vinci. Although it cannot be proven that this was intentional, it is still

present (Obermiller and Burndt, n.d.). The sequence can be seen as suggested in the portrait of *Mona Lisa* in figure (6) below.

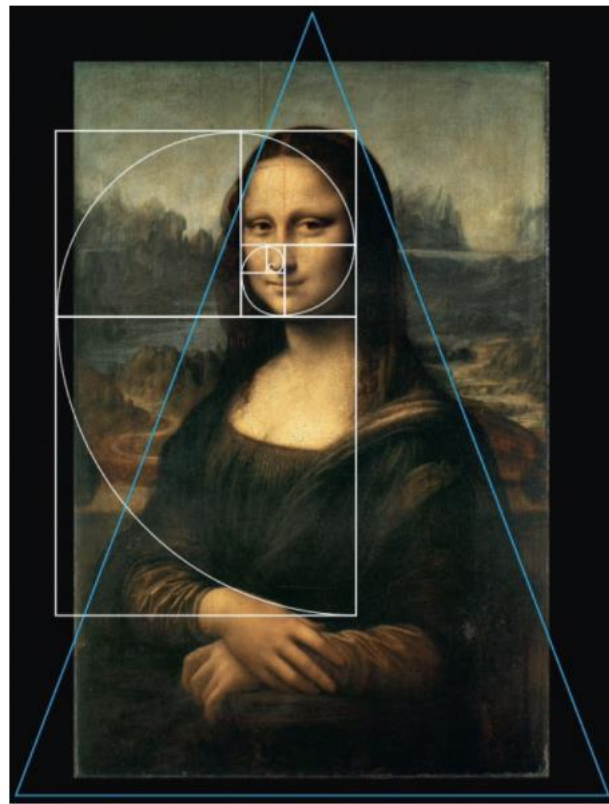


Figure 6, The Mona Lisa, Golden Ratio Applied

It can be argued that the Fibonacci sequence was discovered by art historians due to an instinct to seek pattern. The human brain is wired to seek patterns, and humans willingly engage in pattern seeking impulses in their day-to-day life due to instinct (Gillette, 2022). This implies humans' live life through patterns and use them to recognise regularities in the world and to make deductions and predictions, due to impulse. Bateson also suggests that humans are hardwired to identify systems and sequences (Murray et al., 2015). Therefore, it is not a choice but an instinct. This is the structure to the understanding of life through recognition. This suggests that in the brain there are patterns and patterns in behaviour, and pattern is then used to identify patterns, and patterns in our brains. Humans innate drive to seek pattern is the basis

of a human's survival, pleasure, and comfort. From birth, adolescence to adulthood and arguably prebirth, humans are naturally programmed to observe and perceive pattern.

The Expression of the Emotions in Man and Animals by Charles Darwin studies facial perception, where humans' facial perception skills are studied to question, are they due to nature or nurture. Meaning are they skills human develop through experience or are they phylogenetic, a result of species adaptation (Darwin, 1872). Facial recognition is a way a face or face like imagery is recognised due to the pattern and composition of the face. This can be seen in very early stages of life by new-borns interacting with face like stimuli.

It has been indicated that babies when born, prefer to engage with “faces rather than other forms of stimuli” (Reid et al., 2017) A study conducted by Prof. Vincent Reid, psychologist in Lancaster University, analysed “fetal head turns” (Reid et al., 2017) in response to visual stimuli projected by a light through the uterine wall, using upright and inverted face-like imagery. This imagery consisted of three dots in a triangle to portray a face. This is shown in figure 3 below.

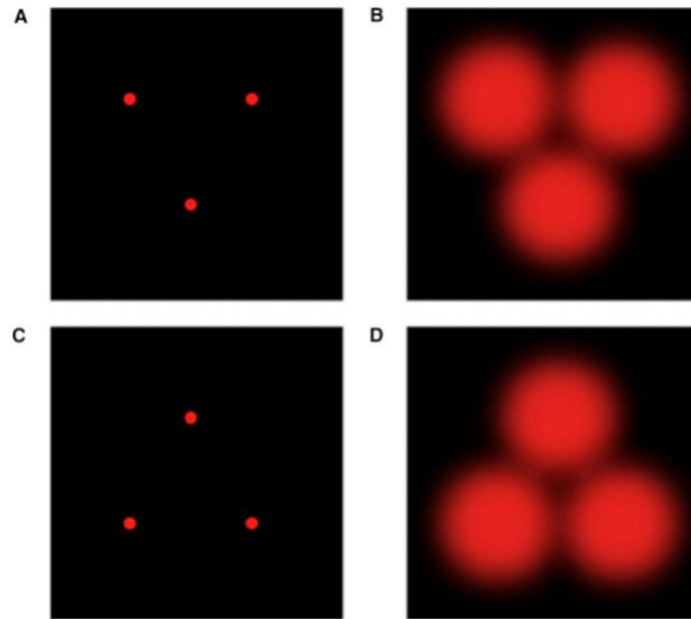


Figure 7,. A conceptual illustration of the stimuli

(A–D) A conceptual illustration of the stimuli utilized in the current study, depicting upright (A and B) and inverted (C and D) orientations. (A) and (C) illustrate the stimuli prior to contact with maternal tissue. (B) and (D) display the consequence of interaction with 30 mm of maternal tissue. (Current Biology, 2017)

The foetuses were monitored by 4D ultrasound and were shown following the dots that represented the upright face (A-B) and turning away or having no interest in the inverted dots to portray an upside-down face (C-D). New-born babies can recognise shapes in the composition of a face, the study suggests that infants pre-birth follow the same pattern. This suggests that even before sight, a foetus is capable of pattern identification.

As early as 34 weeks a foetus can recognise a pattern in the composition of a face. This is facial recognition in the earliest stages of life. Facial recognition has now been

digitally developed and is known as 'AFT' automated facial recognition. It is the way technology has been designed to recognise and identify a person's face, it is used by everyday technology such as an iPhones 'FaceID' and is now also used by the government and police force CCTV to enforce public safety (Lee-Morrison, 2019). This is all due to the design in the technology developed to imitate the way a human would recognise a face and the pattern of a face which leads into pattern in design.

Pattern, as defined in terms of design, is the way motif, "line, shape, and colour" (Cambridge Dictionary, 2022), or collection of these things are used and repeated to create a pattern. These later can be developed, produced, and manufactured to be applied to a product. It is applied to every aspect of life. These patterns created are used in interiors, such as curtains, wallpapers, and furnishings as well as flooring and ceramics, and not to mention the structural layout of the interior. In fashion, it is applied to garments, shoes, and accessories. Whether in the physical pattern printed on a dress, or the pattern followed to cut and sew the dress, pattern is evident and a necessity in design, even when it cannot be seen or immediately recognised. A sewing pattern is a guide that is followed to assemble fabric into clothing to a desired size (Camimade, 2019). Humans surround themselves with pattern for several reasons. Pattern in interiors and fashion is a way of making a house a home, following religion, brining comfort, and pleasure, as well as contributing to individuality of the person. Other common uses of pattern design can be found in installations, makeup, automobiles, and architecture.

Interior design has developed to fulfil humans needs within their own pattern identification system. It is a way for individuals to personalise their own space and make a house a home. Many individuals take inspiration from magazines for

inspiration to decorate their homes, such as *Elle Decoration*, *Country Homes* and *Modern Homes* where they showcase homes and offer style and decoration advice (Elle, 2023). Culture also heavily influences the interior of someone's home from "indigenous crafts to traditional aesthetics" (Long, 2022) and components, colours and placement of the walls and content. An example of this is Feng Shui.

Feng Shui is an ancient Chinese art of arrangement and pattern, based on the belief that the way a home is arranged can affect happiness and success (Collins Dictionary, 2019). It is the way a home and the contents are organised within the home to receive a desired outcome. Organisation is closely linked to systems theory. Systems theory is how things interact and how they later influence each other, and Feng Shui is a great example of this. In Feng Shui objects and spaces are particularly arranged in an environment to achieve harmony and balance to bring "peace and prosperity" (Brown, 2022). This is a result of superstition in Chinese culture. Superstition is a belief that is not based on human knowledge or science but rather magic and the supernatural and spiritual beliefs of someone, or a culture. (Park, 2009). Superstition plays an integral part in the design industry as many cultures have different religions and beliefs which follow different sets of rules. This ultimately comes down to superstition and the fear of doing wrong by their 'god' or higher power. That is why every colour represents something different in every country and religion, as they are believed to have different values. This is then used by designers to appeal to their chosen target market in the industry.

As well as Feng Shui being used in interiors to achieve happiness and tranquillity, this technique is also used regularly in fashion. Someone's home is their protection and security, so it is vital that individuals feel comfortable. A home is a shelter and defence

from the outside world, just like an animal in its habitat. This leads to pattern in the animal kingdom and how it is used for protection and survival.

Following this is the influence of animal patterns in design and fashion, and the dependence on pattern in the animal kingdom.

Patterns are crucial to survival in the animal kingdom to communicate messages and warnings similarly to humans (Murray et al. 2015). Animals use their body movement, vocalisations and the physical colour and pattern on their coat (Searcy and Nowicki, 2010, p.3) to warn off prey, locate their surroundings and transmit messages to other animals (Searcy and Nowicki, 2010). For example, bats use echolocation, this is to navigate an area to nest in, detect obstacles and locate their prey (Fenton, 1983). Echolocation is nature's "built in sonar" (Langley 2021). As Hine and Beardsley (2019) also asserts, it is a method used by some animals, such as dolphins, certain birds, and bats. (Hine & Beardsley, 2019) Echolocation occurs when animals emit a soundwave (Langley, 2021). A 'sound wave' by an animal is composed of "compression and rarefaction patterns" (Pasco, 2021). This then "bounces off an object, returning an echo that provides information about the object's distance and size" (Langley, 2021). Echolocation is an example of how pattern in science is used in an animal's survival and communication, and what humans cannot visually see.

Pattern is also crucial in the animal kingdom too. Animal patterns that are visible to the human eye are extremely vital to an animal's protection and survival as well as being aesthetically pleasing to humans. However, when applied to the correct circumstance, animal print influence can also be credited for human survival too. Pattern in the modern world affirms an individual's place and social status, this is

regularly expressed through fashion. However, this is not a new structure. Pattern in fashion can be a way to identity with groups and cultures and movements.

Pattern is used by humans to make sense of the world and where they belong in it. Humans value their sense of belonging. In an article by Tracy Brower (2020), she states that community is crucial to individuals' wellbeing, and a strong community has a significant sense of purpose. It makes people feel integral to something, gives their life worth, and can make them feel loved. This can be seen through using pattern in design and how it is worn. Nevertheless, pattern can also be used in fashion to discriminate, exclude, and identify certain individuals.

This means of identity was early illustrated in the Middle Ages. Judgmental pattern in the form of stipes were used to control certain individuals, such as "prostitutes, madmen, and clowns" (Murray et al., 2015, pp.50). Wearing stripes, for example, was perceived as a precarious act (Eakin, 2001), so those wearing them, the person wearing them either had no choice or were considered a lower class. Medieval authors wrote about Zebras in *Satan's Bestiary* (Eakin, 2001), "a book written in the Middle Ages containing descriptions of real and imaginary animals" (Cambridge Dictionary, 2023). The book's purpose is to entertain and teach standards.

According to Murray et al., (2015) due to modern sciences and updated studies, Zebra stripes are now known as practical rather than representative. Their black and white stripes are used for regulating the animal's temperature. Yet Tim Caro, ecologist at the University of St Andrews (BBC, 2019) states that Zebras black and white vertical stripes create a confusing illusion to the eye. When these high contrast patterns move at a speed, they can distort the perceived speed and direction of a moving object, this

therefore creates it more difficult for predators to capture and track them (Kelley, 2015). This illusion creates confusion for the predator when the zebras are in a herd. This theory influenced Norman Wilkinson (BBC, 2023), an artist and illustrator in the 1917s with a 'dazzling idea'. He realised it was 'impossible' to camouflage a ship, he would do the 'extreme opposite'. Wilkinson did this by using bold lines and shapes in the use of contrasting colour. Figure 8 is the HMS Argus ship used in the First World War in 1918 (Kelley, 2015) decorated in a high contrast geometrical pattern to disorientate the enemy, similarly to how the zebras coat is used to confuse their predators.

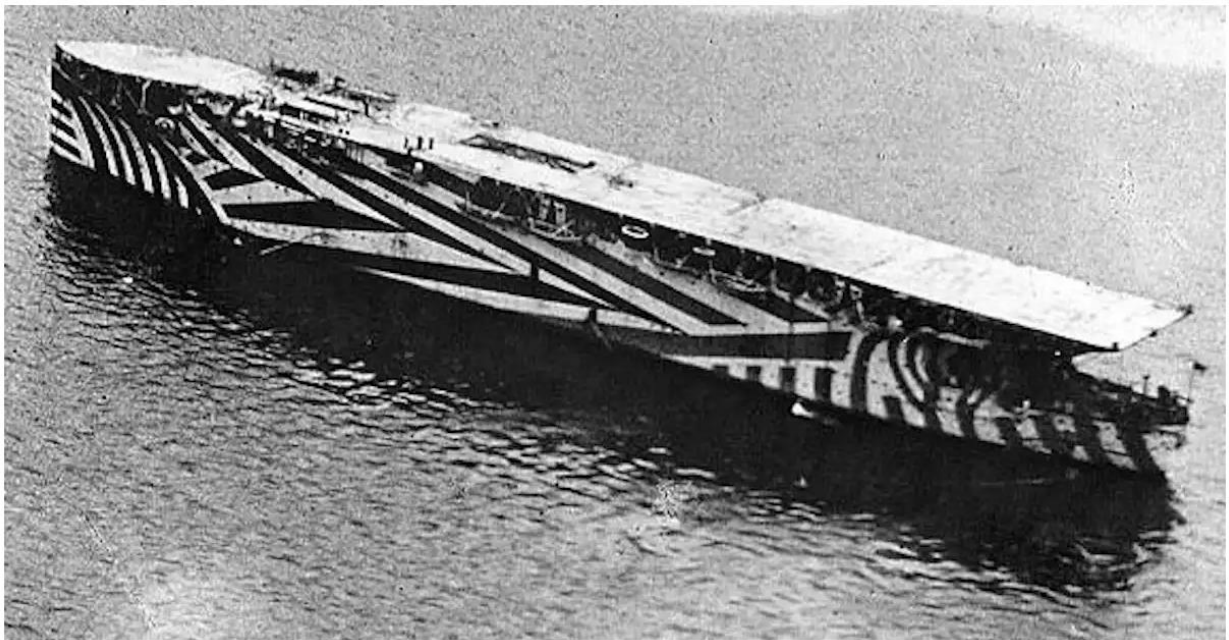


Figure 8, HMS Argus displaying a coat of dazzle camouflage, 1918

Stripes, now according to Vogue, are used worldwide in the design industry by major fashion houses to represent power, in contrast to how they were perceived previously with lower classes. An eye catching and wild print is now seen as a design full of attitude as opposed to a 'satanic and perilous print' (Nast, 2022). This print can be seen worn and sold by the biggest fashion and homeware brands in the world,

including Celine, Dolce & Gabbana and Artemest. These can be seen in the figure 9,10 and 11 below.



Figure 9. Zebra-print single-breasted brocade jacket, Dolce & Gabbana

Figure 10. ZEBRA-PRINT DINING CHAIR, Artemest

Figure 11. Zebra print bucket hat in cotton, Celine

Although these are high fashion and high brand designs, using zebra print is applied represent power and dominance. Yet, as previously mentioned, stripes have been more recently used in circumstances to negatively represent and stereotype classes of individuals, for example, stripes were used in Second World War by The Nazis to clothe the prisoners of the concentration camps in striped, prison uniform. This grouped the hostages together, which gave them distinctive look compared to the officers in the camp. This is seen in figure 12 below.



Figure 12, Child survivors of Auschwitz in 1945

Another example is the use of stripes in the book and film adaption '*The boy in the striped pyjamas*' (2008), a historical drama about the son of a commandant for a German concentration camp who befriends 'Shmul' a young Jewish boy in the concentration camp (Boyne and Herman, 2008). Figure 13 depicts a still from the film showing the young boy 'Shmul' wearing the blue and white striped pyjamas as mentioned.



Figure 13, a screen grab from the boy in the striped pyjamas

The use of stripes in this film is vital to the plot, as all the prisoners in the camp wore blue and white striped pyjamas to further degrade them. This immediately separates the prisoners to the higher profile characters in the film using their clothing. Contradictory to the use of stripes in the Second World War and '*The Boy in The Striped Pyjamas*', blue and white stripes were worn by Breton fishermen as seen in figure 13 as the official uniforms of the French sailors in 1858. The intent of the pattern was to easily locate a fisherman who fell overboard (Fiore, 2020). Meanwhile, the stripes used in the American flag embody freedom, which completely contradicts the prisoners captured in the concentration camps.



Figure 13. the Breton Fisherman, French Sailors in 1858

Stripes became an integral part to fashion iconography, the pioneer being Adidas, (Fiore, 2020) with their iconic three stripes on the trainers worn by athlete Lina Radke. Stripes are a hugely influential design filled with a lot of history. As previously mentioned, the stripes worn by prisoners in concentration camps were used to separate and dehumanise the people suffering in arguably the worst abuse to human form, whilst making a clear and obvious difference to the prison guards who were deemed to be of more importance and upper class whilst they held a position of power. Although now not used on uniforms worn by inmates, stripes continue to be used to portray crime and punishment, with cartoon prison characters often seen wearing striped clothing, and burglars wearing striped t-shirts to portray a bad character by using the horizontal, linear pattern. Due to pattern recognition in humans, this form of

surface pattern is instantly recognisable by the viewer to create an insight and a judgement of someone from first sight.

Although the negative and derogatory way in which stripes were used, stripes now hold a completely different meaning when worn a certain way. For example, the 'pinstripe' seen on a suit. The pinstripe is considered a smart and elegant stripe that reflects a high sense of respectability when worn. It is commonly worn by high class, important businesspeople, originally designed for men (Hampshire and Stephenson, 2006). It promotes the idea of wealth and importance, which is very contradicting to the stripes worn by what was considered, at the time by the Nazis, as the lowest class of people who were captured and tortured as prisoners in the concentration camps. Although many years ago, fashion, and stripes are still used to categorise individuals by representing those in power, create a system ranking and to classify groups of people. For example, stripes are popularly used in educational uniform such as ties and blazers, this distinguishes the difference from other schools and groups the students together as one. They are also used in various thickness and colours to represent different sports teams.

Relative to previously mentioned in the essay, stripes are still used to portray rank and regiment (Hampshire and Stephenson, 2006). First used in the late 18th century (Hampshire and Stephenson, 2006) by French soldiers, stripes are used by the military to distinguish rank, length of service and now used in award medals to portray an award simply by the positioning and colour of the stripes. Not only is the iconography of a stripe instantly recognisable on its own, but it is also frequently used to classify and identify individuals when used in fashion. The importance of the stripe mentioned

is not just in the stripe itself. Fashion design and the way an item of clothing is designed to be perceived is all influenced by the surroundings and person wearing the clothing.

Due to the mentioned systems theory, the position and placement of an item influences the perception of it. Using a stripe as an example, a striped uniform, no matter the colour or position, it is just a striped uniform. Conversely, the meaning changes due to its location. When worn by a young schoolboy on a playing field, a striped blazer insinuates youth and discipline. Nonetheless, when worn by a mature man seen on Wall Street, the clothing illustrates wealth, importance and high power of the person wearing it. Without the clothing, the man nor child would hold any position to assume.

The communication of written fashion also heavily plays its role on the design, how it is positioned, where it is placed and how it is perceived. For example, a striped dress would just be an item of clothing, but when discussed and advertised in a fashion magazine for marketing purposes, the use of adjectives will give the item a purpose and define use of the clothing to pitch to the seller. This is mentioned in Roland Barthes *The Fashion System* (2010). The example used in Barthes is “this long cardigan is discreet when unlined and amusing when reversible” (Barthes, 2010, p.20). The use of ‘discreet’ gives the item of clothing a purpose to the seller, whilst also using ‘amusing’ to describe the cardigan it gives the item a duo purpose. This appeals to a larger market audience, whilst providing a motive and intention to the item, just using adjectives in the magazine. To relate to the striped suit, without a physical image of a navy pinstripe suit it is just a suit. However, a smart suit would appeal to a customer looking for a professional blazer, whilst a ‘casual’ suit would appeal to a customer

looking for a laid-back blazer. These put together would then be a 'smart, causal, suit which gives the garment a multi-purpose use and intent. This shows the power of words and advertisement in the fashion industry and not just the initial design of it.

Discussing pattern throughout the essay it is apparent that it is evident in every aspect of life. To begin with the structure and formation of the universe, pattern is seen in the nature of the world, from the plants living like the aloe pollyphyla (figure 3) showing the golden ratio, to the symmetrical and mathematical pattern in the snowflake (figure 2 and 3). It is apparent that even without the interference of a human, pattern is evident in nature and there are patterns within the patterns formed. To follow on from the natural patterns, the pattern in humans follows, the patterns from birth in the new-born babies with the facial recognition which is a pattern itself. Facial recognition is an internal pattern recognition humans have, to recognise the pattern of a face and face like imagery to arguably a combination of nature and nurture. This led the essay onto human pattern recognition and how it has been used to develop automated facial recognition in technology which is now used by household technology like an 'iPhone' and CCTV used by the government. This proceeds to the pattern in animals, in their science like the ecology of their communication, to the physical pattern on their coats. The pattern on animals holds value and importance in their survival. The pattern on the coat of animals such as the mentioned zebra has history with its perception, and how that was incorporated into design. This opened the discussion for iconography and the importance of iconography in design and how it is successfully used in pattern. To take the circle and a striped pattern as example, how and why it is used in fashion, design and how its interpretation is used effectively in film was discussed. As well as being used in fashion by modern designers such as Dolce & Gabbana (figure 9) and

Celine (figure 11) the intention of the stripe is still used to forecast a certain judgement by people. Throughout this essay, pattern is shown to be important and when used, and effective in aspects of life and design. It is evident that even when it cannot be seen, pattern surrounds everyone and everything. Not only in nature and science, but with art, design, and religion too. It is it the structure to which everything is built to how humans and animals, communicate and emote. It is also used as a way for individuals to express their feelings, personality, and religion too, and it is a way of dissecting and better understanding the world. It is undeniable that without pattern, the world would be understood in a very different way. Indeed, according to Isiah Berlin “To understand is to perceive patterns” (1909-97).

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