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Photography: Vinciane Lacroix, Instagram@vincy.lacroix
https://vincianelacroix.myportfolio.com/

ICA-Belgium vzw
Koningin Astridlaan 1
2070 Burcht-Antwerpen
icabelg@gmail.com
www.ica-belgium.org

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ACKNOWLEDGEMENTS

We would like to express our very great appreciation to our sponsors ENSAV La Cambre for hosting the Colour Day event and Stoopen & Meeûs for supporting financially. The help provided by the volunteers Vinciane Lacroix and Claire De Maere was greatly appreciated. We are also very grateful for the assistance given by the students and staff of La Cambre.
ICA-Belgium is a non profit association that provides a platform to encourage interdisciplinary colour research and disseminates knowledge and studies in order to contribute to the development and challenges in the field of science, art, design and industry in relation to colour. She does this by organising seminars, lectures, courses, forums, study groups and other. ICA-Belgium is a regular member of AIC, International Colour Association.

BOARD & ORGANISING COMMITTEE

**Jeannette Hanenburg** is owner House of Colours. Founder of Colour Professionals. Member of the scientific international organization AIC-color and member of the international study group The Language of Colour. Co-founder of the Belgian Interdisciplinary Colour Association.

**Maja Kaurin** is independent designer based in Brussels who works internationally in architectural, interior, surface and colour design, with special interest in pattern, colour and form in a concept of space. She graduated in Architecture and holds a Master of Science in Colour Dynamics (Environmental Colour Design) by Budapest University of Technology and Economics.

**Filip Roscam** is product designer, colour trend specialist and effect-colour consultant for several clients of Merck KGaA. He holds Board positions at the global organization Color Marketing Group and the Belgian Interdisciplinary Colour Association.

**Inez Michiels** is co-founder and researcher at City of 8, research association in the field of design semantics. Former member of the research group at the Artesis-Plantijn University College in Antwerp Belgium. Co-founder of the Belgian Interdisciplinary Colour Association.
We would like to give a very warm welcome to you all for being here today. We are together here on this symposium on colour which also celebrates the international day of colour. Why the 21st of March? The 21st of March is the day that night and day are about equally long and was founded by the AIC to encourage events in the field of colour.

Welcome to the second symposium of the Interdisciplinary Colour Association Belgium, short ICA-Belgium. ICA is a young association and we are glad you came to celebrate its second anniversary with us.

Also a very special welcome to our speakers of today. About two years ago we started talking about the foundation of a colour association for Belgium with the goal to provide a platform for everyone involved in the world of colour.

With ICA we want to be interdisciplinary and encourage colour research, colour education, collaboration and this in the field of science, art, design, consultancy, education and industry. Our second goal was to become a member of the most prestigious, international association in the field of Colour, the AIC. The members of this international association are formed by 27 countries throughout the world.

- 2015, at the meeting of AIC in Tokyo, there was the question to found a colour association in Belgium.
- 2016 ICA-Belgium was born. The foundation of ICA was mentioned for the general assembly of AIC at the end of the meeting in Chile.
- 2017. At the congress in South-Korea last October, ICA-Belgium has been approved to become a regular member of the AIC, and is now the 28th country which is a member.

Collaboration, education and research are the fundamentals of ICA, which wants to provide a platform for everyone involved in the world of colour. We, the board, strongly believe in the necessity of this association.
What is ICA about. The board represents the interdisciplinary goal of ICA with our different professions, linked to colour we work together, in a strong way and we learn so from each other.

Before I talked about the steps ICA-Belgium has taken until now. ICA-Belgium is ready to grow. Growing bigger can not be done without good nurturing and help of others.

We believe in the founding of ICA Belgium so strongly, that we invested in the setup of ICA-Belgium by making the website, the foundation, getting insurance and organising this second symposium today. For the future we are also looking for professionals who want to become a member and sponsors to help ICA. They both can be the guardians of it’s growth.

Help ICA-Belgium to grow from small beginnings to its full potential. I am going to end with a final question. We need your help. The plan is to organise a symposium each year, beside that, we want to organise colourcafé’s, field trips and study groups. We are not looking for board members but we are looking for enthusiastic people who can help us with one of these events, and maybe have some great ideas on organizing different events, big or small, in the field of colour. If, after today, you want to help, raise ICA-Belgium to its full potential. Let us know and we can talk about the possibilities.

Come and be part of the most colourful family of Belgium. Now it is time to listen to interesting lectures.

Thank you.

JEANNETTE HANENBURG

President ICA-BELGIUM
OVERVIEW

**Biomimetic optical nanostructures.**
*Matthew Shawkey - UGhent*

**Design semantic pathways. Colours connecting meaning, emotion and psychology to visual language.**
*Inez Michiels - CITY OF 8*

**SlowCity, FastCity, SmartCity. Colours in the built environment.**
*Verena M. Schindler - AIC*

**Color as Modernity: Chromatic Ambitions in Art Deco New York.**
*Jada Schumacher - FIT NY*

**Colourful World vs. Colourless Design – how to restore colour and material in the education of architects and designers.**
*Ralf Weber - UDresden*

**The Color Biolab: a transdisciplinary research on color.**
*María Boto-Ordóñez - UGhent*

**Microkosmos – Strange white light properties.**
*Adrien Lucca - ENSAV La Cambre*
Biomimetic optical nanostructures.

Matthew Shawkey

Evolution and Optics of Nanostructures Group, Department of Biology, University of Ghent, Belgium
matthew.shawkey@ugent.be

ABSTRACT
Colors are useful for functions ranging from camouflage to communication to thermoregulation. Structural colors, those produced by materials organized at the nanometer scale, have numerous advantages over those produced by pigments, including greater color diversity, iridescence, resistance to fading, tunability, and potentially low cost of manufacture due to their formation by self-assembly.

![Image](image_url)

Figure 1: Schematic illustrating strategy of using synthetic melanin to produce structurally colored films.

Birds have an astonishing diversity of structural colors ranging from ultraviolet to red. I will discuss our recent progress on biomimetic versions of these nanostructures using three methods: 1) synthetic melanin nanoparticles, 2) polymer blends and 3) nanoscale 3D printing. We use these techniques both to test hypotheses on their function and development, and to produce new materials with potential applications as coatings and sensors.
Design semantic pathways. Colours connecting meaning, emotion and psychology to visual language.

_Inez Michiels_

Researcher, teacher and consultant at CITY OF 8 vzw, design semantics non profit research association.

info@cityof8.com

ABSTRACT

At a time when visual communication, products and environments increasingly need to appeal emotionally to win the hearts of the users, or to bring them into a certain state of mind, for the designer in-depth knowledge of the psychological and emotional effect of visual language is more important than ever. For to be successful, products and environments must be able to inspire, promote well-being, generate emotions and dreams. This paper presents the genetic semantic colour space as a scientifically based design method to connect psychology, emotion and meaning in a natural way to elements of visual language. By means of elementary carriers of meaning that can be found in specific properties of colour, a synaesthetic bridge can be laid to the other forms of expression such as colour palette, shape, composition, texture, body language, sound and taste. The method is suitable for the analysis as well as for the creation of design. The genetic semantic colour space forms the abstract framework for the creative database _KHNUM_, an online research and design tool.

DESIGN TODAY

Ever since Marshall McLuhan published his legendary views on media in the 1960’s, wherein he predicted the return to “the Africa within”, a new era in design practice is unmistakably emerging. Due to new technologies in media, a shift from the printed word and the literary culture, towards a more pictorial form of communication is inevitable, with an emotional way of ‘reading’ as a result. Forty years later Jensen describes this shift more detailed in his work _The Dream Society_ wherein he shows an inclination towards objects that inspire users, instead of products that are only ease-in-use, attractive, affordable or sustainable. Products should enhance people’s lives not only practical, but also emotional. Consumers will not pay for the latest technology, but for the story that evokes dreams and connects with our identity.

More recently, award winning designer Klaus Krippendorff observed in his groundbreaking work _The Semantic Turn: A New Foundation for Design_ (2005) that design urgently has to shift gears from a preoccupation on how artifacts ought to function, or appeal esthetically, to what they mean to their users. “Maybe we
could talk about an analytical or logical turn of design, away from the arts-and-crafts orientation” comments Pelle Ehn in ARTIFACT 2007. Nobel Prize winner Herbert Simon in his The Sciences of the Artificial (1969) suggests that the seemingly elusive and always changing characteristics of design could be transformed in ways such that methods of logic, mathematics and statistics could be applied. He goes so far as to compare future design to natural sciences, and proposes a kind of design engineering.

The growing interest for semantics among designers and marketers is thus not surprising. Demirbilek already noticed this emerging evolution in the US in 2003, where product semantics became one of the most important trends. In the Trend Report 2016 of Wijs design semantics was spotted by David Gillain, general manager at Android (Antwerp based creative agency), as one of the important new trends in Belgium. Companies are increasingly aware that imaging is communication indeed, and that it better be well done.

**SEMANTICS**

Semantics is a science that studies processes of meaning. The goal is usually the arrangement of signs and rules with which ideas or concepts can be described. In a historical perspective semantics is an attempt to realize the synthesis of the languages. Leech (1981) states that semantics is the center of research of the human mind, thought processes, cognition, conceptualization. Langer (1948) points out that not every semantics belongs to language, and that meaning processes include much more such as images or objects but also music: “if the music has a meaning value, then it is semantic”. Linguistics is the study of languages, semantics is the study of what lurks behind the languages, namely the imagination.

Design semantic research is not just the decipherment of mental processing of sensual experiences such as the processing of colour into meaning and emotional reaction. As Lars Lundgren, associate professor in Media & Communication Studies at Sweden Södertörn University defines, semanticists have a strong interest in classification; the use of systems, structures and schemes. The reason for classifying and systematizing is to get a grip on seemingly fluid and always changing phenomenon like colour, meaning, emotion and psychology, in order to understand, communicate and apply these phenomenon in a far more scientific way.

A semantical approach is to search for logical and thus mathematical systems of giving of meaning. Semantics explores this mathematical logic within human biology and neurology, assuming that human understanding is not only a matter of learning and culture but that also an inborn language ability is needed. In this view signs not only refer to the outside, to the concrete, but at the same time have an inner, abstract meaning.
For instance, the term chair does not only presume a reference to this furniture. It is not only a reference to a material object, but also to an idea. Before we can speak we already know what sitting is. ‘Chair’ therefore only becomes understandable from this abstract knowledge about sitting and presumes an ability of understanding. (Fig.1)

AN ABSTRACT FRAMEWORK
Abstraction is the basis of thinking. The ability to work with signs, to process (sensory) information, is innate and proceeds through a language that is specific to the brain and nervous system (Langer, 1948). Leech (1981) cautiously refers to a conceptual basic framework in which abstract ideas are formed. He speaks of a grid, a collection of cells or designative categories. In his impressive study The Act of Creation, a study of the conscious and unconscious in science and art, Koestler links phenomena such as laughter, scientific, technical and artistic creativity with what he calls matrices of thought. He uses the word matrix to designate every ability, habit or skill, every pattern of ordered behavior that is managed by a ‘code’ of fixed rules.

The study of information processing by computers and brains also makes it increasingly clear that behind the multitude of observations and expressions a regularity can be found that can be traced back to a processing method. An example of this type of research is modern linguistics. Noam Chomsky, with his generative grammar, rejects the view that languages are purely conventional. He shows that to a certain extent we are programmed to develop a language. Since the publication of Chomsky’s first work, Syntactic Structures (1957), a stream of data has emerged that has convinced the vast majority of linguists of a universal system that hides behind the diversity of languages. ‘Living systems’ such as language have not been designed and programmed by the observer but are part of the evolving nature. The observer is a product of evolution, he was produced by the observed and thus in a sense forms a unity with it.

Steven Pinker’s cognitive-psychological starting-point (1994) tries to reconcile the new vision of hereditary knowledge with the behaviourist tradition that dominates US universities. Languages are products of the brain (software) and the brain is a
biological computer. Pinker gives arguments from child psychologists, biologists, neurophysiologists, computer specialists, linguists etc... proving that the existence of a thinking-language is not only possible but also necessary. In this view each one of us carries an inbuilt dictionary as part of our mental equipment. It is organized like a thesaurus, so that when one key-concept is found, other similar in meaning are made readily available. Knowledge is not just a list of facts but is organized into a complex network. Expressive language must be structured so that the listener/observer can place each part into the inbuilt framework. This thinking-matrix forms our innate and universal language ability that each of us uses in her own way.

The decoding of the biological signal system is possible by studying the way in which people connect all kinds of impressions. However, there are so many combinations possible and there are so many variants that it seems impossible to check all assumptions. If, for example, we notice that a certain colour corresponds to a certain shape, how do we know whether this is related to the internal organization of the nervous system and the brain, or with accidental external similarities and cultural practices? Even if most people agree that a heart shape matches a red colour, we are not sure if this is a convention or not.

Nevertheless, that the naming of objects is not an arbitrary process is demonstrated by the Bouba-Kiki effect. Wolfgang Köhler, a German psychologist who experimented with perception and movement, observed the Bouba-Kiki effect for the first time in 1929. It has since been repeated all over the world. The effect is that when people have to stick the words Bouba and Kiki on two forms (a fat, round shape and a sharp, pointed shape), 95% to 98% will pin Bouba on the fat, round shape, and Kiki on the sharp shape (Köhler, 1947; Ramachandran, 2001). This suggests that the human brain is capable of extracting abstract properties of both shape and sound.

MENTAL GRAPHICS SPACE

Empirically studying the way in which people connect all kind of impressions is one way of reaching a framework for a semantic design science. Statistical research is elementary in this endeavor, but it is not enough. We also need a mathematical logic that forms the basis of the “thinking-language” demonstrated above. With the publication of his work The Mental Graphics Space (1982), semanticist Ferre Alpaerts proposes the theory of genetic semantics as a method for getting insight in how meaning is established in the human mind. He states that imagining is a natural ability to process certain images according to certain methods. This is technically realized in the nervous system and brain and can thus be understood.

The starting point of genetic semantics is that meaning derives from innate structures of information processing. “The way in which higher organisms process information is derived from the methods used in the cell. The nervous system and the brain are built up of cells and it seems logic that the way cells exchange
signals relies on the genetic code they possess. "From this proposition emerges the idea that the human signalling system can be traced back to the codons of the DNA. The human ability to use signs is thus based on applications of genetic encoding."

Genetic Semantics considers the semantic markers (= semantic features) introduced by J. Katz as ‘letters’ of DNA and combines them in groups of $2^3$ codon ‘words’ of hereditary script (= componential definitions). (Fig.2) The semantic words refer to the key-images of the mental graphics system. The thinking, i.e. the processing of these systems concepts, is a creative matter, namely the imagination.

![Fig.2. Semantic switch: two static (0 and 1) and two dynamic (0>1 and 1>0) semantic markers, correspond with the letters T, A, C and G of the DNA.](image)

The DNA structure can be presented as a spatial classification system, a system with three axes on which static opposites (0 and 1) are placed and movements (0>1, 1>0) are coded. (Fig.3)

![Fig.3. Three axes of meaning.](image)

Ideas are given a coordinate formula containing static or dynamic letters in depth, height and breadth, thus forming a codon, with which they get a place in the space.
and can orient themselves. (Fig.4) Some examples of genetic semantic ‘words’ or codons: 001, 0010, 1101.

This way Pinker’s mental dictionary is viewed as a filled up 3D spreadsheet, an active matrix of which not only the cells are numbered but also provided with formulae that are formed by genetic code signs. This space forms thus a connected database, a huge network of concepts and ideas that are placed into coded cells.

**SPATIAL THINKING**

The 3D structure is crucial in this system and according to the semanticist Greimas (1966) it is inherent to human thinking. He showed that not only we think binary, in antagonists, but also dimensionally, according to aspects. Depth, height and breadth are dimensions of imaginary but nevertheless meaningful positions and movements that form the basis of the meaning. Paul Ricoeur (1977) points out the importance of spatial metaphors. Thinking is orienting oneself in an imaginary space that determines the direction (dimension) and the sense (0 or 1). The anthropologist Raymond Firth (1962) discusses in his work the depth (communication), the height (power) and breadth (class differences) that are found in the ceremonies and rituals of ancient cultures. The 3 dimensions of affect from the bio-informational theory (Lang & Bradley, 1994) can be evaluated in a spatial model with "pleasure", "dominance" and "arousal" on the three axes. Also the three dimensions from the personality theory of Eysenck (1998): extraversion, psychoticism and neuroticism fit in this model.

**DEPTH**

The depth dimension is about differences (BACK) or similarities (FRONT). Which is equivalent to us there we tend to seek contact with (FRONT). What is strange keeps us away (BACK). What lies behind us is distant (BACK), what lies ahead is close by (FRONT). The dimension distinguishes what we can see (what is in front of us), of what we can not see (what is behind us). In psychology this is the antagonism introverted (BACK) – extroverted (FRONT). In the emotional response
the antagonism is unpleasant (BACK) – pleasant (FRONT). It is the theoretical dimension, about communication, the what question, the profound, the in depth.

HEIGHT

The height is the dimension of the force of gravity. Things fall from top to bottom. What is heavy tends to go down (TOP to bottom), what is light in weight has a tendency to float upwards (BOTTOM to top). At the top is the power that dominates. At the bottom is the compliant. It is the hard (TOP) opposite to the gentle (BOTTOM), the strong (TOP) towards the weak (BOTTOM). Our head is the control centre of the body and is at the top. With our feet we stand on the earth. In psychology it is the contrast low cooperativeness (TOP) – high cooperativeness (BOTTOM). In the emotional response it comes to the degree of control one has over someone or something, with great control on top. This is the practical dimension, the how questions, the technical approach, the know-how.

BREADTH

The breadth is the dimension which is determined by the hands, to the left and to the right of the body. Left and right of the king are the representatives of the society (the classes). The Christian God divides humanity into the damned (LEFT) on his left side and the blessed (RIGHT) on his right hand side. The past (LEFT) we usually express with the left hand. Which lies in the future we express with the right hand (RIGHT). The past is associated with passivity (LEFT) and the present or the future with activity (RIGHT). Passivity means rest and the general decline of metabolic processes and glandular function. Activity accelerates the metabolic process and gland function increases. Primitive peoples showed a number of basic behaviours. The active primitive man was a hunter, his activity was focused on conquest and obtaining. A passive behaviour was self-preservation, defence, withdrawal (Lüscher & Scott, 1969). In psychology, these are the calm, rational people (LEFT) facing the emotional, spiritual ones (RIGHT). In the emotional reaction it is about the intensity that a person is touched. Low intensity is on the left side, high arousal on the right. It is the history dimension, the why questions.

COLOUR AS AN ABSTRACT CLASSIFICATION SYSTEM

Colours are important for semantics because of their abstracting quality. According to Dummett (1973), colours are on the borderline between abstract and concrete language objects. He makes a clear distinction between colours on the one hand and shapes on the other. A shape has to be taken as the shape of something, but a colour need not necessarily be understood as the colour of anything. According to his definition, colours are thus abstract objects who have a strong reference in the sense of semantic role ‘internal to language’. (Duke, 2012)

The codic meaning of colours can be determined very accurately and can be nuanced indefinitely. One can better replace the combinations of zeros and ones from the ‘machine language’ with a colour code, which offers more possibilities for creative design applications. The meaning (the spirit) they generate in our ‘living
computers' is part of an inner language, a world that we sense better than that we can put into words.

Although the observer adds the colours to the observation, their qualities are precisely measurable. Through metaphors, colour psychology, striking applications of colours in publicity, packaging, visual art, comic strips and illustrations they are connected with words. Their genetic combination, which represents the meaning, is completely determined by their physical characteristics.

Fig. 5. Basic colour psychology parameters in the semantic space.

Ou et al. (2004) who investigated colour combinations identified three colour factors with the method of factor analysis that gave the best cross-cultural results, in particular the colour temperature, colour weight and colour activity parameters. This results in three antagonistic pairs, which prove important when it comes to emotional values, nml. cold/warm, heavy/light and passive/active. This model is confirmed by Wang (2007). In other studies on colour psychology, the terms inner/outer and hard/soft are used. (Lüscher, 1969; Heller, 1989) Without contradictions these terms can be placed in the 3-dimensional model of genetic semantics. (Fig.5)

DEPTH

There is a strong connection with the colour temperature parameter cold/warm and the parameter far away/close by. The perceptual and psychological effect of this contrast shows that warm colours tend to come forward in an image (close by), while cool colours tend to step back (far away). In classical landscape paintings, for example, the blue colour was applied to suggest depth and distance. Cold colours create space, distance and depth, they do not impose themselves. Cold colours encourage people to do mental activities. Warm colours have the quality to come close. They provide a sociable and physical state of mind. The research of Eva Heller (1989) shows that this colour quality is related to psychological introversion (inward / outward). Extrovert people appear to prefer red, orange and yellow.
A clear correlation has been established between a feeling of temperature and the wavelength of a colour. Psychological research shows that the subjective experience of colour temperature changes abruptly when the value above 120° CIELAB (NCS R50B) has been exceeded. The same sudden change occurs around 330° CIELAB (NCS G50Y). (da Pos & Valenti, 2007) This connection appears to work cross-culturally, although some slight differences in culture are measured, when it comes to the cold/warm borders. (Sato, Xin & Hansuebsai, 2003)

Cold/inner colours are blue, black, green and purple

Warm/outer colours are yellow, white, red and brown

HEIGHT

There is a strong connection between the physical colour parameter of lightness and the feeling of weight and hardness. Osgood (1957) shows a correlation between heavy, hard and large, while lightweight is rather soft, fine and small. Other research results support the earlier qualitative findings that “dark” colours appear heavier than “light” colours, while providing quantitative meaning to the terms dark and light. (Alexander & SHANSKY, 1976) White and black are the most extreme examples of weight. Dark colours, when applied above the viewer, tend to press down or dominate. Because of their heaviness, the weight is physically sensed. A black ceiling will be estimated lower than a white. When applied below the viewer, dark colours tend to give a feeling of support due to their synesthetic effect of hardness.

Heavy/hard colours are blue, black, brown and red

Lightweight/soft colours are yellow, white, purple and green

BREADTH

The psychologist Lüscher (1969) uses the parameter active/passive in his colour test. His active colours are yellow and red, the passive blue and green.

This parameter is strongly connected to the saturation dimension. The amount of chroma has an effect on the feeling of activity. The brighter the colour the more dynamics will arise. Passive feelings such as sadness are associated with very unsaturated colours, while active feelings such as happiness, surprise and anger are linked to bright colours.

Active colours are black, purple, red and yellow

Passive colours are white, brown, green and blue
EIGHT PRIMARY COLOURS

By means of the combination of three dimensional polar parameters, 8 colours are defined and placed in the genetic semantic space. (Fig.6) That these colours are primary is confirmed by different sources. From linguistics we know, thanks to the research by Berlyn and Kay (1969), that primary colours are first mentioned in the evolution of colour naming. The researchers confirm that cross-culturally between 7 to 12 primary colours are named initially. Following the evolution we get a colour range of dark (black) and bright (white), red, yellow/green, blue, brown, purple/pink/orange/gray (Kay, 1975).

From biology, there is the function of the retinal ganglion cells that confirm the selection of the eight primary colours. (Fig.7) The retinal ganglion cells are situated in the innermost layer of the retina, which receive information from the light and colour-sensitive rods and cones in the outer layer of the retina. These stimuli are converted into an electric digital signal via the retinal ganglion cells. After digitizing the analogue RGB system, the retina distinguishes between 6 primary colours that interact as antagonists, where blue is opposite to yellow, green to red and dark to light. Purple and brown are generated by the simultaneous stimulation of these cells.
Black and white are regarded as full-fledged colours because both black and white are considered as such in linguistics, biology and in psychology. Heller (1989) "We connect black and white with a symbolism that can not be compared with any other colour." Black and white are achromatic colours.

**COLOURS AND MEANING**

There is a lot of confusion about the meaning of colours. Their codic meaning is universal because it is determined by their physical characteristics. The abstract meaning, although sometimes very clear, can not be automatically translated into words. There are no fixed rules, because language is an open system. The 'translation' is rather something like laying a tangram, the Chinese puzzle that suggests a figure. Phrases like "red means love" assume a strict, unambiguous relationship. ‘Red’ does not get meaning through ‘love’.

In reverse, the words get meaning through the colours, they are ‘emotionally coloured’ as in "love is red". In Dutch and within a certain context, ‘love’ is assigned the same code as bright red ‘naturally’ produces in us. The abstract meaning of the colours is universal, their external meaning is culturally given, which does not imply that it would be entirely conventional.

'Understanding' or 'grasping' is to fit the idea into a cell within the conceptual framework it belongs. The reasons why an idea lands in a certain cell can often be very diverse.

**Fig. 8. The keywords earth and heaven in the genetic semantic space**

According to the comparative research of Alpaerts & Michiels (2006), "Earth" eg. was placed under the code 000, i.e. the codic combination for the colour blue. (Fig.8) On a dimensional level, the idea of earth can be described as the sum of cold (depth back) + hard (height top) + passive (breadth left). There is a frequently recurring relationship with the term "earth" and the colour blue. The earth is referred to, among other things, as the 'blue planet'. In many simple images such as logos the globe is presented in blue. In Christian representations, the heavenly
God is depicted in yellow opposite the blue earth over which he rules. According to the psychologist Heller (1989), blue is the colour of the reunification with (mother) earth and has a calming effect. Campbell (1969) explains that Buddhist meditation techniques focus the mind on colours. "The earth, then, was to be seen as lapis lazuli, transparent and radiant." In Ancient Egypt as well as in India (Shiva, Vishnu, Krishna), blue is a divine colour, not that of a heavenly god but of an earth god.

**HIERARCHY OF MEANING**

The system of genetic semantics allows a hierarchy of meaning, starting from the abstract level of dimensional semantic markers as described in previous chapter, into an endlessly refining structure of levels 8, 64, 4096, ...

**Dimensional keywords** are the most abstract terms in language and are close to logic signs such as indirect/direct, dark/light or open/closed. These words are the elementary markers of meaning and make synaesthetic translations possible. They appear always in opposite pairs of antonyms placed in the 3-dimensional matrix.

**8-level keywords** are more complex in meaning as they are constructions of dimensional keywords, but still are mostly short words such as “to know”, “to sit”, “food” and primary colour names such as “blue”, “green” etc. Most of these words also have an antonym, but not all of them. 8-level keywords are placed on the eight corners of the semantic space.

In the bio-informational research, differences in levels of meaning are also observed. Emotions such as anger, fear, contempt, etc. are compositions of the three basic dimensions of emotion. Anger is eg. the sum of unpleasant (depth 0) + dominant (height 0) + aroused (breadth 1).

8-level keywords are connected to each other through their dimensional relationships.

1. **CLUSTER**: “Earth” with code 000 is connected to “ground” with the same code. The meaning is clustered, sometimes even synonym, but not always in the strict sense.
2. **MOVING AXIS**: “Ground” with code 000 is connected to “stain” with code 001. Only one dimension switches, in this case it is the breadth dimension that switches from 0 to 1.
3. **ANTONYM**: “Stained” with code 001 is connected to “stainless” with code 110 as an antonym. The meaning is opposite.

**64-level keywords** are formed by combinations of 8-level keywords, thus making them even more complex in meaning. Here you can find assembled words such as “doorway” (“door” and “way”), “crossroads” (“cross” and “road”) or “blue-green”, where the 8-level source is still clear. But also words such as “cooking”, “family”, “detective” etc. are 64-level. Here specific colour names can be searched such as “lilac”, “aquamarine”, “khaki”, “fuchsia” etc.
When a colour is identified as an 8-level codon triplet eg “red” (code 101) then it concerns a more general meaning such as “love” in a broad sense. On 64-level one distinguishes more specific meanings which can be presented as a colour combination or as a specific colour tint. Erotic love (code 011:101) and romantic love (code 101:001) are often pictured respectively in the colour combinations purple-on-red and red-on-black, while charity (code 110:010) and soft erotic (code 111:010) can be expressed in salmon red and pink red. (Fig.9)

This hierarchical relationship is comparable to the evolution in language. More specifically, the development of colour names illustrate this. The language researchers Berlin and Kay (1969) found that after the introduction of names for the primary colours, colour names that are combinations of primary colours will enter the language. These indicate more specific hues of a primary colour. This way colour names come into use such as blue-green, red-orange, etc. some of which in a later stage acquire a more prosaic name, sometimes referring to an object from nature with the same colour, as with “turquoise”.

64-level keywords are connected to each other in the same way 8-level keywords are, through their dimensional relationships: clustered, moving axis and antonym.

**SYNAESTHESIA**

Genetic semantics defends the existence of abstract ideas. As shown with the Bouba-Kiki effect, there is no difference at a certain level between acoustic and visual shapes, colours, postures, gestures, ... We feel this when we compare sign systems, for example we can call a colour, a sound as well as a taste 'sharp'. When this phenomenon occurs spontaneously, it is called synaesthesia: the simultaneous experience of an emotion in eg. colour and smell, or sound and form.

Synesthesia takes place on the dimensional abstract level. For example the colour parameter weight, which is strongly correlated to the lightness parameter, evokes the same emotion as does the size parameter of shape. The relation with area proportion (size of the coloured object) appears to be most significant for the heavy/lightweight colour emotional scale (Wang, 2007). This creates a relationship...
of meaning between the colour quality heavy/light and the shape quality large/small, both placed in the height dimension of the semantic space.

As was shown previously, the height dimension is psychologically and emotionally linked to power, control and dominance. Heaviness or darkness and area proportion are colour and shape parameters that radiate the same emotions such as shown in Fig.10. The higher the bulge on the top of an object, the more aggressiveness it radiates (Roebers, 2013). There is a possible relationship with the testosterone hormone. People who set up a large posture have an increased amount of testosterone in the blood. With that, they radiate more power, willingness to win and a sense of domination (Carney et al., 2010). Lakoff and Johnson (1999) saw that there are many proverbs and sayings that have to do with this form characteristic and certain emotions. Above / high: better, powerful, good, positive, important, wealth, luxury, expensive, overfull, high regard, visible, bossy, ambitious, risky, distinguished, conceited, information-rich, certainty. Under / deep / low: less good, submissive, shabby, problematic, less important, fear, negative, broken, distrusted.

![Fig.10. Synaesthetic similarities in emotional effect of the height dimensional colour parameter dark/light and the shape parameter area proportion on top or bottom.](image)

By carefully comparing statistical research of correlations between the different sensory parameters, a solid network of design handles is formed with which designers can create in a more controlled and scientific way, getting a solid grip on the language they express.
CONCLUSION

Genetic semantics is a valuable and useful new design method because:

- it is based on the congenital processing of sensory and emotional stimuli and it therefore naturally connects with intuition and gut feeling;
- it is substantiated with statistical research from universities and institutions around the world, providing designers with valuable information that helps them substantiate their design choices;
- it can be used as a method for analysing as well as for creation;
- it allows to pin down meaning of keywords and their hierarchical level, so that misunderstandings can be avoided in research and briefings, with fewer redo’s as a result;
- by consciously making use of synaesthesia, designers get full control over the values, emotions and atmospheres they want to radiate and can strengthen or weaken them perfectly;
- it is a method for the future as endless refinement of meaning is incorporated.

This groundbreaking method thus responds to the new evolutions in design practice, as design becomes more and more a sense-making creative activity. The method is a step forward to the analytical or logical turn of design, away from the arts-and-crafts orientation, without losing touch with intuition and gut feeling.

A first step towards a genetic semantic design tool is made with the building of KHNUM (Alpaerts & Michiels, 2018) an online semantic database. Keywords, colours and combinations, shapes, compositions, textures, materials, body language, sounds, music, word-sounds, symbols and their relations, will be able to be searched according to context-related significance and emotional and psychological effect, taking into account cultural aspects.

KHNUM is the result of dozens of years of study and scientific research that summarizes the work of anthropologists, philosophers, graphic designers, colour psychologists, artists, marketing experts, sociologists all in one concept. The unique data structure of Genetic Semantics forms the basis to classify and orient key-concepts in a logical framework.

The first launch of the online tool is planned for September 2018.

SOURCES


SlowCity, FastCity, SmartCity. Colours in the built environment.

Verena M. Schindler

Verena M. Schindler is Art and Architectural Historian and Co-Chair of the Study Group on Environmental Colour Design (SG ECD), Association Internationale de la Couleur (AIC).

ABSTRACT

A city is never finished. It is always evolving, changing and modernizing. How do we approach the continuously fluctuating colour complexity of a city, an urban space? This talk inquires into what makes a city chromatically attractive. An analytical approach to urban colour will be explored and discussed. Insights from different points of view on how to create a relationship between colours, materials and the built environment will be the basis for the study of chromatic atmospheres in urbanism. Then we discuss what the colour concepts of future urban developments are. What are a SlowCity, a FastCity and a SmartCity?

AlgoHouse, Paris, France, 2016 © XTU Architects, Anouk Legendre and Nicolas Desmazières

Green Wall, Musée Quai Branly, Paris, September 2013. Photo © Patrick Blanc
FastCity

Pudong, Shanghai, China. Photo: Jens Fersterra, and

SmartCity. Photo: concept/www.renesas.com and
https://readwrite.com/2016/12/14/3-benefits-cities-can-gain-smart-infrastructures-dl4/

Color as Modernity: Chromatic Ambitions in Art Deco New York.

Jada Schumacher

Associate Professor, Fashion Institute of Technology, New York, New York
Founding Director, designorange, New York, New York.
jada_schumacher@fitnyc.edu

ABSTRACT

The proposed paper offers an in-depth study of color palettes of original Art Deco murals in New York City. Murals such as Stuart Davis’ Men Without Women (men’s lounge of Radio City Music Hall), Yasuo Kuniyoshi’s Exotic Flowers (ladies’ powder room of Radio City Music Hall), Hildreth Meière’s Byzantine masterpieces (surrounding the Torah at Temple Emanu-El), José Maria Sert’s American Progress (30 Rockefeller Plaza), the wall portion of Edward Trumbull’s Transport and Human Endeavor (Chrysler Building lobby), Ezra Winter’s The Fountain of Youth (staircase atrium of Radio City Music Hall), or similar will be explored.

The proposed methodology will include (1) color documentation at the building sites using NCS (Natural Colour System) and/or Pantone Matching System, (2) documentation of materials at the building sites, (3) compilation of color and material palettes, (4) visual photographic essay of murals, and (5) brief text analysis of the social, cultural, and spatial significance of these color choices in the Art Deco era.

Jada Schumacher is an Associate Professor at the Fashion Institute of Technology and Color Certificate Instructor for industry professionals. As Founding Director of designorange, she leads a team in a New York City-based studio providing design custom design and in-house product collections. She has more than 15 years of experience as a designer - in architecture, interiors, and product design. She also serves as an international color and trend reporter for the Government of Japan. As a global designer and educator, she exhibits color installations around the
globe (from the Centre Pompidou to the International Contemporary Furniture Fair NYC) and presents chromatic lectures in cities such as Budapest and Tallinn and at venues such as El Salvador Color Week and Harvard University.

Visual essay for proposal to be completed by applicant. Images here used for explanation purposes only.

Sources of images in proposal:
Colourful Word vs. Colourless Design – how to restore colour and material in the education of architects and designers.

Ralf Weber

Professor of Architecture and Director of the color research collection of Dresden University.

ABSTRACT

Everyday life is bursting with color: The colors, hues and textures of a city combine in a blur of lights, cars and people rushing to work, advertising, shop window displays and the vibrance of cafés on a square. The fabric of buildings that make up streets and squares, trees, the texture of street pavements and the material of roof tiles seen from above are all component parts of a city’s color palate. Many cities are indeed famous for their trademark colors.

Now, imagine a world without color. A city where buildings, streets and trees are of a uniform color: buildings, whose rooms are mainly painted in shades of white? Unthinkable? Not at all, because this is precisely the way many modern cities and buildings are often imagined in the contemporary planning process: through diagrams of line drawings, through mass models of wood, plaster or styrofoam or simply through the one-tone digital mass models that visualize the first ideas.

1. Week Foundations & Color Science
2. Week Color in Urban Design
3. Week Color in Interiors

THREE WEEKS OF COLOR
There is a remarkable dichotomy between the reality of experiencing the world and its planning: a dichotomy between reception and production, and consequently between a world of color perception on the one side, and a design process that regards atmosphere crafted by color, texture and light only as a by-product at the end of the process on the other. In the education of architects and many design professions, the aspect of color plays rather a marginal role and it is often considered a component that is secondary to the design of the plans or the shape and structure of the building.

Yet in the actual experience of buildings, cities and objects, color is experienced via the materials that make up their surfaces, and therefore, is an integral part of the perceptual process. How can this dichotomy be resolved? How can students be taught to imagine the first ideas about shape and space as material ideas right from the start, instead of merely draping a finished design with color, texture and lighting at the end and thus disregard their role as intrinsic components of the design process?

This talk will look at the use of color and material throughout the history of the design process and illustrate the reasons for the schism between material and color on the one side and the design concept and form on the other. Using Dresden University’s model of intensive courses in Space, Color, Light suggestions and examples for an integrated model of teaching color will be presented.
The Color Biolab: a transdisciplinary research on color.

María Boto-Ordóñez *, Kristel Peters, Dirk van Gogh and Bram Crevits

1 KASK / School of Arts of University College Ghent, Ghent, Belgium

*maria.botoordonez@hogent.be

ABSTRACT

Due to the possibilities of transdisciplinary research, in 2016, the School of Arts KASK (Ghent) set up an experimental biolab, LABORATORIUM, an open space for research and education. LABORATORIUM promotes that people from different backgrounds work together by the use of accessible scientific tools and hybrid methodologies.

The main project developed in LABORATORIUM is The Color Biolab. The Color Biolab uses color as a universal language between art and science, involving several artistic and scientific disciplines. This research goes from applicable research as mycoremediation of color waste, sustainable coloring sources or bio-pigments to the experimental movies or the creation of a color names database.

The color biolab project is financed by the Arts Research Fund of University College Ghent.
Microkosmos, Strange white light properties

Adrien Lucca

Artist and a color teacher at ENSAV La Cambre, Brussels.

ABSTRACT

Microkosmos is the title of a large-scale permanent installation for Het Huys, the new building of the Cultuur Gemeenschapscentrum in Uccle (Brussels). Situated in a courtyard outdoors, it consists of a large wall-painting and of a light system that is turned on in the evenings.

Thanks to the development, by the artist, of spectrally-tuned warm-white LED light sources, the visual appearance of the wall painting and of the coloured objects placed in the courtyard drastically change during the night, and the public experiences a form of artificial, light-induced colorblindness. While the colour of the light itself matches the colour of halogen light sources, and while white, grey and black objects appear normally, major hue-shift is produced on bright yellow, pink, blue-green and indigo objects. For example, industrial pils beer such as Stella, Maes or Jupiler appear pink like rosé sparkling wine.

The artist will present the multidisciplinary research and the industrial collaborations that have been necessary to produce this work.

link: https://www.youtube.com/watch?v=A8L18LI8gXQ
OVERVIEW

**Studying emotions and colours in art using Armand Henrion's self-portrait paintings.**  
*Lucia Camenzind - University of Lauzanne*

**Challenges in empirical testing of affective associations with colour.**  
*Domicele Jonauskaite - University of Lauzanne*

**Chromatic-tour: a Colour Guide.**  
*Vinciane Lacroix*

**Semantic Colour Space.**  
*Inez Michiels - CITY OF 8*
Studying emotions and colours in art using Armand Henrion’s self-portrait paintings.

Lucia Camenzind, Domicle Jonauskaite & Christine Mohr

Institute of Psychology, University of Lausanne

INTRODUCTION

Colours are important tools in visual art that may convey emotions. Studies demonstrated that brighter and more saturated colours were associated with positive emotions and darker and less saturated colours with negative emotions (Hemphill, 1996; Valdez & Mehrabian, 1994). To test whether colours might have an impact on which emotions are perceived, we used self-portraits of the Belgian painter Armand Henrion (1875-1958). He depicted himself with a face painted in white, each time with a different facial expression and wearing a headscarf of different colours. We obtained 16 high-resolution scans of original Henrion’s self-portraits from the Klewan Collection, located at the Belvedere Museum in Vienna. In this first study, we investigated what emotions participants perceived and their intensity on each self-portrait. We also tested whether prolonged exposure to the self-portraits affected emotion choice or its perceived intensity.

METHODS

We showed 16 Henrion’s self-portraits in randomized order to 20 participants (8 males, mean age 25.35 years). Participants chose one of 20 emotions displayed in a circle (positive: interest, amusement, pride, joy, pleasure, contentment, love, admiration, relief, surprise; negative: sadness, guilt, regret, shame, disappointment, fear, disgust, contempt, hate, anger; Scherer, 2005). They also rated the intensity of the selected emotion on a scale from 1 (low) to 5 (high). They were allowed to choose the same emotion for as many self-portraits as they wished. The self-portraits were shown twice: in the first run for a duration of 1s to collect intuitive ratings; in the second run for an unlimited amount of time to collect more elaborate, qualitative descriptions (e.g. in which situation the person might be).

RESULTS

Participants most frequently attributed surprise, fear, contempt, disgust, sadness, joy, love, or pride to the self-portraits. For four self-portraits, participants agreed on the displayed emotions – contempt, fear, or surprise. For the other self-portraits, participants were divided on which emotion they could attribute. We found two predominant emotion choices – sadness or disgust, pride or amusement, and disgust or contempt – for three self-portraits. We found more than two emotion choices for the remaining nine self-portraits, and could not deduce a single predominant emotion for those self-portraits. Nonetheless, the
The majority of the participants agreed on the valence displayed on each self-portrait. It seemed that participants attributed a larger diversity of positive (i.e., joy, pride, pleasure, admiration, contentment, amusement, relief, or surprise) than negative (fear, surprise, anger, or disgust) emotions. When tested in the second run, participants generally evaluated the emotion displayed on the self-portrait with higher intensity than in the first run. Conclusion. Henrion’s self-portraits provide an interesting set of emotion images, in particular considering that several different emotions could be attributed to most images. The results indicated that different participants might interpret emotional information displayed on the self-portraits differently, and therefore attribute a different emotion. These stimuli could be used in various research domains to, for example, test emotion recognition, or encourage a debate about emotions. They open avenues to test an association between colours and emotions by varying the colours of the images.
**Studying Emotions and Colours in Art**

**using Armand Henrion’s Self-Portrait Paintings**

Lucia Camenzind, Domicile Jonauskaite & Christine Mohr

Institute of Psychology, University of Lausanne

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**Introduction**

- Colours are important tools in visual art that may convey emotions.
- Studies demonstrated that brighter and more saturated colours were associated with positive emotions and darker and less saturated colours with negative emotions (Valdez & Mehrabian, 1994).
- To test whether colours might have an impact on which emotions are perceived, we used self-portraits of the Belgian painter Armand Henrion (1875–1958). He depicted himself as well as a face painted in white, each time with a different facial expression and wearing a headscarf of different colours. We obtained 16 high-resolution scans of original Henrion’s self-portraits from the Klevan Collection, located at the Belvedere Museum in Vienna.
- In this first study, we investigated what emotions participants perceived and their intensity on each self-portrait. We also tested whether prolonged exposure to the self-portraits affected emotion choice or its perceived intensity.

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**Methods**

- We showed 16 Henrion’s self-portraits in randomized order to 20 participants (8 males, mean age 25.35 years). Participants chose one of 20 emotions displayed in a circle (positive and negative) (Scherer, 2005).
- They also rated the intensity of the selected emotion on a scale from 1 (low) to 5 (high).
- They were allowed to choose the same emotion for as many self-portraits as they wished. The self-portraits were shown twice: in the first run for a duration of 1s to collect intuitive ratings; in the second run for an unlimited amount of time to collect more elaborate, qualitative descriptions (e.g. in which situation the person might be).

---

**Results**

- Participants most frequently attributed surprise, fear, contempt, disgust, sadness, joy, love, or pride to the self-portraits.
- For four self-portraits, participants agreed on one predominant emotion – contempt, fear, or surprise.
- For the other self-portraits, participants were divided on which emotion they could attribute:
  - We found two predominant emotion choices – sadness or disgust, pride or amusement, and disgust or contempt – for three self-portraits.
  - We found more than two emotion choices for the remaining nine self-portraits and could not deduce a single predominant emotion for these self-portraits. However it seemed that participants attributed a larger diversity of positive (i.e., joy, pride, pleasure, admiration, contentment, amusement, relief, or surprise) than negative (fear, surprise, anger, or disgust) emotions.
- The majority of the participants agreed on the selected valence on both runs (1st and 2nd run).
- When tested in the second run, participants generally evaluated the emotion displayed on the self-portrait with higher intensity than in the first run.

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Copyright The Helmut Klevan Collection, Belvedere Museum, Vienna
Studying Emotions and Colours in Art using Armand Henrion’s Self-Portrait Paintings

Lucia Camenzind, Dominc Jonauskaitė & Christine Mohr
Institute of Psychology, University of Lausanne

Results: 3 representative examples

Quantitative Data

One predominant emotion

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Qualitative Data

- « Surprise and admiration. When you read something like a business book, that you learn something incredible. »
- « An circus, when the clown watches acrobats perform acrobatics. He is suprised. »
- « I show him something precious like a diamante. »
- « If I learn something that surprises me positively. »

- « Intense sadness, when you lose somebody important. That make me think of mourning. »
- « He has an emotional sadness, like pain. When you lose somebody from your family or relative. Of when you ask yourself existential questions and do not know the answer then it’s devastating. »
- « It’s for people who do not like the lemon so much, it’s a disgust. »
- « As if he had eaten something super bitter, for example dried nut skin. »

- « Satisfaction. When you finish a huge delicious meal. »
- « Fun with a little bite of pride. Expression that makes a little not necessary negatively. »
- « Completely satisfied, he makes a nice mischief or joke. Nobody realized that it was him, he is really happy, good contentment. »
- « Proud, contentment. Somebody who did a nasty joke, a little naughtly fool of him. »

Conclusion

- Henrion’s self-portraits provide an interesting set of emotion images, in particular considering that several different emotions could be attributed to most images.
- The results indicate that different participants might interpret emotional information displayed in the self-portraits differently, and therefore attribute a different emotion. These stimuli could be used in various research domains to, for example, test emotion recognition, or encourage a debate about emotions.
- They open avenues to test an association between colours and emotions by varying the colours of the images.

References:

- Copyright Théodore Géricault Collection, Behlerowsky Museum, 2000.
Challenges in empirical testing of affective associations with colour.

Domicle Jonauskaite, Nele Dael, Jean-Philippe Antonietti, and Christine Mohr

Institute of Psychology, University of Lausanne

ABSTRACT
While there is a considerable public interest in colour psychology (e.g., how to choose the “best” colour for one’s apartment walls or clothing), colour is a challenging domain to study empirically. Colour is a physical, a perceptual, and a linguistic stimulus. One can see a colour or think about a colour, and there are associated difficulties with testing each type of colour conceptualisation (e.g., monitor calibrations, precise colour presentation, nuances of linguistic metaphors, differences in colour naming). In addition, one can study various aspects of affective associations with colour – colour preferences, colour and emotion links when emotions are displayed on one’s face, body, embedded in music or emotional words, or directly experienced. Based on the available literature, we can conclude that the affective associations with colour vary, and might so depending on the different affect assessment and colour presentation techniques. Before having explored such potential systematic variations, we cannot directly compare results from one type of studies with the results from another type of studies. We argue that we first need to systematically test colour and affect relationships using the different methodologies, and to do so on a cross-cultural level. Such results provide baseline data with which theory-based results can be compared. Moreover, such baseline data allow us to test the interplay between colour and affect in real world applied settings. From our colour psychological perspective, we feel that this research is still in its infancy, in particular when we would like to know whether colour and affect interact such as in potential clinical interventions (“colour therapy”) or consumer advice settings. In this talk, I will present some of our projects in which we aim to help filling gaps and also provide some first baseline data.
Challenges in empirical testing of affective associations with colour

Domicile Jonasukate, Nele Dael & Christine Mohr
Institute of Psychology, University of Lausanne, Switzerland

EMOTION ASSESSMENT METHODS

Emotion associations with colour can be assessed in many different ways which may or may not lead to different conclusions.

For example, participants can be asked to find the “best” colour in an unrestricted sample of colours (right) to match an emotion presented as a concept (A), bodily expression (B), or experimentally induced affective state (C).

Emotion Concepts  Bodily expressions  Induced mood

Experimentally-induced mood via music and mental imagery (Mayer et al., 1995). Data from Jonasukate et al. (submitted)

JOY
FEAR
RELAXATION
SADNESS

Joy is associated with yellow and other warm hues while fear and sadness are associated with achromatic and bluish hues when matched to emotion concepts and induced mood.

Relaxation, however, is associated to green-blue hues more often when it is conceptual rather than experienced.

Colours matched to bodily expressions are more different from other emotion assessment methods (lightness and saturation are more important than hue).

Interdisciplinary Colour Association Belgium Colour Day Symposium, Brussels, 2018

bomicile.jonasukate@unil.ch
ColourExperience.ch

BELGIUM INTERDISCIPLINARY COLOUR DAY 2018 | BOOK OF PAPERS | p. 44
Challenges in empirical testing of affective associations with colour

Domicile Jonasuakite, Nola Dael & Christine Mohr
Institute of Psychology, University of Lausanne, Switzerland

BELGIUM INTERDISCIPLINARY COLOUR DAY 2018 | BOOK OF PAPERS | p. 45

Vinciane Lacroix

"Chromatic-tour" is a new evolving website dedicated to colours. Designed as a compendium of knowledge on colours, it is made of a knowledge map: nodes represent colour entries spatially arranged on the proximity of concepts. The user is invited to visit the field of colours as if he were a traveller exploring various aspects of a country. Thanks to this metaphor common to backpackers and to travel lovers, specific paths in the knowledge domain can be taken according to the visitor’s tastes and actual knowledge. The poster illustrates the concept and suggests a collaborative work in order to propose different subjective guided tours over the colour domain.
Chromatic-tour — a Colour Guide

A collective project gathering knowledge related to the domain of Colour, represented as a map

Vinciane Lacroix
www.chromatic-tour.net
www.vincianelacroix.net

Overview
The Chromatic-tour project aims at presenting colour knowledge, activities, workshops, etc., on a fictional map based on a Colour Mind Map.

Added Value
- the map metaphor is playful, convenient
- viewing tools exist (i.e. framecarte [3])
- existing map can serve as «Memory Palace»
- various layers can be added, even commercial ones
- a common basis for Colour Experts (ICA)

Content
The map is built upon several layers:
- Layer 0: a Colour Mind Map[1] which is a hierarchical representation of the colour domains and subdomains
- Layer 1: an existing (i.e., Paris) or a fictive map, as «Memory Palace» [2]
- Layer 2: a 2D representation of the Mind Map, available at several scales respecting the conceptual distance between domains and sub-domains (polygons)
- Layer 3: tours (lines) involving specific subjects (points) of the subdomains

A First Colour Mind Map

How to contribute?
As an expert in Colour:
- join the chromatic-tour network team
- work on the Colour Mind Map (Layer 0):
  - suggest Colour domains and Sub-domains
  - work on scale / hierarchy of Sub-domains
- work on the Colour Map (Layer 2)
- suggest your own tours (Layer 3)

References
[1] https://everypedia.org/wiki/Mind_map/
[3] https://framecarte.co.uk/
Semantic Colour Space.

Inez Michiels*, Ferre Alpaerts

* CITY OF 8 vzw, design semantics non profit research association.
info@cityof8.com

See ORAL PAPERS: Design semantic pathways. Colours connecting meaning, emotion and psychology to visual language.
Design Semantic Pathways
Colours connecting meaning, emotion and psychology to visual language

Dimensional synaesthetics

DEPTH PARAMETERS

COLOUR
PERSONALITY  PHYSIO  PALETTE

SHAPE

TEXTURE  STRUCTURE

SIZE

EMOTION

CHARACTER

TEMPERAMENT

HEIGHT PARAMETERS

COLOUR
PSYCHOLOGY  PHYSIO  PALETTE

SHAPE

TEXTURE  STRUCTURE

SIZE

EMOTION

CHARACTER

TEMPERAMENT

BREADTH PARAMETERS

COLOUR
PSYCHOLOGY  PHYSIO  PALETTE

SHAPE

TEXTURE  STRUCTURE

SIZE

EMOTION

CHARACTER

TEMPERAMENT
SUPPORT

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Without financial support we are not able to organize events such as this colour day symposium.

Besides contributing to a dynamic colour platform you will benefit from membership in many other ways:
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+ Increase your chances of attention to your work
+ Get opportunities for new engaging colour assignments and cooperation
+ Discount for events
  www.ica-belgium.org/members/

+ SPONSOR

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+ VOLUNTEER

Do you want to contribute with your skills, organise a workshop, walk or other wonderful intervention? Let us know.

Feel free to contact us:

SUPPORT CONTACT INFO
icabelg@gmail.com
Jeannette Hanenburg
+32 (0)495 132 146