

'My colourful lexicon'

Synesthesia and the production of metaphors or 'Is reading synesthetic?'

A theoretical concept for the analysis of synesthetic phenomena and case studies concerning the question of artificial literacy and synesthesia in communication media.

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This article is a comparative study concerning similarities and differences of artificial phenomena in literature, which can be conferred with synesthetical phenomena in terms of their semiotic contents. The basic difference between synesthetical phenomena and the phenomena in artificial texts here described is that these phenomena are parts of artificial products. In that concern they are neither 'ad-hoc'-impressions nor follow a strict cultural codex. We will see different examples of these phenomena. This article provides qualitative information on the types of quasi-synesthetic phenomena we can find in the arts.¹ It observes how the principles of artificial esthetics govern a great amount of iconicity that occurs also within a synesthetical phenomenon. This article describes after a historical introduction synesthesia and its forms in literature comparatively next to literary forms. The question discussed is whether synesthesia is a phenomenon, which is realized in an artificial language or if an artificial language uses to imitate synesthetic effects.² Therefore we discuss the close similarities and differences of rhetorical figures and expressions of synesthetical effects and make a model for showing up the theoretical approach for the description of synesthetic phenomena to discuss the relation between descriptions in art and pathological synesthesia. Finally we discuss how a basic human skill, reading, contains criteria that qualify this skill as a synesthetic phenomenon.

I. Introduction: Esthetics and synesthesia and their historical sources

In the traditional theories of arts up to the 19th century esthetics (Gr. *aísthesis* 'perception') became frequently equated with the theory of the beautiful. Modern philosophers define esthetics as the theory and philosophy of sensual perception in art, design, philosophy and science. Therefore not the terms decide about the 'beautiful' and 'ugly', but the way of the sensuality in connection with the plotting system of the object on the esthetic value of an object. In the traditional view of art until the 19th century esthetics is an equivalent to the theory of the beautiful. For Plato the beautiful

¹ Cf. for the cross-cultural effects of synesthesia:

Osgood, Charles E. "The Cross-cultural Generality of Visual-Verbal Synesthetic Tendencies." *Behavioral Science*. Vol. 5. 1959. Pp. 146-169.

Osgood, Charles E., William H. May, and Murray S. Miron. *Cross-cultural Universals of Affective Meaning*. Urbana and London: U of Illinois P. 1975.

² Smith, Henry Lee. "Synesthesia." *Johns Hopkins Hospital Bulletin*. Vol. 16, number 172. July. 1905. Pp. 258-263.

is the natural-beautiful, in which the idea of the beauty comes to the expression. Art is only mimesis (imitation of the reality). Aristotle revalues the art. At the beginning of the modern times in the Renaissance and in German idealism one later regarded the work of art than ideal and the artist as a 'genius'.³ This background in science is important for the understanding of categories of the beautiful following an ideal conception.

An esthetical idea according to Platonic traditions cannot become a recognized phenomenon; it is an abstract concept that stands next to the real phenomena. The genius may also be defined as the faculty of esthetical ideas. In other words: Sensations do not enable us to adopt an esthetical realism. Taste is a critical faculty that judges by comparison between ideas and impressions of the senses. The etymology of the term 'esthetics' derives from the Greek *aisthesis* ('sensation'). In the Western tradition the term has come to designate not the whole domain of the sensible. The noun 'esthetics' places the term in the context of cultural processes. The noun 'esthetics' provides the only meaning that can be useful in all societies: a definition which encompasses all of the factors which govern an audience's perception of and appreciation for an art object. Esthetics as a noun is a usage that refers to the cultural canons of a people. The German philosopher Alexander Baumgarten (1714 and 1762) first used the term esthetics to convey physical 'beauty'. Today we can distinguish between the idealistic theoretical approach and the empiric approach to esthetic phenomena.

Historically synesthesia was described for the first time at the end of the 19th century.⁴ At the end of the 19th century the term 'audition colorée' was used to describe synesthesia between the sense of hearing and visuality.⁵ We have to look at the

³ Cf. as physiological studies in synesthesia:

Maurer, Daphne. "Neonatal synaesthesia: implications for the processing of speech and faces." S. Baron-Cohen and J. Harrison (eds.). *Synaesthesia: Classic and Contemporary Readings*; Oxford, England: Blackwell. 1997. Pp. 224-242.

Frith, C. D., and E. Paulesu. "The physiological basis of synaesthesia." In: S. Baron-Cohen and J. Harrison (Eds.); *Synaesthesia: Classic and Contemporary Readings*; Oxford 1997. Pp. 123-147.

Grossenbacher, Peter G., and Christopher T. Lovelace. "Mechanisms of synesthesia: cognitive and physiological constraints." *Trends in Cognitive Sciences*. Vol. 5:1. 2001. Pp. 36-41.

Gruber, Edouard. "Questionnaire Psychologique sur l'Audition Colorée, Figurée et Illuminée." *Revue Philosophique*. Vol. 35. 1893. Pp. 499-502.

Howes, David (ed.): *The Varieties of Sensory Experience: A Sourcebook in the Anthropology of the Senses*. Toronto, Buffalo, and London: U of Toronto P. 1991.

Hubbard, Timothy L. "Synesthesia-like mappings of lightness, pitch, and melodic interval." *American Journal of Psychology*. Vol. 109. 1996. Pp. 219-238.

Ione, Amy, and Christopher Tyler. "Synesthesia: Is F-sharp colored violet?" *Journal of the History of the Neurosciences*. Vol. 13.1. 2004. Pp. 58-65.

⁴ Cf. for the cross-cultural effects of synesthesia:

Osgood, Charles E. "The Cross-cultural Generality of Visual-Verbal Synesthetic Tendencies." *Behavioral Science*. Vol. 5. 1959. Pp. 146-169.

Osgood, Charles E., William H. May, and Murray S. Miron. *Cross-cultural Universals of Affective Meaning*. Urbana and London: U of Illinois P. 1975.

⁵ Some of the first articles published are:

Beaunis, H. and A. Binet. "Sur deux cas d'audition colorée." *Revue Philosophique*. Vol. 33. 1892. Pp. 448-461.

Binet, A., and J. Philippe. "Étude sur un nouveau cas d'audition colorée." *Revue Philosophique*. Vol. 33. 1892. Pp. 461-464.

Bishop, Bainbridge. *A Souvenir of the Color Organ, with some Suggestions in Regard to the Soul of the Rainbow and the Harmony of Light*. New Russia, New York 1893.

<http://www.rhythmiclight.com/archives/index.html>

different from how synesthesia is realized. In general, there is a phenomenon synesthesia, which is physiologically an empiric reception and connection of one sense with another. The effect that synesthesia finds a way of documentation is based upon a medium. The most common medium used by synesthetically affected persons is writing or oral speech. We will use samples as case studies taken from personal descriptions of persons with synesthesia, poetic literature describing synesthesia and a sample for an artist producing synesthetical art and a piece of literature, which contains synesthetical descriptions.⁶

The modern neologistic term 'synesthesia' originates from the Greek 'syn' (together) and 'aisthesis' (perception). Synesthesia is an ability of reception where senses are joined. Numbers, letters, and words are realized e.g. in colors. Synesthesia is the phenomenon in which the stimulation of one sense modality gives rise to a sensation in another sense modality. The most prevalent form of synesthesia is 'hearing' music or vowels in color. This is a rather peculiar condition in which the senses get cross-wired. Stimulation of one sense, it seems, causes an inappropriate stimulation of another. According to common models perceptions are represented not in individual nerve cells, but as specific samples on the cerebral cortex. Synesthetical experiencing comes off by a special cross-linking of different brain ranges.

Sight - Hearing - Smell -Taste -Touch. The five traditional senses according to Aristotle

It was since Aristotle observed that the number of the human senses is five. The mixture of sensitivities within a given patch of skin provides a ready basis for the concept of adequate stimulation. The ancient philosopher Aristotle distinguished these five senses as sight, hearing, smell, taste, and touch. Perception is not possible without an entity that acts on the sense organs and the organs themselves. This means that perception is not 'objective' in the sense commonly used, which is outside of the observer. Perception needs an observer. This is because the difference between observers is not reality itself, but the nature of their sense organs; therefore the perception itself is relative to the observer. The sense organs are fundamentally automatic in working, but our evaluation is not, and depends on our knowledge of perception.

Perception - Evaluation - Emotion - Thought - Reminiscence - Imagination.
Concepts of consciousness

The normal ability to think or reason is called in Latin 'sentire'. Latin 'sensus' is a derivarate from 'sentire', to perceive, to feel, from the same root as Old German 'sinnen' with the meaning 'to meditate, to think'. Sensation is an impression, or the consciousness of an impression made upon the central nervous organ, through the medium of a sensory or nerve or one of the organs of sense a feeling, or state of consciousness, whether agreeable or disagreeable, produced either by an external object (*stimulus*), or by some change in the internal state of the body. Perception is only a special kind of knowledge, and sensation a special kind of feeling. Knowledge and feeling, perception and sensation, though always coexistent, are always in the inverse ratio of each other.

A sensation is formed based on the sensory input. Each receptor is more sensitive to a specific kind of environmental change but is less sensitive to others. Five

Bos, Maria C. "Über echte und unechte audition coloreé." Zeitschrift für Psychologie. Vol. 111. 1929. Pp. 321- 401.

⁶ Early works are: Day, Sean A.: "Types of Synesthesia"

<http://www.users.muohio.edu/daysa/synesthesia.html>.

Synaesthesia: Classic and Contemporary Readings; Cambridge, MA: Blackwell. Reprinted from Psychological Bulletin. Vol. 82 (3). 303-331. Pp. 49-98.

general types of receptors are recognized. Receptors sensitive to changes in chemical concentration are called chemoreceptors. Sensations are feelings that occur when the brain interprets sensory impulses. Somatic senses have receptors associated with the skin, muscles, joints, and viscera make up the somatic senses. Taste buds are the organs of taste and are located within papillae of the tongue and are scattered throughout the mouth and pharynx. Within taste receptors taste cells are modified epithelial cells that function as receptors. Taste cells contain the taste hairs that are the portions sensitive to taste.

Philosophical concepts interpret among other things the so-called 'aesthetics of the ugly' as a higher form of beauty. Traditional esthetics assumes that universal and timeless criteria for the evaluation of taste of works of art exist. The metaphysical esthetics of the German idealisms was criticized as ordered esthetics. From this critical basic attitude two currents developed: the psychological esthetics and the art science. All cognitive achievements possess an esthetic potential. In addition the realization esthetics assumes there are different levels of esthetic experiencing, so that in this way also the esthetics of the ugly one can be explained.⁷

II. Case studies of synesthesia

In the following case studies we will see how synesthesia is expressed and described literally.

1. Description of types of synesthesia

One letter of a synesthetical person was publicized online with a description of synesthesia. This letter contains the description of days as colours. In literary terms, this is a quasi-metaphoric construction, when the author describes a day as a 'beautiful orange':

*Today is a beautiful orange Ever since I was a kid, numbers and days of the week have had colours. One is dark blue, two is silver gray, three is orange, four is chestnut brown, five is yellow, six is white, seven is green, eight is dark brown, nine is light tan. Double numbers don't register. Monday is dark blue, Tuesday is silver gray, Wednesday is orange, Thursday is dark brown, Friday is green, Saturday is red, and Sunday is yellow. Today is a beautiful orange day on the river even though it's only Tuesday. Does anyone out there see music as colour? My choir is singing Carmina Burana next weekend. I'd love to know what colour that is!*⁸

⁷ Ramachandran, Vilayanur S. and Hubbard, Edward M.: "Synaesthesia. A window into perception, thought and language." *Journal of Consciousness Studies*. Vol. 8 (12). 2001b. Pp. 3-34.

Day, Sean A. "Synaesthesia and Synaesthetic Metaphors." *Psyche*. Volume 2. Number 32; July 1996.

<http://psyche.cs.monash.edu.au:80/v2/psyche-2-32-day.html>

Downey, June E. "Literary Synaesthesia." *Journal of Philosophy, Psychology, etc.* Vol. 9. 1912. Pp. 490-498.

Marks, Lawrence E. "Synaesthesia: Perception and Metaphor." In Burwick & Pape (eds.); *Aesthetic Illusion*; Berlin 1990. Pp. 28-40.

Osgood, Charles E. "The cognitive dynamics of synesthesia and metaphor." In Honeck and Hoffman, (eds.); *Cognition and Figurative Language*; Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers. 1980. Pp. 203-238.

⁸ Cf.: Liz Schamehorn, Washago, Ontario, Canada.

<http://www.painterskeys.com/clickbacks/synesthesia.htm>.

Since these are individual connotations of phenomena we describe them as pseudo-metaphoric of an individual ideolectic status. *A Day in the Life* contains a description of synesthesia; synesthesia here is based upon memories, which arose from the sense of smelling certain things and its connotations to certain situations:

My memories never really make sense to me. I don't always remember the important stuff, but I have very vivid memories of the things that seemed important to me at the time. Maybe the things I remember reflect my two- and three-year-old consciousness. And maybe it's the vividness and the colors of my memories that attaches them so concretely to my senses. Whatever the method, they're often indelibly bound. When I taste grass, I immediately remember lying next to my dad in the grass, sharing a special moment. He and I were very close at that time in my life, so I have a fondness for grass as a concept. And when I think of certain people -- my great-grandmother, for instance, I can remember the smell of her -- the distinct odor of her house. She had a bright pink, flowery blanket that she'd fold in two on the floor as a pallet for me to lie on, and the polyester surface of it was cool and smooth on my skin, and the smell would fill my nose. My mom still has the blanket, although it doesn't smell like my G'ma so much anymore. I can still create the scent in my head, though -- as vivid as if I were at my house when it was still her house. It's very easy for me to associate sounds and words and music with vivid visual memories, too.⁹

In this example we find connotations of personal memory with visual experience. One form, in which synesthesia is expressed is the quasi-metaphoric form.¹⁰ The personal description given in the following samples contains a poetic form, in which metaphors are used to express the meaning of synesthesia. Giovanni Malito describes with metaphors such as 'the scent of the moon' in *Synesthetics* the phenomenon synesthesia itself:

Giovanni Malito

from *Synesthetics*

(i)
to locate
the scent
of the moon
is the reason
you look up
at night

(ii)
you taste
sunshine
your tongue
tingles
with nothing

⁹ Cf.: <http://www.waterlilies.org/weblog/archives/2002/07/synesthesia.html>.

¹⁰ Vanechkina, Irina Leonidovna. "On K. Saragev's "Colour Hearing". *Leonardo*. Vol. 34. Number 4. August 2001. Pp. 355-356.

Galeev, Bulat Makhmudovich. "Was Scriabin a Synesthete? " *Leonardo*. Vol. 34. Number 4. August 2001. Pp. 357-361.

it must say

*(iii)
hypersensitive
touching air
hand opened
is then closed
squeezing atoms
and molecules
you touch origins
of everything ¹¹*

2. Description of one sense by another one: Painting and music

We now look at the case, where synesthetic phenomena are put into artificial media and one sense is describing another exemplified by the modern artist Wladimir Kandinski. Colour has an emotional, physiological and symbolic effect.¹² By the mid-19th century synesthesia had intrigued an art movement that sought sensory fusion. The union of the senses appears in many forms of art; Germans use therefore the term 'Gesamkunstwerk'. The traditional esthetic philosophy assumes universal and timeless criteria for the taste evaluation of works of art exist. The metaphysic esthetics of the German idealisms was criticized as an ordered esthetics. From this critical basic attitude as two current branches psychological esthetics and the science of art developed. This view is outdated by the modern brain research, which showed that this confrontation is wrong and is not conceivable rational realization without a sensual emotional process. The physician Gustav Theodor Fechner differentiated in the 19th century between 'higher esthetics' and 'lower esthetics'. The 'higher esthetics' is the 'beautiful-mental' esthetics of the traditional philosophy and literature science, which regards esthetics almost exclusively in connection with art. In addition also the information esthetics played a role in the second half of the 20th century. Therefore all cognitive achievements possess an esthetic potential. In addition the realization esthetics assumes there are different levels of esthetic experiencing, so that in this way also the esthetics of the ugly one can be explained. Walter Benjamins calls esthetics the concept of hedonism.

In his early years the painter Kandinsky discovered his synesthesia while attending a performance of Wagner's opera *Lohengrin* in Moscow. Kandinsky started exploring synesthetic experiences as a member of the *Blaue Reiter* group. To evoke emotions and sensations in the beholders and listeners of their art, the group explored the emotional and perceptual dynamics of simultaneous presentations of colour, sound and dance. Kandinsky's main experiments with cross-modal sensations concerned the multi-sensory perception of movement. Kandinsky assumed that one can feel the multi-sensory consonances and dissonances in simultaneously performed colour movements, musical movements and dance movements. Kandinsky's explorations of the consonance and dissonance of simultaneous auditory and visual stimuli offers alternatives for 'Gestalt'-experiments to the current experiments with elementary stimuli. Kandinsky viewed the Compositions as major statements of his artistic ideas. They share several characteristics that express this monumentality: the impressively large format, the conscious, deliberate planning of the composition, and the

¹¹ Cf.: <http://www.poetrymagazines.org.uk/magazine/record.asp?id=6818>

¹² Motluk, Alison. "The Sweet Smell of Purple." *New Scientist*; 13 August. 1994. Pp. 32-37.
Cytowic, R. E.: *The Man Who Tasted Shapes*. Cambridge, MA: The MIT Press 1998.

transcendence of representation by increasingly abstract imagery.¹³ The first three *Compositions* were destroyed during World War II. *Composition IV* (1911, 639 x 404) is divided abruptly in the center by two thick, black vertical lines. On the left, a violent motion is expressed through the profusion of sharp, jagged and entangled lines. On the right all is quite with sweeping forms and color harmonies.



Kandinsky. Composition IV. 1911

Composition VI (1913, 640 x 421) was made two years later. The theme of this work is *The Deluge*. Kandinsky defined three centers to this *Composition*, which are discerned sequentially by the viewer. Initially, the eye is drawn to the pink and white vortex in the left center.



Kandinsky. Composition VI. 1913

In these pictures Kandinski found a way to express abstract qualities not following the traditional mimetic concept of art. To express the synesthetical effects within a theory, Kandinsky used metaphoric concepts consisting of the metaphoric concept of 'spirituality', 'geometry' and 'emotionality'. Kandinsky wrote that the artists had an 'inner necessity' to express the 'inner essence of things'. The main focus of his exploration of color was how it could be employed as an expression of the spiritual. Kandinsky wrote that colors evokes emotions. Along with other formal elements like lines, shapes, and forms, color is a language that communicates to all. An attempt to make yellow colder produces a green tint and checks both the horizontal and excentric movement. Kandinsky's esthetic is rooted in symbolic principles he describes in the following chapters of *Concerning the Spiritual in Art*:

Part I. About general aesthetic

¹³ For the historical background cf.: Ione, Amy, and Christopher Tyler. "Was Kandinsky a synesthete?" *Journal of the History of the Neurosciences*. Vol. 12.2. 2003. Pp. 223-226.

- I. Introduction
- II. The movement of the triangle
- III. Spiritual revolution
- IV. The pyramid

Part II. About painting

- V. The psychological working of colour
- VI. The language of form and colour
- VII. Theory
- VIII. Art and artists
- IX. Conclusion

Part 1 *About general aesthetic* in the *introduction* describes the origin of art in metaphors:

*Every work of art is the child of its age and, in many cases, the mother of our emotions. It follows that each period of culture produces an art of its own which can never be repeated. Shapeless emotions such as fear, joy, grief, etc., which belonged to this time of effort, will no longer greatly attract the artist. He will endeavour to awake subtler emotions, as yet unnamed.*¹⁴

In *The movement of the triangle* Kandinsky speaks about a 'life of the spirits':

*The life of the spirit may be fairly represented in diagram as a large acute-angled triangle divided horizontally into unequal parts with the narrowest segment uppermost. The lower the segment the greater it is in breadth, depth, and area.*¹⁵

Color effects were considered hierarchical depending on the 'level of spiritual development' of an individual. Kandinsky's theory of synesthesia posited that in synesthetes sensory impressions were immediately communicated to the soul. In *Spiritual revolution* Kandinsky writes:

*The spiritual triangle moves slowly onwards and upwards. Today one of the largest of the lower segments has reached the point of using the first battle cry of the materialist creed. Spiritual darkness, the insecurity of ignorance and fear pervade the world in which they move. Maeterlinck is perhaps one of the first prophets, one of the first artistic reformers and seems to herald the end of the decadence just described.*¹⁶

In *The Pyramid* the difference between the arts music and painting is described:

In manipulation of form music can achieve results, which are beyond the reach of painting. On the other hand, painting is ahead of music in several particulars. Music, for example, has at its disposal duration of time; while

¹⁴ Cf.: Kandinsky, Wassily: Concerning the Spiritual in Art. Translated by Michael T. H. Sadler. [Http://www.gutenberg.org/etext/5321](http://www.gutenberg.org/etext/5321)

¹⁵ Cf.: Kandinsky, Wassily: Concerning the Spiritual in Art. Translated by Michael T. H. Sadler. [Http://www.gutenberg.org/etext/5321](http://www.gutenberg.org/etext/5321)

¹⁶ Cf.: Kandinsky, Wassily: Concerning the Spiritual in Art. Translated by Michael T. H. Sadler. [Http://www.gutenberg.org/etext/5321](http://www.gutenberg.org/etext/5321)

*painting can present to the spectator the whole content of its message at one moment. Music, which is outwardly unfettered by nature, needs no definite form for its expression.*¹⁷

In part II *About painting* in V. *The psychological working of colour* the connotation of 'color' and 'things' having this color is described:

Whether the psychic effect of colour is a direct one, as these last few lines imply, or whether it is the outcome of association, is perhaps open to question. The soul being one with the body, the former may well experience a psychic shock, caused by association acting on the latter. For example, red may cause a sensation analogous to that caused by flame, because red is the colour of flame. A warm red will prove exciting, another shade of red will cause pain or disgust through association with running blood. In these cases colour awakens a corresponding physical sensation, which undoubtedly works upon the soul.

No more sufficient, in the psychic sphere, is the theory of association. Generally speaking, colour is a power, which directly influences the soul. Colour is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand, which plays, touching one key or another, to cause vibrations in the soul.

*IT IS EVIDENT THEREFORE THAT COLOUR HARMONY MUST REST ONLY ON A CORRESPONDING VIBRATION IN THE HUMAN SOUL; AND THIS IS ONE OF THE GUIDING PRINCIPLES OF THE INNER NEED.*¹⁸

In VI. *The language of form and colour* the 'weapons' of color are described:

Painting has two weapons at her disposal:

1. *Colour.*
2. *Form.*

Form can stand alone as representing an object (either real or otherwise) or as a purely abstract limit to a space or a surface. This essential connection between colour and form brings us to the question of the influences of form on colour. Form alone, even though totally abstract and geometrical, has a power of inner suggestion. A triangle (without the accessory consideration of its being acute-or obtuse-angled or equilateral) has a spiritual value of its own. In connection with other forms, this value may be somewhat modified, but remains in quality the same.

The more abstract is form, the more clear and direct is its appeal. In any composition the material side may be more or less omitted in proportion as the forms used are more or less material, and for them substituted pure abstractions, or largely dematerialized objects.

Two great divisions of colour occur to the mind at the outset: into warm and

¹⁷ Cf.: Kandinsky, Wassily: Concerning the Spiritual in Art. Translated by Michael T. H. Sadler. [Http://www.gutenberg.org/etext/5321](http://www.gutenberg.org/etext/5321)

¹⁸ Cf.: Kandinsky, Wassily: Concerning the Spiritual in Art. Translated by Michael T. H. Sadler. [Http://www.gutenberg.org/etext/5321](http://www.gutenberg.org/etext/5321)

cold, and into light and dark. To each colour there are therefore four shades of appeal--warm and light or warm and dark, or cold and light or cold and dark.

Generally speaking, warmth or cold in a colour means an approach respectively to yellow or to blue. This distinction is, so to speak, on one basis, the colour having a constant fundamental appeal, but assuming either a more material or more non-material quality. The movement is an horizontal one, the warm colours approaching the spectator, the cold ones retreating from him.

The colours, which cause in another colour this horizontal movement, while they are themselves affected by it, have another movement of their own, which acts with a violent separative force. This is, therefore, the first antithesis in the inner appeal, and the inclination of the colour to yellow or to blue, is of tremendous importance.

The second antithesis is between white and black; i.e., the inclination to light or dark caused by the pair of colours just mentioned. These colours have once more their peculiar movement to and from the spectator, but in a more rigid form.

Cool red (madder) like any other fundamentally cold colour, can be deepened - especially by an intermixture of azure.¹⁹

Kandinsky used for his theory a model conception; for him colour is related to the human soul; an example of this construction are the expressions 'keyboard' for colour, 'hammer' for eye, 'piano' for the soul in part II of *Concerning the Spiritual in Art*. We will now look what makes colours 'speak'. Kandinsky used colors as indicators of other qualities like yellow for warm and blue for cold. The traditional color concepts show some similar basic distinctions between colors and introduce to some basic features of each color. If we look at the color theories, most common is the color wheel or color circle based on red, yellow and blue as basic colors. These are the three pigment colors that cannot be mixed or formed by any combination of other colors. All other colors are derived from these three hues. Green, orange and purple are the colors formed by mixing the primary colors. The meanings of colours have a certain stability. Isaac Newton developed the first circular diagram of colors in 1666. Since then scientists and artists have studied and designed numerous variations of this concept. In general, it is derived from the prismatic arrangement also visible in the rainbow. The primary colors Itten called red, yellow and blue. The secondary colors of mixing two primary colors are orange, green and violet. The tertiary colors exist from mixing a primary and a secondary color. They are yellow-orange, red-orange, red-violet, blue-violet, blue-green and yellow-green.

The use of colors in a metaphoric way –just like Kandinsky did - can base upon a tertium comparationis-description: So the color stands for an attribute it has in common with an object of this color. So the message of this color can be understood. In this way synesthesia follows some artificial rules and is artificial. In other cases the synesthetical effects are based upon a personal connotation system; the connotation of days of the week and colors is a personal one not depending on general cultural or social concepts, but on personal memory and connotation by an individual. Artificial effects of synesthesia are based upon 'cultural memory' more comprehensive in quality than an individual. The Latin word 'forma' derivatives in many languages in Europe and

¹⁹ Cf.: Kandinsky, Wassily: *Concerning the Spiritual in Art*. Translated by Michael T. H. Sadler. <http://www.gutenberg.org/etext/5321>

stands for visible forms and conceptual forms. Color is always related to a form. Form is the equivalent to the disposition, arrangement or order of parts, which can have 'color' as an attribute. If we lack at the connotations colors have, we find that opposite or not harmonizing values are connotated with them. The connotations of colors with certain values brought some 'commo effects', which make it easy for us to make a distinction between general esthetic common connotations and personal synesthetic effects. The basic colors are yellow, red and blue. They have as attributes certain meanings, which mostly relay to 'natural' phenomena of this color.

Yellow

Yellow stimulates the nervous system as well as the mind. Yellow makes objects seem closer and larger. Its opposite colour is violet. Yellow is associated with joy, happiness, intellect, and energy. Yellow produces a warming effect, arouses cheerfulness, stimulates mental activity, and generates muscle energy. In heraldry, yellow indicates honour and loyalty.

Red

Red stimulates the mind and nervous system. Bright red can be an irritant if used over large areas. Red is the colour of fire and blood and associated with energy, war, danger, strength, power, determination as well as passion, desire, and love. Red is a very emotionally intense colour. Red is widely used to indicate danger. Light red represents joy, sexuality, passion, sensitivity, and love. Pink signifies romance, love, and friendship. It denotes feminine qualities and passiveness. Dark red is associated with vigour, willpower, rage, anger, leadership, courage, longing, malice, and wrath.

Blue

Blue has a calming effect. Blue does not require the eye to focus. It is often associated with depth and stability. It symbolizes trust, loyalty, wisdom, confidence, intelligence, faith, truth, and heaven. Blue is considered beneficial to the mind and body. It slows human metabolism and produces a calming effect. Blue is strongly associated with tranquillity and calmness. In heraldry, blue is used to symbolize piety and sincerity. Dark blue is associated with depth, expertise, and stability. Dark blue represents knowledge, power, integrity, and seriousness.

Orange

Orange stimulates the mind. Orange stimulates the appetite. Orange requires the eye to focus, therefore objects seem closer and larger. Orange conveys warmth and assurance. Its opposite colour is blue. Orange combines the energy of red and the happiness of yellow. Orange represents enthusiasm, fascination, happiness, creativity, determination, attraction, success, encouragement, and stimulation. Orange increases oxygen supply to the brain, produces an invigorating effect, and stimulates mental activity. Orange is the colour of fall and harvest. In heraldry, orange is symbolic of strength and endurance.

Green

Green creates a feeling of freshness. Its opposite colour is red. Green is the colour of nature. It symbolizes growth, harmony, freshness, and fertility. Green has strong emotional correspondence with safety. Dark green is also commonly associated with money. It is the most restful colour for the human eye; it can improve vision. Green suggests stability and endurance. In heraldry, green indicates growth and hope.

Violet

Violet does not require the eye to focus; therefore objects and walls seem farther away.

Purple

Purple combines the stability of blue and the energy of red. Purple is associated with royalty. It symbolizes power, nobility, luxury, and ambition. It conveys wealth and extravagance. Purple is associated with wisdom, dignity, independence, creativity, mystery, and magic.

Brown

Brown in more earthy tones creates intimacy. Evokes a sense of tranquillity, but can make a room seem too subdued if used widely without texture or another colour to enliven it. Beiges and tans are more sophisticated tones. Brown suggests stability and denotes masculine qualities. Reddish-brown is associated with harvest and fall.

Gold

Gold evokes the feeling of prestige. The meaning of gold is illumination, wisdom, and wealth. Gold often symbolizes high quality.

White

White is associated with light, goodness, innocence, purity, and virginity. It is considered to be the colour of perfection. White means safety, purity, and cleanliness. As opposed to black, white usually has a positive connotation. White can represent a successful beginning. In heraldry, white depicts faith and purity.

Black

Black is associated with power, elegance, formality, death, evil, and mystery. Black is a mysterious colour associated with fear and the unknown. It usually has a negative connotation. Black denotes strength and authority; it is considered to be a very formal, elegant, and prestigious colour. In heraldry, black is the symbol of grief.²⁰

White	Birth, purity, cleanness
Black	Mourning, death, earth, seriousness, grief
Red	Fight, love, passion
Orange	Warmth, wealth, enthusiasm, creativity, happiness
Yellow	Warmth, happiness, cowardice, betrayal, hatred, joy, intellect, energy
Green	Spring, youth, freshness
Blue	Sincerity, loyalty, melancholy
Violet	Seriousness, dignity
Purple	Power, high-ranked priest, dignity
Pink	Happiness, tenderness, love
Gold	Super-terrestrial, richness, royal power
Silver	Strong confidence

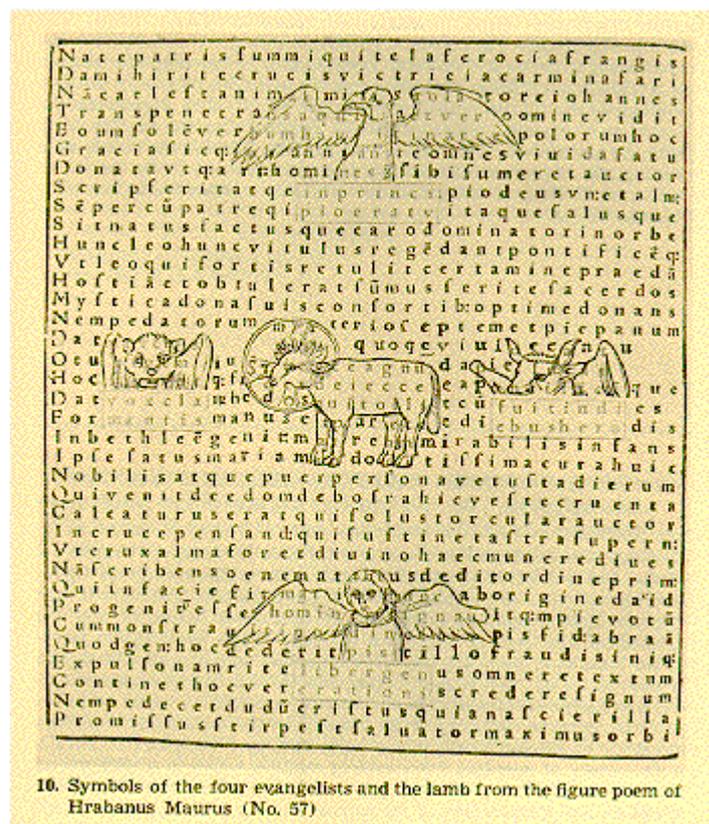
Colour psychology in Europe

²⁰ Kay, Paul. "Synchronic variability and diachronic change in basic color terms." *Language in Society*. Vol. 4. 1975. Pp. 257-270.

Kay, Paul, and Regiel, Terry: "Resolving the question of color naming universals." *Proceedings of the National Academy of Sciences*. Vol. 100 (15); 22 July. 2003. Pp. 9085-9089.

3. Interference of language and picture

Now we discuss synesthetic effects of literature using examples from the Middle Ages. Rhabanus Maurus, abbot of the monastery in Fulda in the 9th century, devised 'visual poetry' around 810 on the subject of the redeeming Holy Cross. The visual poems, which also features illustrations, have been composed from woodcut and type with exquisite craftsmanship. The text continuous in the illustration. The letters printed in red may also be read separately in a different sense. The figures, corresponding with preserved manuscripts, largely consist of carefully inserted xylographic parts within a typographical whole, with the distinction between the two very hard to perceive. This way, the article explores some cognitive and esthetic principles about picture poems. Poetic language draws attention to itself in the hierarchy of signifiers. In manneristic styles there is a greater awareness of the separateness of signifiers. Whereas rhyme, meter, and alliteration impose additional patterning on the phonological signifiers, picture poems, acrostics, and some other manneristic devices impose additional patterning upon the graphemic signifiers. When alliterations are turned into puns, they become manneristic patterning of the phonological signifier. In this sample the four evangelists are integrated in the text and subscriptions are separated through lines giving a second meaning, e.g. the words 'fuit in diebus hero':



Hrabanus Maurus. *Liber de laudibus Sanctae Crucis*
Pforzheim. Thomas Anshelm. 1503. Washington University Libraries.

From this text box emerge individual letters and groups of letters, which compose self-contained poems or sequences of words referring to the basic concept of the composition, the glorification of the Cross and Christianity using effects of

intertextuality. The monumental manuscript contains a series of 28 picture poems taken from the first version of the treatise on the Holy Cross presented by Hrabanus as early as 810–814. The book ends with the famous dedication miniature depicting the author below the Cross as symbol of salvation. The cross is also visualized by characters in two lines of the paper (see photograph above). The commentary volume provides an introduction and guides the reader through the world of Charlemagne who forced these artificial methods for his power as an emperor.²¹

4. Colour and literary languages

Metaphors concerning the matter of sound deal with a common level of synesthesia. William Shakespeare's works are examples for the use of metaphors in a literary text, which can be considered as synesthetical effects. In act IV, sScene II of *The Winter's Tale* red blood that reigns in the winter's pale is described:

*With heigh! the doxy, over the dale, Why, then comes in the sweet o the year;
For the red blood reigns in the winter's pale. The white sheet bleaching on the
hedge,...*

In the Sonnet 99 red is the color of shame:

*Fearfully on thorns did stand, One blushing shame, another white despair;
A third, nor red nor white, had stol'n of both,
And to his robbery had annex'd thy breath;*

In act II, scene V of *Twelfth-Night; or, What You Will* is asked to fool someone 'black and blue':

*To anger him we'll have the bear again; and we will fool him black and blue;
shall we not, Sir Andrew? Sir And.*

III. Theory – Structures and concepts of the representation of esthetical phenomena

The elements of a notation system are tools used to build a composition with a secondary connotation system. A concept as a whole is made of series of segments, which have their active role in the whole and interact among themselves. Colour is the most vital visual sensation in our life. Colours play an important part in our life and in our flower design. They are always there and draw our attention immediately. Colour also influences the composition and this is also the case in a design. Philosophical concepts interpret among other things the so-called 'esthetics of the ugly' as a higher form of beauty. Traditional esthetics assumes that universal and timeless criteria for the evaluation of taste of works of art exist.

Words, which the ancient Greeks used to name concepts of beauty, are structural elements for proportions of parts. For visible beauty *symmetria* (harmony for commensurability) was the principal term. For audible beauty and for musical works it was *harmonia* (consonance). The word *taxis* for 'order' had a similar meaning. Obviously the color connotation described in the sample case above contains certain

²¹ Cf.: Cf. for art and synesthesia:

Basbaum, Sérgio Roclaw. Sinestesia, arte e tecnologia: Fundamentos da cromossonia. São Paulo: Annablume 2002.

basic in common shared meanings. So an emotional approach can be explained when colors are used. The forms of feelings can be divided into three classes of the simple emotions, the affections, and the desires.

Hearing
Vision
Smell
Taste
Touch

The connotation for elements of categories of one sense with another sense can be explained by the use of a tertium comparationis, a third quality both elements have in common; e.g. softness of touch and yellow as a color both stand in opposition to gravity of touch/color.

Perception and sensation of esthetical phenomena

Perception is not possible without an entity that acts on the sense organs and the organs themselves. This means that perception is not 'objective' in the sense commonly used, which is outside the observer. Perception needs an observer. The sense organs are fundamentally automatic in working, but our evaluation is not, and depends on our knowledge of perception.

Cognition
Perception
Emotion
Thought
Reminiscence
Imagination

Methods of consciousness

Structures of esthetical phenomena

Ethic and esthetical values are in close connection. The distinction often made between emotions and judgments gives rise to a host of conflicting accounts of morality, since e.g. emotions contain judgments. Judgments are formed by both emotions and the ratio. Emotions are responses to sense and inevitably incorporate judgments and beliefs about those senses.

Channels of esthetical perception

A channel is a sensory mode utilized by a medium for visual, auditory or tactile perception. Channels are available by the technical features of the medium, in which an esthetical phenomenon appears certain derivatives from Latin 'sentire' (to feel) exist: The sensorium is the part of the brain that receives and coordinates all the stimuli through the senses. Sensuality is the excessive devotion to delights of the senses. Sentiment is an opinion about a specific matter, or an emotion elicited by an image. Although there is no value judgment necessarily implied in noting a sentiment, a speaker is more likely to be taking a disparaging attitude when using 'sentimental' or 'sentimentality'.

The stimulus
 The receptor
 The sensation

Steps in sensation in an psychophysiological approach

The faculties through which the body perceives, receives and feels stimuli from outside are the faculties of sight, hearing, smell, touch, taste, and balance. The senses are the means of providing physical gratification and pleasure. The quality or condition of being is capable of perceiving with a sense or senses and responsive to external conditions or stimulation, or susceptible to the attitudes, feelings, or circumstances. Esthetics is created by the five senses (sight, touch, hearing, taste, and smell stimuli) combined with connotation derived from 'classic connotations' like the symbolic meanings of colors we demonstrated before are seldom. Also synesthetic phenomena –as philological effects- base upon this method. This is an argument for synesthesia as a personal ability. Following Darwin, this faculty for the appreciation of beauty is related to high tastes acquired though culture and depends upon complex associations. The sphere of the senses has here a transmission function; it is a kind of messenger of information between the sense, things and the soul, which are separated from each other. These channels of esthetical perception of the main five senses have certain categories, which can be combined as synesthetical effects, e.g. as colours of vision in combination with taste categories.

Vision	Hearing	Touch	Taste / Smell
Colour	Loudness	Weight	Sweetness
Shape	Pitch	Give	Sourness
Pattern	Beat	Comfort	Texture
Line	Repetition	Temperature	Strength
Texture	Melody	Vibration	Sweetness
Visual weight	Pattern	Sharpness	'Pleasantness'
Balance	Noise	Ease of use	
Scale	Texture	Strength	
Movement	Shape		

Channels of esthetical perception

Esthetical state
 Synesthetical state
 Anesthetical state

Esthetical states

Sensation of the 'Esthetical state'

We can divide sensation into three states: The state of esthetic perception, the anestastic status and the synesthetic perception. A sensation is an experience by the senses. Thoughts and emotions can also be called sensations. The term can also have a negative connotation. Sensibility depends on nerves. Sensation is a perception associated with stimulation of a sense organ or with a specific body condition like the sensation of heat or a visual sensation. The faculty of feeling or perceiving is based on physical sensibility. A sensation is knowledge and feeling, perception and sensation. A sensation is a purely spiritual or psychical affection. Affections are related merely to feeling; passions belong to the faculty of desire, and are inclinations that hinder or

render impossible all determinability of the elective will by principles. Affections are impetuous and irresponsible; passions are abiding and deliberate. Agreeable or disagreeable feelings occasioned by objects that are not corporeal or material.

A sensation is a state of excited interest or feeling. The sensation caused by the appearance of that work is still remembered. Sensation properly expresses that change in the state of the mind, which is produced by an impression upon an organ of sense. Perception expresses the knowledge or the intimations we obtain by means of our sensations concerning the qualities of matter. It consequently involves the notion of externality. Sensation as the faculty through which the external world is apprehended is the entry to the senses. Sense is any of the faculties by which stimuli from outside or inside the body are received and felt, as the faculties of hearing, sight, smell, touch, taste, and equilibrium. A perception or feeling is produced by a stimulus. Sensation is a sense e.g. of fatigue.

The 'anaesthetic state'

The word 'anesthesia' derives from the Greek word *aisthesia* (reception of feeling). Anesthesia means a status without feeling. The term was coined in the 19th century when modern anesthesia began to flourish. Since then the rapid growth of anesthesia has embraced many facets. Anesthetists or anesthesiologists are among the most highly trained medical professionals. Comparing it to anesthetic, which is by construction an antonym of esthetic, synesthetical states can illuminate some of the meaning of esthetical phenomena. If something is anesthetic, it tends to dull the senses or cause sleepiness. In contrast, esthetical may be thought of as anything that tends to enliven or invigorate.

Sensibilities of esthetics

Pleasure comes from the extent to which the product makes the task more pleasurable. Communicating our pleasure and happiness to anyone who has given us a new sensation through any work or act or art, and also sharing that appreciation with everyone we can, is a means to generate essential appreciation itself. Since the basis of one's esthetics is one's natural affects, together with one's artistic affirmations, a person may create her/himself through favouring tastes she/he desires as we have an effect in the synesthetic phenomema, if these are voluntarily wanted. Artistic creation and culture itself are modes of pure communication, in which the synesthetic effects can get an over-personalized meaning. The strength of feeling is usually proportioned to the strength of intellect. When the cognition of the intellect is deep, the feeling arising will also be strong and vivid.

Simple emotions - Affections - Desires. Classification of Sensibilities

Anesthesia is the prevention of consciousness or sensation, usually by means of chemicals known as anesthetics.

The 'synesthetical state'

Synesthetics encompasses both a sensory experience and an esthetical potential. Characteristic of a synesthetical performance style is its consolidation of a variety of artistic principles, forms and techniques, manipulated in such a way as to fuse the senses of the receptor. In opposition to the individual synesthetic effects we have here a voluntarily made artificial product, which has a sender and a receiver. Informations are communicable and not reduced to sensual expressions. The synesthetic style in performance has the ability to communicate. It provides a

'synesthetical sense' within appreciation, the intuitive sense that presents the unrepresentable, articulates the 'unarticulable', going beyond conventional dramatic techniques to present ideas that are beyond conventional communication, as well as thoughts, emotional experience, psychological states. The five senses, usual cross-linkings, are result of cultural coding, which each infant goes through when exploring the reality and experiences as practical. Each genuine synesthetical person has a constant encyclopedia of connotated phenomena, which differs from the encyclopedia of every other one. So synesthesia is an individualized phenomenon intending to save an ideolect, when expressed literally. Since this is a conditioned, trained and socially accepted skill, we could call it 'artificial synesthesia'. It demonstrates the intellectually conditioned state of human capable to read and with that capability able to connote visual phenomena with other senses.

We finally now come to our main thesis: 'Why reading is synesthetical'. The physiological condition of synesthesia is a disturbing procedure in terms of sensory impressions of cognition and reaction, of memory and emotion. Although it would certainly be misleading to translate 'koine aisthesis' and 'sensus communis' simply as 'consciousness', it is accepted practice to translate Aristotle's word 'phantasia' as 'imagination'. Synesthetical descriptions can be classified –when used in literature – as phansatsy, since there is no organized approach to it. Reading is a highly synesthetical process. There are several stages in the reading process. When we read a word, a visual pattern is perceived which is then decoded with reference to an internal representation of the language. This is analyzed syntactically and semantically in the context of a phrase or sentence. In other words: Signs are read and get a meaning to be transferred into sounds or other media. Since this is this automatic synesthetical media use of mankind, we do not care about this process. The word imagination is a direct derivative of 'imaginatio', which is the Latin equivalent of 'phantasia'.

What is this? Esthetical phenomen	Empiric area	Human mind
How is this? Esthetical reciever The esthetical reciever uses senses	Sensual area	Human senses
How is this? Esthetical jugdement The esthetical jugdement is based on the ratio	Intellectual area	Human intellect
How is this? Ethic jugdement is based on the mind	Etheical area	Human emotions

Universal categories of esthetics can only be applicable to the esthetic side of human activity. They are different from other categories. The fundamental categories of plausibility, beauty and artistic truth also belong to objective esthetics. Synesthetical phenomena being a pysiological condition are as an output realized by quasi-artificial forms. But we must consider the difference between voluntarily made artificial products and the 'ad-hoc' built descriptions, which refer to a certain synesthetical phenomenon. Subjective esthetics discusses the issues related to the origin and manifestations of aesthetic creativity. Intellect is a cognitive faculty essentially different from sense and of a supra-organic order. 'Artificial' synesthesia must not relay on a state of concioness; it also can relay on theoretical methods or concepts. This proposition is proved by psychological analysis and study of the chief functions of intellect. These are conception, judgment, reasoning, reflection, and self-consciousness. All these activities involve elements essentially different from sensuous consciousness. In opposition to esthetic phenomena synesthetical phenomena are not communicable;

they tend to be part of an idelect. Phenomena such as reading we called 'artificial synesthesia' are conditionalized forms.