# Harald Arnkil

## Colour and perception – recommended further reading

**General**

Batchelor, David. 2000. *Chromophobia*. London, UK: Reaktion Books.

*A short, but delightful read about Western society’s and modernism’s fear of colour.*

Chevreul, Michel Eugène. 1987. *The Principles of Harmony and Contrast of Colors and Their Applications to the Arts*. With a special introduction and newly revised commentary by Faber Birren. Atglen, PA: Schiffer Publishing.

*A classic opus, originally published in 1839, about the perception of colour in two-dimensional art and design applications, such as textiles and paintings but also women’s and men’s fashion. One of the first modern studies of simultaneous contrast and colour harmony. Influenced the Impressionist and Neo-Impressionist painters.*

Goethe, Johann Wolfgang von. 1985. *Theory of Colors*. Cambridge, MA: The M.I.T Press.

*Another classic read. Goethe’s last literary work, published in 1810 that Goethe regarded his greatest achievement. This English edition consists of a facsimile of Charles Eastlake’s translation from 1840 plus an introduction by Dean B. Judd. It includes the chapters on Physiological Colours, Physical Colours, Chemical Colours, General Characteristics, Relation to other Pursuits and Effect of Colours with Reference to Moral Pursuits.*

Hope, Augustine and Walch, Margaret. 1990. *The Colour Compendium*. New York, NY: Van Nostrand Reinhold Company.

*This comprehensive, illustrated encyclopaedia consists of alphabetically arranged, easy to approach articles covering all aspects of colour including theories, concepts, history, psychology and universal applications*.

Kemp, Martin. 1990. *The Science of Art – Optical themes in western art from Brunelleschi to Seurat*. New Haven, CT: Yale University Press.

*A grand work from a major art scholar. The book is lavishly illustrated and includes special sections and chapters on colour. Kemp reveals fascinating connections between Western art, philosophy and optical science.*

Nassau, Kurt. 1998. *Color for Science, Art and Technology*. Amsterdam: Elsevier Science B.V.

*A scientist’s approach to colour. Very readable even for artists.*

Sloane, Patricia (ed.) 1991. *Primary Sources. Selected Writings on Color from Aristotle to Albers*. New York, NY: Design Press.

*Exactly as the title states: original texts from astutely chosen writers on colour.*

**Colour education**

Albers, Josef. 2006. *Interaction of Color*. Revised and expanded edition. New Haven, CT: Yale University Press.

*A pocket book version of Albers’s classic work. A must for all students of colour.*

Arnkil, Harald. 2013. Colours in the Visual World. Helsinki, Finland: Aalto University.

*This handbook for art, design and architecture students and teachers is a revised English-language edition of the Finnish-language book* Värit havaintojen maailmassa, which was published for the first time in 2007*. The emphasis is on contemporary theories of perception and their relation to the aesthetic and functional and application of colour in art, design and architecture. There are appendices on e.g. lighting, a glossary of colour and light terms and each chapter ends with a set of assignments.*

Bachmann, Ulrich. 2011. *Farbe und licht/Colour and Light: Materialen zur Farb-Licht-Lehr/Materials for a Theory of Colour and Light*. Zürich: Niggli.

*The result of many years of research in colour, light and space in the Zurich University of the Arts (ZHdK). Lots of impressive colour illustrations.*

Belmonte, Pilar. 2012. *VER EL COLOR, Observacíon crítica/SEEING COLOR, A Critical Eye*. Spanish/English language electronic publication available at: www.pilarbelmonte.com/LIBRO/SeeingColor.php

Hornung, David. 2005. *Colour: a workshop for artists and designers*. London, UK: Lawrence King Publishing Ltd.

Itten, Johannes. 1974. T*he Art of Color: The Subjective Experience and Objective Rationale of Color*. Hoboken, NJ: John Wiley & Sons.

*Many now consider Itten’s quasi-religious approach to colour outdated. Especially the chapters on Subjective Timbre, the Twelve-Part Colour Circle and his ideas on colour harmony (derived from the colour circle and sphere) are questionable. The analyses of the old masters’ use of colour are well worth reading, though.*

Itten, Johannes. 1970. *The Elements of Color: A Treatise on the Color System of Johannes Itten, Based on His Book "The Art of Color"*. Hoboken, NJ: John Wiley and Sons.

*This is a softbound and slightly shorter version of the above.*

Osborne, Roy. 2008. *Color Influencing Form: A Color Coursebook*. Universal Publishers.

Swirnoff, Lois. 2003. *Dimensional Color*. New York. NY: W. W. Norton & Co.

*Lois Swirnoff was one Josef Albers’s favourite pupils and an important art and colour pedagogue in major American art schools and universities. Dimensional colour is an extension of the Albersian approach into three dimensions.*

Zwimpfer, Moritz. 1988. *Color: Light, Sight, Sense*. West Chester, PA: Schiffer Publishing Ltd.

*This is still one of the most approachable, lucid and beautifully designed pedagogical introductions to colour. Written by a long-time professor of colour graphic design at Schule für Gestaltung in Basel.*

**Colour in art and design**

Batchelor, David. (ed.). 2008. *Colour/edited by David Batchelor* (Documents of Contemporary Art). London: Whitechapel/Cambridge, MA: MIT Press.

Caan, Shashi. 2011. *Rethinking Design and Interiors - Human Beings in the Built Environment*. London, UK: Laurence King Publishing Limited.

*Research-based books on interior design are extremely rare. This is one of them. Shashi Caan is a New York -based interior designer and design educator, who has taught at several leading universities, including Coloumbia and the Pratt institute. Although well-founded in research, the book is based equally on professional design experience. The book deals with many aspects of spatial design and architecture, but Caan’s strong involvement with colour is also present.*

Gage, John. 1999. *Colour and Meaning: Art, Science and Symbolism*. London, UK: Thames and Hudson.

*Gage was an art historian with an unquenchable thirst for knowledge about colour. This is a slightly more digestible book than Gage’s earlier magnum opus Colour and Culture. Both books are remarkable achievements.*

Gage, John. 2006. *Colour in Art*. London, UK: Thames and Hudson.

*An even more approachable pocket book by Gage.*

Kandinsky, Wassily. 2009. *Concerning the Spiritual in Art*. CreateSpace.

*Whatever one thinks of Kandinsky’s art philosophy and synesthetic ideas, this book is a must read. Written shortly after the time Kandinsky turned to abstract expression in his art. The language is poetic and the book contains long sections on the effects and meanings of colour in art.*

Kobayashi, Shigenobu. 1992. *Color Image Scale*. Tokyo: Tokyo: Kodansha International.

*Kobayashi is a leading researcher in colour psychology and emotional connotations of colour.*

Kobayashi, Shigenobu. 1992. *Colorist: A Practical Handbook for Personal and Professional Use*. Tokyo: Kondasha International.

**Colour in architecture**

Billger, Monica. 1999. *Colour in Enclosed Space: Observation of Colour Phenomena and Development of Methods for Identification of Colour Appearance in Rooms*. Doctoral dissertation. School of Architecture, Chalmers University of Technology, Göteborg, Sweden.

*Monica Billger’s dissertation presents a new method for assessing the perceived differences of colour in interiors illuminated respectively by either daylight or different types of artificial lights. The effects of simultaneous contrast and reflections in space are examined and the book includes a discussion of what colour is as a physical property and as a perceptual quality.*

Brabham, William. 2002. *Modern Color/Modern Architecture: Amédée Ozenfant and the genealogy of color in modern architecture.* Burlington, VT: Ashgate Publishing Company.

*Amedee Ozenfant was a painter, critic and friend of Le Corbusier. In the 1920s he founded in London an architecture school where taught his modernist theories and ideas of colour and space.*

Fridell Anter, Karin. 2000. *What Colour is the Red House? – Perceived colour of painted facades*. Doctoral dissertation, School of Architecture, Royal Institute of Technology, Stockholm, Sweden.

*Research on colour psychology, colour appearance and spatial colour is very strong in Sweden. Involving a thorough theoretical discussion of the problem, and analysing the results of over 3600 observations in the open air, this research investigates the way colours of painted facades change visually in relation to light, surroundings and distance. The results reveal clear and interesting patterns.*

Hårleman, Maud. 2007. *Daylight Influence on Colour Design: Empirical Study on*

*Perceived Colour and Colour Experience Indoors*. Doctoral dissertation. School of Architecture, Royal Institute of Technology, Stockholm, Sweden.

*Another example of the strong Swedish tradition of research into spatial colour. This time concerning the effect of daylight on colours in interiors.*

Lenclos, Dominique & Lenclos, Jean-Philippe. 1990. *Les couleurs de la France: Géographie de la couleur*. Paris: Éditions du Moniteur.

*Dominique and Jean-Philippe Lenclos directed a successful colour design company in paris for many decades. Parallel to this they carried out studies into local and vernacular uses of colour in urban and rural environments, first in France and then in diverse parts of the world. The Georaphy of Colour series is the beautiful summation of their life’s work.*

Lenclos, Dominique & Lenclos, Jean-Philippe. 1995. *Couleurs de l’Europe : Géographie de la couleur*, Éditions du Moniteur, Paris

Lenclos, Dominique & Lenclos, Jean-Philippe. 1999. *Couleurs du monde: Géographie de la couleur*. Paris: Éditions du Moniteur.

Lenclos, Dominique & Lenclos, Jean-Philippe. 2004. *Colors of the World: A Geography of Color*. New York, NY: W.W. Norton and Company.

Linton, Harold. 1999. *Color in Architecture: Design methods for Buildings, Interiors, and Urban Spaces*. New York, NY: McGraw-Hill.

*Linton is an artist with a lifelong career in teaching art, colour and portfolio design to students of art design and architecture in several American universities. He is also a prolific writer of books on these subjects.*

Olsson, G. 2009. *The Visible and the Invisible: Colour Contrast Phenomena in Space*. Doctoral dissertation, School of Architecture, Royal institute of Technology, Stockholm, Sweden. Stockholm: Axl Books.

*Yet another dissertation on colour from Sweden. Although her approach is historical, Gertud Olsson studied colour especially in the work of contemporary German and Swiss architects for this thesis.*

Porter, Tom and Mikellides, Byron. 2009. *Colour for Architecture Today*. Oxford, UK & New York, NY: Taylor & Francis.

*A re-edition of a groundbreaking book on colour in architecture. This is a collection of articles from several important writers.*

Smedal, Grete. 2001. *Longyearbyen in Colour - Status and Challenges*. Bergen, Norway: Eide Førlag.

*Grete Smedal is a Norwegian former interior designer and colour educator. Her life’s greatest commission as a designer was the colour scheme for the new buildings of the town of Longyearbyen, Svalbard, Spitsbergen, 78°N. This book tells the story of that unique endeavour.*

Swirnoff, Lois. 2003. *The Color of Cities: An International perspective*. New York and Chicago: McGraw-Hill Professional Publishing.

*Swirnoff takes a personal look at colours of some of the major cities around the world (see comment on Swirnoff’s Dimensional Color).*

**Colour Perception**

Gregory, Richard. 1998. *Eye and Brain, The Psychology of Seeing*. Fifth Edition. Oxford, UK: Oxford University Press.

*A long-standing and very accessible little book on seeing by the recently deceased grand-old-man of British perceptual psychology.*

Katz, David. 2002. *The World of Colour*, London, UK: Routledge.

*Katz was a German perceptual psychologist who fled the Nazis to Sweden. This book is a classic of colour phenomenology originally published in 1930 as Der Aufbau der Farbwelt.*

Livingstone, Margaret. 2002. *Vision and Art: the biology of seeing*. New York, NY: Harry N. Abrams, Inc.

*Margaret Livingstone is a neurobiologist working in the laboratory of David Hubel, one of the few scientist who have been awarded the Nobel prize for researches into colour vision. Very readable and richly illustrates with diagrams and examples from art.*

Zeki, Semir. 1999. *Inner Vision – An Exploration of Art and the Brain*. Oxford, UK: Oxford University Press.

Zeki is a pioneering researcher of the visual brain, specializing in colour vision. He is the founder of the Institute of Neuroaesthetics and the author of many books and articles on the relationship of neurobiology and art.

**Colour in philosophy, language and culture**

Albert-Vanel, Michel. 2009. *La couleur dans les cultures du monde*. Paris: Editions Dangles.

*Albert-Vanel is a Paris-based artist with a life-long career in teaching and researching colour. His speciality is the rich manifestation of colour in cultures around the world. This book is a unique and systematic study of the subject, probably the first of its kind ever. Albert-Vanel is also the creator of the Planetary Colour System, based uniquely not on the interrelationship of individual colours but of colour combinations. The system also serves as a logical starting point for categorizing the combing of colours in various cultures.*

Arnkil, Harald, ed. 2012. *Colour and Light - Concepts and confusions*. Helsinki, Finland: Aalto University. Available only as PDF, downloadable free at https://shop.aalto.fi/c/1-aalto-arts-books/

*The aim of this publications is to clarify conflicting use of concepts around colour and light and to suggest possible ways of improving inter-disciplinary understanding in the area. In his long introduction colour philosopher C.L. Hardin takes look at the problem of bridging the gap between conscious experience and scientific data, with particular regard to the variability of human colour experience.*

Berlin, Brent and Kay, Paul. 1991. *Basic Color Terms - Their Universality and Evolution*. Berkley and Los Angeles, CA: University of California Press.

*A classic study of colour categorization and use in languages, published originally in 1969. The study has been the subject of much criticism, but the authors have since joined forces with some of the critics to improve on the work in the world-wide study WCS, World Colour Survey (see below).*

Gage, John. 1993. *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*. London, UK: Thames and Hudson.

*A huge achievement in the colour literature, but although richly illustrated, not the most approachable of books on colour. Its 335 pages are dense with scholarly information and historical cross-references. The emphasis is heavily on the visual arts, painting in particular.*

Hardin, C. L. 1993. *Color for Philosophers – Unweaving the Rainbow*. Expanded edition. Indianapolis, IN and Cambridge, UK: Hackett Publishing Company

*A thorough examination of the physical and neurobiological facts behind colour phenomena and colour appearances. Hardin wrote the book for philosophers. As he remarks, they are fond of referring to colour as an illustration about epistemological and ontological truths, without really knowing much about the physical and biological reality of colour. An entertaining lesson in scientific integrity for us all. The book won the 1986 Johnsonian Prize for Philosophy.*

Hardin, C. L. and Maffi, L. 1997. *Color Categories in Thought and Language*. Cambridge University Press.

*Essential reading for all interested in the relationships between colour and language.*

Kay, Paul., B. Berlin, L. Maffi, W.R. Merrifield, and R. Cook. 2010. *The World Color Survey.* Stanford, CT: CSLI Publications, Ventura Hall, Stanford University.

*This book introduces the on-going worldwide research project on colour naming and colour categories in different cultures and languages. It builds on Berlin’s and Kay’s famous 1969 study (see above), revealing the whole complexity of the subject.*

Maur, Karin. von. 1999. *The Sound of Paintings*. Munich: Prestel.

*This book is an abridged and revised version of von Maur’s earlier book of the same name. It charts the history of synesthetic ideas and the cross-pollination of art and music from Richard Wagner and Philip Otto Runge through Kandinsky and Schoenberg to the Fluxus movement and Joseph Beuys. Relationship of sound and colour is a central theme.*

Pastoureau, Michel. 2012. *The Colours of Our Memories.* Cambridge, UK: Polity Press.

*Pastoureau is known for his excellent historical surveys of single colours (see below). In this book he “…presents us with a journal about colours that covers over half a century (1950-2010). Through personal memories, notes taken on the spot, uninhibited comments, scholarly digressions and the remarks of a professional historian, this book retraces the recent history of colours in France and Europe. Among the fields of observation that are covered or evoked are the vocabulary and data of language, fashion and clothing, everyday objects and practices, emblems and flags, sport, literature, painting, museums and the history of art.”*

Riley, Charles. A. II. 1995. *Color Codes – Modern Theories of Color in Philosophy, Painting and Architecture, Literature, Music, and Psychology*. Lebanon, NH: University Press of New England.

*The book consists of a series of essays discussing colour from many different angles, not all entirely visual. Contains plentiful quotations by artists, philosophers, writers etc. A good read.*

**History of colours and colorants**

Ball, Philip. 2008. *Bright Earth: The Invention of Colour*. London, UK: Vintage/Random House.

*This book is a delight for all interested in colour, science and history. Ball is an extremely versatile and knowledgeable writer on the history of sciences. This book traces the development of dyes and pigments and their use, but broadens to also to other aspects of colour and its place in the modern world.*

Brusatin, Manlio. 1992. *A History of Colors*. Boston, MA: Shambhala Publications, Inc.

*A charming and learned little essay on colour by an Italian art historian. Brusatin discusses historical colour theories and their relation to colour materials.*

Delamare, F., Guineau, B. 1999. *Colors: the story of dyes and pigments*. New York, NY: Harry N. Abrams.

*Although small in size, this little compendium of dyes and pigments and their history is packed with information and fascinating illustrations.*

Finlay, Victoria. 2003. *Colour – Travels through the Paintbox*. London, UK: Sceptre/Hodder & Stoughton.

*Finlay is a former journalist. The book is part history, part travelogue and part detective story as Finlay travels to the ends of the world in search of the true origins of colorants and dyes. A very entertaining read.*

Garfield, Simon. 2001. *Mauve: How One Man Invented a Color that Changed the World*. New York, NY: W.W. Norton & Co.

*The fascinating story of how William Perkin invented one of the first synthetic pigments. If it did not change quite the entire world, the consequences for the technology and aesthetics of colouring, dyeing and printing can only be described as a sea change.*

Hills, Paul. 1999. *Venetian Colour – Marble, Mosaic, Painting and Glass 1250–1550*. New Haven, CT and London, UK: Yale University Press.

*A beautifully printed and scholarly book with many illustrations of Venetian art and colour.*

Pastoureau, Michel. 2001. *Blue: The History of a Color*. Princeton, NJ: Princeton University Press.

Pastoureau, Michel. 2008. *Black: The History of a Color*. Princeton, NJ: Princeton University Press.

Pastoureau, Michel. 2014. *Green: The History of a Color*. Princeton, NJ: Princeton University Press.

**Colour Science and colour order systems**

Berns, R. 2000. *Billmeyer and Saltzman's Principles of Color Technology*. New York, NY: John Wiley & Sons.

*This a completely revised third edition of Fred Billmeyer’s and Max Saltzman’s a classic work that originally appeared in 1967. It covers just about every imaginable aspect of colour technology, combining the clarity and ease of use of earlier editions with two decades of advancement in colour theory and technology. Roy Berns, a former student of Billmeyer and Saltzman is Professor of imaging science at Rochester Institute of Technology.*

Evans, R. 1948. *An Introduction to Color*. New York, NY: John Wiley & Sons.

*A classic of colour science.*

Hård, Anders. & Sivik, Lars. 1981. *NCS - Natural Color System: A Swedish Standard Notation*. In: Color Research and Application, Vol. 6, No. 3, pp 129–138.

*This is the only comprehensive and authoritative exposition of one of the world’s most used colour order systems. Written by its developers.*

Kuehni, Rolf. G. and Schwarz, Andreas. 2008. *Color Ordered: A Survey of Color Order Systems from Antiquity to the Present*. New York, NY: Oxford University Press USA.

*A very thorough and beautifully laid-out compendium just about every colour order system ever created. The writers are top authorities of the subject.*

Kuehni, Rolf. G. 2012. *Color: An Introduction to Practice and Principles*. Hoboken, NJ, USA: Wiley-Blackwell.

Munsell, Albert H. 2011. *A Color Notation*. CreateSpace Independent Publishing Platform.

**The physics and chemistry of colours**

Gedzelman, S.D. 1980. *The Science and Wonders of the Atmosphere*. New York, NY: John Wiley and Sons.

Lynch, David K. and Livingston, William. 2001. *Color and Light in Nature*. 2nd Edition. Cambridge, UK: Cambridge University Press.

Nassau, Kurt. (ed.) 1998. *Color for Science, Art and Technology*. Amsterdam: Elsevier Science B. V.

Nassau, Kurt. 1983. *The physics and chemistry of color: The fifteen causes of color*. New York, NY: Wiley and Sons.

Minnaert, Maurice. 1954. *The Nature of Light and Colour in the Open Air*. New York, NY: Dover Publications, Inc.

Rood, Ogden. N. 1973. *Modern Chromatics* (edited by Faber Birren, includes facsimile from 1879), New York, NY: Van Nostrand Reinhold.

**Colour management**

Fraser, Bruce and Murphy, Chris. 2004. *Real World Color Management.* (2nd ed.)Berkeley, CA: Peachpitt Press.

Green, P. and Kriss, M. 2010. *Color Management: Understanding and Using ICC Profiles*. Chichester, UK: John Wiley & Sons.

Sharma, A. 2003. *Understanding Color Management*. Stamford, CT: Cengage Learning.

## Other related and recommended sources

**Books**

Sacks, O. 2006. *An Anthropologist On Mars: Seven Paradoxical Tales*. Picador.

Sivik, L. 1976. *The Language of Colour: Colour Connotations*. In Mikellides B. and Porter T. Colour for Architecture, p. 131. London, UK: Studio Vista.

Ware, C. 2004. *Information Visualization: Perception for Design*. 2nd Edition. San Francisco, CA: Morgan Kaufmann Publishers/Elsevier.

**Scientific articles**

Adelson, E. H. 2000. *Lightness Perception and Lightness Illusions*. Available on the Internet: http://persci.mit.edu/pub\_pdfs/gazzan.pdf

Chen, I. and Lin, J. 2005. Institute of Applied Art, National Chaio-Tung University Hsinchu (Taiwan), *Quantitative Assessment of the Advancing / Receding and the Expansion / Constriction Effects of Colours*, Proceedings of the 10th Congress of the International Colour Association AIC, Granada, Spain 2005.

da Pos, Osvaldo & Paul Green-Armytage. 2007. *Facial Expressions, Colours and Basic Emotions*. Colour: Design & Creativity, 2007, 1 (1):2, 1–20. (Available at http://aic-colour-journal.org/index.php/JAIC/index).

Frank, M.G. & Gilovich, T. 1988. *The Dark Side of Self- and Social Perception: Black Uniforms and Aggression in Professional Sports*. Journal of Personality and Social Psychology 1988, vol. 54, No 1, 74–85.

Hill, R.A. & Barton, R.A. 2005. *Red enhances human performance in contests*. Nature, Vol. 435, p. 293. Nature Publishing Group.

Hubel, David. *David Hubel’s Eye, Brain and Vision*. Internet publication available at: http://hubel.med.harvard.edu/index.html

O’Connor, Zena. 2011. *Colour Psychology and Colour Therapy: Caveat Emptor*. Color Research and Application. Volume 36, Number 3, June 2011. Wiley Periodicals.

Shinomori, K. 2005. *Ageing effects on colour vision - Changed and unchanged perceptions*. Proceedings of AIC Colour 05 - 10th Congress of the International Colour Association, Granada, Spain 2005.

Valdez, Patricia and Mehrabian, Albert. 1994. *Effect of Color on Emotions*. Journal of Experimental Psychology, General 1994, Vol. 123, No. 4, 394 – 409.

Yglesias, Magenta., Stewart, K.T., Gaddy, J.R., Zivin, G., Dogrhramji, K., Thornton, W., Brainard, G.C. 1993. *Does color influence blood pressure and heart rate?* Proceedings of the 7th Congress of the International Colour Association AIC, Budapest 1993.

## International colour organisations

* International Commission on Lighting CIE www.cie.co.at
* Interntional Colour Association AIC www.aic-colour.org
* International Color Consortium ICC www.color.org/index.xalter
* Inter-Society Color Council ISCC (USA) www.iscc.org

## Other useful links

* Colour systems and their history: www.colorsystem.com
* Accessibility and use of colours on the Internet:

World Wide Web Consortium: www.w3.org

* Colour blindness: www.vischeck.com