Chroma256

 internacional colour project

A project by Kevin Todd with staff and students from:

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Yeditepe University, Istanbul, Turkey

Srishti School of Art and Design, Bangalore, India

Millersville University, Pennsylvania, USA

University of Johannesburg, South Africa

Universidad San Francisco de Quito, Ecuador

Stuttgart Media University, Germany

Tongji University, Shanghai, China

Chroma256 _design students from eight countries explore relationships to colour in an international context.

A simple idea with a complex outcome; part culture, research and personal expression.
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Thanks to the faculty, staff and the many students at the eight campuses who made the project possible and enjoyable.

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The presentation of colour in a grid is not unusual in the context of art with Gerhard Richter’s 4900 Colours (Figure 1) being a recent example. Twenty-five chosen colours were organised by a computer program that used chance to define composition. Mondrian, Donald Judd, Ellsworth Kelly, Bridget Riley, Sol Lewitt and Imi Knoebel are other artists that have utilised colour grids and there can be a diagrammatic feel to these works due to their structure. If Richter’s works is programmatic and Riley’s is about perception and illusion then the grids in Chroma256 fit somewhere between information and expression, each square and row telling you something about an individual’s colour choice. However, the overall exhibition functions more on the level of experience or sensation as the visitor encounters a mass of colour, which reflects colour’s capacity to function as something concrete and ephemeral.

Figure 1: Grid from Gerhard Richter’s 4900 Colours.

Kevin Todd

Colour is at once simple and complex, something that can be experienced in context, experienced and imagined, part culture, science and personal preference. Colour is a primary component of communication that can signify status, sensuality, class, power and can express an expressive emotion. It can be approached, analysed and understood in a variety of methods and is an essential component of art and design.

Indeed, individual colour experience is entirely subjective and studies have shown that human colour perception has evolved to include the blue/violet end of the spectrum, to which people were previously colour blind. Each individual has potentially a different colour experience and animals also see colour differently, for example cats distinguish red from black but can perceive ultraviolet as a colour. The current generation of design students are sometimes called digital natives, having grown up with digital technology and their colour experience has assumed an international dimension due to the proliferation of the Internet and the extent to which the technical parameters of media can restrict the range of colour available for display. Although a high-resolution computer monitor may display a wide range of colours, websites are sometimes limited to 256 colours (8 bits per pixel) due to bandwidth (file size) considerations. The Canadian artist Angela Bulloch addressed this issue in her work Standard Universal, which was a “metaphor for the increased homogenization of contemporary society” and where the standard “erases the problem of translation.”

Chroma256 was developed to explore relationships to colour in an international context, a simple idea with a complex outcome: part culture, research and personal expression. Chroma is a score for the measure of colour saturation and 256 being a reference to the technical parameters of colour. The project involves design students in Australia, South Africa, India, Germany, Turkey, China and the United States undertaking the same colour project with the outcome being exhibited in each country.

The purpose of the project is to create an awareness of the complexity of our relationship and use of colour and to explore whether a standardisation is occurring due to computer-based technologies and the trend of designing, where standard software (the Adobe Creative Suite) has also become international. Is digital technology creating a cultural space that requires a particular kind of conformity; technological sophistication masking cultural simplicity/homogeneity?

The project and exhibition have a number of components, each designed to solicit a colour response so that the outcomes from each country can be compared.

Journey Grids

This component involves students documenting their journey to or from campus using a series of eight coloured squares. The choice of colour was entirely at the student’s discretion and could be the colour of something they saw or a colour representing an emotion or memory. Eight students from each campus undertook this task so that each grid comprises sixty-four colours. Each of the eight students was also asked to repeat the task with a child on their journey from home to school and with an elderly person on a journey they undertook regularly, such as from home to the shops. The result was similar grids with sixty-four coloured squares from eight children and eight elderly people. Each country thus produced three large grids of colour, one each from children, students and elderly allowing for a comparison across age groups and countries.

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Perhaps the most commonly used colour wheel for teaching in art and design schools is Itten's twelve step colour wheel (Figure 2) first developed in 1921 while he was teaching at the Bauhaus and published in his book, The Art of Colour. Itten's colour model is based on the three primary colours (red, yellow and blue) from which other colours (secondary, etc) develop through mixing. This process is based on paint or pigment and is termed subtractive in that the base colour or paper is white and therefore in terms of physics a combination of all colours. This model, which was developed for painting, is similar to that used in the printing industry where the primary or process colours Cyan, Yellow and Magenta are used in conjunction with Black to create the CMYK standard also used by computer software today. However, because the computer monitor uses light and the base colour is black (no light) a subtractive system doesn't work and the additive system RGB (red, green blue) is used. There is therefore a 'mismatch' between the colour models used for display and the printing with a much greater range of colours available through the mixing of light on a high-resolution screen.

Designs
Each student was also asked to explain their colour choice and that of the child and elder through design for print with the only restriction being that the page should be 180mm square (a spread of 360 x 180mm). This component allowed for a survey of design styles from the various countries and a range of designs are included in this book and in the exhibition.

Colour Wheel
In order to teach and understand colour from an art/design perspective a number of systems have been developed over the centuries, many of which have focused on a colour wheel. Robert Fludd's colour circle published in 1626 was an early attempt to systemise colour and Sir Isaac Newton and Goethe also produced colour models based on the circle.
For the purpose of evaluating the Chroma256 colours, it was also necessary to consider the characteristics of colour in terms of hue (type), value (lightness) and chroma (saturation) and to allow for white, grey and black in the colour model. A colour wheel (Figure 3) was developed based on the process colours Cyan, Yellow and Magenta such as 100% (vivid) and then mixed to form the secondary colours Red (100% Yellow + 100% Magenta), Green (100% Yellow + 100% Cyan) and Blue (100% Cyan + 100% Magenta). The mixing continues around the wheel to make a twenty-four step wheel with the vivid colours fading towards white at the centre and deepening towards black at the outer edge. Because grey is not included in the basic wheel as an outer circle with the twenty-four vivid colours fading to grey/black along with a grey circle was added. The colours can therefore be recognised from the centre as white, light, bright, vivid, dark, deep and grey/black.

Other terms commonly used in the discussion and teaching of colour included terms such as the coloures usually associated with sunlight and fire (yellow/red/orange), and with water and therefore with a dominance of blue, and earth colours which are generally associated with darker reds/orange and brown. When discussing colour in relation to the colour wheel other terms such as complementarily (sometimes called contrast colours), for colours opposite each other or analogically, for colours adjacent to each other or in the same quadrant are used.

The development of the colour wheel allowed all of the colours to be mapped and for the respective country colour maps to be compared using a common terminology.

Figure 3: Colour Wheel development for Chroma256.
The correlation between the concept word colours is interesting in that the journey colours resulted in fairly distinct colour palettes for each country, which were largely the result of observed colour, obviously influenced by both cultural and environmental factors. The journey colours for Germany and Turkey are very different even though Stuttgart (48.77N) and Istanbul (41.01N) are relatively close in terms of latitude and the journeys were undertaken in March and April, 2013.  The Sunshine Coast (26.6S) and Johannesburg (26.2S) are almost on the same latitude, although Johannesburg is a long distance for the sea. The colour palette for Turkey reflects both the culture and environment as can be seen from the clothes for sale in the local market (Figure 9) and possibly the styles and colours reflect less of a focus on individuality, although department stores in Istanbul do cater for different tastes.

The concept word colours were largely chosen as a result of some consideration around the meaning of the word and are therefore less focused on the external physical environment, perhaps with the exception of Nature. The word clouds added an interesting dimension to the project and this process is not uncommon in a design course, where students begin by listing keywords as a means of exploring concepts. However, their translation to visual communication is a problem as there are few consistent references to colour besides, green for Nature, red for Love and red and black for Pain.

In many cases the larger (most common response) words are common or predictable, such as clock for Time, but the second and third level words are more specific to each country. For example, Turkey lists love as a response to Pain and pain as a response for Love, suggesting more than a few broken hearts. Both China and Turkey list chocolate for Love but India lists cheese with the largest words for Love in India being affection followed by passion. The smallest words are generally the result of a single response and one Indian student listed stupidity for Love and more than a couple of Turkish students listed Galatasaray (the football club) – Fenerbahce, the rival club across the Bosporus was mentioned for Pain! Red is much less prominent for love in the word responses from India and China than for the other countries.

For the concept words some of the outcomes were fairly predictable, such as the prevalence of red for Love (p50-51) but few responses for China and Turkey blue for the USA and Turkey and black for the USA. Pain (p62-63) has a consistent use of black and red and in the darkness still the colour maps and that with the highest contrast is seen in the most common colour for Nature (p58-59), along with brown and blue and in action sense the colours are about a combination of blues, earth, vegetation and dry. Home (p46-47) has a focus on earthy colours (red/brown/orange) and health (p40-41) has less deep colours and more red/orange. Memory (p34-35) has more bluer/black than any other colour and the preference is for the right side of the colour wheel for solid colours. Creation (p38-39) has a strong red cluster but also some green and blue which may reflect landscape as an inspiration of the word - this is reinforced in the word clouds.

Although the sample size for the concept words is small, a happy accident, an essential component of any good design process, meant that sixteen students from Millersville each completed grids for each of the words. This larger sample allows for a comparison with the overall results and it is interesting for example that Memory (Figure 6) should be represented in continually and not a cluster of colours in the right/lower area. There is also a strong correlation between the USA colour choices and the overall response for Health with vivid and bright colours (Figure 7) and Home with a strong focus on earthy colours (Figure 8).
China is the only country not to list food for Creation while it is the largest word for the USA and prominent for India. Ecuadorian and Turkey give a second level Creation word for China, possibly reflecting the range of manufactured goods available in Shanghai versus the largest words for Creation in South Africa in both. The largest Creation word for India and it does not appear elsewhere, although the word is a second level word for South Africa.

Family is by far the most common response for Home except for China where the largest word is parents, possibly a reflection of the one-child policy. There is a strong focus on the physical health with words such as: medicine, exercise, vegetable, sport and doctor but red and yellow are listed for India, green for Ecuador, Germany and China and white for Turkey and the USA. White is prominent for Health in India; loneliness appears for Pain in China and stress is a frequent response in the USA. Mind is prominent for Health in India, Germany and China and it does not appear in the Turkish language response. Although a large number of students participated in the design component, it was not possible to include all the work in the exhibition and third-level tier. This table and figure show that in some countries and the colour sensibility can vary significantly from country to country. The concept word surveys were undertaken in both. Mind is prominent for Health in India, Germany and China and white for Turkey and the USA. White is prominent for Health in India; loneliness appears for Pain in China and stress is a frequent response in the USA. Mind is prominent for Health in India, Germany and China and it does not appear in the Turkish language response.

There are a number of approaches to the design task including designs that are abstract and use only colour and type; by Ronja Vetter (p104-106) from Stuttgart and Yayıy Tang (p98-99) from Shanghai for example. Teneale Rush (p82) and Myra Vega (p107) included word clouds in their design explanations for Love and Nature. Many designs illustrated the colour choices through images allowing Carla Pander (p105) and Andrea Lott (p81). However, many designs have to wider space; all are just as effective. The conscious component of their designs and this creates a nice personal touch. Many designs illustrated the colour choices through images allowing Carla Pander (p105) and Mijia Vigo (p117) included word clouds in their design explanations for Love and Nature. Some designs utilise white space (the paper) to demonstrate the range of approaches and styles from the various countries and choices available are on display in the exhibition, there were some interesting variations depending on language. For example, in the English survey from Ecuador green was much more prominent than in the Spanish response (table), although generally the same words appear (Figure 7). Freedom is more prominent in the German language (Figure) than in the English, although again upon the same primary and secondary level words appear. Interestingly, the word Food is the largest word for Creation in Turkey but does not appear in the Turkish language response.

The range of designs and the differences in its response to the primary colours are encouraging in relation to my concerns about a standardisation of design globally and although each student used the same tool (technology) there is a sense of cultural diversity. It is also clear that colour sensibility can vary between countries and cultures and according to age and perhaps designers should be more sensitive to this information. In the meanwhile, the project has created awareness among the students involved that not everyone sees the world in the same way!
This component involved students documenting their journey from home to campus using a series of eight coloured squares. The choice of colour was entirely at the student’s discretion and could be the colour of something they saw or a colour representing an emotion or memory (light students from each campus undertook this task to form each grid comprising sixty-four colours).

Each of the eight students was also asked to repeat the task with a child on their journey from home to school and with an elderly person on a journey they undertook regularly, such as from home to the shops for example. The result was similar colour grids with sixty-four coloured squares from eight children and eight elderly people.

Each country thus produced three large grids of colour, one each from children, students and elderly allowing for a comparison across age groups and countries.
The Australia colours are mostly warm and on the left side of the colour circle, with a concentration on green, yellow, orange and red. Most colours are in the bright, vivid, and dark bands with fewer deep colours, particularly for green, blue, magenta and red.
Turkey
Twenty-four journeys expressed through colour

Turkey has a large number of dark and deep colours in comparison to other countries and this is particularly so for the children. There are a large number of greys and a good number of earth colours for each age group with little yellow overall.

Colour map_all journey colours

- Colour map_all journey colours

children

students

elderly
India has a preference for vivid and dark colours with a strong cluster in the warm quadrant. White appears for each age group although there are relatively few colours overall in the bright and light bands.
Like other countries, the USA has a preference for the left side of the colour circle but with a cluster of dark and deep blue colours. There is also a preference for dark and deep greens.

USA
Twenty-four journeys expressed through colour

Like other countries, the USA has a preference for the left side of the colour circle but with a cluster of dark and deep blue colours. There is also a preference for dark and deep greens.
Twenty-four journeys expressed through colour

South Africa has relatively few deep or black/grey colours and has more blues than any other country. It has the least difference across the age groups, although the bright yellow in the children’s grid is largely absent for the elderly.
Ecuador has a large number of vivid and dark colours with a good number of warm/earth colours overall. Like Turkey, there is relatively little yellow even though the overall colour preference is not as deep.
Germany has very few deep colours and a strong preference for yellow, orange and red, which are vivid and bright in the elderly grid. The children's grid is the most even overall in terms of brightness with few dark/deep and light colours.
The most obvious feature of the colours from China is the minimal amount of blue and the extent to which there is a preference for red/magenta and dark/deep greens. There are also a relatively large number of grey/black colours and a marked difference between the children and the elderly.
This component involved students expressing or communicating a series of concept words through a grid of four colours so that the response from each country could be compared. Whereas the Journey Grid colours primarily reflected the physical environment, the concept words each had an intangible element and resulted from a more considered process, which explored the expression and understanding of concepts in the various cultures. The words were: Creation, Health, Home, Love, Memory, Nature, Pain and Time.
As part of the workshop/teaching process for the project, approximately thirty students in each country were asked to complete a survey listing eight keywords associated with each concept word. The results were converted to word clouds online using Wordle (www.wordle.net). These word clouds developed from a workshop with students and did not form part of the initial project concept. The larger words in the cloud have a more frequent response, and there were approximately 240 responses to each concept word from each campus.
There is an absence of light colours and a cluster of red/orange with some green, possibly as a reference to nature. The USA colours are cyan, magenta, yellow and black referencing the CMYK model used in printing and suggesting creativity in the context of the computer.
The absence of black and grey is the most obvious characteristic of the colour choices for Health and there are a relatively large number of colours in the bright and light bands.
There is a concentration on the bottom left quadrant of the circle with an emphasis on earth colours. There is little blue or green and only five colours in the cold half of the circle.
As might be expected there is a concentration on red and pink and on vivid and bright colours, with four countries using only adjacent colour schemes. There are only five colours in the top half of the circle, which is an unusual configuration.
This is the only colour map in the whole project where cold colours predominate and nearly half the colours are deep or black/grey. The minimal amount of red is also interesting given its prevalence in other colour circles.
Like Love, Nature has a predictable color scheme with a concentration on green and earth colors, suggesting the landscape. In this context the blue might represent sky, including in the China colors even though it was largely absent from the China Journeys.
Pain expressed through colour

This colour scheme is the most concentrated and is also the deepest and darkest as might be expected for Pain. There are no colours in the bright or light bands and only four colours in the vivid band.
The overall colour scheme for Time is very dark with twenty-three of the thirty-two colours being dark, deep or black/grey. There are no colours in the bottom right quadrant, which is the least popular overall for the whole project.
Each student was also asked to explain their colour choice and that of the child and elder through design for print with the only restriction being that the page should be 180mm square (a spread of 360 x 180mm). This component allowed for a survey of design styles from the various countries and a range of designs are included for comparison in the book and in the exhibition.

Although a large number of students participated in the design component, it was not possible to include all the work in the exhibition and this book. The selected designs were chosen to demonstrate the range of approaches/styles from the various countries and many excellent designs were not included.

Students were not shown the project results from other campuses before undertaking their designs and the range of solutions to the same design tasks is interesting.
En el trayecto que recorrí con mi hermana, al mencionarle que observe y elija entre colores que le gusten y objetos ella tuvo más afinidad por la naturaleza y los colores un poco vivos, me menciona que simplemente le gustan sus colores.

On the way I walked with my sister, when I mentioned that observe and choose colors that you like and objects she had more affinity for nature and the colors a little bright, I mentioned that just like their colors.
Leona Feitz

Curious about the application and purpose of colors in various places...
...she's always on the look out for new tones and combinations...

Andreas Lott.
Our house is near the beach. It is the best beach ever! We visit it every day. I love the sand. Taking my feet and the sand is soft makes when you put it up to your ear. The beach makes me happy. Our house is near the beach. It is the best beach ever! We visit the beach on sunny day too, and my mom love the beach too. I love the sand flicking by foot and the sound is soft makes when you put it up to your ear. The beach makes me happy. Our house is near the beach. It is the best beach ever! We visit the beach on sunny day too.
Tamika Scott

Tamika Scott

Chroma256\_Student design\_Australia

Chroma256\_Student design\_Turkey

Dilara Tuncer - Kübra Cenk - Isil Ersoygin - Huzay Fırat - Ezgi Karagöl

CHILD

Tamika Scott

Tamika Scott

Chroma256\_Student design\_Australia

Chroma256\_Student design\_Turkey

Dilara Tuncer - Kübra Cenk - Isil Ersoygin - Huzay Fırat - Ezgi Karagöl

CHILD
Wang Qin
I went on a walk with Aunt Debbie and Kira. We took photos of stuff we liked. I took pictures of flowers. The pumpkin was my favorite.

- Siyie

Kira Dunleavy
Nyari Masanga
Australia

Yesim Uluçay

Chroma256
_Student design_ Turkey

Chroma256
_Student design_ Australia

Merr Manzor

nature
Carlos Paredes

Paula van Huyssteen
Nazile Büsra Yıldız - Eylül Ergin - Serra Kızıltas - Can Demirel - Yesim Uluçay
Health group colour survey

Chrystal van Niekerk

Nazlie Esma Yıldız - Eyül Ergin - Serra Kızıltas - Can Demirel - Yesim Uluçay
Health group colour survey
Rocks beside the road look like a desert.

Sometimes I catch the bus home.
Journey from apartment to the art lab.

Student Ottey

Christina Ottey
La ruta elegida fue desde mi casa hasta el centro comercial. La referencia de los colores elegidos los tomé en base a los juguetes que les gustaron dentro del almacen. Entramos también en un almacén de ropa y les pedí que elijan la ropa que más les gustaba. Pude notar que loscolores seleccionados son colores cálidos y super llamativos, tanto en ropa, materiales y alimentos. Me dijeron que son colores alegres.

**Niño**

Pantone 2405 C  Pantone 362 C  Pantone 225 C  Pantone 356 C

**Child**

The route chosen was from my house to the mall. The reference I took the colors chosen based on the toys they liked within the warehouse. We also enter into a clothing store and asked them to choose the

clothing they liked. I noticed that the selected colors are warm, super bold colors in both clothes and food materials. They said they are bright colors.
Mindful walking is essential! 

Susie Blue