5th Visual Properties Driving Visual Preference workshop (VPDVP)

Thursday June 13th 2019
Friday June 14th 2019

Organised by
Letizia Palumbo (Liverpool Hope University)
Marco Bertamini (University of Liverpool)

Venue:
Conference Centre
Liverpool Hope University Hope Park
Liverpool L16 9JD

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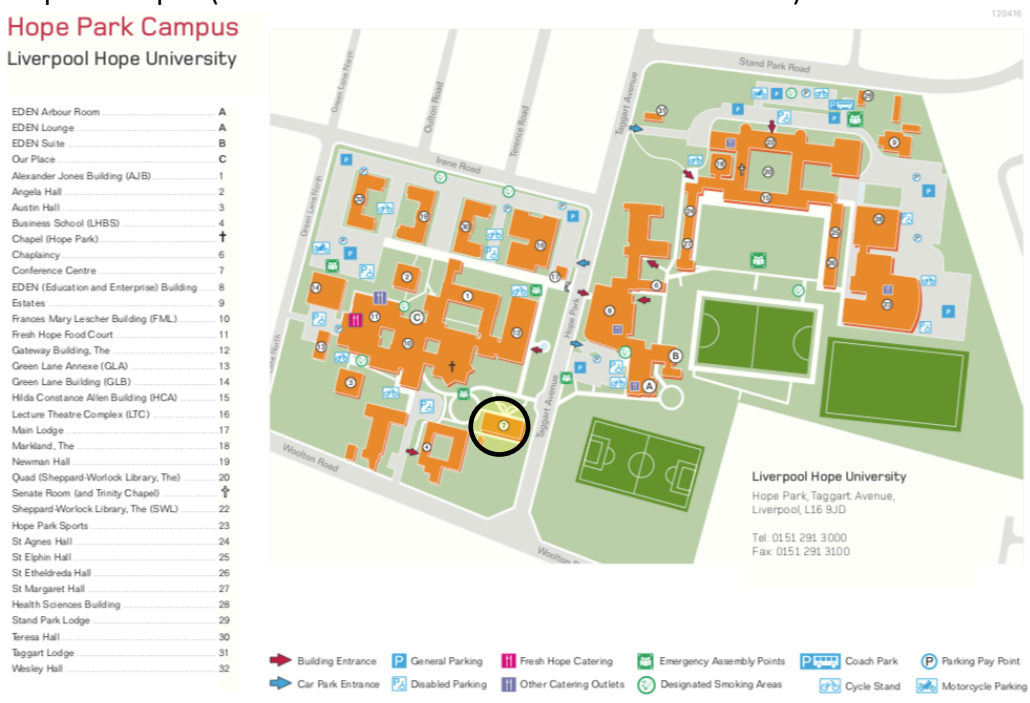
Thursday Programme

13:00-13.10	**Welcome**
13:10-14:10	**Keynote** Aesthetics in the wild: What we can learn from multi-method museum studies (**Johan Wagemans)**
14:10-14:30	Interactions of perceptual fluency and camouflage on object preference **(Jonathan Flavell)**
14:30-14:50	Thirty-six views of X: Variations on a theme reveal individual artist's approaches to composition **(Nicola Bruno)**
14:50-15:10	Individual differences in the rating of flower beauty **(Martin Hůla)**
15:10-15:30	**Discussion over coffee**
15:30-15:50	Assessing visual processing of informative local features with eye movements **(Maria Michela Del Viva)**
15:50-16:10	Pupillary response to paintings of the sun **(Serena Castellotti)**
16:10-16:30	On the musical sublime: the effects of music on the beauty and sublimity of images **(Young-Jin Hur)**
16:30-16:50	The role of faces in 'anchoring' eye movements when viewing representational paintings **(Tobiasz Trawinski)**
16:50-17:10	Seeing a work of art indirectly: When a reproduction is better than an indirect view, and a mirror better than a live monitor **(Marco Bertamini)**
17:10-17:30	**Business meeting**
17:30-18:30	**Lab tours** (optional)
19:00-20:30	**Social dinner**

Map of campus (we are in the Conference Centre - number 7)



Friday Programme

09:10-09:30	Preference and restoration effects of nature and urban images: The roles of image properties and spatial information (**Claudia Menzel**)
09:30-09:50	Interaction between preference for symmetry and curvature with implicit measures and different mindsets (**Enric Munar**)
09:50-10:10	Visual preference for abstract curvature and interior design in individuals with autism (**Letizia Palumbo**)
10:10-10:30	**Discussion over coffee**
10:30-10:50	Do prosopagnosic traits and mental imagery style affect aesthetic preferences? (**Fatima Felisberti)**
10:50-11:10	Expertise and personality traits modulate visual embodiment of aesthetics and emotional experiences (**Beatriz Calvo-Merino)**
11:10-12:10	**Keynote** "People differ ... ? (**Chris McManus)**
12:10-13.20	**Lunch**
13:20-13:40	The relationship between aesthetic appeal and predicted neural processing (**Michelle To**)
13:40-14:00	The effects of 3D spatial geometry on image preferences **(Robert Pepperell**)
14:00-15:00	**Keynote** Embracing an interactionist view of aesthetic preference (**Ed Vessel)**
15:00-15:20	**Discussion over coffee**
15:20-15:40	Extension, animal and human, implies motion (**Stefano Mastandrea**)
15:40-16:00	Aesthetic evaluations of photographs and paintings depicting scenes from nature are associated with individual differences in connectedness to the natural world (**Neil Harrison**)
16:00-16:20	The impact of perceived dynamism on gaze behaviour (**Louis Williams**)
16:20-16:40	Why do we like familiar periodic tables? The role of explicit recollection and eye movements (**Alexis Makin**)
16:40-17:00	**Closing discussion**
17:00	**End**

First Name	Surname	Affiliation
Annalaura	Alifuoco	Liverpool Hope University
Georgina	Bailey	Liverpool Hope University
Ayesha	Batool	University of Nottingham
Alessandra	Batty	Archaeologist
Marco	Bertamini	University of Liverpool
Carole	Bode	Edge Hill University
Nicola	Bruno	University of Parma
Beatriz	Calvo-Merino	City, University of London
David	Canter	University of Liverpool
Serena	Castellotti	University of Florence
Rebecca	Chamberlain	Goldsmiths University
Maria	Del Viva	University of Florence
Nicholas	Donnelly	Liverpool Hope University
Fatima	Felisberti	Kingston University
Jonathan	Flavell	University of York
Piotr	Francuz	Catholic University of Lublin
Lindsey	Freyer	TATE
Tony	Hall	FACT-MMU
Neil	Harrison	Liverpool Hope University
Martin	Hula	Charles University, Prague
Johan	Hulleman	University of Manchester
Young-Jin	Hur	UCL
Alison	Jones	TATE
Elena	Karakashevska	University of Liverpool
Angie	Kemp	Autism Together
Pik	Ki Ho	Trinity College Dublin
Trym	Lindell	University of Oslo
Alexis	Makin	University of Liverpool
Stefano	Mastandrea	University of Roma Tre
Bryony	McKean	University of York
Roger	McKinley	FACT
Chris	McManus	UCL
Eugene	McSorley	University of Reading
Claudia	Menzel	University of Koblenz-Landau
Enric	Munar	University of the Balearic Islands
Letizia	Palumbo	Liverpool Hope University
Galina	Paramei	Liverpool Hope University
Robert	Pepperell	Cardiff Metropolitan University
Giulia	Rampone	University of Liverpool
Ivano	Ras	University of Reading
Nicole	Ruta	Cardiff Metropolitan University
William	Simpson	University of Plymouth
Sandra	Stark	University of Birmingham
Michelle	To	University of Lancaster
Tobiasz	Trawinski	Liverpool Hope University
Ed	Vessel	Max Plank Empirical Aesthetics
Dhanraj	Vishwanath	University of St Andrews
Johan	Wagemans	University of Leuven
Kathrin	Wagner	Liverpool Hope University
Louis	Williams	Goldsmiths University

Organizers

Letizia Palumbo

Liverpool Hope University

Letizia Palumbo graduated in Psychology at Sapienza University in Italy and then obtained her PhD at the University of Hull in the UK. In 2013, she joined Marco Bertamini and his team to work on visual preference. Her research interests span across the areas of visual cognition and emotion.
For more information, please visit the VISION and COGNITION GROUP https://www.hope.ac.uk/psychology/ourresearch/visionandcognition/

Marco Bertamini

University of Liverpool

Marco Bertamini studied psychology at the University of Padova, Italy, and then at the University of Virginia, USA. He moved to Liverpool in 1999, where he established the Visual Perception Laboratory. His interests are broad across visual perception and cognition. For more information visit www.bertamini.org/lab/

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Keynotes

Do people differ?

Chris McManus

University College of London (UCL), UK

Perhaps the most quoted maxim about aesthetics is the Latin phrase, *De gustibus non est disputandum*. The implication is that tastes differ so much between people that there is no point in arguing about them. For experimental aesthetics, however, the impression sometimes seems that the precise opposite applies. Just as with many other areas of psychology, including much of visual perception and cognitive psychology, the emphasis in aesthetics is often primarily on the commonalities, the similarities, across people, on what statistically are *main effects*, rather than exploring the differences between people that are found statistically in variances. This talk will explore when people do differ, and by how much, and when, apparently, people actually are similar in their aesthetics.

Embracing an interactionist view of aesthetic preference

Edward A. Vessel

Max Plank for Empirical Aesthetics, Frankfurt, Germany

What does it mean for a visual property to drive visual preference? We have measured the degree to which different individuals exhibit "shared taste" for a variety of aesthetic domains, and consistently find that the "beholder's share" is more than half of the repeatable variance, and up to 90% for cultural artifacts. These findings, which highlight the importance of internal factors for aesthetic judgments (e.g. semantic associations, familiarity, vividity of imagery, self-relevance), cannot be reconciled with a purely objectivist view of aesthetic experience whereby stimulus properties determine affective outcomes. Who is viewing matters, as do their past experiences, their mood, and their degree of expert knowledge. Additionally, brain imaging (fMRI) of individuals making aesthetic judgments of visual images reveals that there is no simple mapping between visual activity in the human form perception pathway and aesthetic appeal, whereas the default-mode network (DMN), a non-sensory network of brain regions including several midline hubs (aMPFC and PCC), does represent aesthetic appeal in a domain-general manner. Even when one induces externally driven temporal changes in the stimulus (using video of landscapes and dance), moment-to-moment judgments continue to show a surprising degree of individual difference, both in whether people like or dislike specific moments and also in how rapidly people are able to update their aesthetic assessments. Understanding aesthetic experiences therefore requires analysis not just of stimuli, but also of individuals, and of how each persons' unique understanding of the world interacts with aesthetic objects to shape their comprehension and affective responses.

Aesthetics in the wild: What we can learn from multi-method museum studies

Johan Wagemans

University of Leuven, Leuven, Belgium

The overwhelming majority of studies in empirical aesthetics is conducted in the lab with images of art works as stimuli and university students as participants. In contrast, the most intense aesthetic experiences usually occur in an art gallery or museum of fine arts, or when viewing a beautiful scenery in a remote place. We have begun to supplement our work on image aesthetics with "aesthetics in the wild", which is challenging but fun. I will illustrate its main characteristics and potential of this alternative approach with three examples. First, we have conducted a large-scale eye-movement study in which museum visitors could freely look at a computer screen with one of two paintings for 30 sec, while we monitored their gaze. Because of the large sample size, we could examine the role of individual differences (gender, age, expertise) with more power than usual in lab studies. Second, we have designed and run a special exhibit in the Van Abbe museum in Eindhoven with large abstract paintings by Frank Stella, while visitors were wearing eye-tracking glasses. Third, in an ongoing overview exhibition of art work by Pieter Vermeersch in the art museum M in Leuven, we went one step further by combining mobile eye-tracking with position tracking and questionnaires. We are currently still exploring the wealth of data obtained in these three studies. In sum, I would like to encourage more researchers to leave the safe confines of the lab and try more ecological studies in empirical aesthetics, focusing on the aesthetic experiences of art lovers when they interact with real art works in galleries or museums.

Abstracts

Seeing a work of art indirectly: When a reproduction is better than an indirect view, and a mirror better than a live monitor

Bertamini M. [1] and Blakemore C.[2]

[1]University of Liverpool, UK
[2]School of Advanced Study, University of London, UK

The experience of visiting a museum and seeing an original work of art is special. Using hypothetical scenarios, we tested how such experience would be affected by changes in how people are allowed to see a physical artwork. In a first study, participants were asked to imagine that they had travelled to a city to see a painting that they particularly like. They discover that it is impossible to directly see the original painting. Three alternatives are offered: seeing an optical reflection (using a mirror), seeing a video screening (a closed-circuit camera) or seeing a reproduction. In all cases it is made clear that the size, brightness, and resolution will match that of the original. In addition, these options could be within the same room as the original (other side of the room) in the room next door or in a different building. Results show that physical distance did not affect significantly the responses. However, there was an overall preference for seeing a reproduction as opposed to an optical or digital image. Contrary to the idea that the original is always superior to a copy, many people seem to feel that a direct view of a copy is a preferable experience than an indirect view. The second study was simpler and focused directly on the comparison between a mirror and a video camera monitor. Here we highlighted the fact that in the case of the mirror the light reflected originated from the painting. Data were collected in Britain and in China. There was a clear preference for the mirror over the monitor. In both surveys a striking result was the range of opinions, some people would consider any indirect view as pointless, while others found it perfectly acceptable. We discuss the many factors contributing to how people relate to a work of art.

Thirty-six views of X: Variations on a theme reveal individual artist's approaches to composition

Bruno N.

Università di Parma, Italy

A visual artist is working on a picture. The theme of the picture involves an obvious, well-defined key element. Where will the artist position this key element? I call this compositional choice *key element framing*. Is framing of the key element random, or does it follow rules? I propose that a fruitful domain for studying key element framing is found in suitable serial works having a strong thematic homogeneity. What characterizes such series is that they might be regarded as variations on a theme by the same artist, allowing meaningful assessments of random variations while keeping other factors approximately constant. In this work, I report two studies on series originally inspired by 19th century Japanese prints (Hokusai's *Thirty views of Mount Fuji*) and later revisited, in similar form, both in later Japanese works and at the beginnings of the 20th and then 21st centuries in Europe. I call this database of images *Thirty views of X*. Results do not support framing according to "power points" of "power lines" defined by known principles of composition, suggesting that key element framing shows an overall bias for moderate asymmetry, that this bias is modulated by individual and cultural differences, and that there may be an additional effect of print aspect ratio.

Expertise and personality traits modulate visual embodiment of aesthetics and emotional experiences.

Calvo-Merino B., Forster T., Meletaki V., Fanghella M., and Gaigg S.

City University of London, UK

Previous studies have shown that expertise increases visual and emotional sensitivity when perceiving familiar stimuli. For example, professional dancers and musicians are often more sensitive to the emotions expressed in dance and music (e.g. Christensen et al. 2016 for dancers; Schirmer-Mokwa et al. 2015 for musicians). Here we present a series of EEG studies that show how a general embodied response to visual aesthetic or emotional experiences (measured by Somatosensory Evoked Potential -SEP, during a visual aesthetic/emotion task) were modulated by (a) the level of sensorimotor experience of the observer (i.e. dancers vs non-dancers), (b) individual personality traits (measured by questionnaires –TAS Toronto Alexithymia Scale, Beck's Depression Inventory). We calculate an embodiment index by measuring participants' somatosensory-evoked activity by tactually probing the state of SCx during an aesthetic and emotion discrimination tasks while controlling for visual effects (Sel et al., 2014). In the SEPs data, we found significant differences in amplitude and latency of the embodied response between experts and controls (both in the aesthetic and emotion task) between 80-120 ms. Interestingly, we also found significant correlation between individual differences measured in the questioners and the SEPs amplitude of the embodied response. Overall we suggest a general embodiment effect in expertise during visual emotion/aesthetic perception (not driven only by familiar stimuli) and provide evidence for relating neural somatosensory activity and embodiment (independent form carry over visual effects), to subjective measures and personality traits, such as alexithymia and depression.

Pupillary response to paintings of the sun

Castellotti S.[1], Conti M.[1], Feitosa-Santana C.[2,3], and Del Viva M. M.[1]

[1] Department NEUROFARBA, Università degli Studi di Firenze, Italy
[2] Albert Einstein Israelite Hospital, Brazil
[3] Federal University of ABC, Brazil

It is known that, although the intensity of light is the primary determinant of the pupil size, cognitive factors, i.e. cortical visual processing mechanisms, can also affect the pupil diameter. It has been demonstrated that pictures of the sun affect pupil constriction independently of the luminance of the depicted sun and other low-level features suggesting that high-level processing of the image content may also modulate pupil response. Here we tested this hypothesis by measuring pupil response to artistic paintings of the sun, which require an even higher level of interpretation compared to photographs. We also studied colour and context effect by presenting each image in their greyscale and inverted versions. We found that paintings of the sun, although introducing a substantial decrease in light level across the visual field, produced much less pupil dilation compared to paintings depicting diffused-light and moon light scenes, despite having the same mean luminance. These results indicate the involvement of high-level cognitive mechanisms in an allegedly low-level response, supported also by the fact that pupil diameter depended on how subjects interpreted the stimulus. Greyscale and inverted versions of sun images systematically produced bigger dilation, suggesting that colour and context are important factors for triggering this cognitive effect.

Assessing visual processing of informative local features with eye movements.

Del Viva M. M. [1] *and Montagnini A.* [2]

[1] *Università degli Studi di Firenze, Italy*
[2] *Institut de Neurosciences de la Timone CNRS and Aix-Marseille Universitè, France*

Voluntary saccadic eye movements optimize visual analysis through the dynamic sampling of the most informative regions in the scene. By implementing a constrained maximum-entropy model on natural images, we selected a set of local features to be optimal information carriers, as candidate salient features. We measured the discriminability of a compound of these supposedly significant features in comparison to the alternative, random features, in a 2AFC procedure, as a function of their number and contrast. Results show that these features are significantly more prominent than others under fast viewing conditions, suggesting that they get preferential treatment during fast image analysis. We then tested the role of these model-defined informative features for a simple choice-saccade experiment between them and other not- informative features. Our results point to a robust, automatic gaze orientation towards these informative features, in spite of the lack of any clues coming from a global, meaningful structure (contour, line, etc.).

Do prosopagnosic traits and mental imagery style affect aesthetic preferences?

Felisberti F.

Kingston University London, UK

We investigated if aesthetic preferences for paintings and photographs were affected by prosopagnosic traits (i.e. ability to recognize faces) and mental imagery style (i.e. mental representation in the absence of an external input) in the same way as art expertise. To address this question, an online study (N =186) used a multi-dimensional design with the prosopagnosic traits index, the object-spatial imagery and verbal questionnaire, the art expertise questionnaire, and the liking ratings to Picasso's paintings and black and white photographs from assorted artists. The findings showed that prosopagnosic traits were negatively correlated with object and verbal mental imagery style, but contrary to expectations not with the ratings to paintings or photographs. Interestingly, both art expertise and object-based mental imagery were positively correlated with each other and with the ratings for paintings and photographs, but only when people (and by extension faces) were present. The study indicates that aesthetic experiences of neurotypical adults with some types of visual art are not affected by face recognition ability, but are rather modulated by an object-based mental imagery style and level of art expertise.

Interactions of perceptual fluency and camouflage on object preference

Flavell J. C., Tipper S. P., and Over H.

University of York, UK

Humans have highly efficient perceptual systems and processes that rapidly extract information to enable fast and accurate responses. The fluency of these processes is reinforcing, and objects that are perceived more easily are liked more through misattribution of the fluency to the object in question. However, some critical processes are disfluent yet their resolution can be highly reinforcing leading to object liking via a different route. One such example is identification of objects from camouflage. In a series of 5 experiments we explored the relationship between (1) processing fluency and (2) ambiguity resolution from camouflage to object preference. We found that when objects are assessed for "liking", perceptual fluency (arising from contrast and camouflage) dominated the process of preference assessments. However, when objects are assessed for "interest", the disfluent yet reinforcing process of ambiguity resolution overrides the effect of perceptual fluency. In other words, easy-to-perceive objects are liked but hard-to-perceive objects are found interesting. We also show how effects of camouflage can be moderated by manipulating participants' level of engagement with objects through a simple response task. The results have implications for preference and choice in a wide range of contexts by demonstrating the relationship between perceptual fluency, process of resolution, and the critical factor of the form of preference decision.

Aesthetic evaluations of photographs and paintings depicting scenes from nature are associated with individual differences in connectedness to the natural world

Harrison N.

Liverpool Hope University, UK

According to the *Biophilia* hypothesis, humans have an innate affiliation with the natural world. This idea has stimulated a body of research investigating the role of nature related variables in aesthetics. One variable that has so far been relatively overlooked is connectedness to nature - a cognitive and affective sense of connection to the natural world. Here we tested whether this construct is associated with aesthetic evaluations of photographs and paintings of nature. In study 1, participants (N = 82) viewed 14 photographs depicting natural scenes and evaluated them on six aesthetic dimensions. Participants completed the Connectedness to Nature (CN) and Openness to Experience scales. CN positively predicted pleasure ratings and an "aesthetic experience" composite, while controlling for Openness. In study 2, participants (N = 40) viewed representational paintings (12 landscape, 12 interior/still-life), and indicated their aesthetic evaluations (liking, beauty), and familiarity. Participants completed the CN, Openness, and aesthetic expertise scales. Participants were divided into two groups based on a median split of the CN score. Overall, landscape paintings were liked more than non-landscape paintings. Participants in the 'high CN' group liked and found the landscape paintings more beautiful than those in the 'low CN' group, controlling for familiarity, Openness, and aesthetic expertise. There were no differences between groups in liking or beauty for non-landscape paintings. The studies show that aesthetic evaluations of images of nature (photographic and artistic) are related to the viewer's sense of affiliation with the natural world. Theoretical explanations for this relationship are discussed.

Individual differences in the rating of flower beauty

Hůla M. and Flegr J.

Charles University, Prague, Czech Republic

This study follows on our previous research concerning the attractiveness of floral traits for humans. We observed some general preferences, e.g. beautiful flowers were prototypical (radially symmetrical, simple), had sharp contours and blue color. However, we did not examine possible individual differences in the estimation of flower beauty. There is some evidence that preferences for colors or habitats are influenced by age, sex, level of expertise, and other individual factors. These factors might also apply to flower preferences. To examine this issue, we created an online survey in which 1650 adult Czech respondents rated beauty of 52 flower stimuli of diverse shapes and colors, and answered questions concerning their demographics, knowledge of plants, attitude towards plants, and some psychological characteristics. We performed an exploratory factor analysis to reduce the number of questions into several meaningful variables. We created GLM's to compare the relative importance of these variables on general preference and preference for flower colors and shapes. Level of expertise had a positive effect on the beauty rating of almost all determined flower traits; sex did not correlate with the general rating of flower beauty, but women rated typical and round flowers as more beautiful; age had a positive effect on general flower beauty rating; older people liked bilaterally symmetrical and ragged flowers more than younger people; and childhood experience with plants positively correlated with flower beauty. A subsequent study compared the preferences of children (n = 231, mean age = 8 years) and adults. Children had stronger preferences for vivid colors and typical flowers. They also preferred round flowers unlike adults. Our results shed light on how individual differences shape human phytophilia and might be useful for anyone interested in people-plant interaction research.

On the musical sublime: the effects of music on the beauty and sublimity of images

Hur Y.-J., Medeisyte R., and McManus C.

University College London (UCL), UK

Recent studies have measured the sublime and beautiful in visual images, particularly photographs (Ishizu & Zeki, 2014; Hur, Gerger, Leder, & McManus, 2018). The sublime and beautiful are also often discussed in musicology, although there is no empirical work on how these aesthetic evaluations relate to musical experiences. This research examined the aesthetics of music alone and then the influence of music on the aesthetics of images. The first study explored how mode (major key vs. minor key vs. atonal) and tempo (slow vs. fast) related to the sublime and beautiful in 6-second clips of piano music by Bach, Chopin and Schoenberg. The second study explored the relative influence of visual and auditory components on composite stimuli when the music pieces appeared with photographs. For music alone, mode was the predominant predictor, with sublimity predicted by minor keys, whereas beauty was predicted by major keys. In the combined stimuli, aesthetic valuations of both photographs and music clips predicted the overall evaluation. However, the sublimity and beauty of a composite image were influenced about three times as strongly by the visual component as by the musical component. In both conditions, sublimity and beauty were predicted by different sets of variables, suggesting that although sublimity and beauty may be related, they may ultimately operate on separate mechanisms. The results are also discussed in light of individual differences, and will consider whether some of these findings can be predicted by Big Five personality traits, masculinity-femininity, and empathy.

Why do we like familiar periodic tables? The role of explicit recollection and eye movements

Makin A. D. J.[1] *and Poliakoff E.*[2]

[1]*University of Liverpool, UK*
[2]*University of Manchester, UK*

People like neutral stimuli they have seen before. This well-known mere exposure effect could stabilize graphical conventions over time. For example, in chemistry, new periodic table designs have never been adopted, despite arguable conceptual and aesthetic advantages. We examined the role of explicit recollection and eye movements in preference for familiar periodic tables. We presented participants with silhouettes of the periodic table, either in original, non-inverted, or novel inverted orientations. Only 6/24 Psychology students and staff recognized the periodic table during extensive debriefing. However, there was a significant preference for the original, non-inverted orientation. Orientation had a strong effect on ocular scanpaths, which were inverted in the inverted condition. This shows that mere exposure effects are mediated not alone by familiar images, but by familiar sequences of images and eye movements. We think this is an important caveat to understanding the stability of graphic conventions.

Extension, animal and human, implies motion

Mastandrea S. [1] *and Kennedy J. M.* [2]

[1] *Università di Roma Tre, Italy*
[2] *University of Toronto Scarborough, Canada*

Static pictures can imply motion via visible structures e.g. extension – the opening or separation of limbs, as in a horse's legs in different gaits. By hypothesis, the more the legs extend the faster the implied movement. Mastandrea & Kennedy (2018) supported the hypothesis with pictures of horses in standing, walk, trot, gallop, and flying-gallop poses. For art pictures and silhouettes, rated movement increased from standing to flying gallop. Flying gallop has legs extended front and rear, close to parallel to the ground. The extreme leg extension in flying gallop suggests high speed. We report here a study with static photographs of a dancer in which leg extension was varied. Body erect, arms vertical, the dancer was photographed from the front and the side, in jumps ("in air") and feet on the ground. The poses graded from legs vertical to legs horizontal. Observers rated the "movement" suggested by the dancer's poses, and their aesthetic qualities. "Movement" increased as the legs extended. Poses in air had more "movement" than similar poses with feet on the ground. For example, the horizontal static posture on the ground known as "the splits" - maximally extended legs - had lower "movement" than a similar pose in air. Some extensions pictured from the side had more "movement" than similar poses taken from in front. Aesthetic ratings, in general, increased with leg extension for all the different poses, but were higher for "in air". In conclusion, a dancer's leg extension implies motion. The extension is obvious side-on, in-air. In-air poses (jumps) require more energy than similar but static on-ground poses, though these involve considerable tension. Associated with energy, implied motion may be an aesthetic factor for many objects, but, we caution, serenity can be as attractive as furious movement.

Preference and restoration effects of nature and urban images: The roles of image properties and spatial information

Menzel C., Schreine M., and Reese G.

University of Koblenz-Landau, Germany

Viewing nature compared to urban environments is generally preferred and evokes several beneficial effects on human well-being. It is known that nature and urban images differ in several properties, such as colour and spatial frequency of the properties. In a series of experiments, we investigated whether these differences in image properties contribute to the beneficial effects of nature. In the first experiment, we presented photographs of natural and urban environments in either their original, as line drawings, or as phase-randomized versions. The latter lacks the spatial information but retain certain image properties. Viewing of original nature images or their line drawings versions, evoked higher restoration, liking ratio and restorativeness ratings compare to urban environments. This pattern was not found for phase-randomized images, indicating that spatial information is necessary for restoration and preference. Some image properties predict preference and restorativeness ratings but only when environment is not included in the model. In the second study, original and phase-randomized images were presented in three different implicit association tests. These tests had different attribute dimensions: valence, mood, and restoration. Original nature images were associated with positive attributes (i.e., good, positive mood, restoration) and original urban images with negative attributes (i.e., bad, stress). Phase-randomized images were generally associated with negative attributes but for valence these were less strong for nature than urban environments. In the third study, we currently investigate whether restorativeness and preference are mediated by different spatial frequencies. Nature and urban images are presented with either all, only high, or only low spatial frequencies in implicit association tests and explicit ratings. Preliminary data from both measures indicate that spatial frequency content does not affect preference and restorativeness differently. In sum, results show that both for preference and restoration, spatial information is crucial although low-level visual processing seem to play a minor role as well.

Interaction between preference for symmetry and curvature with implicit measures and different mindsets.

Munar E. and Chuquichambi E.

University of The Balearic Islands, Palma, Spain

We propose a contribution to the understanding of the interaction between preference for symmetry and preference for curvature. On the other hand, people use different mental states to complete a task. They are referred as mindsets and these might affects preferences. We aimed to test implicit preference for curvature and symmetry by a revised Stimulus-Response Compatibility task (SRC). This task activated a mindset on symmetry or contour by making participants focus on one of these features. Affective correspondence between stimuli and response cues on compatible and incompatible conditions of correspondence were analysed. The stimuli were meaningless shapes that combined symmetry and contour features: symmetrical/curvy, non-symmetrical/curvy, symmetrical/sharp, and non-symmetrical/sharp. The response cues were schematic faces – that represented happiness and sadness– with positive and negative affective valence. Participants had to match as fast as they could a stimulus with a schematic facial expression. Two blocks were presented, one in which contour dimension had to be evaluated and one in which symmetry dimension had to be evaluated. In each block, participants had two types of tasks: incongruent and congruent. In the congruent task, the target feature, curvature in one block and symmetry in the other, had to be matched with the “happy” face. In the incongruent task, the target features had to be matched with the “sad” face. The aim of the task was to assess the facilitation of the congruency of the stimuli. The four types of stimuli got faster responses in congruent condition than incongruent condition. The effect size was higher in the symmetry dimension than in the contour dimension regardless of the mindset. The effect size in the symmetry dimension (preference for symmetry) was similar in both mindsets. However, the effect size in the contour dimension (preference for curvature) was higher in the symmetry mindset than in the contour mindset.

Visual preference for abstract curvature and interior design in individuals with autism

Palumbo L.[1], Rampone G.[2], Clarke E.[1], Bertamini M.[2], and Vartanian O.[3]

[1]Liverpool Hope University, UK
[2]University of Liverpool, UK
[3]University of Toronto Scarborough, Canada

Liking for smooth curvature, as opposed to angularity, has been documented for a variety of stimuli and with different tasks. This phenomenon has implications for how people interact with their environment and for people's well-being. The current project extended this study to individuals with autism (ASC) to individuate factors that contribute to the development of friendly-design environments. We examined visual preference for curvature in autism (ASC=16) and in matched (for age, gender and IQ) neurotypical individuals (NTD=20). Experiment 1 employed abstract shapes with different contours (angular vs. curved); Experiment 2 employed coloured lines (angular vs. curved) presented through a circular or square aperture. Finally, in Experiment 3 we showed interior design environments varying for Appearance (curvilinear vs. rectilinear), Ceiling height (high vs. low) and Space (enclosed vs. open). Participants produced like/dislike or approach/avoidance responses. Preference for curvature was confirmed with abstract stimuli in both ASC and NTD groups. In contrast, overall participants preferred rectilinear over curvilinear interior designs. Interestingly, preference for curvilinear designs was significantly smaller in the ASC group. Furthermore, preference for rectilinear over curvilinear designs was stronger when presented with low ceiling rooms. In terms of approach responses, we found an Appearance by Space interaction: when presented with open space rooms participants approached more those with rectilinear design than those with curvilinear design. Finally, we also found a Ceiling by Space interaction: when presented with open space rooms, participants approached more those with low ceiling than those with high ceiling. We discuss the role of individual differences and how these dimensions can impact the evaluations of ecologically valid settings.

The effects of 3D spatial geometry on image preferences

Pepperell R., Ruta N., and Burleigh A.

Cardiff Metropolitan University, Cardiff, UK

Linear perspective is the standard method for rendering 3D image geometry. However, our previous work suggests that images created using linear perspective do not accurately represent 3D space, particularly under normal viewing conditions and for wide fields of view. We have shown people prefer images that are created using a non-linear spatial geometry, similar to those developed by artists over many centuries (Burleigh, Pepperell & Ruta, 2018). We have created a new form of 3D renderer that generates non-linear images of 3D space. We will present data to show that people preferred interacting with images created using our method compared to standard linear perspective, and were better in estimating the distance of specific targets. Furthermore, our findings show that people prefer to interact with 3D spaces when they are represented with wide fields of view (>100º) and that this preference increases for wider fields of view (142°) when using our novel method compared to the standard linear perspective method. We will discuss the implications of these findings for our understanding of visual space, and why some depictions of visual space are preferred to others.

The relationship between aesthetic appeal and predicted neural processing

To M. P. S., Sasse L., and Tolhurst D. J.

University of Lancaster, UK

Fechner (1876) proposed that aesthetic judgment is a bottom-up process, derived from basic perceptual features, such as colour and shape. Reber, Schwartz, and Winkielman (2004) suggested preference is correlated with how easily objects are processed and recognised while Reber, Stark and Squire (1998) have also demonstrated that preferred prototypical stimuli trigger less neuronal activity, suggesting that processing fluency is reflected by reduced cortical activation. Our experiment examined whether a computational V1 model that simulates the activity of neurons processing low-level features (To et al., 2010, 2019) could predict aesthetic judgement of 75 original photographs and 75 distorted variants. We asked 15 participants to rate how much they liked the images (Like), and another 16 participants to rate how interesting they found them (Interest). Full-colour images (3.2 deg square) were presented for either 150ms or 5 seconds to compare primary vs. secondary appraisal. For each image, the model estimated the neuronal activity for each chromatic plane (Luminance, Red/Green, and Blue/Yellow), five spatial frequencies (1.25, 2.5, 5, 10 and 20 cycles per degree) and 6 orientations (vertical, 30, 60, horizontal, 120 and 180 deg). We compared participants' ratings with the various model outputs and found that all ratings were negatively correlated with activity corresponding to 20cpd in all images. In addition, the Interest ratings for images presented for 150ms were positively correlated to activity arising from Luminance and R/G planes, 1.25 and 2.5 cpd, and horizontal and vertical orientations. These results will be discussed.

The role of faces in 'anchoring' eye movements when viewing representational paintings

Trawinski T.[1, 2] and Donnelly N.[1]

[1] University of Southampton, UK
[2] Liverpool Hope University, UK

The viewing (henceforth spectatorship) of a painting leads to an aesthetic experience and a representation stored in memory. In this talk we recorded eye movements made to representational paintings by naïve spectators as they viewed paintings that would later be discriminated from foils. There were 100 paintings drawn from 5 different motifs. Eye movements were dominated by fixations to faces but where the probability of fixating a face was related to its orientation. In the first study, we asked participants to make liking judgment to set of portraits. In a second study Chinese and British participants performed the same task but with an additional set of paintings drawn from East Asian art. For both Chinese and British participants, fixations were dominated by those made to faces. Furthermore, the results showed evidence of an eye movement analogue to the Other Race Effect whereby the duration and number of fixations made to faces was influenced by participant group. The results will be discussed in terms of the influence of faces on spectatorship of representational paintings.

The impact of perceived dynamism on gaze behaviour

Williams L.[1], Brinkmann H.[3], McSorle E.[2], and Rosenberg R.[3]

[1] Goldsmiths, University of London, UK
[2] University of Reading, UK
[3] University of Vienna, Austria

When considering the dynamic gestures of an artist and the impact that such movements have on the perceiver, it is important to consider the individual differences of art observers. It has been found that the dynamics of a man-made painting impacts aesthetic ratings due to the observation of the artist's gestures (Sbriscia-Fioretti et al., 2013) where such low-level features of an artwork have been suggested to influence early stages of art viewing (Chatterjee, 2011; Chatterjee & Vartanian, 2014; Tinio, 2014). However, it is unclear how individual perceptions of the dynamic movement within an artwork influences the aesthetic experience. Here we explored this relationship examining both gaze and aesthetic ratings of pleasantness in relation to perceived dynamic movements. In an eye-tracking study, we showed 30 different abstract paintings to 40 participants – 20 novices and 20 experts (art students). We used self-reporting to investigate the perceived dynamism of each painting and its relationship with a) the average number and duration of fixations b) the average velocity, duration, amplitude and curvature area of saccade paths, and c) pleasantness ratings. Despite finding no differences of eye movement behaviour due to expertise, we did find that average saccade velocity, number of fixations, and pleasantness ratings increased with an increase in perceived dynamism ratings. Meanwhile, saccade duration decreased with an increase in perceived dynamism. These results indicate that there is a relationship between individual perceptions of dynamic movement in abstract paintings and the aesthetic experience when considering gaze behaviour and pleasantness ratings.

NOTES