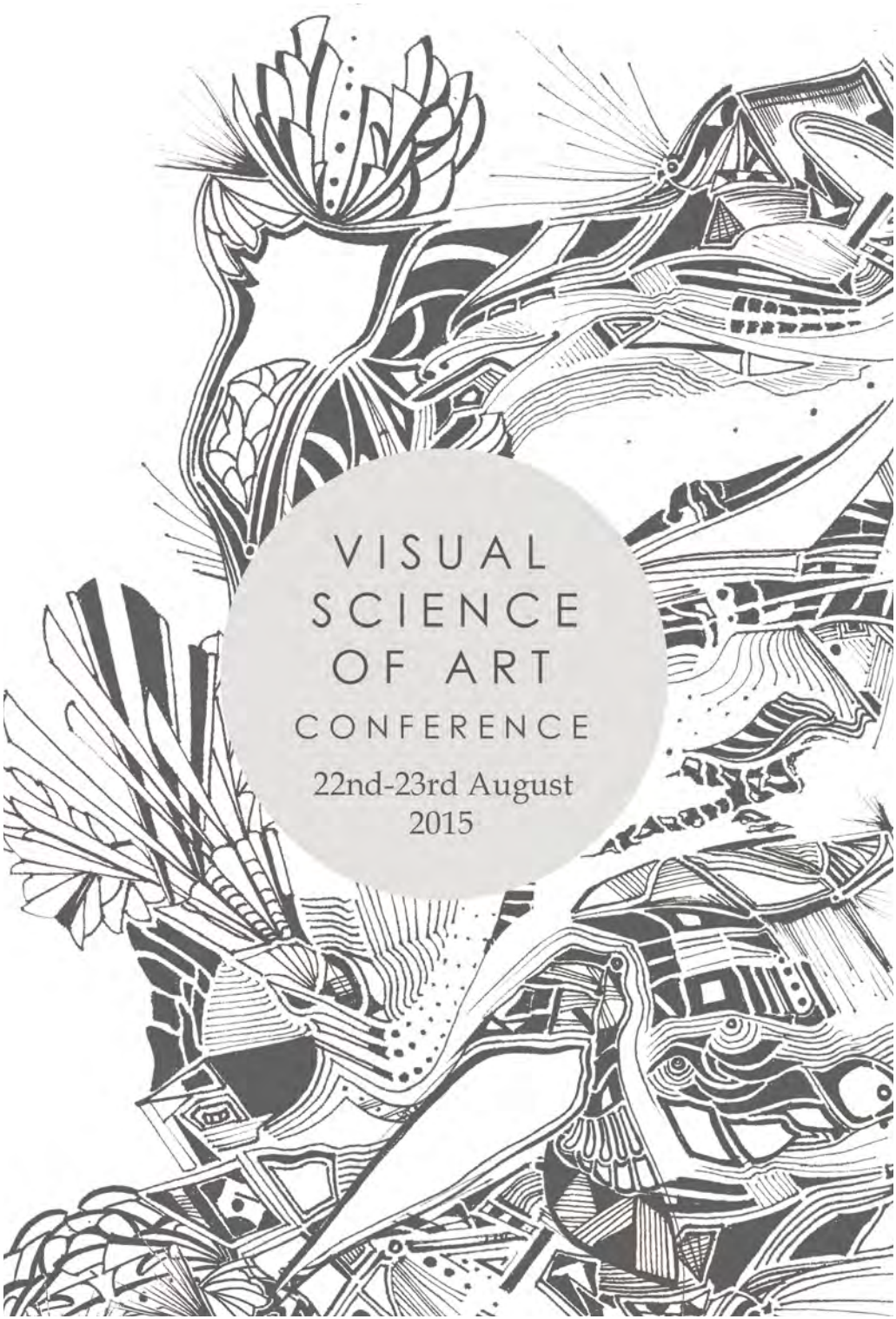
VISUAL
SCIENCE
OF ART
CONFERENCE
22nd-23rd August
2015

Welcome to the Visual Science of Art Conference 2015. We look forward to your attendance and contribution during this event.

There is a growing interest in studying interactions between perception and art. An increasing number of publications and these meetings have encouraged researchers, scholars and artists to gather together as a community that can cooperate, discuss and develop new scientific perspectives.

We hope you enjoy the event and associated activities.

The organizing Committee


Marco Bertamini (Chair)


Kate Bennett


Alexandra Forsythe


Alexis Makin


Letizia Palumbo


Giulia Rampone


Nichola Street

# OPENING EVENT

## Saturday August 22nd

We are very pleased to announce an event open to everybody coming to ECVP and its satellite meetings. This event will take place on Saturday August 22nd at the Everyman Theatre on Hope Street.
www.everymanplayhouse.com
There will be a conference registration desk throughout the afternoon. At 3pm there will be a screening of the BAFTA-nominated documentary, Tim's Vermeer, about the possible use of optical devices by the artist Vermeer (www.theguardian.com/film/2014/jan/19/tims-vermeer-review-mark-kermode), followed by a discussion.

Tim Jenison will be at the event. After the screening he will be joined on the panel by Prof Sir Colin Blakemore, Prof Christopher Tyler, Prof Philip Steadman


http://www.ecvp.org/2015/everyman.html

# SCHEDULE

## Sunday 23rd August 2015

8:30 – Arrival

9:00-11:00- Talk Session One

11:00-11:30- Coffee Break
*(Central Teaching Hub)*

11:30-12:30- Keynote Address
Professor Stephen Palmer

12:30-14:00- Lunch and Poster Session
*(Guild of Students, Mountford Hall)*

14:00-15:30- Talk Session Two

15:30-16:00- Coffee Break
*(Guild of Students, Mountford Hall)*

16:00-17:00- Talk Session Three

17:00- Business meeting

## Session One 9:00-11:00

**9:00 Empirical aesthetics: Fatal problems with both axes?** *Alexis Makin, University of Liverpool, UK*

**9:15 Creativity and Aesthetic experience** *Ivan Stojilovic & Slobodan Markovi, University of Belgrade, Serbia*

**9:30 Artists and illusion,** *Nicholas Wade, University of Dundee*

**9:45 Describing abstract artworks – Terminology and low-level image properties,** *Nathalie Lyssenko & Gregor Hayn-Leichsenring, Institute for Anatomy I, University Hospital Jena, Germany*

**10:00 Mentalizing and aesthetic appreciation: Behavioral and event-related potential analyses** *Susan Beudt & Thomas Jacobsen*, *Experimental Psychology Unit, Helmut Schmidt University / University of the Federal Armed Forces Hamburg, Germany*

**10:15 The artistic Turing test: An investigation into the perception of machine made artwork** *Caitlin Mullin, Rebecca Chamberlain & Johan Wagemans, University of Leuven (KU Leuven), Belgium*

**10:30 The aesthetic appeal of non-easy-on-the-mind artworks: Aesthetic effects of ambiguity, indeterminacy, uncertainty** *Claus-Christian Carbon, University of Bamberg, Germany*

**10:45 Universal beauty versus cultural context: Are they rivals or companions in aesthetic experience?** *Christoph Redies*, *University of Jena School of Medicine, Germany*

## Keynote 11:30-12:30

**Aesthetic Science: An Ecological Approach**

*Stephen E. Palmer, University of California, Berkeley*

## Poster Session & Lunch 12:30-14:00

## Session Two 14:00-15:30

**14:00 Perceptual annotation of art collections: a case study on 1400 faces from the Rijksmuseum** *Maarten Wijntjes, Delft University of Technology, Netherlands*

**14:15 Testing times for cognitive expansionism.** *Andrew Parker, Oxford University, UK*

**14:30 Relating Dancer Motion to Brain Activity Reveals Perceptual Differences in Romantic and Classical Ballet Styles** *Frank Pollick[1], Naree Kim[2], Donald Glowinski[3], Antonio Camurri[4] & Seon Hee Jang[2, 1]University of Glasgow UK, [2]The Republic of Sejong University Korea, [3]University of Geneva Switzerland & [4]University of Genoa Italy.*

**14:45 The perception of beauty and ugliness in the cinema: a pilot study** *Marina Iosifyan*, *Paris Descartes University, France*

**15:00 Cinematic Universality: Do you see what I see?** *Tim Smith, Birkbeck, University of London*

**15:15 How British artists challenged the conventions of linear perspective** *Robert Pepperell, Cardiff School of Art & Design, UK*

## Session Three 16:00-17:00

**16:00 Curvature effect: explicit and implicit preference** *Letizia Palumbo & Marco Bertamini*, *University of Liverpool, UK*

**16:15 Selfie and the city: A world-wide, large, and ecologically valid database reveals a two-pronged side bias in naïve self-portraits** *Nicola Bruno, Federica Protti, Dipartimento di Neuroscienze, University of Parma, Italy*

**16:30 Let's talk about kitsch: Presenting a functional model which links aesthetic appreciation to the dynamics of social motivation and self-determination** *Stefan A.Ortlieb, Fabian Gebauer, Jennifer Ettner Claus-Christian Carbon, University of Bamberg, Germany*

**16:45 Through the Looking Glass: breaking the rules of perspective** *Colin Blakemore[1] & David Hockney[2] 1.School of Advanced Study, University of London, 2. Los Angeles, California*

# SESSION ONE ABSTRACTS
9:00-11:00

## Empirical aesthetics: Fatal problems with both axes?

Alexis Makin
*University of Liverpool*

Empirical aesthetics has adopted some conventions from visual psychophysics: We typically vary an objective property of the stimulus (the X-axis) and measure some subjective response (the Y-axis). Meanwhile, the richest accounts of aesthetic experience emphasize rare and special emotional states, including mindfulness, peak experience and aesthetic rapture. Researchers often cite Kant, who described a 'sense of the sublime'. Unfortunately, such ineffable feelings cannot be practically evoked or measured, and cannot be plotted on our Y-axis. More humble emotions, such as positive valence, are also part of the aesthetic experience. But in practice, it is very difficult to obtain any hot emotional reaction with well-controlled stimuli over repeated trials. Thus we resort to plotting cold evaluations on the Y-axis. Now the X-axis becomes deeply problematic. Real-life aesthetic experiences are produced by gestalts, or wholes, where many dimensions work together (perhaps in some kind of impressive harmony). This means that preferences for individual features alone cannot say anything about attraction to multidimensional objects in art of nature. This 'Gestalt Nightmare' was evident in a simple experiment with just three dimensions: symmetry, color and curvature. I thus propose that the future of scientific aesthetics requires transcending the quasi-psychophysical approach altogether.

## Creativity and Aesthetic experience

Ivan Stojilovic & Slobodan Markovi
*University of Belgrade, Serbia*

The study examined whether creativity is equally important in creating but also in experiencing an artwork i.e. whether a more creative person would have a richer, higher- quality experience of an art. There were 84 participants in the study, students from the University of Belgrade. The participants judged 21 figural, semi-abstract and abstract paintings in two time points on the scales Beautiful, Creative, Pleasant, Interesting and Comprehensible. During the second assessment the participants were divided in two groups: first immediately started judging the presented paintings, while the second (experimental) had to make a collage for 45 minutes before assessing the paintings. Final model shows that the semi-abstract paintings are assessed as the most creative. The greatest influence on the judgement of creativity has the assessment of painting`s interestingness ($b=0.62$, $t(447)=24.25$, $p<.001$), then pleasantness ($b=0.09$, $t(128)=4.70$, $p<.001$) and comprehension ($b=-0.06$, $t(141)=3.26$, $p<.01$). Interaction of time session and groups is also significant ($F(9,279)=2.96$, $p<.01$) – the group that made collages before assessment, judged the paintings as significantly more creative than the control group. The biggest influence on the assessment of a painting`s beauty has the judgement of its pleasantness ($B=0.46$, $t(497)=18.9$, $p<.001$), interestingness ($B=0.34$, $t(127)=23.3$, $p<.001$), comprehension ($B=0.19$, $t(1157)=7.44$, $p<.001$), style of a painting ($F(2,3431)=18.77$, $p<.001$), and the divergent thinking results ($B=0.18$,$t(77)=3.74$, $p<.001$) and perceptual distortion test ($B=0.14$, $t(76)=3.95$, $p<.001$). The results show that doing a creative activity (making a collage) prior to experiencing artworks and divergent thinking influence the judgement of artistic paintings.

## Artists and illusion

Nicholas Wade
*University of Dundee*

We revel in using our eyes, particularly when puzzling over pictures. Since the dawning of depiction, artists have engaged in the multiple modes of manipulating pictorial images to produce illusory worlds on flat surfaces: the objects represented lack the depth and motion of their referents. The history of art can be seen as a struggle to accommodate these missing dimensions. Pictures are not only a source of fascination for artists, who produce them, but also for scientists, who analyse the perceptual effects they induce. Illusions provide the glue to cement the art and science of vision. Painters plumb the art of observation itself whereas scientists peer into the processes of perception. Both visual artists and scientists have produced patterns that perplex our perceptions and present us with puzzles that we are pleased to peruse. These two sides of pictorial representation are displayed as well as presenting novel 'perceptual portraits' of those who have dabbled in the art of illusion. They include Arcimboldo, Boromini, Pozzo, Holbein, van Hoogstraten, Magritte, Dali, Duchamp, Albers, Vasarely, Riley, Yvaral, Pollock, Hockney, Hughes, Escher, Ernst, Reutersvärd, Orosz, Farkas, Tabary, Del-Prete, Fukuda, Kitaoka and Colvin.

## Describing abstract artworks – Terminology and low-level image properties

Nathalie Lyssenko & Gregor Hayn-Leichsenring
*Institute for Anatomy I, University Hospital Jena, Germany*

One of the major challenges in psychological aesthetics is the uncertainty of the terminology used in experiments. There are basically two possibilities to instruct participants: (A) to define for them what is meant by a specific term (e.g., beauty) or (B) to give no instructions and let the participants intuitively decide what terms they want to use. In this study, we used the latter approach and searched for terms that are intuitively used by participants for the description of abstract artworks. Moreover, we studied their correlation with statistical image properties. Participants were asked to describe each of 150 abstract paintings spontaneously using four or more adjectives. We found interactions of structure-describing terms with the statistical image properties. Additionally, emotional terms correlated with color value. After that, we used the ten most frequently used terms to create five different rating scales (liking, interestingness, structure, complexity, friendliness). Another group of participants evaluated the same abstract paintings according to these rating scales. We found significant correlations among the scales (e.g., complex with liking and interesting) and between term scales and low-level image properties (e.g., complex/interesting with self-similarity and complexity). In conclusion, we found an interaction between subjectively used terms and objective image properties.

## Mentalizing and aesthetic appreciation: Behavioral and event-related potential analyses

Susan Beudt & Thomas Jacobsen
*Experimental Psychology Unit, Helmut Schmidt University / University of the Federal Armed Forces Hamburg, Germany*

We used event-related brain potentials to explore the impact of mental perspective taking on processes of aesthetic appreciation of visual art. Participants (nonexperts) were first presented with information about the life and attitudes of a fictitious artist. Subsequently, they were cued trial-wise to make an aesthetic judgment regarding an image depicting a piece of abstract art either from their own perspective or from the imagined perspective of the fictitious artist (i.e., theory of mind condition). Positive self-referential judgments were made more quickly and negative self-referential judgments were made more slowly than the corresponding judgments from the imagined perspective. Event-related potential analyses revealed significant differences between the two tasks both within the preparation period (i.e., during the cue-stimulus interval) and within the stimulus presentation period. For the theory of mind condition we observed a relative centro-parietal negativity during the preparation period (700 – 330 ms preceding picture onset) and a relative centro-parietal positivity during the stimulus presentation period (700 – 1100 ms after stimulus onset). These findings suggest that different subprocesses are involved in aesthetic appreciation and judgment of visual abstract art from one's own vs. from another person's perspective.

## The artistic Turing test: An investigation into the perception of machine made artwork

Caitlin Mullin, Rebecca Chamberlain & Johan Wagemans
*University of Leuven (KU Leuven), Belgium*

The ultimate test of success for a machine-artist would be to convince the viewer that the art was human generated. We conducted a discrimination test, analogous to the Turing test, in which subjects were shown artworks generated by both machine-artists and human-artists and asked to distinguish between them as well as give an aesthetic impression. Results demonstrated that participants could successfully discriminate the provenance of the artwork, although this effect is driven largely by a greater ability to detect human made art. When examining the aesthetic judgments, participants showed no significant aesthetic preference for the true origins of the work, but a general bias against machine made art was revealed with a significant preference for artworks believed to be human made. An investigation into the statistical properties of the artworks from these two sources revealed that participants may have relied on the distribution of oriented edges within the piece to assign it to the correct category.

While this bias against machine-made art may not be surprising, we asked whether this stemmed from a lack of understanding or interaction with machine-artists' process. A follow up study was conducted where we tested participants at an exhibit of drawing robots to determine whether greater understanding would produce a more positive response. Results are discussed within the context of artistic value, aesthetic judgments, and embodiment of machine-artists.

## The aesthetic appeal of non-easy-on-the-mind artworks: Aesthetic effects of ambiguity, indeterminacy, uncertainty

Claus-Christian Carbon
*University of Bamberg, Germany*

Research in aesthetics often suggests that aesthetic appeal mainly emerges from a easiness of processing—with one word, something which is processed easily due to its prototypicality, fluency, familiarity, simplicity etc. is also liked best. This rather art-naïve but often to be found cognitive perspective on aesthetic phenomena fully neglects how complex typical reactions to artworks are in fact, especially if we analyze art perception in a cultural context in which the following processes make artworks really interesting and also appealing on a very general level: deep elaboration, the ongoing attempt to create meaning, partly dissolving some mysteries and associating the artwork with represented knowledge. With a variety of current research attempts we want to make clear how strong aesthetic experiences can be when artworks in fact are non-easy-on-the-mind due to ambiguity, indeterminacy and uncertainty. Additionally we invite one artist to demonstrate the specific appeal that such a kind of artworks has on the art-interested beholder.

## Universal beauty versus cultural context: Are they rivals or companions in aesthetic experience?

Christoph Redies
*University of Jena School of Medicine, Germany*

Two seemingly opposing views predominate in current theories of aesthetic perception. Contextual theories postulate that aesthetic experience depends on cultural and individual factors such as familiarity, expert knowledge or the art-historical context (e.g., Leder et al., 2004; Bullot & Reber, 2012). Universalist theories claim that aesthetic experience is based on a "significant form" of beautiful objects (Bell, 1914), which can be universally recognized by humans across cultures (Redies, 2007). Here, I propose a unifying model that accounts for both aspects of aesthetic experience. The model distinguishes between two parallel and independent modes of processing. (1) Perceptual processing based on the intrinsic form of an artwork. If the artwork is beautiful, a beauty-responsive mechanism is activated in the brain. This bottom-up mechanism is universal amongst humans. (2) Cognitive processing based on explicit information and cultural context. It is variable between individuals. An aesthetic experience is induced if processing along both streams is favorable, i.e. with activation of the beauty-responsive mechanism in the perceptual stream ("aesthetics of perception") and mastering in the cognitive stream ("aesthetics of cognition"). I speculate that this combinatorial mechanism of perceptual/cognitive processing plays a role in group-specific social bonding between the members of a (cultural) group.

KEYNOTE ADDRESS

11:30-12:30

## Aesthetic Science: An Ecological Approach

Stephen E. Palmer
*University of California, Berkeley*

I suggest that aesthetic science be centrally defined as the descriptive and theoretical study of liking/disliking responses and how other variables systematically influence them (e.g., contextual fit, knowledge, ambiguity, novelty/familiarity, culture, emotion). I also suggest distinguishing aesthetic science from a science of art, because aesthetics is not restricted to human artifacts, as art is. I then consider two aspects of aesthetic response – human preference for color and spatial composition – and argue for the importance of ecological variables arising from relations between observers and objects in their environment. I first review evidence supporting the "ecological valence theory" of color preference that people tend to like/dislike colors to the extent that they like/dislike all of the things strongly associated with those colors (Palmer & Schloss, 2010). I then review evidence supporting the "affordance space hypothesis" of spatial composition, that people tend to like compositions in which the object's affordance space (i.e., the volume of space surrounding the object within which salient ecological interactions occur) "fits best" at the center of the picture's frame or subframe (Sammartino & Palmer, 2012). Both sets of findings suggest a re-evaluation of Kant's proposal that aesthetic response is "disinterested" and not centrally connected with purposive real-world behavior.

# SESSION TWO ABSTRACTS
14:00-15:30

## Perceptual annotation of art collections: a case study on 1400 faces from the Rijksmuseum

*Maarten Wijntjes*
Delft University of Technology, Netherlands

We investigated the potential value of perceptual annotation of art collections. We used the data from the Rijksmuseum (Netherlands), which offers its entire collection online including metadata accessible via an API. In this case study, we were interested in the depiction of faces. We used a face detection algorithm that selected 1400 faces from a total of 4190 paintings that span the period 1430-1951. We first manually classified the posture and gaze direction in five categories. A clear distinction was observed between leftward and rightward posture when analyzed historically: a leftward posture dominates the period 1550-1770 while a rightward posture dominates the period 1770-1880. Secondly, we annotated highlight locations in the eyes. Highlights are unambiguously annotatable and can be used as light direction indicators. An overwhelming amount of highlights was positioned left (84%), which is in line with previous research on illumination direction (Sun and Perona, 1998). Again, historical analysis revealed additional insights: an interaction was found between posture and highlight positions over time. Thirdly, we annotated 'chiaroscuro curves': manually drawn lines that sample illuminated and shaded areas of the skin. Although interesting observations were made on an individual level, the analysis did not reveal temporal trends. This study shows that perceptual annotation of art opens up new possibilities to compare many artworks simultaneously and reveal how artistic conventions have evolved historically.

## Testing times for cognitive expansionism.

*Andrew Parker*
Oxford University, UK

This year the Dulwich Picture Gallery in London embarked upon a mass psychology experiment. Among 150 pictures on display, one was a fake, prepared in oil paints in a Chinese workshop, dedicated to offering reproductions of Western art. The visitors to the gallery were invited to spot the fake. This naturalistic experiment takes us to the heart of how we view, appreciate and value art. There are two strands within the cognitive neuroscience of art appreciation that both need critically examination. First, the fields of art history and criticism have a number of methodologies of their own with their own self-supporting validity. Second, cognitive neuroscience seeks to re-examine many human activities, which are traditionally the domain of other disciplines, with a single consistent methodology, usually mechanistic and reductionist in its instincts, In the case of art appreciation, some cognitive neuroscientists have employed explanatory frameworks that are firmly rejected in art criticism, such as the idea of a single dimension of aesthetic beauty or a simple polarized scale of "attraction versus repulsion" in responding to artworks. In this talk, I shall be concerned with the progress towards the cognitive neuroscience of art appreciation and critically examine the structure of the assumptions.

## Relating Dancer Motion to Brain Activity Reveals Perceptual Differences in Romantic and Classical Ballet Styles

Frank Pollick[1], Naree Kim[2], Donald Glowinski[3], Antonio Camurri[4] & Seon Hee Jang[2]
*[1] University of Glasgow UK, [2] The Republic of Sejong University Korea, [3] University of Geneva Switzerland & [4] University of Genoa Italy.*

An established question in art is what perceptual properties define the style of an artwork. We explored this question in the context of Romantic and Classical ballet by relating novel measurements of dance motion to brain activity. Our hypothesis was that if the relationship between dance motion and brain activity of visual areas differed between prototypical Romantic and Classical ballet excerpts then this would support the idea that these stylistic differences involve perceptual encoding of the dance rather than simply high-level cognitive interpretation. To test this we used fMRI to scan 18 novice observers while they viewed the same dancer perform excerpts of Romantic (Giselle) and Classical (Swan Lake) ballet. Our measure of motion was based on the deformation of the silhouette of the dancer; motion of the dancer was related to brain activity by finding regions where dance motion was correlated with brain activity. Results showed a brain region common to both Romantic and Classical dance styles that is known to be involved in motion processing and body representation. However, the Classical style elicited additional regions of correlation extending towards parts of the temporal cortex of the brain known to represent visual form. These results confirm our hypothesis that perceptual differences exist between the two styles and further explanations that Classical ballet emphasises visual form.

## The perception of beauty and ugliness in the cinema: a pilot study

Marina Iosifyan
*Paris Descartes University, France*

Most experimental studies in psychology of art are concentrated on the aesthetic of beauty, while the aesthetic of ugliness remains obscure. Present study investigates the cinema-tactile associations and the emotional response to beauty and ugliness in the cinema. 17 participants evaluated seven materials (fur, wood, et al.) on 13 semantic differential scales. Participants next watched 4 preselected film fragments by Kim Ki Duk, Greenway, Visconti and Kar Wai varied in perception (beauty-ugliness). They were then asked to rank the above materials in order "most – least" consistent with the viewed fragments while feeling thermometer measured the emotional response. Finally respondents were asked to express their aesthetic judgment of viewed fragments using a scale 0-100. Experimental evidence demonstrates strong correlations between the emotional/cognitive associations of the fragments and the association of the materials chosen to these fragments ($0.79 < r < 0.99$). These results support not only the emotion mediation hypothesis (Palmer et al., 2013) for the cinema but reveal cognitive mediation mechanism. We also assessed the differences in perception of ugliness and beauty. The emotional response to the beauty was lower on average than that for ugliness ($F(1, 66) = 7.18$, $p = .009$). No such effect on the aesthetic judgment was identified ($F(1, 66) = 1.52$, $p = .221$). Beauty and ugliness are both aesthetically significant; however ugliness is more emotion provocative.

## Cinematic Universality: Do you see what I see?

Tim Smith
*Birkbeck, University of London*

The way we perceive the visual world is influenced by individual differences (endogenous factors) and demands of the stimulus (exogenous factors). Traditional investigations into scene perception typically use static representations of naturalistic scenes and report large spatiotemporal variations in where individuals fixate and attend. Such idiosyncrasies are anathema to anybody who is designing a visual experience to ensure universal comprehension such as a filmmaker. However, filmmakers believe they have at their disposal a suite of compositional heuristics –the Continuity Rules- that maximise attentional synchrony, i.e. the clustering of gaze across viewers. I will present a short series of computational, eye movement and behavioural studies testing the continuity rules and showing how manipulation of exogenous features can increase attentional synchrony but that this may be sometimes overridden by endogenous factors such as viewing task, narrative comprehension and age (e.g. infants vs. adults). These studies will illustrate how gaze is much more at the mercy of artists when watching moving images compared to static visual media but that this does not guarantee that all viewers perceive movies in the same way.

## How British artists challenged the conventions of linear perspective

Robert Pepperell
*Cardiff School of Art & Design, UK*

Despite several hundred years of investigation there is still no agreement about how visual space is structured or how it should be accurately represented. For much of that time linear perspective has been the dominant method of representing visual space, with its numerous supporters arguing it is the only correct method. However, artists have consistently pointed to linear perspective's deficiencies, such as its inability to deal with wide-angle views, and several have proposed alternatives ways of capturing the appearance of the visual world. One of these, W. G. Herdman, was a Liverpudlian who painted views of his home city during the 19th century using a radical new form of projection that captured the full span of the visual field. Since then a number of significant British artists have experimented with alternative ways of depicting visual experience. In doing so they have recorded visual features that have never, or hardly ever, been recorded before, including double vision, perceptual curvature, peripheral indistinctness, and the body seen from its own point of view. In this paper I will outline some of the novel ways British artists challenged deep-seated conventions about how to represent visual experience.

# SESSION THREE ABSTRACTS
16:00-17:00

## Curvature effect: explicit and implicit preference

Letizia Palumbo & Marco Bertamini
*University of Liverpool, UK*

Shapes with smooth curvature are preferred over angular shapes in several contexts, including architecture and design. It is unclear whether such a preference derives from a negative response to angles, as they might signal a threat (Bar & Neta, 2006), or whether curvature is preferred because it is visually pleasant (cf. William Hogarth). In Experiment 1 irregular polygons were liked less than polygons with smoothed vertices. Polygons were perceived as more complex than the curved versions, however there was no correlation between complexity and preference. In Experiment 2 a set of colored lines (angular vs. curved vs. straight) were presented within a frame that represented an aperture. Curved lines (parabola) were preferred over either angular or straight lines. Experiment 3 employed the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998). Observers implicitly associated curved and angular shapes with positive and negative words respectively. Finally, in Experiment 4 the Manikin task (De Houwer, Crombez, Baeyens, & Hermans, 2001) confirmed an approach reaction to curved shapes (smoothed polygons) but did not confirm an avoidance response for angular shapes (polygons). Taken together these experiments suggest that curvature is per se visually appealing. The nature of such a preference needs further investigation.

## Selfie and the city: A world-wide, large, and ecologically valid database reveals a two-pronged side bias in naïve self-portraits

Nicola Bruno & Federica Protti
*Dipartimento di Neuroscienze, University of Parma, Italy*

Self-portraits are more likely to show the artist's right than left cheek. This phenomenon may have a psychobiological basis: Self-portraitists often copy their subject from mirrors and, if they prefer to present their left cheek (more expressive due to right-lateralization of emotions) to the mirror, this would result in a right-cheek bias in the painting. We tested this hypothesis using SelfieCity (3200 selfies posted on Instagram from December 4 through 12, 2013 from New York, Sao Paulo, Berlin, Moskow, and Bangkok), which includes two selfie-taking styles: a "standard" (photograph of selfie-taker) and a "mirror" (photograph of mirror reflection of selfie-taker) style. We show that the first style reveals a left cheek bias, whereas the second reveals a right cheek bias. Thus side biases observed in a world-wide, large, and ecologically valid database of naïve self-portraits provide strong support for a role of psychobiological factors in the artistic composition of self-portraits.

## Let's talk about kitsch: Presenting a functional model which links aesthetic appreciation to the dynamics of social motivation and self-determination

Stefan A.Ortlieb, Fabian Gebauer, Jennifer Ettner Claus-Christian Carbon
*University of Bamberg, Germany*

In 20th century art criticism the term "kitsch" has been used to contrast "high art"—i.e. unique and groundbreaking artistic achievements—with overly simplistic and consoling commodities of popular culture (Greenberg, 1936; Kulka, 1996). This elitist distinction raises an interesting question: Why is kitsch so popular? Norman (2004) claims that we do not value keepsakes because they are particularly beautiful, but because they cheer us up on a rainy day. Does kitsch help us to cope with uncertainty and negative emotions? If this is the case, we expect appreciation of kitsch to be dynamically related to feelings of security and self-determination: Whenever we feel vulnerable and dependent we should become more susceptible to its familiar, clear-cut, benign, and thus reassuring qualities. Based on these considerations we present a functional model which relates preference for novelty, complexity, ambiguity, and fluency to the basic needs of social motivation (Bischof, 1989) and self-determination (Deci & Ryan, 2000). Besides, we present results from an experimental study (N=135) showing that decorative objects are rated less kitschy after in sensu exposure to existential threats. Our model also allows for an integration of other recent findings on art perception (Landau et al. 2006) and design evaluation (Carbon et al., 2013). Finally, it offers new research perspectives for empirical aesthetics in the postmodern era by taking phenomena of popular aesthetics into consideration.

## Through the Looking Glass: breaking the rules of perspective

Colin Blakemore
*School of Advanced Study, University of London*
David Hockney
*Los Angeles, California*

Leon Battista Alberti (*De Pictura,* 1435) codified the empirical observations of Filipo Brunelleschi in the formal geometry of perspective projection. Further elaborated by generations of artists and theoreticians, the laws of perspective governed Western art for more than 400 years (Kemp, M, *The Science of Art* 1990). However, difficulties dogged perspective from the start. Even Mantegna, the master of foreshortening, disobeyed the rules of perspective in rendering the relative size of bits of the body, because the illusion of depth in a painting is never perfect enough to trigger complete size scaling. Also, the geometry of planar perspective is 'correct' only for a single, fixed viewpoint. But we have two eyes, and we move around as we view real scenes and pictures. Leonardo pointed out that the appearance of the relative sizes of objects is better represented by projection on a curved surface ('prospettiva naturale'). Saccadic shifts of fixation move the high-resolution fovea from point to point and the resulting experience approximates a sequence of local 'snapshots', projected on an imaginary screen orthogonal to the line of sight. Hockney has recently exhibited seamless photomontages, each fusing more than 100 individual photographs taken from different viewing points, each with its own vanishing point (*Painting and Photography,* 2015, Annely Juda Fine Art, London). The compelling three-dimensionality of these images might arise from the way that they simulate normal vision.

# POSTERS

**Naturally biased associations between music and poetry. A step into ideasthesia**
Liliana Albertazzi, Luisa Canal, Fulvio Ferrari, Iacopo Hachen, Rocco Micciolo & Sebastiano Sitta
*University of Trento, Italy*

We present part of a wider study we are conducting on natural associations in the general population between a series of classical musical selections and a series of classical poetic strophes. Differently from other studies in the field of cross-modality, the association is tested between complex auditory stimuli and the semantic tenor of poetry. Our hypothesis was that the semantics of the different strophes were associated with certain musical selections. The stimuli were music clips of the duration of 60 sec each and poetic quatrains. The experiment was conducted in two phases, using the Osgood semantic differential on a bipolar rating scale of 10 adjectives, expressing dynamic, emotional, tactile, auditory and light perceptual connotations. Participants were first asked to rate each couple of antonyms for each of the musical selections, and then for each of the poetic strophes. Results show some significant correlations between the semantics of some strophes and the semantics of some musical selections.

**Art expertise in construing meaning of representational and abstract artworks.**
Megan Snellock1, David Bimler2 & Galina Paramei1, *1Liverpool Hope University & 2New Zealand Massey University*

We examined the role of art expertise in construing artwork meaning. Stimulus set consisted of representational (N=12) and abstract (N=12) paintings from 1900-1930. Thirty Arts students (experts) and 34 Psychology students (non-experts) rated the paintings on six 7-point bipolar scales: Boring-Interesting; Ugly-Beautiful; Annoying-Pleasing; Uninformative-Informative; Cool-Warm; Naïve-Sophisticated. Factor analysis was applied while exploring components underlying the scales and the paintings. Outcomes showed that ratings on five 'evaluative' scales were highly correlated (apart from 'Cool-Warm') and clustered for experts vs. non-experts. For the whole cohort, a two-factor solution was obtained, with the dominant factor making a distinction between representational and abstract paintings (Augustin & Leder, 2006; O'Hare, 1976) and capturing most of the differences between Arts and Psychology students. The 2nd, smaller factor, Cool-Warm, is the description of the paintings' palettes and distinguishes dull or blue-dominated paintings from those with vibrant red and orange. Pairwise comparisons of the two groups' ratings did not differ for representational artworks, apart from non-experts finding them more 'Interesting'. For abstract paintings, however, experts' ratings were higher in 'Beauty', 'Information' and 'Sophistication'. The findings indicate cognitive mastering of nonrepresentational artwork meaning by experts who seemingly perceive beauty in association with interestingness and sophistication (Biaggio & Supplee, 1983).

**The depiction of visual space in Canaletto's Venetian vedute**
George Mather, *University of Lincoln*

Canaletto's vedute seem almost photographic in their depictions of Venice, so much so that he has long been rumoured to have used a camera obscura as an aid to photographic accuracy. Venice is largely unchanged from the period in which Canaletto worked, so it is possible to visit many of the locations depicted in his vedute and compare a photographic image of the scene against Canaletto's depiction of it. Results reveal that very few paintings show evidence consistent with the use of a camera obscura. However contrary to the use of optical aids, many of Canaletto's vedute show significant distortions in the shape, proportion and relative size of elements in the scenes depicted, perhaps intended to manipulate the viewer's perception of the scene. Several viewpoints were sometimes combined in a single painting to create a so-called 'multi-perspective' image (Franke et al., 2008, ACM Transactions MCCA, 4, 1-13). Many campi were enlarged significantly in apparent width and/or depth, in order to magnify the sense of space. The proportions, placement and relative sizes of buildings were altered in a way that is

consistent with deliberate enlargement of the central motif of the work (Pepperell & Haertel, 2014, Perception, 43, 395-416).

**Perception of local shape**

Johan Wagemans1, Andrea van Doorn2 & Jan Koenderink1, *1University of Leuven (KU Leuven) & 2Utrecht University*

Formally, "local" shape" implies second order structure. A complete taxonomy involves three parameters, namely orientation, magnitude, and "shape proper". Orientation appears as accidental, and magnitude ("Casorati curvature") as a mere quantity, whereas shape as a quality is described by a single parameter, the "shape index". Shape is a quale. Although the shape index is a continuous scale, it can be divided into three qualitatively different regions: convexities, saddles and concavities, mutually separated by ridges and ruts. Observers immediately recognize these, much like primary hues. Can they also use the continuous scale? In an experiment observers rated the shape index and the Casorati curvature of curved patches shown as computer graphics movie sequences. Observers use the full shape index scale and can simultaneously rate the Casorati curvature. Apparently they have a much finer sensitivity to local surface shape than the mere taxonomy based on curvature polarities (cap, ridge, saddle, rut, cup). We report discriminability in the shape quality and magnitude domains.

**Observational visual depiction involves interplays of proximal and distal modes of seeing**

Leon Lou, *Grand Valley State University*

How does visual perception in observational depiction (drawing and painting) differ from everyday non-artistic visual perception? Implied in Gombrich's (1960) schemata theory is the assumption that artists see no differently except they allocate their attention to the elements and features in the scene in such a way that allows them to simulate distal objects better in a 2-dimensional medium. In contrast, the "innocent eye hypothesis" (Ruskin, 1857) assumes that observational depiction is contingent on seeing the view-dependent proximal aspects of the to-be-depicted. Inspired by professional artists' working experience, I propose that an adequate theory of observational drawing must include the interplays between the proximal and the distal modes of seeing. The benefits of a dual-mode account of seeing in observational depiction include the possibility of 1) explaining the apparent effectiveness of Betty Edwards'(1979) "right brain based" approach to teaching drawing despite of the failure in empirical studies to find a consistent relationship between the drawing accuracy and the perceptual constancy errors, 2) explaining how artists' strategies of working on 2-d or 3-d elements in different phases of depiction affect the appearance of their art, and 3) explaining the effects of both within-mode and between-mode perceptual learning separately.

**Panel paintings versus peepshows**

Jan Koenderink1, Andrea van Doorn2, Baingio Pinna3 & Robert Pepperell4, *1 University of Leuven (KU Leuven), 2 Utrecht University, 3University of Sassari & 4Cardiff Metropolitan University*

Linear perspective is based on peep-show presentation, whereas the majority of pictures are enjoyed in "panel-view". In panel-view the observer is free to move, and the picture is most often reduced in angular size. Perhaps surprisingly, art museums rarely (or never?) mark the spot from which a work should be viewed. Typically people view pictures of their holiday scenes on postcard-size prints or on their smartphones. How does this ever make sense? Apparently most pictures are not experienced as "windows" on a virtual world – the Gibsonean interpretation – at all. Photographs offer planar renderings of the optical array (or "viewing sphere") at the moment of exposure. We consider the formal properties of such maps in relation to viewing methods. Linear perspective is the unique map in the true Gibsonean sense. Here the only freedom that the observer has is monocular eye movement. We investigate how translations of the vantage point may be substituted for this rotation group, thus changing the viewing mode from peephole to panel viewing.

**Observer presence & varieties of perspective**

Andrea van Doorn1, Jan Koenderink2, Baingio Pinna3 & Robert Pepperell4, *1Utrecht University, 2University of Leuven (KU Leuven), 3University of Sassari & 4Cardiff Metropolitan University*

Apart from classical linear perspective, various alternatives have been proposed in the arts. Examples are Guido Hauck's semi-curvilinear perspective or Albert Flocon's system. In Hauck's rendering the verticals and horizontals are rendered straight, but in general straight edges are rendered curved. (Be warned that Hauck's "horizontals" are not the shortest routes, thus they are not geodesics!) In Flocon's rendering all generic straight edges are rendered curved, including generic verticals and horizontals. Of course, linear perspective is unique in rendering all straight edges as straight, this is its main claim to fame. However, linear perspective requires peep-hole viewing, whereas other renderings are suitable for panel-viewing from any distance. All these various renderings evoke mutually quite distinct spatial impressions. Informally, it appears that there exist strong idiosyncratic preferences. In an experiment we had observers grade renderings with respect to the feeling of observer "presence", or "immersion". We identify groups of observers with mutually distinct preferences. The largest group strongly prefers Hauck's rendering, with Flocon's as a second. A much smaller group prefers linear perspective throughout.

**Visual Preference for Curvature and Art Paintings**

Javier Vañó-Viñuales1, Robert Pepperell2, Guido B. Corradi1, Gerardo Gómez-Puerto1 & Enric Munar1 *1University of the Balearic Islands & 2University of Wales Institute Cardiff,*

The visual preference for curvature is a human phenomenon that has been found on numerous studies. After the success of Bar and Neta (2006) on finding the preference for curvature using sharp-angled and curved versions of the same object, our research group replicated those results using the same stimuli but with a forced choice task in a approach-avoidance framework. With this new task, the preference for curvature was also found in short exposure times: 40 and 80 milliseconds. Next we decided to apply the same paradigm but using art paintings. Pairs of similar abstract art images –a curved version and a sharp-angled one- were created. We used both color and black and white paintings. Only a weak effect was found in the color pairs with 40 ms exposure time. After these results we have revised the paradigm: (a) modifying some edges in sharp-angled paintings to have a more analogous set of curved images, and (b) using a Likert scale with the aim to simulate art appreciation. The new results are promising …

**Are there differences between the observations of paintings and photographs?**

Marianne E. Venderbosch, Andrea J. van Doorn, Jan J. Koenderink & Susan F. Te Pas *Helmholtz Institute, Utrecht University, Netherlands*

We explored how nine monchrome images of the same model were perceived by a large group of people. The images enclosed three categories: three paintings after model, three paintings after photograph and three photos. The stimuli were presented one at a time in a cubic light tent placed on a table in front of the observer. While watching the stimulus in the tent, the observer had to answer 24 questions. The questions were related to the topics: relief, depth, interaction between light and material and empathic awareness. We found that there are differences in perception between the paintings after model, paintings after photo and the photographs. We also found an influence of the ground colour (white, gray or black). In total 266 students of three different locations, psychology and geology students from Utrecht University, art students from the University of the Arts in Utrecht and industrial design students from the Technical University in Delft participated in the experiment. There were no differences between the three participating groups of students. Cluster analysis revealed that the questions could be clustered in two categories: one consisting of more tangible, the other one consisting of more nontangible aspects of the images.

**'The Curves of Life': Generating naturalistic, biologically interesting curves for testing drawing ability, visual memory and visual perception using Fourier synthesis**

Chris McManus1 , Rebecca Chamberlain2, Howard Riley3, Qona Rankin4 & Nicola Brunswick5
*1UCL, 2University of Leuven (KU Leuven), 3Swansea School of Art, 4Royal College of Art & 5Middlesex University*

Tests of visual memory mostly use intact or fragmented photographs, geometrically regular stimuli varying by colour and location, or complex geometric objects such as the Rey-Osterrieth figure. However many such tests can be verbally labelled. Our interest is in the visual memory of art students when drawing from life (the human nude), such objects having no straight lines but many curves of great subtlety and meaning. We therefore needed a set of novel, complicated curves which were not easy to label verbally, and could be varied subtly and continuously to assess perceptual thresholds and visual memory.

We generated curves by Fourier synthesis, using predefined harmonics. Log amplitude of harmonics was linearly related to log frequency, making the curves fractal-like. Phases were set at random, resulting in an almost infinite set of possible curves. Although 'complex' in everyday language, our curves are mathematically 'simple', the line never crossing itself, that being checked for in the generating Matlab program. Our poster will show: exemplars of the curves; curves drawn by art students in direct vision and from memory; and variants of the curves, where the phase of a single harmonic varies through 360 degrees, for testing perception and memory. We believe such 'Complex Fractal Fourier Curves' are not only useful for studying drawing, but also are a useful tool for studying visual perception and visual memory.

**Eye movements, aesthetic preference and drawing**

Louis Williams, Eugene McSorley & Rachel McCloy, *University of Reading*

Forming an aesthetic judgment is a continuous process and examining the pattern of eye movements can be used to uncover this process. Using this approach it has been found that people spend longer and make more fixations towards stimuli they aesthetically prefer. It remains unclear to what extent there is a relationship between the aesthetic experience and the activities involved in the creative (drawing) process. Here we examine this relationship to understand whether the patterns in eye movements for aesthetic preference are consistent when free-viewing and when a task involves a drawing decision. Furthermore, we investigate if eye movements are similar for images rated highly for drawing preference. Aesthetic ratings were taken for geometric shapes (either before or after the main experiment). These were presented two at a time and participants were asked to either free-view them or make a drawing preference between them. It was found that participants looked more and for longer at the images they aesthetically prefer. Whilst making drawing decisions fixation corresponds with drawing choice, aesthetic preference is also considered during this task suggesting that there are common processes involved in aesthetic preference and production choice. A second experiment examined the preferences of experts and found a similar pattern of results; however it is apparent that drawing preference is a better predictor of eye movements for experts compared to novice artists.

**Towards an empirically based definition of piano keyboard touch: expressive body movements and key-motion measurements**

Eleonora Kojucharov1&2 & Antonio Rodà3, *1 University of Ghet Belgium, 2 University of Paris 8 France & 3University of Padova*

The concept of piano touch is generally described by pedagogues through abstract adjectives and blurred imaginative definitions, sometimes even confusing it with timbre. Moving towards an acknowledged scientific touch definition, resting on MIDI-technologies allowing key-control features specific measurements, this research aims at investigating the touch/timbre relationship by empirically defining: to what extent (1) key-velocity, tempo and articulation and (2) arms/hands movements vary as a function of different types of touch, and (3) how arms/hands movements may influence the resulting tones in terms of key-velocity, timing and

articulation. Through questionnaires 19 pianists provided 209 piano-touch quality descriptors; the 5 most used were selected by semantic proximity. 5 Pianists recorded, for each descriptor, 4 different musical excerpts. Audio-video/MIDI recordings were carried out. Pianists' answers allowed a timbre/touch conceptual classification into 5 semantic categories. The quantitative analysis of pianists' performances showed significant relations between key-velocity/articulation and touch, whereas a qualitative analysis of the video-recordings revealed that performers use particular movement shapes – i.e. wrist rotation or upward hand movements – consistently related to touch changes (although individual differences exists between them), thus providing elements for a deeper view on piano-performance expressive processes, benefiting both a scientific description of touch and its pedagogical applications.

**Do aesthetic stimuli attract visual spatial attention?**
Bettina Rolke & Elisabeth Hein, *University of Tübingen, Germany*

We used a probe dot task to investigate the question whether aesthetic stimuli attract visual spatial attention. In this task, two pictures of chairs were presented to the left and the right of fixation, followed by a dot at one of the chair's position. Participants decided at which side the dot was presented. To estimate the impact of the aesthetic value of the chairs, we paired either highly aesthetic or less aesthetic pictures with neutral ones. Participants reacted faster when the dot was presented at the position of the aesthetic chair than at the position of the neutral one. This "congruency" effect was absent for less aesthetic chairs. This result suggests that aesthetic stimuli capture attention. Additionally, participants had to perform a recognition memory task, in which they were asked to decide whether a chair had been presented before or not. Here, highly aesthetic chairs were more accurately recognized than neutral or less aesthetic ones. Both results are in line with the "fluency theory of aesthetic experience" (e.g., Reber, Winkielman, & Schwarz, 1998), which proposes a cognitive processing benefit for aesthetic stimuli. Furthermore, our results indicate that attention plays an important role in processing the aesthetic value of stimuli.

**Subjective experience of nudes in paintings**
Slobodan Markovic & Natasa Radosavljevic, *University of Belgrade, Serbia*

The purpose of the present study was to specify the underlying dimensions of subjective experience of the representation of female nudes in paintings. In the preliminary study 1 a set of seventy representative descriptors of subjective experience of nudes was selected. In the preliminary study 2 a set of twenty-one paintings of female nudes was selected. In the main study twenty participants judged the paintings on a check-list of 137 descriptors. Using the 'stringing-out' method a unique matrix of judgments was created. In the factor analysis (principal component method plus Promax rotation) four main dimensions were obtained: Beauty (most saturated scales: beautiful, tender, soft, harmonious, etc.), Erotica (erotic, lustful, passionate, etc.), Pornography (pornographic, shameless, imposing, etc.) and Bizarreness (bizarre, grotesque, nasty, etc.). Promax rotation revealed low-to-moderate positive and negative factor inter-correlations: Beauty-Erotica (.152), Beauty-Pornography (-.199), Beauty-Bizarreness (-.329), Erotica-Pornography (.157), Erotica-Bizarreness (-.287) and Pornography-Bizarreness (-.077). According to these correlations, dimensions can be arranged in the following order: Beauty-Erotica-Pornography-Bizarreness. These results suggest that artistic representation of the nude female body may induce different kinds of experiences, from pure aesthetic experience ('disinterested beauty') through experience of more or less explicit sexuality to experience of complete bizarreness.

**Expression beyond representation: An experimental study of the expressive contribution of lines in painting**

Jane Boddy1 & M.W.A. Wijntjes2, *1University of Vienna, Austria & 2Delft University of Technology, Netherlands*

Besides a narrative function, artworks often contain expressive value. Sad, melancholy, joyful, energetic and tranquil are examples of evaluative terms that are used to describe expressive values. In most paintings, the expression is mediated by representation (i.e. a crying face). However, in the course of the nineteenth century, a popular idea originated that artists are able to control the expressive value of their works by using particular types of lines. Since then it has been shown that abstract lines can successfully communicate expressive content (Takahashi 1995). In works of visual art lines are often used for expressive purposes, while simultaneously representing objects from reality.

In our research, we are interested in understanding the expressive contribution of lines in painting. We first conduct an experiment in which we ask observers to rate the expressive content of a set of reproduced images of European painting. After evaluating the overall expressive values, we are interested in the contribution of the line structure. We first explore whether naive observers are able to indicate areas that contain specific expressive line structures, and to what extent observers' judgments agree. Lastly, we present isolated areas to assess the expressive interaction between the local line structures and the global scene.

**Vertex recognition and the deficiencies of linear perspective in art**

James Geary, *University of Kent, UK*

The development of linear perspective provided Renaissance artists with a means to produce lifelike three-dimensional depictions of objects. There are times, however, when artists fail to produce solid, three-dimensional depictions of objects despite using linear perspective correctly. In this paper I will use Irving Biederman's psychological theory of Recognition-by-Components to explain one of the major deficiencies of linear perspective, and furthermore to propose a solution. I will show how Recognition-by-Components theory explains why the depiction of the vertices of an object is required, in addition to linear perspective, for three-dimensional depictions to be successful. The paper will begin with an explanation of the deficiencies of linear perspective, using a painting by Leonardo da Vinci as an example. It will continue with an outline of Biederman's Recognition-by-Components theory, including Biederman's classification system for vertices. The paper will conclude with an explanation of how Recognition-by-Components theory can be applied to art, including an example of how Hieronymus Bosch's depictions of three-dimensional objects could have been improved with an understanding of Biederman's theory.

**On the relationship between determinacy and art appreciation across different episodic contexts**

Claudia Muth, Marius Raab & Claus-Christian Carbon, *University of Bamberg, Germany*

We appreciate stimuli which defy easy recognition but still offer detectability of patterns—faces within random blots (Muth & Carbon, 2013) but also fragmented objects within Cubist artworks (Muth, Pepperell, & Carbon, 2013). To test the stability of the relationship between determinacy and aesthetic appreciation across different episodic contexts, we let N=58 volunteers evaluate an artistic movie continuously on determinacy, ambiguity, or liking via the Continuous Evaluation Procedure (CEP; Muth, Raab & Carbon, 2015). The movie consisted of five episodes revealing Gestalts with increasing or, in a second between-participants condition, decreasing determinacy. In the increasing-determinacy group, determinacy was generally rated higher and showed better predictive quality for liking than in the decreasing-determinacy group. It can be assumed that when the movie started with low determinacy of Gestalt unexpectedly strong increases in determinacy had a bigger effect on liking than in the condition that started with high determinacy. We also revealed that other features change the effect of determinacy on appreciation: for some parts of the movie, liking was strongly influenced by the material's

ambiguity and contrast (calculated according to Tamura et al., 1978) but not by its determinacy. This makes clear that determinacy is an important but not an ultimate predictor for art appreciation—the resulting pattern calls for considering the episodic context as well as a multidimensional framework when examining effects of aesthetic appreciation.

**The modal figural completion: a powerful principle of object formation**
Katia Deiana1, Jan Koenderink2, Andrea van Doorn2 & Baingio Pinna3, *1University of Sassari, 2University of Leuven, & 3University of Sassari*

This work explores phenomenologically the problem of modal figural completion (see Pinna, 2013). This perceptual problem is related to the amodal completion (Michotte, 1951), which occurs when an object, partially occluded behind another object, appears amodally completed. The term 'amodal' refers to the experience of completeness of shapes partially occluded although these shapes are not actually seen. Differently, in the modal figural completion, the term "modal" implies the actual and spontaneous completion of a visual object seen only partially. The modal figural completion was studied with subjects of different ages (from 4 to 30) through four different experimental tasks: free descriptions, pictorial reproduction, completion of contours representing human forms seen from different perspectives and photograph of 3D human models. The results demonstrated the saliency of the modal figural completion clearly related to the fact that we usually see pieces or single parts of objects, although we do not perceive them as such. Rather, we always perceive complete and entire objects even when we 'see' only single portions of them.

**The aesthetic value of multi-modal semantic gaps**
Marius Hans Raab, Claudia Muth & Claus-Christian Carbon, *University of Bamberg, Germany*

A chair covered with nails (Uecker, 1963); a clown massacring children (King, 1986); a somber swordfight to the death accompanied by cheerful Flamenco-Blues disco music (Tarantino, 2003): The combination of conflicting perceptions—within a given sensory modality as well as between modalities—is a common technique in art and entertainment. To assess if such a mismatch has an effect on aesthetic experience beyond mere irritation, we asked participants to read a thrilling short story. During this task, we a) played suspenseful background music (congruent), or b) played airy and joyful background music (incongruent), or c) played no music at all (control). Both types of music amplified the subjective experience with regard to suspense (pre vs. post task). In the incongruent condition, however, the highest suspense ratings and the highest subjective increase in fear (measured with the STADI; Laux et al., 2013) were reported. We hypothesize that such incongruences remove well-known topoi from the automatism of perception (as proposed for art itself by Shklovsky, 1917). The mismatch requires perception to fall back to prima facie evaluation in an attempt to generate sense. Our findings suggest that this goes along with intensified emotions assisting deeper elaboration—a prerequisite of true perception of art.

**The D-Scope®: Where absence forms structural essence**
Carol Macgillivray, *Goldsmiths, UK*

According to dictionary definitions, cinematic ontology requires an 'image system' which we take to mean a recording lens for creating an image and a screen for reshowing that image. The D-Scope® does not deal in images. It deals in real and concrete objects appearing to move in an ecological environment. The way we see these objects, and perceive them in apparent motion is ultimately the substance of the D-Scope®. This paper aims to distinguish between 'moving image' and 'apparent movement' by using the D-Scope® as an investigative tool. It is a tool that does not rely on the intervening lens of a camera or the screen for creating animation. In the D-Scope® an 'image' can be constructed with no indexical relationship to the perceived world or it can in fact be a reified part of the outside world: Thus real/unreal loses its defining edge and objects that appear stable and that act according to natural laws can transform into the unnatural. Materiality and solid relationships may dismember and escape into immaterial

relationships: artworks call up both transcendent and immanent planes of aesthetic experience: impressions and apperceptions that invoke the intensity of the present moment combined with the ineffable. Here an image is no longer 'a representation of the external form of a person or thing in art' but just is.

**On kitsch and kič: A cross-cultural comparison of kitsch-concepts based on the Bamberg Repository of Contemporary Kitsch (BaRoCK)**

Uwe C. Fischer1, Ivan Stojilovic2, Jennifer A. Ettner1, Claus-Christian Carbon1 & Stefan A. Ortlieb1 *1University of Bamberg & 2University of Belgrade*

The German word "kitsch" is commonly used in Serbian ("kič") as well as in many other languages—but does it mean the same? We addressed this question in a cross-cultural rating study based on 208 images of decorative and devotional objects from the Bamberg Repository of Contemporary Kitsch (BaRoCK): 24 undergraduate students from Serbia (n=12) and Germany (n=12) rated these stimuli in terms of familiarity, determinacy, arousal, perceived threat, kitschiness, and liking. In addition, art expertise, ambiguity tolerance and basic value orientation were assessed. In both samples kitschiness and liking were negatively correlated. Apart from the German sample, kitsch and threat were positively associated among participants from Serbia. A multivariate analysis controlling for age and gender revealed that in general ratings for kitsch and liking did not differ between cultures. Average ratings for familiarity and determinacy were higher in the Serbian sample. However, these differences result from several culture-specific items and do not reflect systematic pattern. A multilevel regression analysis showed that liking or kitsch judgments were independent from nationality. In both cultures liking was positively related with arousing, non-threatening and familiar items, whereas kitsch-ratings were inversely related to arousal and familiarity. Generally, stimuli were rated less kitschy by participants who valued stimulation, tradition and security. In sum, there was no structural difference in kitsch-concepts between both cultures indicating that kitsch is a rather culture-independent phenomenon.

**Angular size differences of selected and depicted scenes in observational painting**

Bilge Sayim, Johan Wagemans & Naoki Kogo, *University of Leuven (KU Leuven), Belgium*

In observational painting, artists 'realistically' depict perceived scenes and objects on a canvas. To accurately reproduce what is observed, visual angles in selected scenes are mapped to corresponding angles on the canvas, ideally in an undistorted projection that retains spatial relations. To match observed angular sizes, artists can either select scenes that match the angular canvas size, or adjust angular size differences between the observed scene and the canvas during the painting processes. Here, we investigated the relation between angular sizes of selected and depicted scenes. Art students painted scenes, in a public park and from a building with panoramic view, without constraints in regard to the selected scene and the size of the canvas. We measured the visual angles of the selected scenes and paintings from the viewing position of each participant. We found that in both settings, the angular size of painted scenes was on average larger than that of the observed scenes. Participants did not select matching angular sizes but adjusted for (or discarded) size differences during the painting process. We discuss our results in regard to spatial vision, in particular distortions of visual space, and expertise in painting.

**How the art photos already shot change our visual perception & how the visual perception changes the photos to be shot?**

Kazim Hilmi Or, *Private Office. Eye Surgeon, Turkey*

The photographic art changes our visual perception because of the shooting techniques, which can bring details to photos, which are not available in "normal" visual perception. Beside of these effects, the photos shot changes our visual perception and our visual perception changes the photos which are to be shot. These effects will be shown at example photos and discussed according to human psychology, eye and brain physiology and visual perception

**Dynamic configurations influence aesthetic preference**
Damien Wright & Marco Bertamini, *University of Liverpool, UK*

There is a rich literature of research investigating preference for abstract stimuli and art. For example, reflection symmetry is preferred to random patterns (Makin, Pecchinenda & Bertamini, 2012; Jacobsen & Hofel, 2002). However, these studies have only considered preference to static stimuli. Dynamic stimuli can be just as powerful in producing an emotional response such as in the form of motion pictures and kinetic art. Despite this very little research has been conducted to examine how this stimulus property influences aesthetic preference. We conducted a series of experiments to begin this exploration. Participants provided explicit preference ratings for highly salient symmetrical and random configurations. Each element of the configuration had local rotation along with the whole pattern having a global transformation (expansion, rotation, shear or translation). The length of time that each of the configurations were presented for was gradually reduced across the experiments. Our results demonstrate that there was a consistent preference for symmetrical configurations over random ones and that dynamic configurations were preferred to stimuli that had no motion. For symmetrical configurations, expansion was the preferred dynamic transformation whilst shear was the least. We conclude that symmetry and motion are both salient aspects that can impact on the aesthetic preference for visual stimuli.

**Cleaning up peripheral clutter: No crowding in paintings of peripherally viewed images**
Tilde Van Uytven1, Erik Myin2 & Bilge Sayim3 ,*1Royal Academy of Fine Arts Antwerp, 2 University of Antwerp & 3 University of Leuven*

A strong limit of peripheral vision is crowding – the inability to identify objects in clutter that are easily identified in isolation. We presented a professional artist with cluttered images in the periphery. The task was to paint as accurately as possible how an image appeared, i.e., to minimize differences between the image viewed peripherally and the painting viewed centrally. Eye tracking and gaze contingent presentation ensured that the images were only viewed in the periphery. The resulting paintings differed strongly from the presented images. There was a reduction of spatial detail with eccentricity due to crowding and diminishing accuracy in the periphery. Next, we digitized the initial paintings and presented them at the same peripheral location as the original images. The task was to paint the presented stimuli (the initial paintings). Comparing the resulting, secondary paintings with the initial paintings showed that there were virtually no differences. Our results show that the initial paintings only contained spatial details that were discernible in the periphery, and that they were only cluttered to an extent that did not yield crowding. We discuss our findings in regard to appearance changes in crowding and peripheral phenomenology

**Role of eccentricity on evaluation of abstract symmetry**
Giulia Rampone, Marco Bertamini & Noreen O'Sullivan, *University of Liverpool, UK*

Preference for visual symmetry is strong, and in part it may derive from ease of processing. As sensitivity to symmetry drops rapidly with eccentricity, one expects rating to follow the same trend. We explored this by manipulating eccentricity. A grey circle (radius ~ 12deg) was presented on a monitor. At the beginning of each trial, participants chose a fixation point within the circle. An abstract pattern (radius ~ 3deg), either symmetrical or random, flashed for 200ms on a random location within the circle. Therefore, distance between fixation and center of the pattern was not set a priori. Preference was rated on a 9-point scale. Multilevel linear modeling was performed on reaction times and preference ratings. Surprisingly the decrease in reaction times with eccentricity was not significant. However, eccentricity was a predictor of decreased preference for symmetric patterns, but not for random patterns. Was this effect due to misclassification of symmetry with increasing eccentricity? A second experiment was performed in which a group of participants saw only symmetry and another group saw only random patterns. Again, eccentricity had a negative effect on preference formation for symmetry but not

for random. This study suggests an important role of eccentricity in preference formation for symmetry.

**The emergence of the multidimensionality of visual complexity**
Manuela Marin & Helmut Leder, *University of Vienna, Austria*

The multidimensionality of visual complexity is a well-documented phenomenon in the literature. Visual complexity may refer to the number and variety of elements, their disorganization and symmetry (Nadal et al., 2010). However, little is known about how and when this multidimensionality emerges in the perception of visual stimuli. We thus explored the time course of visual complexity perception in two experiments by varying the presentation duration. Stimuli comprised 96 environmental scenes (IAPS pictures) and 96 representational paintings (Marin & Leder, 2013), matched for semantic and emotional contents, and were presented for 1 or 5 s. In total, 109 females rated the perceived number of objects, their disorganization and the differentiation between a figure-ground vs. complex scene composition on 7-point ratings scales. In the 1-s condition, average ratings of the number of objects and disorganization were nearly identical in both picture sets. However, in the 5-s condition the multidimensionality of visual complexity emerged, as indicated by differences in mean ratings of the number of objects and disorganization. In the 5-s condition, both pictures sets were perceived as more organized. These results have clear implications for perceptual and cognitive theories in which complexity plays a role, especially in theories of aesthetic experiences.

**Right and Left in Portraits**
Elena Nikitina, *Russian Academy of Sciences, Russian Federation*

The reviews of portraits painted by famous Western artists from the fifteenth to the twentieth centuries showed that the majority of portraits showed the left profile of the sitter. Several convincing explanations of this fact are proposed: some of them are related to the preferences of the artist (Latto, 1996), some to the customer's requirements and some to the basic features of perception. In this research we tested two hypotheses: (1) The most convenient position of a sitter is different for right and left-handed artists. (2) The direction of male portraits sometimes can be connected with the desire of the customer to demonstrate his awards and orders. We examined 653 portraits by Russian artists from 18th to 20th century. There was no significant difference between directions of all faces (left – 51%, right – 49%). But we found that only for V. Borovikovsky (left-handed) and I. Repin (ambidexter) most of the female sitters looked right. Comparison of face direction of 379 male portraits from our stimuli set (left – 47%, right – 53%) with the direction of 326 portraits depicting the heroes of the Patriotic war with Napoleon (from the Gallery of 1812, State Ermitage) (left – 53%, right – 47%) may be an argument in favour of Hypothesis 2.

**Material change by colour remixing in Dutch still lifes**
Zarko Milojevic1, Sylvia Pont2, Karl Gegenfurtner1 & Maarten Wijntjes2 *1Justus Liebig University, Germany & 2Delft University of Technology, Netherland*

Dutch Golden Agestill life painters were famous for their incredibly realistic depiction of materials. To do so, painters use various visual cues, such as texture, specular highlights orcolour. We investigated how much information is carried solely by colouring, and whether color changes can lead to changes in material appearance. We used still lifepaintings from the Rijksmuseum collection. We selected and segmented objects depicting various materials(wood, porcelain, tin etc.)and recoloured the cutout objects using an optimal transport algorithm (Rabin, Peyre, Delon&Bernot, 2011). Eight objects were used as targets and 13 objects as sources, resulting in 104 stimuli. Observers were asked to categorize the material, colour, and finishing, and to rate the confidence of their choices. Many objects' material appearance changed according to the source's colouring even though shape, texture and spatial characteristics remained the same. However, in some cases objects that had the same colouring source were classified in different colour categories, e.g. an object was called greenish or yellowish,

depending on the perceived material. Thus, results show that the colour distribution is indeed a key, but not the only ingredient for material perception.

**Hypersparse responses to abstract artworks in a model of primary visual cortex**
Paul Hibbard1 & Louise O'Hare2, *1University of Essex, UK & 2University of Lincoln, UK*

Zeki (1999) argued that abstract artists such as Mondrian and Malevich were searching for the fundamental 'building blocks' of images. If these building blocks reflect the basis functions with which the visual system encodes information, we predict that their paintings would produce sparse, highly efficient responses in the visual cortex (Redies, 2007). To test this hypothesis, we simulated the response of a neural population to a variety of paintings and other images, using a model of the primary visual cortex (Hibbard and O'Hare, 2015). We calculated the response to (i) abstract artworks by Malevich and Mondrian (ii) impressionist paintings by Monet (iii) hyperrealist paintings by Denis Peterson (iv) natural images and (v) uncomfortable images, such as periodic gratings. We calculated the kurtosis of the population responses as a measure of population sparseness. We found that the impressionist and hyperrealist paintings produced population responses that were similar in sparseness to natural images. Abstract paintings produced responses that were significantly more sparse than natural images, and uncomfortable images produced responses that were significantly less sparse. These results support the view that abstract paintings by artists such as Mondrian and Malevich are 'optimised' for the way in which visual information is encoded in the primary visual cortex.

**Shall we listen to figurative or to abstract music? On the categorization of music using pictorial concepts.**
Rossana Actis-Grosso & Daniele Zavagno, *University of Milano-Bicocca, Italy*

It has been shown that classic music is a better fit for figurative artworks than jazz, which most tend to associate to abstract art. However the boundaries that separate music styles and pictorial styles are rather fuzzy. We wanted to investigate such boundaries and also the possibility of classifying music using the pictorial concepts "abstract" and "figurative". We therefore conducted an experiment divided into two parts. In Part 1 participants are asked to: i) categorize 30 paintings into abstract or figurative (10 paintings are clearly figurative, 10 are clearly abstract, and 10 can be classified either way); 2) express an aesthetic judgment on a 7 point Likert scale. In Part 2, participants listened to 40 musical excerpts (20 classical, 20 jazz) lasting 15 secs each and the task was to the same as in Part 1. Categorization results for Part 1 show that the terms "abstract" and "figurative" assume subjective meanings related to the ability in recognizing the painting's content. Categorization results for Part 2 show that most classic music is categorized as "figurative" whilst most jazz as "abstract", with some noticeable exceptions that suggest the possibility of extending such concepts also to music.

**Volume of Precuneus Predicts Overall Aesthetic Appreciation of Abstract Art**
Xiaoxiong Lin1, Lingyan Wang1, Ce Mo2 & Yan Bao1, *1Department of Psychology Peking University, China & 2 Peking-Tsinghua Life Science Center,Peking University, China*

Previous neuroesthetic studies mainly focus on examining brain activation patterns involved in viewing visual art. The present study aims to find out whether the structural feature of human brain is correlated to the aesthetic appreciation of visual art. Different from naturalistic and surrealistic art, abstract art is of special interest since it is dominated by formal aspects rather than by semantic content. We hypothesize that the appreciation of abstract art might show a positive correlation with the volume of certain brain regions, which may indicates the ability to perceive formal aspects of art. Twenty-one subjects' T1 structural images were scanned, followed by a behavioral measurement in which each subject was asked to rate the aesthetic aspect of 25 abstract paintings on 7-point scale. All of the paintings are art works of famous artists, which are assumed to carry good properties of formal aspects, but are unfamiliar to the subjects. A whole-brain voxel-based morphometry of grey matter was conducted. Results show that the grey matter volume of precuneus in both sides is positively correlated with the mean

aesthetic appreciation score, which means that subject with larger precuneus tends to appreciate more of abstract paintings. No correlations between other brain areas and aesthetic scores are observed. These results seem to suggest that the volume of precuneus predict to what extent a person might appreciate abstract art.

**Comparison of Image Complexity Reduction Methods in a Contrast Based Aesthetic Adjustment Task**

Tandra Ghose1, Yannik T. H. Schelske2 & Takeshi Suzuki3 *1University of Kaiserslautern Germany, 2Department of Computer Science University of Kaiserslautern Germany & 3 Ricoh Institute of Technology, Japan*

For our participants the task "change contrast of the image so that it looks most aesthetically pleasing to you" was quite intuitive. However, it is a challenge to find aspects of images that are required for automating the task. The goal was to find methods to decrease image-complexity to reduce computational load while preserving task-relevant features. We tested two techniques – pixelization (image was divided into 50x50px blocks and filled with one of its 16 most representative colors) and low-pass filtering. The resulting images, "mid-level version", had reduced semantic information but allowed for region segmentation and grouping as in the original image. Semantic information was completely removed in the "low-level version", by randomly shuffling 50x50px blocks. We selected three different parameter sets such that the low-pass-filtered-image perceptually matched the mid-level-pixelized version.
Filter-S: by matching by its Spectrum with pixelized image,
Filter-E: by an Explicit matching task "choose the filtered image that looks most similar to the reference image",
Filter-I: by a 2-IFC Implicit task "select the interval that contains the filtered/pixelized image".
Preferred contrast values and eye-movements were recorded from 35 participants. They saw just one variation of each of the original image. Low-level-Pixelized version resulted in contrast-adjustments similar to the original image followed by Filter-I, Pixelized, Filter-M, Filter-E, Low-level-Filter-M. Luminance gradients created by low-pass filtering interferes with contrast-adjustment. Pixelization suits the purpose better.

**Perceptually vivid and phenomenally mysterious stimuli as artistic strategy to highlight the constructive nature of perception**

Ivana Franke1 & Bilge Sayim2, *1Studio Ivana Franke Germany & 2University of Leuven (KU Leuven) Belgium*

In most everyday situations, vivid visual perception of an entity goes hand in hand with the experience of this entity as 'real' and not mysterious. Phenomenal mysteriousness usually requires the lack of appropriate categories to externalize one's experience, i.e., it is unclear what entities exist that could cause the experience at hand. Often, a high level of perceptual vagueness, i.e. uncertainty regarding which of a number of available categories the entity belongs to, is required for the experience of mysteriousness. Here, we show examples of vivid perceptions that yield strong experiences of mysteriousness. In a range of art installations, specular highlights are reflected from surfaces that are invisible to the observer. The highlights are perceived as small self-luminous entities grouped into larger configurations, without a clear location in space. Observer motion induces the perception of counter-intuitive changes of size, shape, distance, and rotation of the configurations. These – at the same time vivid and inexplicable – perceptual phenomena regularly yield the experience of the configurations as unreal, animate and mysterious. We discuss these installations in light of fundamental properties of the visual system, phenomenal reality, and naïve realism, and show how they highlight the constructive nature of vision.

**Systematic distortions of vertical alignment in drawings of faces and non-face objects**
Neil Harrison & Simon Davies, *Liverpool Hope University, UK*

A crucial part of accurately drawing or painting portraits is the correct vertical alignment of the eyes. Non-experts typically place the eyes higher on the head than they are actually located, and this systematic positioning bias has recently been experimentally confirmed (Carbon & Wirth, 2014). However, the explanation for the positioning bias remains unclear and furthermore it is not known whether biases in vertical alignment are specific to the production of faces. In a series of studies we asked participants to draw faces either from memory or to directly copy photographs of faces. Participants also copied images of objects such as houses and doors. Our results replicated the systematic positioning bias for eyes reported by Carbon and Wirth (2014), where the eyes were drawn higher on the head compared to their real locations in the photographs. In addition we found vertical positioning biases for non-face objects when salient features were located either in the upper or the lower portion of the object. Our results are discussed in relation to the theory that distortions of vertical alignment in drawings are influenced by the position of the salient features of the face or object to be drawn.

**The effect of perceptual fluency on aesthetic preference and affective experience in children and adults**
Dragan Jankovic, *University of Belgrade, Serbia*

According to hedonic fluency model the perceptual fluency or cognitive ease with which information is processed leads to positive affect and aesthetic preference (Reber, Schwartz, & Winkielman, 2004). However, previous studies with children often questioned the universality of that hypothesis (for example, the reverse mere exposure effect in children). In the present study we investigated the relation between perceptual fluency and aesthetic preference of visual stimuli in participants from three age groups (adults, 13 and 9 year olds). Perceptual fluency was manipulated by abstractness of visual stimuli (Cubist artworks with high and low content accessibility). Participants rated presented artworks on the seven-step bipolar beautiful-ugly scale and the Connotative differential - scale aimed for measurement of the three basic dimensions of affective experience: valence, arousal and cognitive evaluation. The results showed that stimuli with higher content accessibility were preferred in comparison to stimuli with lower content accessibility equally in all age groups. In addition, stimuli with higher content accessibility were experienced both, as more pleasant and more arousing. While the change in pleasantness is expected, simultaneous change in arousal stay behind the scope of hedonic fluency model.

**Personal traits and preferences for abstract artworks**
Gregor Hayn-Leichsenring & Nathalie Lyssenko, *Institute for Anatomy I, University Hospital Jena, Germany*

There is a huge individual variability in personal taste with regard to abstract artworks. One reason for this variability may be the lack of semantic meaning in abstract art. In the present study, we investigated personal traits as described in the 'big five inventory' (Goldberg, 1981) and their relation to preferences for abstract artworks. We asked participants to rate images of 150 abstract artworks on a computer screen according to their interestingness, structure, complexity and pleasantness and how much the participants liked the image. Then, we looked for individual correlations of ratings with low-level properties of the presented images (e.g., self-similarity, complexity, anisotropy). Furthermore, participants were asked to complete the BFI questionnaire. We then arranged participants in groups according to their personal traits and asked in how far these groups differed in their ratings. Interestingly, we found significant differences between groups especially for the liking and structure ratings. As an example, ratings of extroverted persons on structure correlated positively with self-similarity and complexity and negatively with anisotropy, while ratings of introverted persons did not correlate with any of these low-level properties at all. Therefore, we propose that personal traits are associated with preferences of low-level statistical properties of abstract artworks.

**Synesthetic Metaphors in the Russian and Italian Languages: A Comparative Study.**

Georgy Blinnikov, *Moscow State Linguistic University, Russian Federation*

The paper deals with a comparative study of metaphorical transfers of adjective meanings from one sensor zone into another (synesthesia) in the Italian and Russian languages. Hypotheses about the direction of synesthetic metaphorical transfers are verified in both languages. The research was performed using the text corpora of the Russian and Italian languages and the survey of native speakers. First, semantic groups (zones) of adjectives correlating with the modalities of sensor experience (eyesight, hearing, touch, smell, taste) were formed. Then, 218 adjectives in both languages were examined for the ability to produce intermodal metaphorical transfers. Each semantic zone was coupled with another one and the number of metaphorical transfers between the zones in each pair was counted. These data were used for the mathematical processing using the multidimensional scaling. As a result, two dimensions, structuring the space of metaphorical transfers, were revealed: the number of the metaphors produced and the direction of transfers. In both Russian and Italian, the touch and the taste are the most productive source zones, while the eyesight and the hearing are the usual target zones. Although, it was established that the structure of synesthetic transfers in the Russian and Italian languages is similar, some supposedly culturally based differences were found. In particular, Italian 'visual' adjectives produce more metaphors than similar adjectives in Russian.

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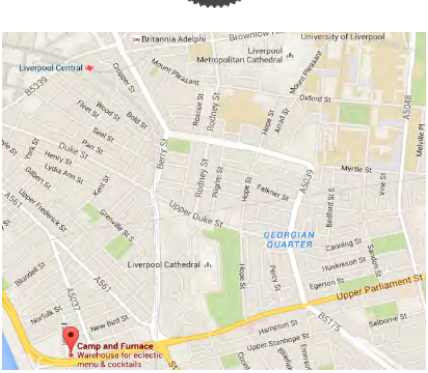


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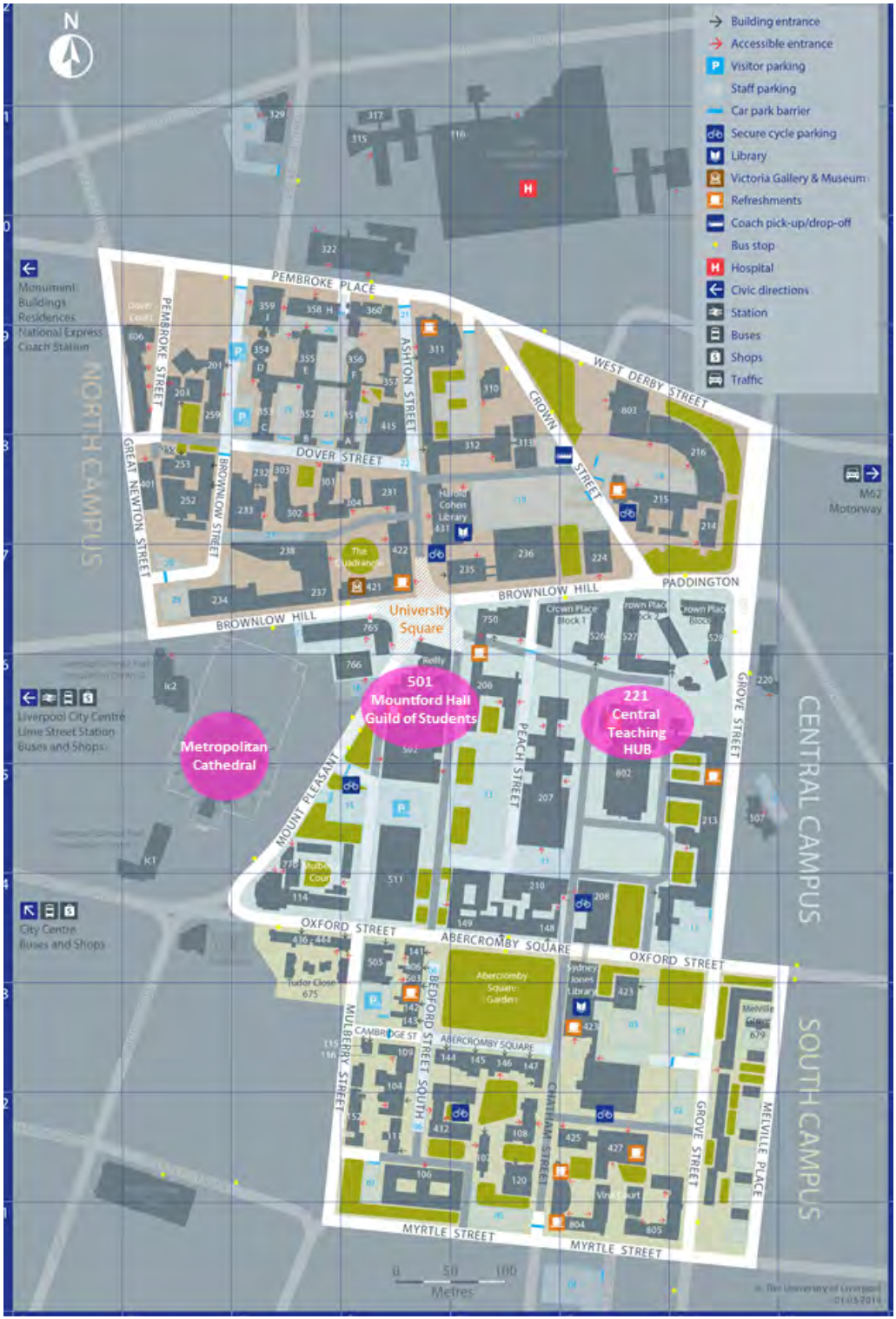
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Accessible entrance
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Staff parking
Car park barrier
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Library
Victoria Gallery & Museum
Refreshments
Coach pick-up/drop-off
Bus stop
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Civic directions
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