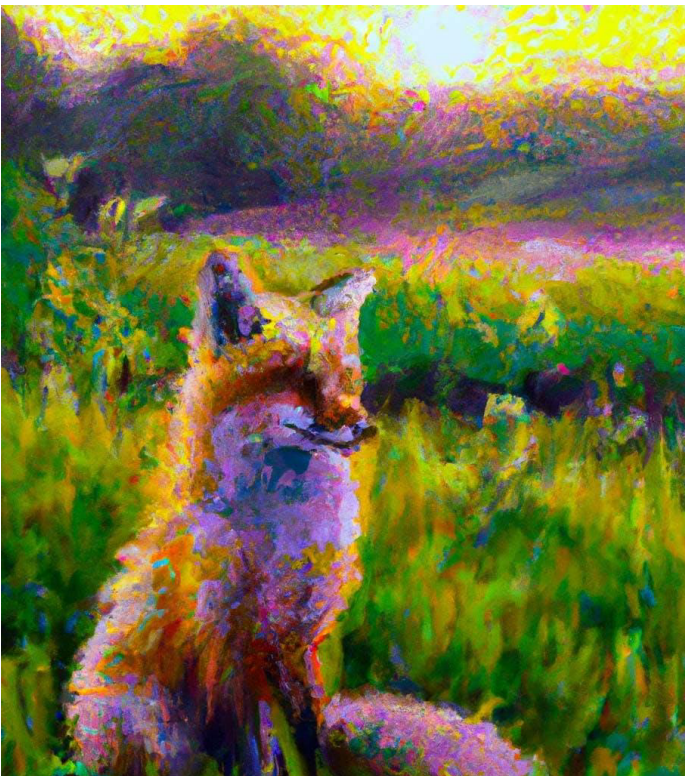


9th Visual Properties Driving Visual Preference

Workshop

2nd June 2023



University of Liverpool
Academic Boardroom (room 2.35 2nd floor)
Eleanor Rathbone Building

<https://www.bertamini.org/lab/vpdvp.html>

Programme

09:00-09:20	Welcome
09:20-09:45	Marco Bertamini: Properties driving preference
09:45-10:15	Chris McManus: Drawing conclusions
10:15-10:30	Lauren Sigda: Physiological correlates of “being moved” by art and emotional images.
10:30-10:45	Rebecca Chamberlain: The impact of expertise and embodiment on evaluation of drawing traces.
10:45-11:00	Stacey Humphries: Art and the motor system in Parkinson’s disease.
11:00-11:30	Coffee break and posters
11:30-12:30	Keynote by Claus Christian Carbon: Aesthetics beyond the visual empire
12:30-13.30	Lunch and posters
13:30-13:45	Enric Munar: Curved shapes are also preferred in museums.
13:45-14:00	Letizia Palumbo: The role of visual exploration and personal traits in the responses to artworks at TATE Liverpool.
14:00-14:15	Young-Jin Hur: Can fashion aesthetics be studied empirically? The preference structure of everyday clothing choices.
14:15-14:30	Guido Orgs: Complexity in audio-visual aesthetics.
14:30-15:15	Coffee break and posters
15:15-16:15	Keynote by Francis McGlone: A C voyage
16:15-16:30	Irene Reppa: Nudge and bias in subjective ratings of faces and icons.
16:30-16:45	Nicolas Wade: Anaglyphic portraits.
16:45-17:00	Philip McAdams: Chromatic and spatial image statistics predict infants’ and adults’ visual preferences.
17:00-17:15	John Maule: How does the environment affect visual preference for colour?
17:15-18:00	Round table discussion: How do we teach empirical aesthetics?
19:30	Social Dinner (Bold Street)

Organizers

Alexis D.J. Makin

Alexis Makin studied Psychology and Neuroscience at the University of Manchester 2003-6. He is now a Senior Lecturer in Psychology at the University of Liverpool. He mainly works on neural responses to visual symmetry.



Marco Bertamini

Marco Bertamini studied psychology at the University of Padova, Italy, and then at the University of Virginia, USA. He moved to Liverpool in 1999, where he established the Visual Perception Laboratory. He is now working at the University of Padova again. His interests are broad across visual perception and cognition.

For more information visit www.bertamini.org/lab/

Friday Night Dinner Location



List of attendees

First Name	Surname	Affiliation	Attending
Ahmad	Abudoush	The University of Manchester, The University of Jordan	Presence
Tolulope	Ajao	University of Liverpool	Presence
Albane	Arthuis	Goldsmiths, University of London	Presence
Michael	Batterley	University of Liverpool	Presence
Paul	Bejjani	Goldsmiths, University of London	Presence
Marco	Bertamini	University of Padova	Presence
Carole	Bode	University of Liverpool	Presence
Luc	Boutsen	Aston University, Birmingham	Presence
Ned	Buckley	University of Liverpool	Presence
Rebecca	Chamberlain	Goldsmiths, University of London	Presence
Megan	Chambers	University of Sussex	Presence
Fatima	Felisberti	Kingston University London	Presence
Francis	McGlone	University of Liverpool, Aalto University	Presence
Anna	Franklin	University of Sussex	Presence
Timo	Giesbrecht	Unilever	Presence
Martin	Guest	University of Liverpool	Presence
Johan	Hulleman	University of Manchester	Presence
Benjamin	Hunt	University of Liverpool	Presence
Young-Jin	Hur	London College of Fashion	Presence
Irene	Reppa	Swansea University	Presence
Andy	Jones	Liverpool John Moores University	Presence
Elena	Karakashevska	University of Liverpool	Presence
Hae Eun	Lee	Goldsmiths, University of London	Presence
Alexis	Makin	University of Liverpool	Presence
John	Maule	University of Sussex	Presence
Phillip	McAdams	University of Sussex	Presence
Chris	McManus	University College London	Presence
Eric	Munar	University of the Balearic Islands	Presence
Taysa-Ja	Newman	University of Sussex	Presence
Andy	Nordqvist	University of Aberdeen	Presence
Guido	Orgs	Goldsmiths, University of London	Presence
Letizia	Palumbo	Liverpool Hope University	Presence
Galina	Paramei	Liverpool Hope University	Presence
Cesare Valerio	Parise	University of Liverpool	Presence
Laura	Rai	Goldsmiths, University of London	Presence
Reshanne	Reeder	University of Liverpool	Presence
Jurate	Rimiskyte	Sheffield Hallam University	Presence
Daniel	Roberts	University of Liverpool	Presence
Lauren	Sigda	University of Vienna	Presence
Stacey	Humphries	Goldsmiths, University of London	Presence
Kezia	Terry	University of Sussex	Presence
Anna	Thomas	Unilever	Presence
Katerina	Vafeiadou	Goldsmiths, University of London	Presence
Nick	Wade	University of Dundee	Presence
Kinjiro	Amano	University of Manchester	Online only
Maria Cristina	Buzzo	University of Lille	Online only
Benedetta	Carraro	San Raffaele Hospital, Milan, Italy	Online only
Erick Gustavo	Chuquichambi	University of the Balearic Islands	Online only
Ramona Daniela	Ciumau	Università degli studi di Padova	Online only
Thiago	Costa	University of Verona	Online only
Sophia	Diaz	Università degli Studi di Padova	Online only
Samantha	Dodds	University of Manchester	Online only
Delaram	Farzanfar	University of Toronto	Online only
Elena	Gheorghiu	University of Stirling	Online only
Ronald	Hübner	University of Konstanz	Online only
Anuhya	Nalluri	Faculty of Optometry	Online only
Giulio	Palma	University of Southampton	Online only
Giulia	Rampone	University of Liverpool	Online only
Saeedeh	Sadeghi	Cornell University	Online only
Alberto	Sanna	Ospedale San Raffaele	Online only
Marta	Sron		Online only
Marica	Zulianello	Università di Padova	Online only

Abstracts

Keynote 1: **Aesthetics beyond the visual empire**

Carbon, C.C.

In perceptual sciences, we face a clear predominance of the visual domain—for empirical aesthetics, this seems to be even more pronounced as we mostly focus on non-dynamic images, sculptures, and architecture, for instance. This focus might be caused by the simple fact that the presentation of visual stimuli can be easily realized by static images and simple one-shot measures. In contrast, stimuli of other sensory domains inherently unfold over time: music shows rhythm, melody and changes in instrumentation and volume, the taste of olfactory and gustatory stimuli change with temperature and by chemical reactions and show inherent dynamics, and haptics always requires movement to capture haptic experiences. Thus, they obviously include additional time aspects, and in the case of haptics, we are furthermore not only passively analyzing an object but are concurrently touched by the object itself. This led to a lack of knowledge about haptic aesthetics. But as soon as we develop theories and methods on the aesthetic experience of haptic materials, for instance, we understand that the research of visual aesthetics also benefits from these theories and methods as experiencing as such is a dynamic process. This helps to develop the field of visual aesthetics further and integrate aesthetics of different sensory modalities to a more holistic view on aesthetics.

Keynote 2: **A C-Voyage**

McGlone, F.

The skin is innervated by fast conducting myelinated nerves and slowly conducting unmyelinated nerves – the latter coding for the experiences of pain and itch. Recent research has identified a population of c-fibres (c-tactile afferents or CTs) that send ‘feel good’ signals to the brain when activated by gentle touch, and how this kind of touch may be all-important in developing a healthy ‘social brain’, sustaining human relationships, regulating the immune system, and controlling stress. Research into the sense of touch has focussed mainly on touch receptors (mechanoreceptors) found in the fingertips where information is conveyed to somatosensory areas of the brain by fast-conducting nerve fibres, enabling this information to be processed in ‘real-time’ – an important factor when handling objects or tools, or being touched. However, we have recently discovered that touch has another channel, beyond the purely discriminative one, an affective and affiliative one, comprising highly sensitive slowly-conducting peripheral nerves in the skin of the body that respond to gentle caressing touch – c-tactile afferents (CT). This talk will describe research that has characterised the structure and function of CTs using psychophysical measures, electrophysiological recordings, functional neuroimaging, psychopharmacology, and measures of stress hormones. These data provide support for the functional role of a body-based emotional touch system – one that underpins the pleasurable aspects of nurturing care between a mother and her infant, the reassuring hug from a friend in times of need, and the impact of social contact on the brain and the body’s stress regulatory systems – and much more.....

Drawing conclusions

McManus, C.

Drawing has been relatively neglected in studies of visual aesthetics. The drawing of complex curves, particularly of the sort shown in life drawing of the human body, has been little studied. This talk will describe some earlier published studies, and some later unpublished studies, that we have used to investigate the drawing of curves.

Physiological correlates of “being moved” by art and emotional images

Sigda L., Gartus A., & Leder H.

Several studies have reported the empirical underpinnings of mixed emotions and their physiological profiles; however, few studies have undertaken composite constructs such as the feeling of “being moved”. Rooted in the distancing-embracing model reported by Menninghaus et al. (2017), purporting that the state of being moved results from a pattern of distancing over fictional/ impersonal visual stimuli. This allows for a following round of processing, enabling viewers to positively embrace the experiencing of negative emotions and creates a moving sensation which, rather than peak pleasure, mixes positive and negative emotions to compose a pleasurable experience (Zickfeld et al. 2019). Here we aim to disentangle the visual sensory experience of “being moved” in line with aesthetic and non-aesthetic images. To understand the distinct visual and temporal signifiers of being moved, we conduct a study of two conditions. In the first experimental condition, we pair

images from the Nencki Affective Picture System (NAPS) dataset of varying valence and arousal to assess participants' feelings through a non-aesthetic prompt of positive vs. negative stimuli. Results are compared against a condition displaying renowned aesthetic paintings rated as emotionally stimulating according to the VAPS database (Fekete et al. 2022). The contrast of these two conditions represents a crossover between behavioral and physiological measures applied to dissect the understudied origins of the state of being moved. We use behavioral surveys in tandem with physiological facial EMG and skin conductance measures to pinpoint temporal markers of the emotional progression and the severity of response. The pattern of emotional response between these conditions to isolate the effects of the aesthetic experience on the sensation of being moved. Our preliminary results indicate positive in valence and mildly arousing images have the greatest moving effects, corroborating prior research (Pelowski et al. 2017) findings that this combination is most likely to produce a mixed emotion, moving sensation rather than purely one emotion or similar feelings like awe or admiration.

The impact of expertise and embodiment on evaluation of drawing traces

Chamberlain R., McConnell O., Berio, D. Lee H & Orgs, G.

Traces of gesture and movement are prevalent in visual art: from sweeping brushstrokes to vigorous scribbles they allude to the actions and intentions of the artist. Theories of embodied aesthetics suggest that aesthetic pleasure is partly derived via motor simulation of the content of the artwork as well as the artist's movements (Freedberg & Gallese, 2007). Recent research suggested that drawing expertise increases sensitivity to movement properties evident from static traces (Chamberlain et al., 2022). However, to date no study has investigated the neural correlates associated with processing the underlying movement dynamics of static traces and whether these play a role in aesthetic evaluation. An EEG study compared art students (n=20) and non-art students (n=25) behavioural and neural responses to computer-generated drawing traces derived from a biologically plausible movement model (Chamberlain et al., 2022). Participants received motor or visual priming via videos of drawing movements, prior to providing aesthetic ratings of the static traces of those movements. Data analysis is ongoing, but we hypothesise that: 1. Drawing movements that received motor priming will be more aesthetically pleasing than those that had received visual priming or no priming, 2. Drawing movements that received motor priming will induce greater alpha band desynchronisation in the aesthetic rating phase, which will correlate with the scale of the aesthetic response, and 3. Expertise will modulate these effects such that individuals with drawing expertise will show greater alpha band desynchronisation for static traces, particularly those that they have received motor priming for. Such a result will demonstrate that sensorimotor activity in the brain plays a role in aesthetic evaluation of static drawing traces, which is modulated by motor expertise.

Art and the motor system in Parkinson's disease

Humphries, S.

Visual art offers cognitive neuroscience an opportunity to study how subjective value is constructed from representations supported by multiple neural systems. A surprising finding in aesthetic judgment research is the functional activation of motor areas in response to static, abstract stimuli, like paintings, which has been hypothesised to reflect embodied simulations of artists' painting movements. However, whether such motor involvement functionally contributes to aesthetic appreciation has not been addressed. We examined the aesthetic experiences of patients with motor dysfunction, who rated the motion content and their aesthetic appreciation of high-motion Jackson Pollock paintings and low-motion Piet Mondrian paintings. People with Parkinson disease demonstrated stable and internally consistent preferences for abstract art, but their perception of movement in the paintings was significantly lower than controls for both categories of painting. The patients also demonstrated enhanced preferences for high-motion art and an altered relationship between motion and aesthetic appreciation. Our results do not accord well with an embodied simulation account of aesthetic experiences, because artworks that did not include visual traces of the artist's actions were still experienced as lower in motion by Parkinson patients. We suggest that the motor system may be involved in integrating low-level visual features to form abstract representations of movement rather than simulations of specific bodily actions. Overall, we find support for hypotheses linking motor responses and aesthetic appreciation and show that altered neural motor functioning changes the way art is perceived and valued.

Can fashion aesthetics be studied empirically? The preference structure of everyday clothing choices

Young, J.H.

Fashion is one of the most prevalent and accessible aesthetic activities in everyday life, yet still missing in the literature is a systematic study on clothing preference. Therefore, the present study, recently published in the

peer-reviewed journal *Empirical Studies of the Arts*, explored whether a preference structure on clothing style (represented by 34 styles/cuts) can be established and whether this clothing preference structure can be further understood through colour preference (e.g. hue, brightness, & saturation) and individual differences (e.g. personality, demography, political orientation, etc.). Based on an online survey consisting of 500 participants, both exploratory and confirmatory factor analyses revealed a four-factor preference structure of clothing style, i.e. the Everyday Clothing Preference Factors (ECPF). The preference structure revealed four factors, namely feminine (e.g. dresses, skirts, lingerie, tights, & blouses, etc.), essential (e.g. shirts, jackets, trousers, & chinos, etc.), comfortable (e.g. hoodies, joggers, sweatpants, & sweatshirts, etc.), and trendy (e.g. dungarees & boiler suits) styles. Furthermore, the preference for each of these clothing styles was correlated with certain colour preferences and individual differences, suggesting the presence of psychological mechanisms underlying clothing preference. The findings provide a theoretical advancement in the understanding of the dynamics involved in everyday clothing behaviours. The study also provides novel contributions to empirical aesthetics and preference research, where fashion was rarely examined before. Practically, the findings may inform retail marketing practices and sustainable fashion, as they may facilitate further understanding of the mechanisms of fashion consumption.

Curved shapes are also preferred in museums

Munar E. Chuquichambi G., Ruta N., & Pepperell R.

Several perceptual attributes have been shown to affect judgments of preference both in artworks and stimuli in general. Contour has been a widely studied perceptual attribute in the field of visual preference, specifically curved vs sharp-angled contours. In a previous study, we showed that participants assigned higher liking ratings to the curved version than to the sharp-angled version of the similar paintings. These results came from laboratory and web-based experiments in which digital images of the paintings were seen through a computer screen. Ecological context modulates the relationship between art experience and viewing behaviour. It has been shown that people view paintings for longer in the museum than in the laboratory. Art museums and galleries foster and focus on artistic and aesthetic experiences. Aesthetic experience necessitates an intentional orienting of perception toward distilling the properties of artworks. However, according to the *facsimile accommodation* hypothesis, participants should evaluate the kind of contour in a similar way to other pictorial qualities. Therefore, we expected that the curvature effect with the original paintings exhibited in the museum would be similar to the effect in the laboratory using digital images. In the present study, we used the original paintings of the same 48 digital reproductions as the previous study. The paintings were exhibited in two museums. We carried out measures of liking, implicit wanting, and explicit wanting. In Study 1 data were collected from 55 participants on handheld tablets and 103 participants recorded their responses in booklets in Study 2. Participants liked the curved versions significantly more than the sharp-angled versions and reported wanting them more. They also looked at the curved versions from a closer position than the sharp-angled versions. Our findings suggest that similar processes and mechanisms affect the aesthetic judgements of and preferences for both artistic and non-artistic stimuli.

The role of visual exploration and personal traits in the responses to artworks at TATE Liverpool

Palumbo L., Harrison N., Trawiński T., Kass J., & Donnelly, N.

It is established that art appreciation is fostered by the way spectators pay attention to the artworks, and the extent to which this occurs may depend on individual characteristics. At present, supporting empirical evidence that clarifies the relationship between individual characteristics, visual engagement, and aesthetic responses, especially in the real gallery setting, is sparse. In the present study we investigated the role of visual exploration of artworks in relation to personal traits and aesthetic responses at TATE Liverpool. Specifically, the study tested whether visual exploration mediated the influence of individual differences in personality and cognitive style on aesthetic responses. Fifty-six visitors to the gallery viewed seven artworks while their eye movements were recorded. Participants rated their aesthetic response to the artwork and wrote their thoughts and impressions about each artwork. Written reports were analysed in terms of word count and frequency of use of aesthetic descriptors. Participants completed individual difference measures, including Openness to Experience (OTE) and Need for Cognitive Closure (NFC) before viewing artworks. The results showed that (1) the duration of looking at artworks (dwell time) mediated the relationship between OTE, NFC and word count as well as the frequency of use of aesthetic descriptors, and (2) the spatial distribution of fixations mediated the relationship between both OTE and NFC and the number of words used in response to viewing artworks. The results indicate that visual exploration plays a functional role in the experience of artworks in a real gallery setting, and that visual

exploration is a mechanism through which OTE and NFC influence aesthetic responses. Future research will investigate the nature and the time course of visual engagement with artworks and its impact on aesthetic experience. More broadly, this study contributes to understanding the role of individual differences in eye movement behaviour in real-world settings.

Nudge and bias in subjective ratings of faces and icons.

Reppa, I. & Felisberti, F.

The current study examined whether and to what extent ratings of appeal are influenced by (a) whether participants are asked about their liking or their disliking of a stimulus, and (b) the stimulus environment at the time of the rating. We presented 240 images, 120 faces and 119 icons (one icon was excluded due to a coding error). In each of the two stimulus categories there were 40 images of high appeal, 40 images of medium (average) appeal, and 40 faces and 39 icons of low appeal.

To ensure we are measuring affective, as opposed to attentional evaluations we asked 163 participants how much they liked icons and faces (via a 'How much do you *like* this?' 1-7 Likert scale) and 187 participants how much they disliked them (via a "How much do you *dislike* this?" 1-7 Likert scale). Stimuli were rated either following high, medium and low appeal stimuli. The results showed that: (a) the scale used did not make a difference in the pattern of results, suggesting that ratings were based on affective responses, and (b) the order of presentation influenced faces and icons in different ways. Specifically, faces rated after medium appeal faces were rated as more liked (and less disliked) compared to faces rated after low appeal faces. The results suggest a bias effect in appeal ratings which is demonstrated for both icons and faces. The potential bias resulting from the rating context in subjective ratings of icons and faces is clear and should be noted by researchers, suggesting that considerable care is needed in creating appropriate stimulus environments for subjective rating of stimuli.

Anaglyphic portraits

Wade, N.J.

Faces provide one of the most preferred visual stimuli and this applies to pictures of faces as well. Pictorial portraits are viewed with two eyes despite the fact that they are mostly monocular: they have been produced from a single viewpoint (either by artists or photographers). The differences between the images on each eye are a consequence of the separation between them rather than differences in two pictorial images. Viewing with two eyes detracts from the monocular cues to depth within the singular portrait because of information for the flatness of the pictorial surface. Binocular portraits, on the other hand, incorporate differences between two pictorial images producing perceptual effects that cannot be seen by a single eye alone. The differences can consist of small disparities that yield stereoscopic depth or large ones that produce binocular rivalry. Binocular portraits require viewing with a stereoscope, many varieties of which exist. Those shown here are anaglyphs which can be observed through red/cyan filters. They are not conventional stereoscopic portraits where the sitter is imaged from two slightly different locations. Rather, the binocular processes of cooperation (stereoscopic depth perception) and competition (binocular rivalry) are manipulated in the anaglyphic portraits.

Chromatic and spatial image statistics predict infants' and adults' visual preferences.

McAdams P., Svobodova, S., Terry K., Newman T.J., Chambers M, Taylor R.P., Bosten J., Skelton A. & Franklin A.

Natural scenes and art contain statistical regularities in features such as colour and space (Graham, & Redies, 2010). Adult visual perception and visual aesthetics appear to be tuned to these image statistics (Simoncelli & Olshausen, 2001). Of interest, is how visual perception tunes to image statistics during development, and what role this plays in the development of visual aesthetics. It has been suggested that infants' visual preferences can reveal perceptual primitives of adult aesthetics (Göksun et al., 2014), e.g., infants look longer at colours that adults prefer (Skelton & Franklin, 2020). Here, we present a series of infant studies that investigate infants' and adults' visual preferences for natural scenes, art, and fractals. Do infants look longer at the stimuli that adults prefer, and is infant looking and adult liking driven by image statistics? We find that some aspects of adult aesthetic preference can be traced back to infants' visual preferences. For example, infants look longer at the edge co-occurrence statistics found in natural scenes and that adults like; and the amount of variation in the luminance and saturation of artworks contributes to infants' visual preferences and adults' aesthetic preferences. We also find that infants have a visual preference for fractals, that differs from adults' aesthetic preference, possibly suggesting an adapting role of visual experience on aesthetics; and that a combination of chromatic and spatial image statistics predicts infant looking to artworks. These studies potentially identify 'perceptual primitives' of aesthetics that can be traced back to early sensory biases in infancy.

How does the environment affect visual preference for colour?

Maule, J., Skelton, A., Wozniak, B., Nabil, S., Kuyateh, S., Lindberg, A., Selimovic, A., Richter, Y., Bosten, J., Hernik, M., Laeng, B., & Franklin, A.

Colour influences visual preference for natural scenes and artworks (e.g. Penacchio et al., 2021). Observers find patterns with colour variation which is similar to that found in natural scenes (i.e. blue-yellow (Bosten et al., 2015)) more comfortable to view than patterns with colour variation which occurs less frequently in natural scenes (Juricevic et al., 2010). This suggests that the naturalness of chromatic distribution is partly responsible for the visual aesthetic response. It is not known, however, how preference for “natural” colour distributions is calibrated – through life-long, developmental, or evolutionary tuning. At the peak of the four seasons, observers ($N_{\text{total}} = 323$) in Oslo (59.9°N) and Tromsø (69.6°N) (Norway) provided ratings for computer-generated “Mondrian” stimuli containing different colour distributions. Both locations experience seasonal changes in day length, but in Tromsø the sun does not rise for almost two months during winter, and does not set for almost two months in summer. Despite extreme seasonal changes in daylight, the data show rigid preferences, with no differences across seasons or testing locations. Analysis of observers’ birth season and birth latitude suggests a subtle effect on discomfort ratings, specifically for observers born above the Arctic Circle during the winter, when daylight was most scarce. In another experiment observers ($N = 30$) were exposed to a set of images of natural scenes with inverted red-green contrast. Observers showed adaptation to the altered chromatic statistics, shifting their pattern of preference according to the chromatic variation in the scenes they were adapted to. These results show that visual preference is generally robust to naturally-occurring seasonal changes and differences in the developmental environment. However, when presented with radically altered chromatic scene statistics, preference can be affected. This has implications for the understanding of the role that naturalness plays in visual aesthetics, and the fluidity of visual aesthetic preference.