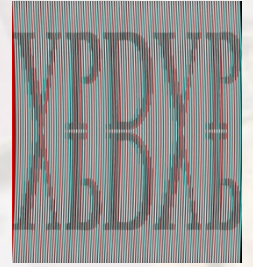


10th
Visual Properties Driving Visual Preference (VPDVP)
workshop



2nd
Psychology, Art and Neuroaesthetics (PAN)
meeting



Visual Art and Creativity

Roma 14th and 15th of June 2024
Dipartimento di Scienze della Formazione
Università degli Studi Roma Tre
Aula Volpi
via del Castro Pretorio 20, 00185, Rome



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

<https://aipass.org/gruppi-tematici/gruppo-tematico-psicologia-dellarte-e-neuroestetica/>

Visual Art and Creativity Workshop

AIP group on Psychology of Art and Neuroaesthetics ([PAN](#))

10th Visual Properties Driving Visual Preference ([VDPVP](#))

Friday 14/06/2024

[University Roma Tre](#) - Department of Education – [Aula Volpi \(Via del Castro Pretorio, 20\)](#) [TEAMS LINK](#)

- 13.00 *Opening and Welcome (Marco Bertamini and Stefano Mastandrea)*
- 13.40 *Can Fundamental Principles of Nature Explain Aesthetic Experience?*
Robert Pepperell
- 14:00 *Can Curvature Be Considered an Aesthetic Primitive? 10 Years of Studies*
Enric Munar
- 14:20 *Golden Ratio: A Study on Individual Preferences*
Claudia Salera, Marco Iosa, Anna Pecchinenda
- 14.40 *Predictive Processing, Visual Art, and The History of Empirical Aesthetics*
Jacopo Frascaroli
- 15.00 - 15.30 *Coffee break*
- 15.30 KEYNOTE
Predicting Facial-Attractiveness Judgments
Ben Jones, University of Strathclyde, UK
- 16.30 *"Every Painter Paints Themselves: Turning the Right Cheek In 1000 Self-Portraits*
Chris McManus
- 16.50 *Portraying the Best Side? An Analysis of Rembrandt's Paintings and Etchings*
Sophia Diaz, Marco Bertamini
- 17.10 *Effects of Tattoos on the Aesthetic Appreciation of Human Stimuli as Influenced by Internalized Social Norms, Expertise, and Tattoo Status*
Thomas Jacobsen, Christian Duer, Dustin Krämer, Selina M. Weiler
- 17.30 *Posing biases in people that do not exist, and other forms of digital portraiture*
Nicola Bruno
- 17:50 RoundTable discussion / Social Dinner

Saturday 15/06/2024

[University Roma Tre](#) - Department of Education – [Aula Volpi \(Via del Castro Pretorio,20\)](#) [TEAMS LINK](#)

- 09:00 *Welcome*
- 09.10 *Mona Lisa's Smile: A Phenomenological Interpretation Based on Perceptual Organization Principles*
Alessandro Soranzo, Eleonora Bilotta, Francesca Bertacchini
- 09.30 *What Role Does Spatial Aesthetics Play in Shaping Visitor Experience in A Museum?*
Marta Pizzolante, Sabrina Bartolotta, Eleonora D. Sarcinella, Andrea Gaggioli, Alice Chirico
- 09.50 *Exploring Individual Differences in Visual Perception: Insights from Neurodiversity and Immersive Technology*
Sarune Savickaite, Neil McDonnell, David R. Simmons
- 10.10 *Thinking in Terms of Opposites and Creativity*
Ivana Bianchi, Marco Bertamini, Ian Verstegen, Roberto Burro, Erika Branchini, Matteo Cacchiarelli
- 10.30 - 11:00 *Coffee break*
- 11.00 KEYNOTE
The Neurocognitive Basis of Creative Thinking
Mathias Benedek, University of Graz, Austria
- 12.00 *Understanding Sensorimotor Processes in Aesthetic and Emotion Perception Of Dance*
Beatriz Calvo-Merino, Claudia Corradi, Vasiliki Meletaki, Alex Jones, Jon Silas
- 12.20 *Implicit Aesthetic Processing and Emotional Priming: An fmri Study on Artistic and Non-Artistic Stimuli*
Sabrina Fagioli, Giulia Bechi-Gabrielli, Marco Bozzali, Emiliano Macaluso, Stefano Mastandrea
- 12:40 *The Posterior Cerebellum's Role in Feeling Moved by Visual Artwork: A Transcranial Direct Current Stimulation Approach*
Ryan Slaby, Zaira Cattaneo
- 13.00 Lunch

Saturday Afternoon a le Palais - Palazzo Barberini

Museo [Palazzo Barberini](#) - [Via delle Quattro Fontane, 13, Roma](#)

The neurocognitive basis of creative thinking

Mathias Benedek¹

¹Creative Cognition Lab, University of Graz

Creative ideas change our world, from small improvements in everyday life to major contributions in art and science. But what are the (neuro)cognitive mechanisms underlying creative ideas? In this presentation, I briefly introduce how the complex trait of creativity is conceptualized and studied from the perspective of psychology. Then I will present recent findings on the cognitive and neural basis of creativity, which highlight the relevance of memory, control, and attention processes in creative cognition. Relevant works in this field addressed among others the following questions: How do semantic and episodic memory support creative ideation? Are creative ideas based on spontaneity or cognitive control? What is the role of attention in imagination? Taken together, these findings enable us to increasingly appreciate creative thinking as the extraordinary result of ordinary (neuro)cognitive processes.

Thinking in terms of opposites and creativity

Ivana Bianchi¹, Marco Bertamini², Ian Verstegen³, Roberto Burro⁴, Erika Branchini⁴,
Matteo Cacchiarelli¹

¹Department of Humanities, University of Macerata;

²Department of General Psychology, University of Padua;

³Visual Studies, University of Pennsylvania;

⁴Department of Human Sciences, University of Verona.

The topic will be addressed at two levels. In the first part we will briefly review empirical and theoretical evidence that justify the question/hypothesis. In the second part we will discuss two studies, where the hypothesis is tested with tasks where the range of solutions is open (i.e. open-tasks).

In the first study participants engaged in a design activity. They were shown the images of two objects (a moka pot and a chair) and asked to draw as many different variants of these objects as they could think of. In one condition the task was performed after being trained to "think in opposites". The other two control conditions had absence of training or a different training.

In a second study we explored whether training people to look at artworks in terms of "showing opposites" improves the pleasure and/or interest experienced. Also in this case two control conditions were included in the study - absence of training and a different (historical) training. The results of the studies (which are currently in progress) will be discussed in terms of fluidity and flexibility of responses, in study 1, and of aesthetic pleasure and interest ratings, in study 2.

Posing biases in people that do not exist, and other forms of digital portraiture

Nicola Bruno¹

¹DiMeC, Unità di Neuroscienze, University of Parma

Numerous studies have documented posing biases in painted portraits and self-portraits. In particular, there is evidence for artists' preferences for displaying sitters showing the left or right cheek, depending on some key factors. Here I report a study of such biases in photo-realistic portraits produced using a generative adversarial network (GAN) algorithm, that is, in portraits of people that do not exist. Results are compared with estimates from previous studies of contemporary digital self-portraits (selfies). Implications for studies of composition in portraiture are discussed within the framework of models of nonverbal communication on digital media.

References

Bruno, N. (2023). Posing biases in people that do not exist. *Perception*, 53(2), 1-4.

Bruno, N., Bertamini, M., & Protti, F. (2015). Selfie and the city: A world-wide, ecologically valid database reveals a two-pronged side bias in naïve self-portraits. *PLoS ONE*, 10(49), e0124999. <https://doi.org/10.1371/journal.pone.0124999>

Understanding Sensorimotor Processes in Aesthetic and Emotion Perception of Dance

Beatriz Calvo Merino¹, Claudia Corradi¹, Vasiliki Meletaki^{1,2}, Alex Jones³, Jon Silas³

¹Center for Clinical Social and Cognitive Neuroscience, City, University of London

²Center for Neuroaesthetics, University of Pennsylvania

³Middlesex, University, London, United Kingdom

Emotional expression is a key component of art and therefore of the aesthetic experience. Previous research suggests sensorimotor cortex plays a role in emotion perception, suggesting that we understand emotions by internally simulating them in our own body. The current study investigated the role of emotion embodiment in both emotion perception and aesthetic experience, exploring the interaction between emotion and aesthetic processes. Participants rated short clips of dance videos while brain activity was recorded using EEG. Frequency analysis with special emphasis on visual and sensorimotor impact on emotion and aesthetic perceptions will be discussed. These results highlight the importance of emotional content on aesthetic experience and suggest that sensorimotor simulation may be differentially engaged depending on emotional valence and aesthetic preferences.

Portraying the best side? An analysis of Rembrandt's paintings and etchings

Sophia Diaz¹, Marco Bertamini¹

Department of General Psychology, University of Padova

According to a comprehensive survey of 1474 portraits painted in Western Europe, artists have predominantly painted posers with their left-cheek facing the viewer [1]. This effect is stronger in females: 68% of females presented their left cheek, compared to 56% of males. This phenomenon could be explained by the affective hemispheric laterality, and the fact that the left side is more emotionally expressive, combined with gender biases with respect to portraying emotions. The opposite pattern in self-portraits may be explained by the use of a mirror [2].

In Rembrandt's paintings (N = 546), the gender difference is particularly strong [3]. A majority of males present their right-cheek (183/125 for males and 51/108 for females). This pattern is present even when the analysis is restricted to portraits (N = 468) (158/103 for males and 31/98 for females), and also within the large set of self-portraits (N = 64, with 49 right-cheeked self-portraits and 9 left-cheeked).

We also explored Rembrandt's etchings (N = 146 portraits, which are mirror-reversed, compared to paintings). The gender asymmetry was reduced, possibly because of the process of printing, and in the case of self-portraits (N = 24) the bias was reversed. Overall, it seems Rembrandt made explicit choices to represent males and females differently, and, at least in part, the technique (i.e., etching) affected the resulting pattern.

References

- 1 McManus, I. C., & Humphrey, N. K. (1973). Turning the left cheek. *Nature*, 243, 271–272. <https://doi.org/10/fhsgx3>
- 2 Bruno, N., & Bertamini, M. (2013). Self-Portraits: Smartphones Reveal a Side Bias in Non-Artists *PLoS ONE*, 8(2): e55141
- 3 Schirillo, J. A. (2007). Gender's effect on the hemispheric laterality of Rembrandt's portraits. *Spatial Vision*, 21, 1(2), 19–26. <https://doi.org/10/dtm88r>

Implicit Aesthetic Processing and Emotional Priming: An fMRI Study on Artistic and Non-Artistic Stimuli

Sabrina Fagioli^{1,2}, Giulia Bechi-Gabrielli^{2,3}, Marco Bozzali^{4,5}, Emiliano Macaluso⁶, Stefano Mastandrea¹

¹Laboratory of Experimental Psychology, Department of Education, Roma Tre University, Rome

² Neuroimaging Laboratory, IRCCS Santa Lucia Foundation, Rome

³Department of Human Neuroscience, Sapienza University of Rome, Rome

⁴Department of Neuroscience "Rita Levi Montalcini", University of Turin, Turin

⁵SC Neurologia 2U, AOU Città della Salute e della Scienza, Turin

⁶Université Claude Bernard Lyon 1, CNRS, INSERM, Centre de Recherche en Neurosciences de Lyon (CRNL), U1028 UMR5292, IMPACT, F-69500, Bron

Several studies have suggested that engaging with art can promote well-being among individuals, even when artworks convey cruel or brutal emotional content. In this study, our aim was to investigate how the implicit processing of artistic versus non-artistic images conveying positive, neutral or negative emotions, influences the subsequent affective processing of a neutral stimulus.

Twenty-two art-naïve participants underwent fMRI scans while using a Self-Assessment Manikin (SAM) scale to rate the liking and arousal of emotionally neutral Chinese pictograms (targets) that followed the brief presentation of emotionally valenced artistic or non-artistic images (primes). An adapted version of the Affective Misattribution Task (AMP) was used to assess the impact of the emotional primes on the judgment of the neutral targets.

Behaviorally, the results indicated that priming by images with positive valence led to higher pleasure-judgments of the Chinese pictograms compared to neutral and negative prime images. Imaging data revealed that the implicit processing of artistic images, as opposed to non-artistic ones, was associated with the activation of the left caudate. Negative primes induced activation of the left ventrolateral prefrontal cortex. The type of prime (artistic vs. non-artistic) did not exert any significant modulation of the effect of emotional valence. However, when considering subjective behavioral ratings, negative emotional valence conveyed by artistic primes was found to modulate activity in occipital areas.

Our findings suggest that art is effective in regulating the intensity of negative emotions and can be a valuable tool for emotional engagement in different settings.

Predictive Processing, Visual Art, and the History of Empirical Aesthetics

Jacopo Frascaroli¹

¹Department of Psychology, University of Turin

In the last few years, a remarkable convergence of interests and results has emerged between scholars interested in the arts and aesthetics from a variety of perspectives and cognitive scientists studying the mind and brain within the predictive processing (PP) framework. This convergence has so far proven fruitful for both sides: while PP is increasingly adopted as a framework for understanding aesthetic phenomena, the arts and aesthetics, examined under the lens of PP, are starting to be seen as important windows into our mental functioning. The result is a fast-growing research programme that promises to deliver important insights into our aesthetic encounters as well as a wide range of psychological phenomena of general interest. In this talk, I will probe the effectiveness of PP as a framework for understanding visual art. I will start by presenting the fundamentals of the PP approach to aesthetics in general, clarifying how this approach might account for several aspects of our engagement with visual artworks in particular. I will then show how the PP apparatus can, if used flexibly, illuminate the appeal (or failure) of very different artworks and artistic styles. Throughout the talk, I will try to connect the PP approach to visual art with many past and present acquisitions in empirical aesthetics, from Fechner's pioneering work to the Gestalt approaches to art, from Berlyne's psychobiological theory to Martindale's prototype theory, and up to present-day approaches that stress the importance of processing fluency, learning, interest, empathy, and motor simulation in aesthetic experience. The upshot will be a pleasingly general picture – no doubt tentative and to be further articulated – that allows a much-needed move towards a more unified empirical aesthetics.

Effects of tattoos on the aesthetic appreciation of human stimuli as influenced by internalized social norms, expertise, and tattoo status

Thomas Jacobsen¹, Christian Duer¹, Dustin Krämer¹, & Selina M. Weiler¹

¹Experimental Psychology Unit, Helmut Schmidt University / University of the Federal Armed Forces
Hamburg

The evolving scientific interest in body alterations, particularly tattoos, has increasingly focused on the nuanced interplay between visual features and aesthetic judgment. While the conceptual structure surrounding the aesthetics of tattoos has been a subject of study, their specific aesthetic appreciation remains largely unexplored. This study aimed to delve deeper into this visual dimension by examining the impact of tattoos on the aesthetic perception of individuals, particularly focusing on the differences in beauty perception among diverse age groups (older and younger than 50), experts and non-experts (tattoo artists), and individuals with and without tattoos. Utilizing a series of systematically varied images of a male and a female model, the study manipulated the degree of tattoo coverage in six distinct conditions: Baseline (no tattoos), Light, Moderate, Heavy, Extreme, and Extreme + Face. 487 participants evaluated the beauty of these models under varying tattoo conditions. The study's findings reveal noticeable differences in aesthetic appreciation rooted in the visual processing of tattoos, based on expertise in tattoo art, tattoo presence, and age group, with a general trend of decreasing beauty perception as tattoo coverage increases. The Extreme + Face condition was particularly notable for receiving the lowest beauty ratings. These results underscore the significant influence of tattoos on aesthetic appreciation, which appears to be intricately linked to visual perception, one's expertise, presence of tattoos, and ingrained social norms, particularly those related to age. The study further considers the broader implications of these findings and their potential applicability in understanding the dynamics of aesthetic appreciation in contemporary society.

Predicting facial-attractiveness judgments.

Ben Jones¹

¹University of Strathclyde

Facial-attractiveness judgments influence a diverse range of important social outcomes. For example, people prefer to date, mate with, hire, and even vote for people with attractive faces. Consequently, there is now a large literature investigating the physical characteristics that attractive faces possess. The dominant theoretical framework adopted by such studies is derived from Darwin's sexual selection theory and proposes that symmetric, prototypical, and sexually dimorphic facial characteristics will be considered attractive because they signal that an individual has a strong immune system and will produce healthy offspring. Here, I will first describe recent findings that challenge these fundamental assumptions. I will then present evidence that an entirely data-driven (i.e., atheoretical or 'bottom-up') model based on principal component analysis of shape and colour information in face images substantially outperforms models derived from sexual selection theory in predicting facial-attractiveness judgments. Finally, I will conclude that the strong focus on sexual selection theory has hindered progress in understanding facial attractiveness and that now would be a good time for researchers working in this area to consider alternative theoretical perspectives.

“Every painter paints himself”: Turning the Right Cheek in 1000 self-portraits

Chris McManus¹

¹University College London

In a 1973 paper entitled ‘Turning the Left Cheek’, McManus and Humphrey described how painted portraits more often showed the left rather than the right cheek [1]. A recent systematic review of 61 studies found an excess of left cheek portrayals in 37 (61%) studies, a right cheek excess in 7 (12%) studies and no significant bias in 17 (28%) studies [2]. A few days after that 1973 paper was published, Professor Walter Landauer wrote to us [3] describing an excess of right cheeks in 302 self-portraits (183 right cheek, 60.6%) from Goldscheider’s 1937 book, *Five Hundred Self-Portraits* [4]; and we mentioned his result in our second 1973 paper [5].

New editions of Goldscheider’s book with somewhat different self-portraits were published in 2000 [6] and in 2018 [7]. Self-portraits by female artists were relatively rare, but were the subject of a 2001 exhibition [8]. From the four sources combined, excluding duplicates and details, 996 self-portraits were available from 748 artists, of whom 615 were male and 130 female (17.4%), with female artists mostly active in the past two centuries.

This paper will explore asymmetries in painted or drawn self-portraits portraying just the artist. Ignoring symmetric self-portraits, which as Lindell noted are far more frequent after the invention of photography [9], in 586 asymmetric self-portraits there was a clear excess of right cheeks (60.1%) over left cheeks (39.9%), with no difference in proportion of right cheeks in 493 self-portraits by male artists (60.9%) than in 93 self-portraits by female artists (55.9%), a result similar to that in the smaller sample of Suitner and Maass [10].

The painting of self-portraits raises many interesting issues for aesthetics and lateralisation, not least in the use of mirrors and the presentation of self. What is clear is that, as a quattrocenro Tuscan proverb put it, “Ogni pittore dipinge sè” -- every painter paints himself -- resulting in a mass of interesting material.

References:

1. McManus IC, Humphrey NK: Turning the left cheek. *Nature* 1973, 243:271-272.
2. Van Jole O, Westerhausen R: When posing in portraits turns cheeky: A systematic literature review of the left-check bias. Poster: North Sea Laterality Conference, Bergen, August 2022 2022.
3. Landauer W: Personal correspondence to I C McManus concerning left and right cheeks in self-portraits, 4th June 1973, 1973.
4. Goldscheider L: *Five hundred self-portraits : from antique times to the present day in sculpture , painting, drawing and engraving*. London: George Allen and Unwin; 1937.
5. Humphrey NK, McManus IC: Status and the left cheek. *New Scientist* 1973, 59:437-439.
6. Bell J: *500 Self-Portraits*. London: Phaidon; 2000.
7. Rideal L, Bell J: *500 Self Portraits*. London: Phaidon; 2018.
8. Rideal L, Chadwick W, Borzello F: *Mirror mirror: self-portraits by women artists*: National Portrait Gallery; 2001.
9. Lindell AK: Capturing their best side? Did the advent of the camera influence the orientation artists chose to paint and draw in their self-portraits? *Laterality: Asymmetries of Body, Brain and Cognition* 2013, 18(3):319-328.
10. Suitner C, Maass A: Positioning bias in portraits and self-portraits: Do female artists make different choices? *Empirical Studies of the Arts* 2007, 25(1):71-95.

Can curvature be considered an aesthetic primitive? 10 years of studies

Enric Munar¹

¹University of the Balearic Islands

At the conference of the IAEA in 2014, we presented a talk titled Visual Preference for Curvature as a Potential Aesthetic Primitive. Ten years later we have published 14 studies directly related to preference for curvature. What can we conclude? First, "aesthetic primitive" is a term rarely used in empirical aesthetics. Latta (1995) used it from a psycho-physiological perspective related to art, Dissanayake (2015) used it from a broad anthropological point of view, and we used it from a more evolutionary and cognitive perspective. We are especially interested in the phylogenetic emergence of the aesthetic trait as an internal experience, and its relation to neuro-cognitive processes, that gave rise to particular behaviours, including art. In this line, "aesthetics primitives" are phylogenetic constituents that gave rise to the aesthetic trait and refer simultaneously to properties of our world and resonations in our brains (following Latta's words). Some of these constituents are perceptual preferences that would be intrinsic and unconditioned, which can be expected to be universal and innate. These ancient visual preferences should still be influencing our current behaviour to some extent and acting at a low level in the visual system. Returning to the initial question, I will present the results of our studies that lead me to answer in the affirmative, although we cannot yet state with enough empirical support. I will also include findings that are not in line with an affirmative answer, but we can propose an explanation for them. Finally, and in line with Latta's writing, I will set out what I believe should be the next research line to be pursued.

Can fundamental principles of nature explain aesthetic experience?

Robert Pepperell¹

¹Cardiff Metropolitan University

We would ideally like to explain the variety and complexity of aesthetic experience using fundamental principles of nature. While several proposals of this kind have been made over the last two centuries or so, we still lack a naturalistic theory of aesthetic preference and affect. Here I discuss some general principles that might ultimately explain why we find stimuli attractive or repulsive. Following nineteenth century researchers such as Gustav Fechner and twentieth century pioneers of Gestalt theory, I highlight the role of energy flow in nature and the well-known tendency of physical systems, including living systems, to minimise free energy and maximise entropy. Less well known are the proposals from earlier scientists that energy transfer and entropy production in physical systems is hedonically valenced; that is, it has the property of feeling good or bad for the system at a fundamental level. On this account, energy gain, which increases stress or tension, has a negative valence while energy loss, which reduces tension, has a positive valence. I develop this proposal by suggesting that the property of hedonic valence is harnessed in living systems to drive adaptive behaviour, from approach-avoidance reactions in simple organisms to aesthetic responses in humans. Focusing on these fundamental principles allows us to combine the quantitative methods of physics with the qualitative concerns of psychology to inform a biologically grounded science of aesthetics. My aim is to foster a deeply integrative research programme with profound explanatory potential across art and science.

What Role Does Spatial Aesthetics Play in Shaping Visitor Experience in Museum?

Marta Pizzolante¹, Sabrina Bartolotta¹, Eleonora D. Sarcinella², Andrea Gaggioli^{1,3}, & Alice Chirico¹.

¹ Research Center in Communication Psychology (PSICOM), Catholic University of the Sacred Heart of Milan

² Department of Psychology, Catholic University of the Sacred Heart of Milan

³ Applied Technology for Neuro-Psychology Lab, IRCCS Istituto Auxologico Italiano

This exploratory study investigates the impact of specific spatial design characteristics on the emotional and aesthetic experiences of participants within a virtual museum environment. The investigation centers on four key design elements: balance (symmetrical vs. asymmetrical), coloration (warm vs. cool), lighting (intense vs. soft), and environmental dynamics (dynamic vs. static). Each of these elements was selectively manipulated to create eight distinctive iterations of the same virtual museum setting, aiming to explore the relationship between design characteristics and aesthetic perception. The study employs a mixed-methods approach, utilizing self-report measures and psycho-physiological assessments. A pre-experimental questionnaire evaluates users' aesthetic predispositions and emotional states prior to their interaction with the museum spaces. Additionally, participants' heart rates are monitored using electrocardiograms (ECGs) to provide an objective measure of their emotional responses. Participants (N = 47) are then immersed in eight virtual scenarios of the museum, presented through a Virtual Reality (VR) headset, organized into four blocks of two scenarios each. Following each block, participants complete a post-experimental questionnaire designed to retrospectively assess their emotional and perceptual experiences associated with each museum environment. Concurrently, ECG data is analyzed to correlate heart rate changes with specific design elements, further elucidating the emotional impact of spatial aesthetics. The findings of this study are anticipated to provide significant insights into the role of design in shaping aesthetic and emotional experiences in virtual environments, particularly in contexts like museums where aesthetics play a crucial role.

Golden ratio: a study on individual preferences

Claudia Salera¹, Marco Iosa¹, Anna Pecchinenda¹

¹Università Roma Sapienza

The golden ratio (Phi, $\phi = 1.618034$) - an irrational number which results when a straight line is cut so that the proportion between the shorter part and the longer part is the same as that between the longer part and the whole - has been considered a benchmark for beauty. Evidence of golden ratio can be found since the ancient Greeks throughout the centuries as well as in Renaissance paintings and stimuli containing this proportion are often perceived as beautiful and aesthetic. Experimental evidence is however mixed as the literature struggles to establish the existence of individual preferences for golden ratio. To gain new insights into the nature of these preferences, one-hundred participants completed an implicit association task (IAT) with different types of stimuli (i.e., dot-patterns either in golden ratio or random proportion) to assess under which conditions golden ratio stimuli are preferred over other stimuli. In addition, also explicit measures were used (i.e., ratings, line bisection task, Ultimatum Game). We found evidence of implicit preference for golden ratio stimuli, whereas explicit measures revealed mixed results. Possible accounts are discussed.

Exploring Individual Differences in Visual Perception: Insights from Neurodiversity and Immersive Technology

Sarune Savickaite¹, Neil McDonnell¹, & David R. Simmons¹
¹University of Glasgow

Our research explores visual perception, investigating how individual differences influence the interpretation of visual stimuli. By employing a person-centric approach, we navigate through the unique cognitive landscapes of individuals with neurodivergent traits, particularly focusing on autism, attention deficit hyperactivity disorder (ADHD), synaesthesia and aphantasia. Drawing upon diverse methodologies including drawing analysis and Virtual Reality (VR), we seek to understand the nuances of perceptual experiences (Savickaite et al., 2022).

We start by acknowledging the multifaceted nature of neurodiversity, recognizing it as a natural variation in human cognition. Through participatory action research and arts-based methodologies, we aim to amplify the voices of individuals with neurodivergent conditions, fostering a deeper understanding of their lived experiences. Using VR as a tool, we used immersive environments to explore the intricacies of visual processing in autism, ADHD, synaesthesia (Taylor et al., 2023) and aphantasia (Figure 1). Our findings challenge traditional theories, suggesting a nuanced relationship between autistic traits and perceptual organization. Moreover, we extend our exploration to encompass individuals with aphantasia and synaesthesia, broadening the scope of the inquiry.

By integrating qualitative and quantitative methods, we illuminate the complexities of visual perception, advocating for a holistic understanding of cognitive processes. Through innovative approaches such as sequence matrix plots (Savickaite et al., 2022) and qualitative data analysis, we shed light on previously unexplored facets of visual cognition. Our research contributes to the development of techniques and tools aimed at enhancing communication and creative expression for individuals across the neurodiversity spectrum.

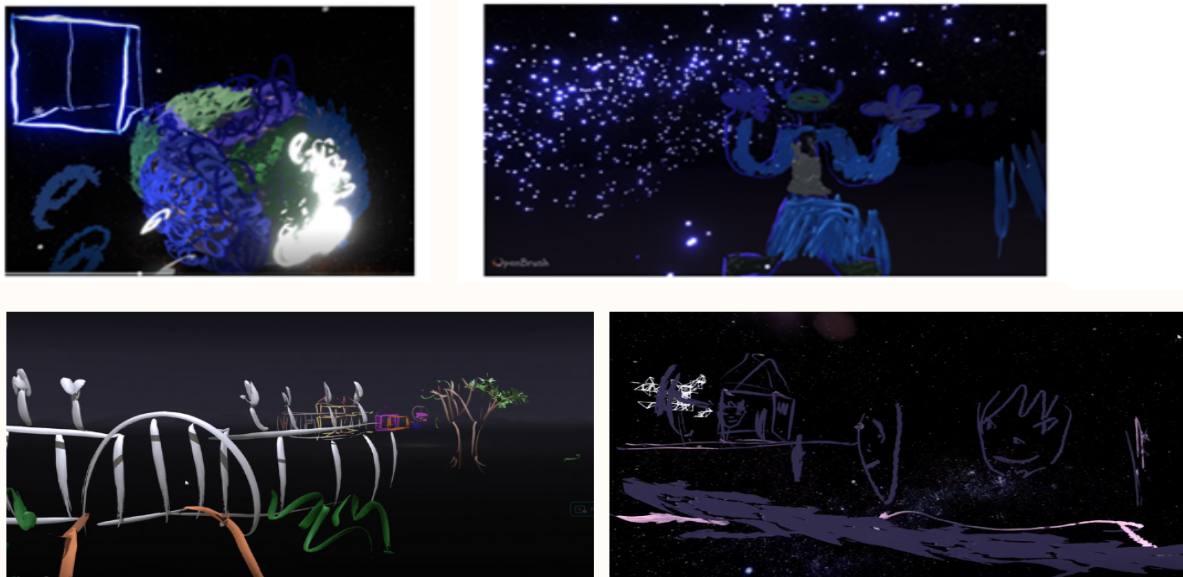


Figure 1. Examples of drawings produced by autistic participants (top) and individuals with aphantasia (bottom) using VR.

References

- Savickaite, S., McNaughton, K., Gaillard, E., Amaya, J., McDonnell, N., Millington, E., & Simmons, D. R. (2022). Exploratory study on the use of HMD virtual reality to investigate individual differences in visual processing styles. *Journal of Enabling Technologies*, 16(1), 48-69.
- Taylor, R., Savickaite, S., Henderson, S., & Simmons, D. (2023). Using immersive virtual reality to recreate the synaesthetic experience. *i-Perception*, 14(3), 20416695231166305.
- Savickaite, S., McDonnell, N., & Simmons, D. (2022). Data Extraction and Visualization from Three-dimensional Drawings Made in Immersive Virtual Environments.

The Posterior Cerebellum's Role in Feeling Moved by Visual Artwork: A Transcranial Direct Current Stimulation Approach

Ryan Slaby¹, Zaira Cattaneo¹
¹Università degli Studi di Bergamo

n/a

Mona Lisa's smile: a phenomenological interpretation based on perceptual organization principles

Alessandro Soranzo¹, Eleonora Bilotta¹, Francesca Bertacchini²

¹Università della Calabria – Dipartimento di Fisica

²Università della Calabria – Dipartimento di Ingegneria Meccanica, Energetica e Gestionale

Viewers have been enthralled with the Mona Lisa's enigmatic expression for centuries, leading to a variety of interpretations. Based on the psychological theory of perceptual organization (Wertheimer, 1923), this work offers a fresh interpretation. The focal point of the study is the "Ambiguity-Nuance," a softly blended, shaded area that frames the upper lip and is thought to affect how an expression is perceived because of perceptual organization. Using meticulously created artwork and methodical manipulations of the Ambiguity-Nuance to alter its perceptual organization, two experiments were conducted, with 32 participants each. Participants rated the level of contentment perceived in the portraits from different distances. Results show the manipulation of the Ambiguity-Nuance alters the perceived level of contentment. More specifically, substantial changes in perceived expression result from adjusting the perceptual associations between the Ambiguity-Nuance and the mouth. These results apply to other portraits by Leonardo, such as La Bella Principessa (Soranzo & Newberry, 2015) and la Scapigliata (Soranzo, 2024), and highlight the critical role that psychological concepts play in forming the Mona Lisa's ambiguous expressions.

References:

Wertheimer M. (1923) Untersuchungen zur Lehre von der Gestalt, II. Psychologische Forschung, 4:301–350.

Soranzo A & Newberry M (2015) The Uncatchable Smile in Leonardo da Vinci's La Bella Principessa Portrait. Vision Research, 113, 78–86. <http://dx.doi.org/10.1016/j.visres.2015.05.014>

Soranzo A (2022). Another ambiguous expression by Leonardo da Vinci. Gestalt Theory. "Colour and Space in Perception and Art". Sciendo. 44 (1-2), 41 – 60. <https://doi.org/10.2478/gth-2022-0001>