

**IAEA 2016**

Proceedings of the

**XXIV. Conference of the  
International Association of Empirical Aesthetics**

Edited by Helmut Leder, Michael Forster, Gernot Gerger, Marcos Nadal, Matthew Pelowski & Raphael  
Rosenberg

August 29 to September 1, 2016

**Vienna, Austria**

## **Mechanism of semantic markers: An eye tracking study**

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The aim of this poster is to present the results of our eye tracking experiment, developing an idea of our previous eye tracking study on intention of an artist, where we pinpointed and categorized specific places and features of image, which we call "Visual salient and semantic markers" as traces of expression of artist's intention. Nevertheless, our previous design has not answered clearly whether the markers of certain visual properties could shift the beholder's scanpath of an image, and thus the semantic impact on beholder's interpretation. We hence prepared this follow-up eye tracking experiment which aimed to answer the question by analyzing explorative eye movements of 20 volunteers. They viewed pictures with various objects and two dominant figures, both depicting different emotion, while one of the figures was visually emphasised by bright colour. The poster will present the findings whether the first glance, attracted by visually salient feature to the first or the second figure of certain emotional value, changes the whole structure of looking on the rest of the picture. Volunteers also filled out questionnaires rating pictures on Likert scale, and answered questions about their basic interpretations of the image. The experiment intends to empirically validate the basic mechanism how artist, only by visually emphasising certain semantically charged place, manipulates beholder into different viewing and interpretation.

## **MuSyC – Music, Synaesthesia, Colour**

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MuSyC is a project which aims at building a music to colour synaesthesia visualizer. Synaesthesia is a neurological phenomenon in which perception of a certain stimulus, such as the musical note 'A', involuntarily elicits another seemingly unrelated sensation, such as seeing the colour red. There are various types of synaesthesia, one of the most common of which is music to colour associations (chromesthesia). However, explaining the qualia or feeling this cross-sensory activation elicits is hard to do – thankfully, music visualizers have made it easier to showcase how sound can influence and shape images. MuSyC aims to simulate chromesthesia in real time. My goal with MuSyC is to make a wearable device which is sensitive to the frequency or pitch of a sound and flashes certain colours in response to particular defined pitches or notes, such as the universal A, B, C, D, E and F. Not only will this device allow non-synaesthetes to experience the world and music from the eyes of a music-colour synaesthete, it has great potential to be used as a tool for performance art in collaboration with musical orchestras and bands. Additionally, this device can also be used as an educational tool for those beginning training in music and those who need an additional visual cue to help distinguishing between closely related notes. Moreover, this device can be used as a way to visualize music for those who are deaf or hard of hearing to complement the experience of the physical vibrations of music.

## Interpersonal judgments of Individuals with facial disfigurement before and after treatment

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On the basis of physical attractiveness, people tend to make certain social judgments. Facially disfigured individuals are discriminated against in social, professional and academic settings. However, research in the field of facial disfigurement has been limited – we do not know what inferences drive these negative behaviors. To develop interventions to tackle this discrimination, this study aimed to determine what inferences people make about the social, internal, and personality attributes of facially disfigured individuals. Using surgical atlases, we built a corpus of 26 pairs of images of disfigured individuals before and after corrective treatment. Participants (N=145) viewed one of each of the pair of images and reported how each face made them feel in terms of valence, dominance, and arousal. Participants then made inferences about 31 personality, internal, and social attributes of the pictured individuals using semantic differential scales (e.g. introverted vs. extraverted; unhappy vs. happy). We predicted that disfigured faces would be perceived relatively negatively across some traits. We found that treated and untreated faces evoked strongly different emotional responses: participants reported feeling happier, more in control, and less aroused when viewing treated faces. Moreover, individuals who received corrective treatment were viewed more positively in terms of personality (emotional stability, conscientiousness), internal attributes (happiness, intelligence) and social attributes (trustworthiness, popularity). These findings suggest that social judgments made on the basis of facial disfigurement could contribute to stigma against disfigured individuals in their professional and personal lives. This study suggests that receiving cosmetic treatment for aesthetic improvements to appearance can improve how people are viewed by others.

## Pretty bad – recognition memory for faces of varying attractiveness

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Attractive individuals benefit from a number of positive attributions favouring them in social situations such as hiring decisions, democratic votes, and jurisdiction. However, their faces do not appear to be particularly well remembered: In a series of studies we found poorer memory for attractive individuals compared to less attractive individuals, with a further drop in memory performance for medium-attractive faces. Here, we focused on gender effects and associated neural activity during memory encoding and retrieval of faces sampled across the attractiveness spectrum. Male and female participants (N ≥ 20) were asked to learn and later remember attractive, medium-attractive, and unattractive faces of both sexes while their EEG was simultaneously recorded. Attractive faces were remembered less accurately, with a further decline for medium-attractive faces, and this finding was neither modulated by stimulus nor participant gender. Behavioural findings are discussed with additional reference to modulations of event-related potentials (ERPs) thought to reflect perceptual and emotional processing. We interpret our results both with respect to an adapted version of the multidimensional face space model, and relative to other face memory biases.

## **Aesthetic Testimony, why do we value it less?**

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Is it legitimate to base one's belief about aesthetic matters on the say so of others? Is it possible to acquire knowledge about aesthetic matters solely on the basis of testimony? Many philosophers have assumed that it is not, in contrast with mundane non-aesthetic matters, or that it is less so. Opinions differ, however, as to what explains any such asymmetry. Some suggest that there is some in principle difference between aesthetic matters and mundane matters. Others suggest that the asymmetry can be put down to more contingent differences, such as the relative background level of disagreement in different domains. Experimental philosophers have recently started to investigate the extent to which the various positions in the philosophical debate about aesthetic testimony enjoy intuitive support. Evidence of asymmetries between ordinary thinking about aesthetic and mundane testimony has been found. For example, participants seem to treat testimony about the aesthetic as being of less epistemic value. In this talk, I summarize the current state of the debate and report the results of a number of new studies. This series of experiments starts to explore what might explain these asymmetries and they help to shine light on why people treat aesthetic testimony and testimony about mundane matters in different ways. For example, the evidence suggests that the asymmetries between domains are greatest among those participants who think that the background levels of disagreement and deception about aesthetic matters are higher than in the mundane case.

## **Creativity in the conformist individual**

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A preceding socio-psychological study, evidenced two contrasting types of subjects to be identified: one with fascist potential and the other with democratic potential. It is believed that a characteristic of someone with fascist potential is the conformism of ideological, political and cultural ideas. This definition, however contradicts with other social-cultural ideals such as the push for change and of the typical transformation of extremism. Following this apparent contradiction an experiment was conducted with the precise purpose of highlighting, if any, creative aspects in the conduct and judgment of individuals with a high potential fascism. 18 subjects (7 female, 11 male) were selected from 148 individuals with the highest potential fascism, who were among a sample from a research with regard to authoritarianism which was carried out by myself in collaboration with Roberto Galeotti. They were subjected to an analytic interview focusing on the characteristic factors concerning creativity and divergent thinking, projective questions. Tests with regard to the attraction of complexity, divergent transformation of an aesthetic stimulus and title attribution. The results evidenced an internal dialectic regarding extremist conformism which were far more complex than the simplicity of well-known ideologies, highlighting a type of subject which was not apparent from previous studies; the pseudo-fascist. The methodology of the study used, re-dimensioned the heuristic validity of certain categories (i.e fascist) and of the generalizations that are connected with them allowing the meaning of certain attitudes to be read more clearly as well as the depth of aesthetic choices.

## Measuring the basic affective tone in poetry

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Despite a growing literature on the relation between sound and meaning in language, it is still an open question whether and to which extent the overall affective meaning of a text is (co-)determined by the specific use of sound in general, or of phonological units in particular. We investigate such a sound-meaning relationship in poems, presenting a novel quantitative measure to assess the "basic affective tone" of a text based on foregrounded phonological units and their iconic affective properties. The novel method is applied to the volume of German poems "verteidigung der wölfe" (defense of the wolves) by Hans Magnus Enzensberger, who categorized these 57 poems as friendly, sad, or spiteful. Our approach examines the relation between the phonological inventory of the texts to both the author's affective categorization and readers' perception of the poems—assessed by a survey study. Categorical comparisons of basic affective tone reveal significant differences between the 3 groups of poems in accordance with the labels given by the author as well as with the affective rating scores given by readers. Using multiple regression, we show our sublexical measures of basic affective tone to account for a considerable part of variance (9.5%20%) of ratings on different emotion scales. We interpret this finding as evidence that the iconic properties of foregrounded phonological units contribute significantly to the poems' emotional perception—potentially reflecting an intentional use of phonology by the author. Our approach represents a first independent statistical quantification of the basic affective tone of texts.

## The use of storytelling practices in the emotional intelligence and interpersonal relations research

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The field of emotional intelligence and interpersonal relations research with the use of art-based methods as well as its practical application is becoming more and more actual with increasing amount of changes in social situation of development in context of modern childhood. Research target is to formulate the model of storytelling use as a method for emotional intelligence study combined with traditional social-psychological research of childhood, based on the position of L.S.Vygotsky's cultural-historical theory on the social situation of development, principles of A.N.Leontiev, A.V.Petrovsky's theory of personality in group, J.D.Mayer, P.Salovey's model of emotional intelligence. Based on method of emotional definition (N.D.Feshbach., K.Roe) a special story and a storytelling procedure were created and used with a set of cards illustrating basic emotions (P.Ekman). Child's work with cards during storytelling as well as his/her verbal descriptions of characters' emotional states were fixed by the research procedure. The classical method of interpersonal relations in group study (A.V.Petrovsky, M.Y.Kondratyev) was also used. The data was obtained on 397 children (aged 7-8) sample in different types of Russian educational institutions and analyzed with IBM SPSS Statistics 21.0. Findings showed the storytelling research potential for determining emotional intelligence's peculiarities significantly linked with interpersonal relations in peer groups of children. Research outcomes were discussed and used in creating a program, based on the storytelling art-practices for individual and group psychological work with children focused on emotional and social development. The program is under approbation in a number of educational institutions in Moscow.

## **Aesthetic differences between genres in poetry and music**

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This study examined individual differences in aesthetic responses during silent reading of sonnets – a highly structured literary form in iambic pentameter that shares a number of rhythmic characteristics with music. Participants read sixteen sonnets at a self-defined pace, first for familiarity. For a second reading of each sonnet, participants judged vividness of the poem's imagery, valence of poem theme, valence of personal feelings about the poem, strength/intensity of their feelings, and aesthetic pleasure (AP). To examine individual differences in poetry perceptions, we also assessed, prior to the first reading, both positive and negative affect using the PANAS, and considered the role of visual and auditory imagery abilities using the VVIQ and BAIS survey measures, respectively. We also considered potential differences associated with music and literary training. As an online measure of AP, literary trained participants highlighted words within the sonnets that they felt were particularly aesthetically pleasing (positive) or displeasing (negative). Results revealed that strength/intensity of feelings, valence of feelings, and positive affect accounted for approximately 76% of the variance in AP ratings. Moreover, we found that positive highlighting was positively correlated with AP ratings; to our surprise, this contrasted with negative highlighting, which had no impact on AP ratings. Although neither imagery vividness nor visual/auditory imagery abilities contributed substantially to AP, vividness was a greater predictor of AP for individuals with high imagery abilities. Findings will be discussed in the context of the relation between rhythm and aesthetic pleasure in music and language more broadly.

## **Explaining individual differences in preference for curvature**

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People tend to prefer objects with curved contours to objects with sharp contours (e.g. Bar & Neta, 2006; Palumbo & Bertamini, 2016; Palumbo, Ruta, & Bertamini, 2015). Nevertheless, as with other aesthetic features (Jacobsen, 2004), there are also considerable differences among people in the extent to which they prefer curvature. The aim of the research presented here was to explore the possible reasons for such differences. Specifically, we sought to determine whether individual differences in preference for curvature were explained by participants' aesthetic sensitivity, experience with art, openness to experience, or intelligence. Thus, we asked 40 participants to perform a 2AFC preference for curvature task (Munar, Gómez-Puerto, Call, & Nadal, 2015), a computerized version of the Visual Aesthetic Sensitivity Test (Götz, Borisy, Lynn, & Eysenck, 1979), a short art interest and activities questionnaire (Brieber, Leder, & Nadal, 2015; Brieber, Nadal, Leder, & Rosenberg, 2014), the openness to experience scale from the NEO-PI-R (Costa & McCrae, 1992), and Raven's intelligence test. Linear mixed effects modelling was used to predict participants' preference for curvature (proportion of curved choices) using their aesthetic sensitivity, experience with art, openness to experience, and intelligence scores as predictors. Results are discussed in terms of the multiplicity of cognitive and affective processes contributing to aesthetic appreciation (Leder, Belke, Oeberst, & Augustin, 2004; Leder & Nadal, 2014).

## Theory of mind processes modulate aesthetic appreciation of conceptual art

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How does theory of mind (ToM) processing affect aesthetic appreciation and aesthetic judgment of different kinds of artistic objects? When aesthetically appreciating a piece of visual art such as a painting, further elaboration on thoughts about the artist's mental state could enhance the depth and comprehensiveness of the beholder's aesthetic experience. Findings of a recent electrophysiological study indicate different sub-processes involved in preparation for and during the aesthetic appreciation of visual abstract art from one's own vs. from an artist's perspective. With reference to conceptual artworks, an aesthetic episode might only occur when engaging in ToM reasoning. Thus we were interested in studying to what extent such reasoning affects the appreciation of conceptual art. Artistic descriptions of genuine conceptual artworks were designed to involve either ToM processing or no such processing. Participants were presented first with an artistic description (including ToM or not) and second with a photograph of the corresponding conceptual artwork. Afterwards they indicated whether they liked or disliked the artwork using a Likert scale. We will present key findings of this study offering valuable clues to discuss the role of ToM in aesthetic appreciation in general as well as the specifics when investigating conceptual art.

## Experimental illustrations for the evaluation of factors which codetermine humorous experience

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We started from a black-and-white illustration which elicits an average level of humor in the average beholder. The incongruence favoring humor is the fact that the road marking arrows have obvious contents that do not convey any real information to the puzzled motorist. We graphically reduced the curvilinearity and introduced chiaroscuro effects, also varying the background coloring. The images were evaluated individually by young adults of both genders by means of an 11-point humor scale (from a minimum of 0 to a maximum of 10), with rotation of the order of trials and other methodological safeguards. Different experimental groups were examined with various combinations of graphic style and background colorings. We showed that a rounded graphic style without chiaroscuro effects favors humor intensity, which is also favored by a bright pink background rather than a purplish gray one. Maximum humor is obtained with a combination of a rounded graphic style and bright pink background, while the minimum humor is obtained with sharp edges and a purplish gray hue. In short, we demonstrated the role of emotional detachment as an essential ingredient of humorous experience, favored by a rounded graphic style, the absence of chiaroscuro effects, and the use of emotionally reassuring colors such as pink. The paper contains the necessary illustrations and statistical analyses.

## **Percepts & parameters: A prospective approach of architectural materiality**

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Numerical encapsulating processes in architectural creation, from perceived realities weaving fictions, or figments feeding computer-generated geometries, a projective attitude is based on a virtualizing stance. Whether analogically imagined, whether computer simulated, these projections come true from successive language translations. Sketches and models are classical techniques in the process of conception which computer aided designs intrinsically modified. Raising new paradigms in terms of information treatment, this research aims to explore the potentialities of such hybridizations through the measuring of subtle worlds. Object-oriented programming (OOP) introduced the fundamental concept of encapsulation. Then, as a nodular black box, encapsulation is a concealed implementation through objects interacting together as building blocks. Broadening this concept to any sort of significant support, this experiment is a work-in-progress which aims to demonstrate how the shift from creative semantics to formalized syntaxes results in singularities. Identifying invariants or puncturing data sets from unexpected analogic territories such as lexical fields, fictions or matter convulsions, a group of students at the Architecture School of Lyon, France, was observed to collect material for this investigation. For all intents and purposes, the goal is to extract advanced operational possibilities starting by implementing percepts as analogic fluxes into parametric geometries. In this pedagogical context, the investigations of the MAP-Aria - laboratory for architectural modeling - leads and observes the potentialities of such a prospective approach using digital and parametric OOP-like tools as crucial keys of control. We expect these tools to deliver singular ranges of aesthetics possibilities targeting unforeseen and innovative architectural materialities.

## **Poetic vs. ordinary language: Reopening the case in light of new evidence**

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Deviation from common language use is considered a key feature of poetic language (Aristotle, 1932; Wordsworth, 1802); it is assumed to “de-automatize” and thereby extend and intensify the reception process (Shklovsky, 1965). Following suggestions by Bierwisch (1965, 2008) and Klein (2005), we assume that the poetic deviation from ordinary language is best conceived of in terms of the relation between two knowledge systems: mental grammar and poetic competence, i.e. the schematic knowledge that allows for the production and/or reception of verbal art. We propose and exemplify a simple approach to study this relation at a basic level: Sentences are judged along the two relevant evaluative dimensions of acceptability, i.e. the degree to which an utterance sounds natural/unmarked to competent native speakers, and poeticity, i.e. the degree to which an utterance is perceived as poetic by competent readers. Varying stimulus features systematically enables us to explore the relation between grammatical and text-type knowledge. We present data from two quantitative studies (single-item forced choice and Likert scale ratings) that confirm the validity of the approach and its applicability at the sentence level. Results corroborate the notion of interacting knowledge systems in evaluating short, unfamiliar stimuli: The acceptability task (“how natural?”) taps into grammatical knowledge and results in severe penalties for clear rule violations. When judging poeticity (“how poetic?”), participants draw upon both grammatical and text type knowledge and exhibit additional sensitivity to more subtle stimulus features. For types of deviation that actually occur in poetry, poeticity negatively correlates with acceptability.

## High entropy of edge orientations characterizes artworks from different cultural backgrounds

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In a companion presentation at this meeting (Redies, Brachmann & Wagemans), we studied whether “visual rightness” of an artwork manifests itself in a particular arrangement of edge orientations. We compared edge orientations pairwise in each of >1600 paintings of Western provenance and found that, on average, Shannon entropy of the edge orientation histograms was high, i.e. edge orientations exhibited a low degree of correlation, in each of the paintings. At the same time, collinearity of edge pairs was low in comparison to images of other man-made objects or scenes (photographs of simple objects, architecture or urban scenes). Here, we extend this investigation to artworks from diverse cultural backgrounds that were produced by various techniques (Islamic manuscript illuminations, Chinese brush paintings, Japanese woodcut prints, calligraphy and Western graphic art). Similar to the results for Western paintings, entropy of edge orientation was high and collinearity low in these sets of artworks, while complexity was more variable. We conclude that high entropy of edge orientation is a widespread finding in artworks from different cultural backgrounds. Our results are compatible with the notion that a large body of visual artworks are characterized by specific statistical image properties across human cultures. [This abstract was submitted in parallel to the VSAC 2016 conference in Barcelona].

## Aesthetic judgments of contemporary paintings by art museum visitors

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The art gallery setting is the usual environment for the appreciation of contemporary artworks by the general public. With an aim to understand how different cognitive and affective ratings of art relate to each other. Gallery visitors viewed and made judgments about real works of art in the setting where art is normally viewed, in contrast to the majority of previous research which is based in the laboratory. Participants (N = 129 gallery visitors), viewed 20 contemporary paintings amongst a larger art exhibition, and judged the artworks on Liking, Meaning, Interest, Valence, Artistic Merit and Understanding rating scales, whilst in the process of contemplating the artworks. The poster will present the results of a cluster analysis which will show how the different ratings relate to each other. Findings from empirical visual research undertaken in a ‘real life’ context can add to theoretical research in cognitive psychology and neuroaesthetics, which is often restricted to the laboratory. These results would also be of interest to museum curators, gallery owners and authorities commissioning art to improve the aesthetic appeal inside public buildings, for the benefit of both health and intellectual stimulation.

## **Differences in cognitive processing when appreciating figurative and abstract art can be detected by integrating EEG and eye-tracking data**

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In the context of a project assessing the effects of “Arts in Hospitals” the present study aimed at exploring the fruitfulness of integrating psychophysiological methods to ethnographic approaches. We assess whether significant differences can be detected in cognitive processing when attending figurative or abstract art that has been manifestly reported as pleasant or unpleasant by the subject. The experiment measures the absolute power of different EEG frequency bands (i.e. delta, theta, alpha, beta & gamma) in two experimental conditions: i) abstract paintings and ii) figurative paintings. Eye-tracking and self-report data were gathered simultaneously. Each condition included 20 paintings (total of 40), which were pre-selected and assigned to each condition following a rigorous procedure involving an external contributor. A total of 30 non-artist participants (10 females, average age 24.6 (s=4.6)) were recruited for the study. Every test session lasted around 90 minutes (including preparation). Band power analysis for the five investigated frequency bands revealed that largest significant differences between the two conditions were apparent in Theta, Alpha and Beta activations. Based on the results and existing tendencies in the EEG literature, it can be postulated that figurative art viewing involves higher mental engagement, more demanding information retrieval and memory-related cognitive processes than abstract art. Therefore, it could seem to be counter-intuitive the fact that abstract art - with a lesser demand in cognitive load - is generally considered to be anxiety-provoking by virtue of its alleged ambiguity (e.g. the emotional congruence theory), independently of its aesthetic effects on particular subjects.

## **Conscious episodes during literary reading: From foregrounding to disportation**

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Non-conscious processing dominates the act of literary reading (Jacobs 2011). Almost all empirical and neurocognitive work conducted on literary reading and poetics has focussed (either purposely or otherwise) on this non-conscious reality. The many intriguing studies on transportation (e.g. Gerrig 1993; Green 2005), narrative engagement (e.g. Busselle & Bilandzic 2009) and absorption (e.g. Kuijpers 2014) attest to this. As do the many studies on literature and empathy: both cognitive empathy (or ToM) and predominantly affective empathy. But what of consciousness? What role does it have to play in acts of literary reading? And what might such phenomena as foregrounding (van Peer 1986, Miall & Kuiken 1994; Hakemulder 2004) and disportation (Burke 2011) play in the triggering and the sustaining of conscious ‘awakenings’ during the ‘submersive’ state that is literary discourse processing. This presentation will investigate this and, drawing on some contemporary cognitive and neurocognitive theories of conscious (e.g. Dehaene 2014), it will also explore the divisions and connections between non-conscious and conscious processing during literary reading. The talk will conclude with preliminary suggestions for experimental design to empirically test any emerging theory.

## Neuroaesthetics of dance: Watching brains, moving bodies

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A fundamental difference between dance and other kinds of art is that in dance, both the artist and the artwork are contended within the human body. The body itself (or to be more precise, the dancer's body) acts as a dynamic canvas from which dance movements flow. Interestingly, the common spectator's aesthetic experiences are contained within his own body, which mirror with passion the performed movements. The idea of an internal embodiment of the dance and its associated emotions has been heightened by the recent discoveries of the action observation network and neural simulation mechanism in the human brain. Neuroimaging studies have mapped the observed action in the same cortical regions that we use to execute movements ourselves. Interestingly, neuroimaging studies have also shown that these internal embodiment mechanisms are influenced by the observer's previous experience with the observed movements and with the observer's aesthetic preference. Since then, the pathways that dance aesthetics and neuroscience research have taken have converged into a wider framework that include a two-way circular road. On the one hand Neuroaesthetics research feeds information to the artistic community about how dancers' brain are special (because its bodily abilities) and how the spectator's conscious and unconscious brain/body processes the observed dancer's movements and intentions (emotion, aesthetic response). And on a continuous loop, dancers and choreographers' feedback scientist the reality of the performing scene, allowing to extend views from narrow laboratory spaces and enclosed participants to an ecological and real experience of feeling performing arts.

## Museum objects, aesthetic stimulation and psychological wellbeing in early to middle stages of dementia

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Neuropsychological evidence proposes that touch, a key sense that becomes more important as people age, may invoke a sense of wellbeing through being linked to emotional and motivational systems in the brain. The present study examined the impact of handling museum objects in small groups of participants with dementia (Alzheimer's (n = 37), vascular (n = 24), frontotemporal (n = 4), mixed-types (n = 13) and HIV-related (n = 2)). The main research question enquired if handling museum objects could enhance wellness, happiness, interestedness, confidence and optimism. Sub-questions investigated the role of aesthetic experience on object handling and sought to understand the relationship between aesthetic experience and wellbeing at 2 different dementia stages. Eighty participants (53 males) (range 54 - 89 years, M = 74.81) took part. Measures: pre post administration of the Canterbury Wellbeing Scales and audio-recorded sessions, the latter subject to content analysis. Parametric tests showed significant improvement in overall wellbeing ( $t(76) = -9.79$ ,  $p < .001$   $d = .77$ ). Participants reported higher levels of wellbeing at Time2 (M = 405.68; S.D. = 76.25) than at Time1 (M = 347.86; S.D. = 74.62). Differences in wellbeing were also demonstrated by testing the effects of gender and dementia stage in a 2 x 2 x 2 mixed-design ANOVA. Content analysis revealed aesthetically 'unpleasing' objects produced as many verbally fluid responses as those considered 'pleasing'. The results confirm that brief interactions with museum objects can impact wellbeing and challenges the common conception that reminiscence-focused activities, rather than those that consider aesthetic experience, should be the norm for art-based dementia activities.

## Musical friends and foes: Social interaction in collective improvisation

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What is the nature of the musical experience offered by collective free improvisation (CFI)? Many authors, including musicians, have suggested that CFI possesses a deep ethical resonance, both for the listeners and the musicians themselves. This is a feature arguably shared with many musical practices all over the world. However, it is perhaps more explicitly displayed by CFI, which, in the absence of any musical text serving as common ground for the musicians, directly allows and enables the exploration of a large array of interpersonal relations through musical means. In support of this claim, we will present the results of a study conducted with 20 musicians, who recorded 100 improvisations in duo. This study shows that spontaneous dyadic musical interactions can not only mediate, but also directly communicate complex positive and negative social attitudes such as authority, reconciliation, disdain, caring, or disrespect, and that such communication is significantly based on non-prosodic cues linked to temporal and harmonic coordination. These results are of great significance for the aesthetics of music, as they show that musical expressiveness goes well beyond the basic garden-variety emotions (joy, anger, sadness, etc.) most commonly examined in recent literature. Musical sounds in CFI are like a cathartic playground, in that they lead us to experience not only the full spectrum of mundane emotions, but also multiple ways of relating to the other(s) – from alliances to conflicts, from mutual assistance to indifference, from friendship to enmity.

## Aesthetic responses to computer-generated and man-made art

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The generation of genuinely creative works of art could be considered as the final frontier in artificial intelligence. One test of success for a machine artist would be to convince the onlooker that it was generated by a human being and to produce an aesthetic experience identical to that induced by man-made art; an artistic Turing test. There is little research on whether individuals can differentiate between computer-generated art and man-made art, and if they can, whether judgments are driven by impressions of intentionality, or surface characteristics that suggest the mode of production. Furthermore, the aesthetic impact of computer-generated art has yet to be explored. Participants were shown a series of artistic images, half of which were computer-generated. They were asked to categorise each image as computer-generated or man-made. Aesthetic ratings of the computer-generated and man-made artworks were also recorded and image statistic information was extracted. Participants displayed a general bias against machine-made art. 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. These data have implications for the way in which A.I. algorithmic art is created. It can also provide insights into the ways aesthetic perception can be modulated according to the provenance of an artwork which is critical to understanding how art will be valued and perceived in the future.

## **The right hemisphere's dominance for creativity and metaphor processing is not right**

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The right hemisphere is often regarded as the hemisphere through which our creative impulses are implemented. Metaphor comprehension and production is an important kind of creative thought. The hypothesis that the right hemisphere also specializes in coarse coding of semantics would seem to offer a sensible account of the right hemisphere's dominance in processing metaphors and reify its role in creative thought. However, we contend that previous neural studies of metaphor processing have been compromised by inadequate stimuli design and a conflation of the use of different kinds of metaphors. I will review our attempts at constructing appropriate metaphor probes that are relatively matched to literal language on relevant psycholinguistic dimensions. Using these stimuli in an fMRI study, we show that sentential metaphor processing engages both hemispheres, especially bilateral inferior frontal gyri and the left posterior middle temporal gyrus. Finally, in ongoing work, we demonstrate that patients with left hemisphere focal brain damage and those with logopenic variant of primary progressive aphasia can have disproportionate deficits of metaphor over literal language comprehension. These data argue against the hypothesis that the right hemisphere specializes in metaphor processing, suggest that such processing engages bilateral brain regions and, if anything, relies more crucially on the left hemisphere.

## **Prospects for a neuroaesthetics of architecture**

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The interest in the neuroscience of architecture is growing as evidenced by recent meetings, institutional organizations, and edited books. However, this interest seems to rely on scattered observations that are not motivated by an overarching theory or grounded in substantial experimental work. In this talk I will consider 4 frames from which one might approach architecture that could guide systematic research. Buildings might be regarded as an example of an object. Buildings might be considered as landscape. Buildings could also be thought of as an extension of one's body. Finally, building could be regarded as large tools designed to accomplish specific functions. Each of these frames might subject "architecture" to the kind of aesthetic principles relevant to objects, landscapes, bodies, or tools, and raise different questions in developing a research program in the neuroscience of architecture. I will probe the extent to which the aesthetic triad (systems devoted to sensory-motor, emotion-valuation, and meaning-semantic systems) that has been useful in conceptualizing the neuroscience of art and beauty might apply to the neuroaesthetics of architecture.

## **The sense of touch in aesthetic appreciation of artworks**

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This talk discusses the importance of including the haptic sense for the aesthetic appreciation of certain artworks. We try to respond to the question of what is lost when the tactile experience is ignored or prevented, owing to curatorial and conservational reasons. Our presentation firstly outlines some crucial moments in the history of touch in artistic creation. Second, it synthesizes a few pivotal studies regarding the cognitive and neuroscientific aspects of tactile information processing in humans, which are pertinent to this issue. These research outcomes show that the tactile contact causes interest consequences in the cognitive process and the emotional perception and reaction when creating or appreciating works of art. Finally, we argue that preventing spectators from touching artworks made to be touched might hinder the artistic communication and educational benefits that such an experience can offer. Undoubtedly, the act of touching gradually destroys the artwork that is touched. One solution proposed to this problem is to offer accurate replicas of those artworks, which are better experienced by touch. Here the cognitive neuroscientists play an essential role, since they know selecting characteristics that evoke similar patterns of neural activity as those stimulated by the real objects when touched. We expect more solutions to be proposed through a vivid debate on the topic. We believe a synergy of efforts among artists, art curators, and neuroscientists might not only provide new ways of experiencing art, but also encourage creativity and innovation.

## **Beyond behavioural preferences: On how experience modulates individuals' emotional embodiment during dance observation.**

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Engaging observers emotionally is an aim of most dance performances. These emotional reactions have been a much-investigated object of study in empirical aesthetics. Yet, both in the theatre and in the laboratory context it is difficult to ascertain whether observers genuinely feel and automatically embody the emotions expressed by a dancer, or, whether s/he merely expresses a conscious behavioural aesthetic preference regarding the dancer's movements and concomitant performance features (i.e. music). Here, we present a series of studies where we explored observers' objective reactions to dance by measuring their autonomic physiological responses (galvanic skin response) during dance observation as an indicator for emotional arousal. In a first study, we explored how different features of a dance performance (dance movements and music) interact to evoke the desired affective response. In a second set of studies, we investigated how this response is modulated by observers' level of experience in expressing affective or emotional movements themselves. We showed that dancers –who by definition are motor experts in expressing affect with body movement– showed greater sensitivity to the affect expressed in dance movements –both behaviourally and physiologically. By contrast, participants with Autism Spectrum Disorder (ASD) –who have difficulties in recognizing and expressing bodily emotion– showed atypical behavioural and physiological responses to expressions of emotion in dance. Overall, these results shed light on the interaction between the multiple strands of a performance (e.g. music, dance), and the characteristics of the spectator (e.g. expertise level) for a successful embodiment of the emotion depicted in a dance.

## Content and the perception of complexity in painting

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To date, in empirical aesthetics complexity is mainly understood as a visual concept, most often restricted to formal aspects of art. Yet, from any art historian's perspective, complexity as an aesthetic dimension cannot at all be reduced to quantifiable visual elements, but rather needs to be understood as a concept that combines both, content and form perception. Moreover, recent findings suggest that meaning is inferred from a visual representation rapidly and automatically, impeding the independent processing of form and content. The main objective of the present study was, therefore, to clarify the influence of semantic meaning processing on complexity perception. As we assume the assignment of meaning in art to rely on explicit knowledge and expertise, we compared the complexity ratings given by a group of ten art experts and thirteen non-experts to a set of 90 paintings. We found that perceived complexity is indeed essentially influenced by form as well as content perception, whereas observers with different knowledge backgrounds do not only differ linearly in their overall evaluation, their evaluation is also based on different factors. From these traces of subjective cognitive processes it follows that the concept complexity is essentially grounded in perception and the interaction with the object; it can thus not be understood as self-consistent objective property of an artwork. This has major implications for the measurement of complexity, as traditional approaches to the concept will in many cases violate the measurement invariance principle and hence not enable reliable and robust conclusions.

## The Turbulent Heart, revealed in four-dimensions

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The dynamics of blood flow in the heart can provide important clues to its health. Starting from 3D imaging of a patient's beating heart, detailed computational fluid dynamics (CFD) simulations of the blood flow were performed, vortical structures were algorithmically tracked, and data-driven visualizations were algorithmically rendered. Unretouched visualizations from this process revealed, for the first time, the presence of turbulent flow structures in the left atrium and ventricle, the persistence of which in both time and space tells us much about the cardiac energetics. New visualization approaches were required: Inspired by visual conventions from the futurist art movement, we "froze" these complex four-dimensional (3D + time) flow structures into a single image, showing, from left to right, the formation and then dissipation of vortex rings in the left atrium (blue) and left ventricle (red) as the heart relaxes. Design choices were informed by perceptual theories that are synergistic with appraisal and interest (A&T) theories of empirical aesthetics: An organism's perceptual system is induced when it picks up stimuli produced by environmental change and variation; our algorithm reduced unchanging and unvarying details to emphasize (or "caricature") changing elements. Similarly, A&T predicts that audiences engage in a "novelty check" for what is new-unfamiliar prior to the "appraisal of coping potential" phase that examines if they can understand the event; To aid understandability of vortex ring formation and dissipation, a number of frames were chosen to provide sufficient continuity between frames while minimizing overlap.

## Revisiting Eysenck's notion and measure of aesthetic sensitivity

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H. J. Eysenck had a profound influence on empirical aesthetics. His body of work contributed to the development of experimental methods, theoretical concepts, and psychometric instruments. One key notion in Eysenck's thinking was that of a general factor (T) of 'good taste'. Together with the German painter K. O. Götz, Eysenck developed a test of visual sensitivity to measure the T factor: the Visual Aesthetic Sensitivity Test (VAST). The VAST is a 50-item test in which two figures (geometric forms or brushstrokes) are presented together, where one is always better designed than the other. Our aim was to conduct an analysis of the VAST's psychometric properties and re-examine the notion of aesthetic sensitivity. We recruited 157 participants who took a computerized adaptation of the VAST. Tetrachoric correlation between items yielded a poor psychometric performance (mean correlation = 0.0012). An item-by-item inspection revealed that the geometric form items perform better than the brushstroke items. Our results, from a narrow perspective, suggest possible avenues for improvement in the measurement of aesthetic sensitivity and, from a broader perspective, call for a re-examination of Eysenck's notions of aesthetic sensitivity, preference, and taste.

## Preference for curvature: Effects of presentation time and backward masking

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A growing body of literature reveals a widespread tendency for people to prefer curved-contour objects (Bar & Neta, 2006, 2007), rooms (Vartanian et al., 2013), design elements (Westerman et al., 2012), and geometric figures (Bertamini, Palumbo, Gheorghes, & Galatsidas, 2016; Palumbo & Bertamini, 2016; Palumbo, Ruta, & Bertamini, 2015; Silvia & Barona, 2009) to equivalent sharp-angled alternatives (Gómez-Puerto, Munar, & Nadal, 2015). Nevertheless, such studies differ greatly in their methodological details; most notably in the time stimuli were presented to participants. Here we aim to clarify the effects of presentation time and backward masking on participants' preference for curvature, measured as the proportion of curved choices in a 2AFC task. We recruited 270 participants and randomly assigned them to one of 8 groups, depending on presentation time (20, 40, 80, 300 ms) and whether or not the target stimuli were backward masked. Our results suggest that preference for curvature arises when stimuli are shown for 40ms or more, and that backward masking markedly reduces this preference when stimuli are shown only briefly. Our results have implications for understanding the early perceptual processes involved in preference for curved contours, and suggest that this effect is quite robust to presentation time but not to competing visual processes, such as those exerted by masking.

## Are we all aesthetic realists? A cross-cultural investigation in folk aesthetics

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Aesthetic realism is the thesis that aesthetic properties (such as “being beautiful”, “being sublime”, etc.) are real, mind-independent properties of objects. To put it otherwise: it is the claim that beauty is not in the eye of the beholder, but in things themselves. One traditional argument in favour of aesthetic realism is that it is supposed to be consistent with the ways we ordinarily think and act about aesthetic properties. Indeed, since Kant, philosophers have claimed that we naturally tend to think that aesthetic judgments can be correct or incorrect, and that they aim to be universally valid. And aesthetic realism is the best explanation for these attitudes. However, is it true that most people spontaneously consider that aesthetic judgments can be correct, or incorrect, and thus do not only express subjective appreciation? So far, empirical evidence on the subject have been scarce. In this conference, I will present data from more than 2000 participants recruited across 18 countries. Participants were presented with aesthetic disagreements and asked to rate the correctness and incorrectness of the contradictory judgments. In opposition to received philosophical wisdom, most participants answered that aesthetic judgments were neither correct, nor incorrect, suggesting that they do not take a realist stance on aesthetic properties. I will end by discussing how to best characterize our natural approach and understanding of aesthetic properties

## The shaping of aesthetic preferences for dance by experience

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Perceiving others in action, whether in daily contexts like seeing a commuter run to catch a train, or in highly refined artistic settings, such as watching a skilled dancer perform on stage, evokes affective responses in an observer. The extent to which an observer’s prior experience with an observed action shapes his or her affective evaluation remains poorly understood, and is essential for advancing knowledge about how we perceive and interact with others in a social world. We present studies that attempt to construct a more complete understanding of the impact of experience on action perception and affective judgment when watching complex whole-body dance movements, using complementary behavioural and brain-based approaches, such as skill training interventions, functional neuroimaging and physiological measures of implicit affective responses. In one series of experiments, a dance-training paradigm was used to investigate dance experience instilled in participants de novo. Specifically, we address how experience acquired through the auditory, visual or motor domains shapes perception and explicit affective responses at behavioural and brain levels. In a complementary line of research, we recorded facial muscle activity while dancers and non-dancers watched dance movements, to investigate how prior experience impacts an implicit, objective measure of affect and determine how this corresponds with subjective, self-report measures of liking. Overall, the results of these experiments suggest that experience with a particular movement affects explicit and implicit affective judgments of that movement, as well as significantly modifies brain circuits engaged during action perception.

## **Creativity, social networks and patronage: Early Twentieth-century Modernist Literature as a case study**

**Raymond Crozier**

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Individual artistic production needs time and space, which require financial and other forms of support. Patronage has been extensively studied but there has been little empirical research into the forms it takes and how these relate to the nexus of social relationships surrounding artistic practices. This study aims to identify patterns of relationships among writers and patrons and to analyse the various forms that patronage and social support take. It takes the early modernist period in literature as a case study. This is a distinctive period in a number of respects: it represents a break from the literature of the past; it introduced writers of lasting reputation, including Eliot, Joyce, Pound and Yeats in English and Proust in French; I concentrate on English-language writers and their supporters. Social networks are constructed on the basis of analysis of biographical information, beginning with Pound, Aldington and Doolittle, generally considered the instigators of modernist poetry. Nodes represent writers and patrons and links depict explicit relationships of patronage and social support. Extensive and complex networks are identified, involving direct and indirect forms of financial, editorial and personal support. There is considerable overlap between the roles of patrons and writers. Small, relatively short-lived literary magazines were significant in patronage. The neglected role of women in promoting and sustaining modernism during this period is identified. This was not restricted to wealthy donors but included women in creative, editorial, managerial and publishing positions.

## **Neuronal music**

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We illustrate here that ensemble recordings of single neurons from the human brain can be used to compose music. We first describe the recordings, which were obtained in human patients implemented for neuro-surgery. The recordings can be done with up to 100 electrodes, from which single neurons can be isolated (typically of the order of 100 simultaneously-recorded neurons). In some cases, the quality of the recording allowed us to separate between excitatory and inhibitory neurons. Second, we show that converting the activity such large ensemble of neurons into audio signals can be used as a tool to "visualize" global change of activity in the brain, that would be otherwise difficult to detect using visual representations. Finally, we show that the activity of single neurons can also be used to compose music, thanks to the fact that the activity of the brain is characterized by many different types of rhythms and oscillations. We exploited this rhythmical activity to drive instruments with neurons, such as percussions, bass, steel drums, synthetic bells. Here, we show two types of music composition, one that strictly respects the timing of the firing activity of the neurons, and another one that uses "loops" created from selected periods of neuronal activity. To finish, we will play different musical pieces composed from the activity of neurons during states of the brain, such as wake or sleep.

## **Aesthetic experience of changes in Van Gogh's painting technique**

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This paper examines the experience of changes in Van Gogh's painting technique over the five known periods in the artist's opus. Segments of different size were cut out of each of the five paintings shown. In the first part of the research, we examined segments of digital reproductions, all of which had the same resolution (400x400 pixels). In the next part, there was one detail of a known theme in each segment shown. Finally, in the third part of the research, the whole paintings from which the stimuli were extracted were shown. Undergraduate students of Psychology with no previous art education, estimated these three series of stimuli. Two seven-point scales were used for: a) judgment of their perceived quality or artistic value (valuable/not valuable) and b) judgments of liking (like/dislike). By variance analysis, it has been established that the periods had an effect on the estimation of the liking of the technique, the details and the whole paintings. The recognition of the theme from a detail has no effect whatsoever, as expected. We especially interpreted the paintings over which there was a noticeable disagreement when estimating different levels of enlargement. The paintings from the earlier period were evaluated as more valuable and likeable, except those which were maximally enlarged. Among all of the paintings, the fourth one, which originated during the artist's voluntary stay at a mental institution, was the most distinguishing. Our research builds on similar studies, introducing a psychological perspective to the observation of this problem.

## **Fulfilling Gricean Communication Principles predicts aesthetic liking**

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In visual art, a key aspect of positive aesthetic experience concerns viewers' ability to construct meaning by regarding art as a communicative process. The Gricean framework posits that adherence to or intentional violations of maxims facilitate a clear communication. We operationalized these maxims to fit an art viewing context, along with an index of intent, and used hierarchical linear modeling to assess the predictive power of each maxim (and intent) for artists' and non-artists' liking of images varying in abstraction. We then examine expertise differences in maxim fulfillment. Forty-seven non-artists and 15 artists responded to an artistic communication survey while viewing 20 images that varied in abstraction; responses were pooled and analyzed using HLM analysis. Results showed that maxim fulfillment (or understanding nonfulfillment as intentional) was related to increased liking and that most maxims, and intent, maintained predictive power across abstraction levels. Furthermore, means comparisons showed no differences for artists and non-artists in maxim fulfillment, intent, and liking for representational images; for abstract images artists yielded higher mean ratings for all the maxims and liking but not for intent – suggesting artists see intentional nonfulfillment in such cases, whereas non-artists see violations. Results indicate that viewers typically come to art viewing scenarios with an expectation that the artist intended to communicate something via the artwork. Trained individuals can construct meaning in a greater range of artistic styles due to a sharing of common ground with the discipline. Grice's model seems to be well suited to understand aesthetic communication and preferences.

## Variation basis of divergent thinking

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The creativity variation has been receiving increased attention. Martindale (1995, 1999) put forward the theory of cognitive disinhibition which refers creative thinking to the state of free-floating (Martindale, 1995, 1999). If creative thinking is based on cognitive disinhibition, then the former would consist of variation. Despite the theoretical thrust of the variation focus on creativity, little empirical work has examined relationships between creativity and variation. Three hypotheses were tested. First, the variation of divergent thinking (DT) occurs. To make a control condition, second, the variation of intelligence (IQ) was under examination. The suggestion is IQ yields no significant variation. Third, the variations of DT and IQ differ rather than closely interwoven. Two independent samples, totaling 308 participants (199 girls and 109 boys, aged from 15 to 17) were involved in the study. DT was measured by the alternate uses test (Wallach & Kogan, 1965) and IQ by the German IST-70 (Amthauer, 1973). A variation was assessed using within-person standard deviation (WPSD) scores (e.g., Epstein et al., 2012; Reckess, 2014). WPSD and mean scores of DT (and of its categories) significantly and positively correlated in both samples. Similar correlations of IQ were non-significant or significant with opposite signs regarding to different subtests. WPSD scores of DT and IQ did not correlate. When factor analyzed, 2 orthogonal factors emerged representing WPSD loadings of DT and IQ, respectively. Findings appear to be noteworthy due to they shed light on the variation of DT. It is withdrawn from the variation of IQ.

## Exploring the narrative nature of music using Guided Imagery and Music (GIM) therapy

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We are developing a new approach to musical narrativity in which musical structure is compared with stories told spontaneously by music therapy clients during listening. In GIM, clients experience imagery (social and physical situations) that appears to be evoked by music, and has a narrative structure related to music's temporal structure (Bonny, 1995). To assess the musical influence on imagery, we explored if most clients experience the same imagery types in the same musical passages. 23 clients, guided by the first author, underwent deep relaxation for 5min, then heard music lasting 30min (Bonny's 'Nurturing' programme, 7 compositions). They were instructed to report whatever imagery occurred to them. The recordings of sessions were coded using MAXQDA for 4 imagery types; scenery (client observes), action (client acts), presence (characters appear) and transformation (client changes). The 4 types were derived from narrative theory (Herman, 2012). Results showed a distinction between the percentage ratio of imagery types in all compositions, confirming the influence of music on the imagery. In Britten's 'Sentimental Sarabande' the ratio (scenery:action:presence) was 63:25:12; Walton's 'Touch her lips' 100:0:0; Berlioz's 'Flight to Egypt' 51:25:24; Berlioz's 'Shepherd's Farewell' 43:12:45; Puccini's 'Humming Chorus' 61:20:19; Massenet's 'Sous les Tilleuls' 58:23:19; Canteloube's 'Brezairola' 54:18:28. Scenery dominated everywhere, presence occurred in vocal pieces, action appeared when a new theme was introduced. Transformation (common in GIM) occurred rarely, always during action and therefore wasn't included in the count. This is the first study of musical narrativity through GIM that confirmed the codependence of narrative and musical elements.

## Is the relation between perceptual fluency and aesthetic preference mediated by emotion?

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The aesthetic preference of an object often depends on the perceptual and conceptual fluency with which the object can be processed. It has been hypothesized that this relation is due to the fact that fluent processing elicits a positive emotion that is then attributed to the aesthetic value of the processed object. In visual aesthetics this relationship can potentially be tested by pupillometry, given that positive emotions cause an enlargement of the pupil. Indeed, for conceptual fluency in connection with the processing of art work this relationship has already been confirmed. In the present study we wanted to test whether perceptual fluency also elicits a positive emotion. Because it is known that symmetric objects are processed more fluently than asymmetrical ones, we had participants to decide as fast as possible whether dot patterns were symmetrical or not. They also had to rate the aesthetic value of the stimuli. As expected, symmetric stimuli were rated higher in aesthetic value and identified faster than asymmetric stimuli. However, pupil size was smaller for symmetrical patterns, which is contrary to the hypothesis that perceptual fluency elicits a positive emotion. Thus, our study does not support the idea that the effect of perceptual fluency on aesthetic preference is mediated by emotional processes.

## Songs for the Ego: Theorizing musical self-enhancement

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This talk outlines a theoretical account of musical self-enhancement. I claim that listening to music serves as a resource for actively manipulating affective states so that a positive self-view is maintained and a sense of optimism is provided. Self-enhancement—the process by which individuals modify their self-worth and gain self-esteem—typically takes place in social interactions. I argue that experiencing music may serve as a unique “esthetic surrogate” for interaction, which equally enables self-enhancement. This ability relies on three main characteristics of the musical experience, namely, its capacity to (a) evoke empathetic feelings, (b) elicit social cohesion and affiliation, and (c) elicit feelings of reward. I outline how these characteristics relate to theories of music cognition and empirical findings in psychology and neuroscience research. I also explain the specifics of musical self-enhancement and how it differs from music’s other regulatory functions such as mood- and emotion regulation. My aim in introducing the notion of musical self-enhancement is to broaden our understanding of how music functions as an environmental resource entailing access to unique affective states and how musical experiences are co-constituted by both the agent and the sonic environment. This specific use of music for self-enhancement can be regarded as a form of affective niche construction, providing the external conditions in which people can experience themselves more positively and maintain high self-esteem.

## **How empowering music influences performance and risk-behavior in sports: A randomized controlled trial**

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Anecdotal evidence suggests, that in sports music has been used to bring people in the right mindset prior to competitions, helping them to reach the peak of their confidence levels. We wanted to test whether motivational music improves sport performance and promotes risky behavior in sport settings. It was hypothesized that the effect of listening to motivational music on performance and risk-behavior is mediated by an enhancement of state self-esteem and a decrease in performance anxiety. The study design requires participants to throw a ball into a funnel basket in multiple trials from various distances. While the hitting rate from fixed distances serves as a measure for the throwing performance, risk-behavior is assessed in trials where participants chose distances themselves. Participants were randomly assigned to one of the three experimental groups. The first group listened to self-selected music, the second to experimenter-selected music, and the third served as control group with no music. At the time of abstract submission, the experiment is being conducted in the laboratory of the Max Planck Institute for Empirical Aesthetics. Data collection is expected to be completed by the end of March.

## **The study of self-awareness verbalizations of adult visitors exploring contemporary art in a museum context**

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Unlike traditional art, contemporary art is no longer primarily based on canonical principles of beauty, but more on principles of communication. This has the effect of prompting viewers to questions, partially, their contemplative attitude and become actors in a creative process. The aim of our research program is to access and understand the actual experience of an individual exploring contemporary art in a museum context. Specifically, this study aims to identify visitors' different focus of interest other than the artwork itself that contribute to their museum experience. Our study is based on the analysis of adult visitors' verbalizations while exploring contemporary art in a museum context. The data was collected using the Thinking Aloud method. This approach is one where visitors are asked to articulate ideas, thoughts they may have as they tour the galleries. The verbal comments of 84 participants, age 18 to 70 years old that possess different levels of education and museum frequentation, were recorded by an accompanying person. Their voice recorded comments were transcribed and analysed with the aid of computer-assisted qualitative data analysis software tools. Our findings place visitors' self-awareness as the most prominent focus of interest followed by museography, the role of the institution and on matters outside the museum space. In the process of art appreciation, visitors became self-aware and identified, suggested and foresaw different aspects about themselves. Results suggest that further research is needed to better understand the role of self-awareness in contemporary art exploration and its applications in museum education programs.

## How merchandise steals the city: Some psychological tools

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Here we consider the transformation of the modern city into a network of closed citadels and increasingly isolated from any urban fabric, not only to work but to live, go shopping, enjoy leisure, with the need to move between citadels by cars, other closed cells in which to spend a lot of time. Through this transformation, the merchandise steals the city as a place of unexpected uses, paths and meetings: so, no more events would change everybody life and the city itself, only technical accidents occur in the network of closed citadels and cars. We know that in the current economic system, the supply of goods and services affects the demand, and this also applies to homes, transportation, leisure, comfort and security. But this conditioning does not extend his grip with only the economic blackmail: from its inception has used psychological springs, giving form to every need, desire or fear to promise immediate satisfaction. But the latest appeal seems to be security, motivated by fear of the “outside”, and aiming to eliminate any experience of the city as unexpected. Now the question is what, if any psychological instruments act against the elimination of the city, and how. Dystopias warn of catastrophic consequences, global utopias propose alternative models, but a research that moves from the ruins of real cities to interrupt and merge history's course, as Piranesi and Benjamin did, can give nor destinies, nor models, but stimuli to imagine and to experiment new possibilities to live events in the cities.

## Which properties determine the aesthetic preference for basic polygonal forms?

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At least since the seminal work of Birkhoff (1933) a research goal has been to isolate geometric or perceptual properties that predict aesthetic preference relations between simple polygonal forms (triangle, square, pentagon, hexagon, etc.). Although Birkhoff's approach turned out to be rather limited, it became clear that symmetry plays an important role for aesthetics. The aim of the present study was to further examine which geometrical and perceptual properties of basic forms determine their aesthetic value. For this objective we conducted a series of experiments in which participants had to indicate their aesthetic preference for different polygonal forms and to assess their symmetry. The polygons appeared as upright or slightly rotated single elements, or as group of elements with a common form but different size. As a result, there was a great discrepancy between preference judgements and perceptual symmetry. Interestingly, the number and orientation of elements had little effect on the preference order. We also calculated objective measures of aesthetics, goodness of form, and symmetry for each form. However, none of them can account for the observed preference judgements. If at all, then there was a weak relation between the preference order and the forms' number of symmetry axes. These findings suggest that there is no simple geometric or perceptual property that can account for the preference between basic polygonal forms.

## How to go beyond flat axiologies in neuroaesthetics

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Empirical approaches to aesthetics (and neuroaesthetics in particular) have been criticized from philosophers of art for not providing any means for justifications of aesthetic judgments (Dorsch 2014) and for not making any contribution to our understanding of why we value art (Noë 2015). I will argue that these critics not properly identify the explanatory project of empirical aesthetics, yet they nonetheless identify a putative blind spot of the field. Namely that they subscribe to “flat” axiologies (e.g. focus on correlates of beauty, hedonic value, and simple preference judgments) and thereby undercut the necessary re-evaluative element that enters into our aesthetic appreciation of art. In my paper I will briefly explain this element and address whether recent approaches in Neuroaesthetics might provide ways to answer the above challenge. These are: (1) studies that address longer time scales and different networks of aesthetic appreciation (Cela-Conde et al. 2013, Vessel et al. 2012). Such studies could be seen as attempts to identify more complex evaluative states that underlies our aesthetic appreciation of art. (2) Approaches that aim to distinguish responses of art experts from those of naïve viewers by highlighting the experts’ ability to insulate themselves from what could be seen irrelevant context factors (Kirk 2009, Freedberg & Kirk 2015). I will argue that both can inform philosophy with respect to the values that underlie our appreciation of art.

## Age, health and attractiveness perception of virtual (rendered) human hair

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The social significance of physical appearance and beauty has been documented in many studies. It is known that even subtle manipulations of facial morphology and skin condition can alter people’s perception of a person’s age, health and attractiveness. While the variation in facial morphology and skin condition cues has been studied quite extensively, comparably little is known on the effect of hair on social perception. This has been partly caused by the technical difficulty of creating appropriate stimuli for investigations of people’s response to systematic variation of certain hair characteristics, such as colour and style, while keeping other features constant. Here, we present a modelling approach to the investigation of human hair perception using computer-generated, virtual (rendered) human hair. In three experiments we manipulated hair thickness (Experiment 1), hair density (Experiment 2), and hair style (Experiment 3) of human head hair and studied perceptions of age, health and attractiveness. Our results show that even subtle changes in these features have an impact on hair perception. We discuss our findings with reference to previous work on facial morphology cues that influence human social perception, thereby suggesting that hair is a salient feature of human physical appearance, which has been largely dismissed in previous research on human beauty.

## Transgender priming in Medieval Europe

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Measurements of crucial face proportions suggest the Holy Face is consonant with a female face. Does a modern audience perceive this? We selected 22 female, 11 male, and 11 images of the Holy Face; all neutral en face. Each image showed the area beneath the eyebrow down to the tip of the nose; hiding any hints from hairstyle, facial hair, etc. Each image was shown with a word (“male” or “female”) presented 100ms before the image. A word congruent with the image predicts faster reaction times and higher accuracy for deciding the gender. We recruited 12 female and 9 male subjects. Priming the Holy Face with the word “female” significantly increased the number of decisions for female. The Holy Face showed a strong interaction effect, i.e. fast detection of gender relied on the prime word. Female faces were faster to decide as “female”, regardless of priming word. Male faces showed a significant interaction effect, where the decision for male was fastest if primed with male, and the decision for female was fastest if primed with female, but the effect is stronger for the Holy Face. Our subjects readily accepted a primed suggestion of female (or male) for the Holy Face. A modern audience perceives portraits of the Holy Face of the period as androgynous. Since perception of the studied features is likely similar, we infer that the medieval audience perceived the androgyny of the Holy Face. Was this planned? Was androgyny associated with divinity in medieval Europe?

## Elongation and perceived beauty of simple shapes

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In a series of studies, we explore the role of elongation on perceived beauty of simple shapes. Our goal is to see if people prefer elongation and whether preference increases indefinitely or peaks. We also seek to explore the interaction of elongation with other salient properties like complexity and symmetry. In Study 1 128 undergraduate participants in three experiments rated or selected in a paired choice paradigm right triangles with axis ratios varying from 1.0 to 2.5 (Friedenberg, 2012). ANOVA and Chi-Square analyses revealed a preference for more compact shapes and no effect of the golden ratio. In Study 2 observers judged the beauty of random polygons with 8 sides in Experiment 1 or with 16, 24, or 32 sides in Experiment 2, using elongation lengths of 70-190 mm. Regression analyses showed a significant linear increase in mean ratings with axis length but with lowered slopes for shapes with a greater number of sides. A third study using translational, reflected and rotational symmetries showed peak ratings at 160 mm for most contour types. Familiarity likely accounts for the difference in findings between triangles and random polygons. In the last two studies there is a strong preference for longer shapes limited by complexity and a symmetry-length interaction. The results have interesting implications for the subjective beauty of animal bodies and for product design.

## **Linguistic structures in the mental visualization and graphic representation of abstract concepts**

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Thought and language are closely related and according to some, one would not be possible without the other. In the case of mental visualisation we can talk about an imaginative process that is only partly detached from language. Mental visualisation, in fact, can make use of in more or less extensive measures, representative modalities and structures that are typically linguistic (metaphor, synesthesia, juxtaposition, chiasm...) regardless of whether the object visualised is real or unreal, concrete or abstract, and, we assume, even when the visualisation is made using abstract forms. To test this hypothesis, we conducted a series of experiments on the mental visualisation and graphical representation of certain conceptual stimuli. The subjects of the experiment were asked to mentally visualise 10 concepts and accordingly to make a graphic representations of each on an A3 page. Following a period of 7-30 days brief interviews regarding the drawings created were conducted with each subject. The graphic results show use of typically linguistic representative modalities, especially when the conceptual stimuli elicits an emotional involvement (direct or indirect) from the subject. The interviews not only confirm this tendency, but also give an indication of the existence of even more complex narrative-compositional structures than those deducible from mere examination of the graphic responses.

## **Individual differences in aesthetic judgments of symmetry**

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It is well known that for abstract graphic patterns, symmetry is an important predictor of aesthetic judgments. However, it is also known that this is true only on average, and that there are substantial individual differences. We investigated individual differences of preference for symmetry in two experiments: In an online study, 80 participants rated 250 abstract black-and-white patterns differing in symmetry and complexity for liking. In addition, participants completed the 16-NCCS questionnaire measuring individual need for cognitive closure. The second experiment was conducted in the lab and 108 participants rated the same stimuli and filled out the same questionnaires as in the first experiment. For each stimulus pattern, a score of mirror symmetry ranging from 0 to 100 was calculated. In both experiments, we found a significant interaction between the individual need for cognitive closure and the mirror symmetry scores of the stimuli: While on average, participants preferred symmetric over less symmetric stimuli, the higher the NCCS score was, the higher was also the preference of symmetry. This is in line with theory, since a high need for cognitive closure is associated with increased preference for order and structure. While a relation between need for cognitive closure and preference for figurative over abstract art was shown recently, here, we found evidence that need for cognitive closure also increases preference of symmetry. Therefore, the results of our research further support the relevance of need for cognitive closure for predicting individual differences in aesthetic preferences.

## Cycle-dependent shifts for male attractiveness?

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Women, due to evolutionary factors, seem to exhibit different mating strategies. During fertile days they prefer more masculine looking males as they advertise good genes (but, on the downside, bad social and relationship qualities). During non-fertile days more feminine looking males are preferred as they advertise good social and relationship qualities. However, recent meta-analyses report contradictory findings regarding cycle-dependent preference shifts (Gildersleeve et al, 2014; Wood et al., 2014). Based on critical points raised in these meta-analyses the following two stage experiment was conducted. In stage one 34 normally cycling women during their fertile days—confirmed by luteneizing hormone test—and non-fertile days were asked to produce ideal mates for a short term sexual relationship context by means of reverse correlation. Reverse correlation allows revealing implicit internal preferences with only little explicit interference. A short term context was framed because cycle-dependent shifts are reported to be stronger in this context. In stage two a separate sample of 33 normally cycling women (fertile and non-fertile days) and a sample of 43 male participants evaluated the produced faces on cycle shift relevant dimensions—attractiveness, dominance, masculinity, symmetry, trustworthiness, and emotionality. Results showed that faces produced during fertile days showed a mixture of masculinity and positive social traits—fertile compared to non-fertile day faces were considered more attractive, symmetrical, dominant, and trustworthy. However, sex of rater or cycle status during evaluation only had little influence. This dissociation of cycle-dependent preference shifts during production but not evaluation is discussed in relation to recent literature.

## Revolution or Evolution?

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My practice explores the universal principle that explains transformation - the unity of opposites. Via researching the physics of mirroring and the concepts of dualism and polarity, I discovered the fundamental element of my visual language - the use of transparent support. This enables me to materially realise my sensory perceptions, and also to visually articulate the thoughts I have on consciousness and reality. The artwork is presented to the viewer on the opposite side to that which I have painted, and so the viewer sees the painting as one would in a mirror (a front-back reversal, along the depth axis). Revolution is the progressive motion of a body around a horizontal axis remaining on the same plane. This motion can arrive at the completely opposite point, or back where it started from. For an evolutionary (helical) movement the central point on the plane must become a line, so one can move up or down it. This different perspective reveals the opposing sides and the fact that they are two aspects of the one plane. The horizontal and vertical are also part of the artwork, it is simply that one is material and the other is immaterial. The viewer needs to rotate the piece, or rotate around the piece, to see its opposite. The artwork and research considers the point that revolution does not create evolution, but only continues the feedback loop of repetitive movement - and that for an evolution it is the principle of the unity of opposites that is required.

## **The Concept of Aesthetic Experience**

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My thesis here is that one's account of aesthetic experience depends on what one takes as the paradigm objects or occasions for such experience. Experience of great artworks is quite different from that of sunsets. If one requires that the account covers both, the criteria will be narrow and minimal and might not distinguish aesthetic experience from other kinds. To determine whether there is one or several vernacular concepts of aesthetic experience I surveyed 44 people outside aesthetics as to (1) what they consider a paradigmatic aesthetic experience; (2) why they consider this experience aesthetic; and, (3) if the answer to question 2 appeals to beauty, whether they had seen paintings by Hieronymus Bosch, Guernica, or Goya's dark paintings, and whether the experience of them was aesthetic. In answer to 1 and 2, 23 people gave examples from nature. 20 of them appealed to the beauty of the scene. 19 appealed to art in answering 1. Only 1 mentioned beauty, and 15 spoke of engagement emotionally and/or intellectually with the work. Of the 21 who appealed to beauty in answering 2, 18 had not seen the paintings mentioned in 3. One said the experience was arresting but not beautiful, and one said the experience was not aesthetic. The survey thus confirms two distinct senses of aesthetic experience, one referring to nature and beauty, and the other to art and engagement on different mental levels. Accounts of the aesthetic experience of art need not capture that of nature.

## **Inversion affecting facial attractiveness**

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Assessing facial attractiveness is a ubiquitous, innate, and hard-wired phenomenon. Hence, it is highly adapted to the default mode of processing a face: the upright orientation. By rotating or inverting faces we can disrupt this default mode and study how faces are assessed in general. Here, we rotated faces for 90 (tilting to either side) and 180 degrees (i.e. inversion) and asked for facial attractiveness and distinctiveness ratings. For both orientations, we found that faces were judged more attractive and less distinctive than in the upright orientation. Importantly, these effects were more pronounced for less attractive faces and nearly disappeared for highly attractive faces. The less attractive a face was, the more it gained by rotation. Based on our findings, we argue that facial attractiveness does not rely on the presence of attractive features, but on the absence of distinctive, non-attractive features. We further propose that non-attractive features are potentially weighted against an individual, attractive prototype in assessing facial attractiveness.

## **The twofold role of processing fluency: An empirical analysis of the affective and the cognitive path to fluency-based aesthetic preferences**

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Most often, people make aesthetic preference judgments spontaneously. However, there are also instances when they engage more actively in processing of aesthetic stimuli. These two different approaches to aesthetic preference judgments have recently been integrated into a model of fluency-based aesthetic preferences, called the Pleasure-Interest Model of Aesthetic Liking (PIA Model). Based on the two types of processing predicted by the model, the aim of the present research is to investigate how fluency affects peoples' affective, cognitive and overall aesthetic preference judgments. Our empirical analysis employs product designs (bikes, chairs, lamps) as stimuli and experimentally manipulates design typicality as an operationalization of processing fluency. Type of processing is manipulated by disassociating the context in which a design is presented, assuming that relative to a normal context, an alienated context causes a perceiver to engage in active stimulus processing. For lamps and chairs the results show that fluency has a positive effect on peoples' affective response but a negative effect on their cognitive response. Importantly, context alienation moderates these fluency effects: the negative effect of fluency on the cognitive response is reinforced but the positive effect of fluency on the affective response is mitigated. Additionally, the effect of fluency on overall aesthetic preference is mediated by both the affective and cognitive response. Overall, this research provides empirical support for the PIA Model and shows that it is important to understand how processing style affects the formation of fluency-based aesthetic judgments.

## **Art Appreciation: Aesthetic experiences in a contemporary and traditional art gallery at Museum of Fine Arts, Boston.**

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Aesthetic experiences are occurring daily in museum settings. However, the experience of looking at art in the museum context has not been broadly studied in the field of psychology of aesthetics. Our goal was to determine how 160 younger (<25) and older (>60) adults visitors at the Museum of Fine Arts, Boston, appreciated contemporary art. 80 participants were asked to complete a questionnaire at the exit door of the Contemporary Art Gallery. The other 80 completed the same questionnaire at the exit door of the Art of Europe Gallery. Demographic information of participants was collected. We asked participants to rate in a scale from 1 (easy) to 6 (difficult) how difficult to understand contemporary art was. In addition, we asked participants to rate their experience in the museum in a scale from 1 (enjoyable) to 6 (boring). Non-parametric Mann-Whitney U and Chi-Square tests were performed to look for group differences. Open-ended questions were analyzed with Atlas.ti software. Results showed that an easier understanding of contemporary art was found in participants of the contemporary art gallery than in participants in the traditional art gallery. Moreover, there were differences between age groups; younger adults stated that they liked more contemporary art while older adults stated that they enjoyed more their museum experience. The contribution of this study showed the various degrees of appreciation and understanding of contemporary art. Therefore, activity programs in museums for different groups on how to be engaged with contemporary art must be attended.

## Traces of intention: An eye tracking study

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The aim of this paper is to present the results from our eye tracking experiment regarding much discussed art historical question: intention of an artist. We pinpointed specific places and features of image, which shift viewers' attention, comparing 90 paintings to its 90 source photographs (artists actually used them as models). We named these particular places Visual salient and semantic markers (VSSM). We assume that during creative process, artist inserts these markers into an art work via his style, materials, techniques etc. In the context of theory of art, VSSM can be connected with traceable expression of artist's intention, affecting beholder's oculomotor behavior and his resulting interpretation. Via VSSM, this hitherto solely philosophical concept could be experimentally validated by analysis of behavioral data gained by eye tracking. Our experiment compares low-level visual saliency and scapaths of exploratory eye movement in an art work and its reference photograph, and also implements other types of analysis of recorded eye movements (40 volunteers). Differences between fixation maps in photographs and art works are detected as VSSM, which have been further categorized according to visual characteristics. The paper will also discuss resulting implications for the ongoing theoretical debate on artist's intention, which particular facet of „intention“ could be reconstructed through its detectable traces. Last but not least, the paper will discuss the role which VSSM might play not only in the first short period of viewing, but in a longer period, affected by top down processes.

## Neural correlates of liking and perceived complexity of music

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The relationship between liking and complexity has been a topic of great interest in empirical aesthetics. Behavioral studies have shown that subjective complexity is an important factor that contributes to aesthetic evaluations of stimuli. While several brain regions contributing to liking of music have been identified, how complexity preferences for music are represented in the brain remains an open question. In this study, we investigated the neural correlates of the relationship between liking and perceived complexity of music. Two participants rated music excerpts for liking and complexity while their neural activity were measured by using functional magnetic resonance imaging. We examined the correspondences between representational dissimilarity matrices (RDMs) that were obtained from behavioral ratings and neural activity in moving spherical searchlight regions. We found two bilateral clusters where the behavioral RDM was significantly correlated with the neural RDMs ( $p \leq 0.05$ , Student's t-test, Bonferroni correction, cluster size  $\geq 100$  voxels). The clusters extended over Heschl's gyrus, Rolandic operculum and superior temporal gyrus in both hemispheres, and insula in the right hemisphere. This result indicates that the patterns of neural activity in these brain regions are similar to the pattern of liking and complexity ratings. This work takes the first step toward identifying the brain regions whose intrinsic representations might play a role in determining the relationship between liking and perceived complexity of music. Future work will investigate these brain regions over a large group of participants who have different music preferences.

## Assessment of visual arts in primary education in The Netherlands

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The U-curve model of graphic development posits a decline in aesthetic production in middle childhood. This model has been criticized as reflecting a preference of the modernist style in Western art and a number of studies have tried to confirm or disprove its assumptions. This study is a partial replication of previous research. A total of 144 teachers in primary education with different levels of art expertise (general teachers and artist teachers) judged a collection of drawings produced by subjects from different age and expertise groups (5, 8, 11 and 14-year-old children, and adult artists and non-artists). Five assessment criteria were used, namely expression, technical quality, pleasingness, interestingness and 'overall quality' (good-poor). Previous studies had demonstrated that unlike laymen, art experts value drawings by the youngest children and artists more highly than drawings from the other groups: they produce U-curve appreciation patterns. This study confirms the mean judgment pattern of artist teachers for all assessment criteria, except technical quality, is a U-curve. However, also the general teachers with no special training in art, judged drawings of 5-year olds higher than of older children. Only technical quality improves with age, but it is not considered an important criterion by both artist teachers and general teachers. Pupils hold an opposite view: they consider technical quality important and their assessments of drawings become more positive with age of the makers. The differences in assessment criteria between teachers and pupils can pose an educational problem. More transparent assessment procedures in art education are advocated.

## An artwork is an artwork is an artwork? – On the intensions of the term “artwork” in empirical aesthetics

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Art is undefinable. There is no way to unquestionably tell whether an object is an artwork or not. However, although the extension of the term artwork (i.e., the range of objects to which this concept applies) remains vague, the different intensions of this term (i.e., the internal concept that constitutes a formal definition) are well defined. The present meta-analysis investigates the various concepts of artworks (i.e., intensions) that scientists from different fields use in current research in empirical aesthetics. In most of their studies, the selection of stimuli (i.e., extension) derives from an institutional concept of artworks, in which an object is an artwork if it is presented in an art exhibition or if critics refer to it as an artwork. In contrast, the studies themselves investigate specific attributes that artworks might possess. These attributes derive from essentialistic concepts (a materialistic approach according to which an artwork possesses universal properties), intentional concepts (i.e., artworks are defined by the intention of the artist), functionalistic concepts (i.e., artworks fulfill a certain purpose) or other concepts. The application of two or more concepts within one study leads to an indeterminacy of the stimuli and, thus, to systematic problems concerning the interpretation and comparability of the experimental results. Consequently, we encourage researchers to be aware of the various intensions of the term artwork and we propose specific steps to ensure a valid interpretation of research results

## Depicted and Depiction – Differences in gist ratings on attractiveness and beauty in art portraits

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We asked whether the perception of the attractiveness of a person differs from the perception of the beauty of the image composition in art portraits. To address this question, we conducted a gist study, in which each image was rated after an ultra-rapid presentation (URP; 50ms) and after a longer presentation (LTP; 3000ms). Participants rated art portraits according to two different hedonic values: (1) attractiveness of the depicted person and (2) beauty of the image composition. Additionally, images from other categories (abstract artworks, landscape paintings, magazine covers, and photographs of art installations, cars, faces, house facades and landscapes) were evaluated for their hedonic value (liking). Next, we compared the rating differences between URP and LTP for the different image categories. Ratings for beauty in art portraits were higher for LTP than for URP on average. We found a similar pattern for the liking of abstract artworks and landscape paintings. In contrast, ratings for attractiveness of a person depicted in an art portrait were higher in URP than for LTP; similar results were obtained for attractiveness ratings of veridical faces as well as liking ratings of cars and house facades. As an explanation, we speculate that beauty ratings of the composition of artworks benefit from cognitive (top-down) information, while the attractiveness of the depicted person and the liking of man-made objects are increased if perceptual (bottom-up) processes dominate. This dichotomy between cognitive and perceptual processing of beauty suggests that they are mediated by different neuronal mechanisms.

## An examination into cross-sensory aesthetic pleasure

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In project UMA, we have demonstrated that the aesthetic pleasure for designed artefacts results from a joint influence of –seemingly– opposing forces, such as unity and variety (principle of unity-in-variety) or typicality and originality (MAYA principle). These principles have furthermore shown to hold in different sensory modalities and apply both to the visual and tactile domain. Since perception is essentially multimodal and since aesthetic preferences show cross-modal interactions, we set out to investigate whether the two principles also work across modalities. We predicted that artefacts high in visual unity/typicality and tactile variety/originality –or vice versa– are aesthetically preferred over ones that are only high on one dimension, i.e. unity or variety. This prediction was tested in a series of experiments with water bottles, car keys, and material samples. Whereas the bottles were collected from the market, the car keys and materials were systematically designed to vary along the dimensions under study. First results confirm that the two principles work in both sensory domains and explain a significant portion of the variance in aesthetic appreciation. The data do not clearly show a crossmodal effect, but this may be due to shortcomings in the manipulations. We are therefore currently setting up a follow-up study to test the cross-modal effect more rigorously. Results will be available by the time of the conference. The studies presented build on earlier research into the effects of sensory (in)congruity and sensory dominance and may have interesting implications for multimodal theories of conceptual representation.

## The influence of head orientation, expression and gaze shift on perceived attractiveness of unfamiliar faces

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Successful social interaction relies on effective processing of multiple facial cues such as eye gaze, expressions and head orientations. These dynamic features also influence aesthetic preferences for faces. Previously, we found faces conveying a neutral-to-smiling expression change coupled with an engaging gaze shift were perceived to be more attractive than those with a gaze shift away from the observer or an expression change from smiling to neutral. The current study investigated whether gaze shifts across different head orientations also affect the perceived attractiveness of expressive faces. 24 participants were asked to rate the attractiveness of smiling and angry faces with a gaze shift either towards or away from them and a front or three-quarter view. There was a main effect of head orientation with front facing faces rated as more attractive than ¾ view. A smiling expression was perceived as more attractive than angry expression. An interaction between head orientation and expression revealed that smiling, front facing faces were most preferred whilst faces with an angry expression, shown from the front facing view were least preferred. Interestingly, gaze shift had no effect on perceived attractiveness. Moreover, the interaction between gaze shift and expression found in our previous experiment disappeared when head orientation was included. Our research suggests that salient, social cues that are meaningful to the observer, such as head orientation, play an important role in judging the perceived beauty in faces. These results have important implications for understanding how social attention affects preferences for others.

## How does the distribution of forms or colors affect the aesthetic value of a picture?

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It is widely assumed that basic visual features of a picture can affect its aesthetic value. One prominent feature in this respect is perceptual balance, i.e. how well the elements in a picture are distributed. Recent research has shown that the deviation of the center of the perceptual 'mass' in a picture from the picture's geometric center is closely related to liking. But liking also depends on how homogeneously the elements are distributed in the picture. This research used pictures consisting of elements with a single form but differing in size and varying in balance and homogeneity. The present study went a step further. All pictures were similar in balance and homogeneity, but the elements differed in color or shape. The question was how the distribution of these features affects preference. To investigate this issue, two forms (black circles and black squares) or two colors (black circles and red circles) were distributed in different ways in the pictures. Red or quadratic elements clustered either in the left, middle, or right part of the pictures. The results show that pictures with elements of the same form and color were preferred to pictures with mixed colors and forms. Furthermore, pictures were liked more when the red or square elements clustered in the center of the picture. These results show that the distribution of basic visual features in a picture can have a systematic effect on aesthetic preference.

## **Photography: Ethics and empathy in aesthetics**

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Theories of the psychology of aesthetics are emerging that emphasize the importance of higher cognitive levels and emotion in aesthetic experiences. Fortunately, neuroscience holds promise for explaining the necessary physiological basis for the psychology of the aesthetic experience. (Pearce et al, 2016). Accounting for ethical choices in aesthetics remains to be explored at both psychological and physiological levels. I would like to propose that emotion, which is clearly a part of the aesthetic experience intervenes between ethical and aesthetic preferences. In particular, the emotion of empathy provides the basis for understanding works of art. I will analyze photographs by Wendy Snyder Mac Neil for evidence of empathic emotional reactions to visual images. I would propose that empathy provides the bridge from emotion to ethics by allowing the reduction of cognitive dissonance between the sadness or other negative emotion portrayed in the photograph and the ethical meaning of the photograph. The process of dissonance reduction in art, long ago suggested by Vygotsky and others, resembles the experience of problem solving. Bever's idea of conflict integration in aesthetics and creative problem solving also provides a framework for this process. I will use the ostensive method of Rudolph Arnheim to illustrate how empathy provides the means to resolve the dissonance between the emotion portrayed and the meaning for the observer. These examples will provide a basis for future empirical work and will serve to illustrate previous theories of aesthetic experience based on empirical findings.

## **The Sublime, an empirical investigation**

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The sublime has occupied a special space in aesthetic theory since Burke's classic *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* of 1757, referring to a group of aesthetic experiences associated with magnitude and power. Despite recent use of the term in general psychology, there is a lack of empirical characterisation of the sublime, especially in relation to beauty. Our exploratory work addresses these issues: (1) to understand the physical characteristics of items judged as sublime, (2) to understand underlying emotional and cognitive factors of the sublime and (3) to understand the role of individual differences. Study 1 was an image rating task in which participants rated a wide range of natural images on their degree of the sublime and beauty. Study 2 was a word-association task, with words taken from a corpus of aesthetic-related and sublime-related adjectives/phrases being rated in terms of their perceived associations with the sublime and the beautiful. Results demonstrate that there are physical and psychological properties associated uniquely with the sublime, and that individual differences may play an important role. The current results provide insight into the literature of the sublime, and have implications on recent trends of emotional and environmental psychology.

## The process of the aesthetical experience – Measuring involvement

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The methodology of empirical aesthetics ranges from the scales of preferences used in early experimental psychology to the new technological possibilities offered by neuroaesthetics. This study is meant to contribute to the examination of this issue. The study presented herein utilizes the interview situation of qualitative research to empirically capture the involvement and psychical distance. By examining the subjective distance between the beholder and the work of art, we intend to demonstrate the multidimensional character of the aesthetic experience. At the same time, we want to show that art appreciation is a dynamically changing process rather than a static and numerically specifiable end result. Three groups of participants were involved in the research: artists, art experts and laymen. We asked 41 people altogether to tell us which of the pictures presented to them they felt to be the closest to or the furthest from them. We asked questions both concerning only one of the pictures and both of the pictures. Based on the results of the interview analyses, various aspects of appreciation could be distinguished. While as far as emotional factors and recollection of personal memories were concerned, there was little difference between the group of experts and lays, but experts have been stricter regarding artistic quality. In light of the results, we can conclude that art appreciation is a complex process – a combination of manifold processes indeed. The research highlights that the concept and measurability of preference remains a valid question.

## A feeling of calm created by environmental enclosure in Japanese Zen gardens

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Japanese Zen gardens are characterized by rocks arranged on white sand, thought to represent natural landscapes in an abstract manner. The gardens are generally located adjacent to a structure and surrounded by walls and trees. In studies on the gardens' aesthetics, much attention has been paid to local design elements such as rock arrangement. However, it is questionable whether the aesthetics are attributed solely to local elements. Environmental and ecological psychologies emphasize that people are surrounded by the environment; therefore, we focused on the global layout of the gardens' environment. This study especially investigated the relation between environmental enclosure and aesthetic feelings. We sampled 18 Zen gardens and conducted a field survey and a virtual reality experiment. The typical observation point of each garden was defined as the center of the structure's porch. From the point, a 3D laser scanner measured the layout of the surrounding environment. The measurement was used to calculate the degree of enclosure. In addition, we photographed the surrounding environment to create a panoramic image. In the experiment, the images were presented using a head-mounted display. Participants (N = 30) virtually looked around each garden's environment and rated it with respect to aesthetic and spatial feelings. Our analysis examined the partial correlations between environmental enclosure and rated feelings. As a result, the feeling of calm was found to increase with environmental enclosure. This result suggests that the distinctive aesthetics of Zen gardens are created by their global layout as well as their local elements.

## **The Fiction Feeling hypothesis: Neurocognitive evidence**

**Arthur M. Jacobs**

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The fiction feeling hypothesis (FFH) is a key element of the neurocognitive poetics model of literary reading (NCPM; 2015). It was inspired by results indicating that children's processing of stories eliciting affective and cognitive empathy is associated with medial and bilateral orbitofrontal cortex (OFC) activation (Brink et al., 2011). It states that narratives with emotional contents invite readers more to be empathic with the protagonists and immerse in the text world (e.g., by engaging the affective empathy network of the brain, mainly the anterior insula and mid-cingulate cortex), than do stories with neutral contents. Here I present results from several recent neurocognitive studies that support the FFH and discuss implications for the neuroaesthetics of prose and poetry reception.

Brink, T. T., Urton, K., Held, D., Kirilina, E., Hofmann, M., Klann-Delius, G., et al. (2011). The role of orbitofrontal cortex in processing empathy stories in 4-to 8-year-old children. *Front. Psychol.* 2:80. doi: 10.3389/fpsyg.2011.00080

Jacobs AM (2015) Neurocognitive poetics: methods and models for investigating the neuronal and cognitive-affective bases of literature reception. *Front. Hum. Neurosci.* 9:186. doi: 10.3389/fnhum.2015.00186

## **The scientific study of literary experience: Sampling the state of the art**

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Literary Experience (LE) has been designated the object of the Scientific Study Of Literature (SSOL) focusing on key issues, such as the question what literature does, and why we turn to literary reading (Miall, 2011; cf. Hoffstaedter, 1987). While about four decades of SSOL have charted a lot of ground on the experiential and behavioral aspects of LE, at least two big white spots remain. The first concerns the ontogeny of LE. How does LE develop and which role does exposure to one-word and micro-poetry play in this (Jacobs, 2016)? The second concerns the neuronal processes underlying figurative language processing. Are the key affective, cognitive, and neural processes accompanying LE, e.g. immersion and aesthetic feelings, similar or identical to those underlying experiences with other artful stimuli, e.g. paintings, films, or music? Do they have a common basis in ancient neural emotion and reward learning circuits and if so, how have these been connected to the language system? An overarching final issue addressed here is: Which models and methods are required for an integrative SSOL which includes phenomenological and neurocognitive perspectives?

## **Times of beauty: On the mental chronometry of aesthetic experience**

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What have we learned from measures with high temporal resolution, like cognitive electrophysiology? For some time, event-related potential (ERP) research has contributed to our understanding of aesthetic experience. ERPs help to elucidate component processes of cognitive, evaluative, or affective nature. The sequence of subcomponents as well as their mental chronometry can be established. The talk will trace contributions to different domains of aesthetic appreciation, like visual aesthetics and music.

## **Embodied aesthetics and self-perception: Less may be more**

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People dance all over the world – notably for different reasons and in different forms. Yet, amongst these idiosyncratic movements, different ‘dance styles’ have evolved, each following specific aesthetic principles aligned with the function and meaning of the dances. For instance, a ballerina aims at a gravity-defying image of lightness to convey dignity and control whereas a contemporary dancer appears powerful and grounded, passionately expressing closeness to nature and physical limitations. The specific aesthetics of a dance style, such as its movement quality, the related body image, its body culture and the role of these factors in dance appreciation and creation have been relatively ignored by empirical aesthetics. Since the prototypical actions of a dance style are closely linked to the aesthetics of a dance, we argue that a better understanding of how embodying different dance styles affect dancers’ physicality and self-other perception is an important influence on dance appreciation. We collected responses from 198 dancers and non-dancers to a set of online questionnaires. The data for established theatre dances (ballet and contemporary dance) and more recent predominantly street-culture based dance styles (Street dance/Hip Hop and Dancehall) showed that the level of embodiment is a significant factor; while the dance style is not. Self-identified semi-professional dancers scored lower on body shame and appearance anxiety than did professionals, dance students, or non-dancers. Notably, many studies on dance expertise are conducted with semi-professional dancers. The particular (positive) body image we found for this expert group may thus have coincidentally benefited many empirical investigations.

## **Watch This!**

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On three different screens, three faces are shown, seemingly still, yet moving. Seeing the minimal facial twitches and eye movements is intriguing: What goes on in their minds? What are they looking at? Why do they respond in certain ways? Through earphones, breathing, footsteps, swooshing and cracking noises are audible. For short moments, the gallery audience is also shown snippets of a dance performance: Double Points by the choreographer/dancer Rosie Kay, slowly resolving the mystery: these are the faces of a dance audience. The video-sound installation allows gallery audience to immerse into the bodies and minds of dance spectators - in some ways taking on the role of the researcher. The artwork was inspired by the research on the AHRC funded project "Watching Dance: Kinaesthetic Empathy" (2008-2011). The dance performance by Kay was employed to study spectators' neurophysiological and emotional responses to watching dance (Jola, Pollick, & Calvo-Merino, 2014; Reason, Jola, Kay et al., in print). As the post-doc on the project with a background in cognitive neuroscience and dance, it was important for me to emphasise the missing link between what is accessible from the outside and the spectators' invisible neuronal processes, two parts that were situated at the core of the interdisciplinary research project combining neuroscience and audience research. The installation was selected for exhibition at the Bluecoat Gallery in Liverpool in 2010, as part of the Moves Festival and it is still targeting prevailing questions on the intriguing links between embodied aesthetic experiences and experimental research.

## **“How did it get so late so soon?” Quantifying the impact of dance spectating in vivo on subjective time perception”**

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The copresence of bodies inherent to the context of performances is an invitation to investigate how the singular “presence” of the dancers (Louppe 2004, p.153), underpinned by their attention to the present moment, may inform the presence of the audience (Citton, 2014, ch. 4). The Choreographer Myriam Gourfink uses a contemplative practice (Energy Yoga) to produce a state of altered consciousness in her dancers. The resulting dance is extremely slow and hypnotic. Spectators report the sensation of temporal dilatation (Fontaine, 2002). We wanted to quantify this subjective phenomenon and relate it to changes in kinesthetic and interoceptive attention (Lamotte et al., 2012, Pollatos et al., 2014) and in physiological rhythms (Konvalinka et al. 2011). As part of the Labodanse project (Bachrach et al 2015), we combined physiological monitoring, experiential reports and three different temporal tasks before and after the performance: Subjective Tempo Production and Rating, (STP, STR, McAuley et al., 2006) and assessment of the temporal window inducing the Apparent Motion effect (AM, Marusich, Gilden, 2014). STP and STR demonstrated decreased subjective tempo postperformance. Apparent motion was reported postperformance with longer temporal intervals between the flickering dots. Individual effect size correlated with reported attention to the breath of the dancers. Correlations with changes in physiological data are now being analyzed.

## **The advantage of three-quarter views of faces: Combined effects of gaze and orientation of faces on person judgements in social settings**

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In social situations, faces differ simultaneously in gaze and orientation. We studied how a three-quarter view of a face, often considered as more attractive and, preferred in art portraits, influence a person's judgement when looking at others. We presented scenes with two average faces, varying in three gaze conditions and three head orientations. Participants rated all faces in all scenes for trustworthiness and attractiveness. Participants rated averted gaze in three-quarter views as more attractive than front and profile views, and evaluated faces of direct gaze in front views as more trustworthy than other views. Moreover, faces that were being looked at by another face, were seen as more attractive and trustworthy. Further, we varied facial attractiveness in the scene by pairing a highly and a less attractive face. Participants rated highly attractive faces as more attractive and trustworthy, independent of the head orientation and the direction of gaze. Our findings emphasise that social evaluations such as trustworthiness are unaffected by the aesthetic advantage of three-quarter views of two average attractive faces, and that the effect of beauty is more powerful than subtle effects of gaze and orientations

## **Neurophysiology of aesthetics: Epistemology and new paradigms**

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Artwork is a complex unique object done with techniques that are unique to the artist. Artwork is appreciated by the observer in the specific context in which is exhibited which is also unique. For these reasons artwork can have a unique impact on the observer. Research on artwork requires a holistic experimental approach, preferentially with studies in situ. Noteworthy, it is no possible to create a control stimulus to compare with the artwork and its context; also it is not possible to control the environment during experiments in museums. Yet, such open system holistic research methodology is not only essential for research in aesthetics but can be an inspiring model for science in general. I will present studies from my laboratory: an eye movement study run first in museum Maillol (painting exhibition of F. Bacon, 2004), and repeated later on in the laboratory; a study of body oscillations and of subjective sense of visual vertical run at the museum Grand Palais, during the sculpture exhibition Promenade, Richard Serra, 2008. I will conclude that the key point is defining in advance the physics, the dominant neurophysiological dimension of the artwork and measure with multiple methods its specific effects on the observer. For instance, an artwork that can challenge gravity and equilibrium (sculptures of Richard Serra), another artwork can challenge perception of depth and movement (Francis Bacon). This provides a way in combining advantages of the holistic open dynamic system research approach with more reductionist approaches.

## Seeing with borrowed neurons

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Mirror neurons are cells that respond as if one were directly carrying out an action, even though one is simply observing another person carrying out this action. This work postulates the additional existence of mirror networks; i.e., entire complexes of cells that respond as if one is engaging the world in the same way as another perceptual entity. This mode of response is typically invoked by close interaction, or as in the case to be discussed here, by engaging with a penetrating work of art. For example, to the extent that one is moved by Cezanne's paintings of his native Provence, one will enter into his perceptual framework of undulating curves and reduced palette of ochres and greens, whereas a painting by Matisse will invoke both primary sensations and primal archetypes. It will be shown that these dynamics can be simulated via facilitation, that is, the process by which individual neurons and networks thereof are more likely to respond once they have been triggered. In particular, a simplified model of visual processing will be presented illustrating that repeated exposure to a painting will cause the network to look at novel scenes with the framework implicit in the painting. In summary, to the extent that art is successful, it achieves its aims by overlaying one's existing perceptual tropes with different sensations, and transporting one, if only temporarily, to an alternative and possibly richer way of seeing.

## Influence of information: How different modes of writing about music shape music appreciation processes

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Informative texts, such as program notes and CD booklets, may have an effect on listeners' aesthetic judgments, but also, more fundamentally, on how listeners' perception of the music may be modified by extramusical information. In order to shed light on this issue, we designed two listening experiments adapting the framing paradigm. In the first experiment, participants had to listen to three identical excerpts of Brahms' 1st symphony in a within-subject design. Prior to listening diverging descriptions of existing recordings were presented for each excerpt. In the second experiment, participants listened to a Sinfonia by J. Mysliveček (1737–1781). Half of the group was told that they would be listening to W. A. Mozart, whereas the other half was told they would be listening to Mysliveček. The composer's names were combined with texts containing either an emotional-expressive or structural description resulting in a 2x2 between groups design. In both experiments, participants (N = 170) had to rate the music using a semantic differential that queries aspects of structure, sound, musical and emotional expressiveness, and liking. Findings showed that contextualized listening not only influenced the listener's attitude, as studies on the prestige effect have shown extensively, but in addition, different modes of writing about music affected liking of the music heard. In addition, the perception of aspects pointing at the music's meaning, such as emotional expressiveness, were more likely to be influenced by different modes of writing about music than the perception of aspects on a more technical level, such as musical structure.

## Perception of direct vs. averted gaze in art portraits: fMRI and eye-tracking study

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Gaze and gaze perception has been an important topic in both art history/visual studies and cognitive neuroscience, thus constituting a field for a potentially fruitful interdisciplinary research. So far, however, the empirical research on gaze perception exerted only negligible impact on discussions of gaze in art history. The first part of the talk introduces the recent study of our team consisting of separate fMRI (25 subjects) and eye-tracking (22 subjects) experiments, designed to explore the neuronal and behavioral response to painted portraits with direct versus averted gaze. In addressing a question of how is the neural and behavioral response to expressive faces in portraits by classic and modernist painters modulated by the direction of gaze, we aimed at elucidating the role of representational medium through which the face is presented, in activating social cognition mechanisms. We further analyzed possible modulatory effects of several stylistic and semantic characteristics of the portraits. The main result of the study is that direct (vs. averted) gaze exerts less pronounced emotional response through eye contact (activation in amygdala and temporal poles) than realistic photographic stimuli used in neuroimaging studies, but it engages more intensively higher cognitive functions as documented by prefrontal activations. Our results also documents effect of stylistic variability within given representational medium on brain activity. The second part of the talk then outlines the significance of such experimental research for the conceptualization of gaze in contemporary art history/theory, and particularly how it highlights the limitations of dominant poststructuralist theories of gaze in humanities.

## Brain functional plasticity reflecting learning of implied motion in abstract paintings

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Early 20th century artists including Duchamp and Balla tried to portray moving objects on a static canvas by superimposing objects in successive portrayals of an action. Previously, we showed that a visual motion-sensitive area MT+ was activated when people view paintings explicitly designed to convey a sense of visual motion (Kim & Blake, 2007). The involvement of the area MT+, however, was specific to people who have prior experience with those paintings. In the present study using fMRI, we investigated whether human visual motion and biological motion sensitive areas show functional plasticity following learning of implied motion in abstract paintings. 14 observers with little interest in art participated in the study, which consisted of 3 stages including 1) pre-learning scanning, 2) learning, and 3) post-learning scanning. During the two scanning stages before and after learning, four paintings intended to portray motion (MP) and four "static" paintings (SP) were presented to the observers while their brain responses were measured using fMRI. During the learning stage, observers were given information about two MP and two SP, randomly selected from the eight paintings. Results showed greater response to MP than to SP in areas along the dorsal visual stream and frontal action-related areas, which was observed only after learning, not before learning. In addition, the learning effect was generalized to unlearned paintings. These results suggest that the network of neural machinery ordinarily engaged during perception of real visual motion shows functional plasticity induced by learning of implied motion in abstract paintings

## **Form-Knowledge: A design-specific form of knowledge. An empirical study about the systematic use of cognitive formal patterns in the design process as a basis of decision making in architecture and design**

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Problems in communication about architecture and design between professionals and laypersons commonly lead to misunderstandings and false assessments which ultimately result in too many wrong decisions in the planning process. While there are many aspects by which the two groups differ from one another, this study will focus on the role a cognitive repertoire of forms or geometric patterns play in the decision making process in design and in particular on the imbalance in the formal assessment and the assumed differences in the aesthetic judgements of spatial plan configurations. Cognitive processing of visual-spatial compositions requires the establishment of individual formal repertoires by both beholders and producers of such forms. This cognitive repertoire seems to differ considerably between the two. For the beholders, the repertoire is likely based on experience and intuitive. For the producers, it is acquired by a more rationalized and systematized process. This will be exemplified by an empirical study where 150 architectural students are tested at the beginning and the end of their university education and look at the influence of their increasing design experience. Based on the assumption that this knowledge of formal patterns influences individual aesthetic judgements, the study investigates which categories experts and non-experts apply in their judgements and whether an increase in the number and complexities of these categories result in different judgements.

## **Have we overlooked gender diversity in empirical aesthetics?**

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Empirical studies in aesthetics have relied on binary notions of gender. In the study of aesthetics, the inclusion of the categories woman and man may appear to be inclusive but may well be excluding people who identify as a gender other than woman or man. This paper engages with feminist theory and praxis of inclusive research. A literature review of the research in aesthetics was undertaken to determine how or if gender had been examined. It was found that no studies were conducted with binary gender as its focus. Furthermore, no studies adopted an inclusive gender research approach. This paper reports on the second phase of research, which tested for gender differences. Participants are from three gender groups: Cisgender [a person whose gender identity aligns with the gender assigned at birth], transgender [a person whose gender identity does not correspond to that person's sex assigned at birth] and non-binary gender [a gender identity that is not defined in terms of binary oppositions such as man and woman]. Four tested variations of two different stimuli were presented to the above participant categories. Stimuli were rated using a seven point scale for variables typicality, novelty and aesthetic preference. Data will be analyzed using ANOVA. Results have implications for conclusions drawn from existing empirical aesthetics research. Using simple techniques, researchers will be able to gather more inclusive data. Moving away from binary notions of gender to a more inclusive gender model can give a more nuanced understanding of aesthetics.

## The significance of impenetrability of visual perception for psychological aesthetics

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The relationship between seeing and thinking is a matter of great interest in psychology, cognitive science, and aesthetics. The pendulum has swung repeatedly between the position that perception is fully encapsulated and one that insists on its penetration by cognitive (“top-down”) effects. The strong claims by Firestone and Scholl (F&S, *Behavioral and Brain Sciences*, 2015) of impenetrability of perception concern at least three important issues in empirical aesthetics (Konečni, 2015b). One is art expertise. In his attempt to link this major concept to cognitively penetrated perception, Stokes (2014) invoked experiments on the “memory color effect” (e.g., Witzel, et al., 2011), yet precisely these findings are open to a serious challenge with regard to several “research pitfalls” described by F&S. The second issue is the alleged emotional effect of paintings. Specifically, the multifaceted critique by Konečni (2015a) of the claim by Bulot and Reber (2013) that paintings can elicit “automatic emotional responses” is strongly supported by the evidence presented by F&S – which is (also critically) applicable to other aspects of the “historical-contextualist” view of art appreciation. The third issue involves Nanay’s (2015) widely publicized doubts about the truthfulness of the conclusion that Danto reached by means of his “gallery of indiscernibles.” Nanay insists that Danto’s inference was based on the false premise that perceptual experiences are not cognitively penetrable, but, to support the opposite claim, he calls precisely upon experiments (e.g., Goldstone, 1995; Lupyan, et al., 2010) that are highly suspect with regard to the pitfalls described by F&S.

Firestone, C., & Scholl, B. J. (2015, July 20). Cognition does not affect perception: Evaluating the evidence for 'top-down' effects. *Behavioral and Brain Sciences*.

Goldstone, R. L. (1995). Effects of categorization on color perception. *Psychological Science*, 6, 298–304.

Konečni, V. J. (2015a). Emotion in painting and art installations. *American Journal of Psychology*, 128, 305–322.

Konečni, V. J. (2015b). The significance of encapsulation of visual perception for philosophy of mind and aesthetic analysis. *Clinical and Experimental Psychology*, 1, 102.

Lupyan, G., Thompson-Schill, S. L., & Swingley, D. (2010). Conceptual penetration of visual processing. *Psychological Science*, 21, 682–691.

Nanay, B. (2015). Cognitive penetration and the gallery of indiscernibles. *Frontiers in Psychology*, 5, 1527.

Stokes, D. (2014). Cognitive penetration and the perception of art. *Dialectica*, 68, 1–34.

Witzel, C., Valkova, H., Hansen, T., & Gegenfurtner, K. R. (2011). Object knowledge modulates colour appearance. *i-Perception*, 2, 13–49.

## Learning to see by learning to draw: A longitudinal study of perceptual changes among artists-in-training

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Many have claimed that artists see the world differently than non-artists. Empirical work on this issue has yielded mixed results, and no studies have approached this issue longitudinally. We compared artists' and non-artists' perceptual and drawing performance, to determine how strongly our tasks were inter-correlated, and to track the development of art students' skills during a semester of formal training in drawing. We administered perceptual and drawing tasks to 38 art students in an intensive drawing course and 40 non-art students. Tasks included mental rotation, embedded figures, interpretation of bi-stable figures, visual illusions, global-local task switching, blurred photos, limited-line tracings, and freehand drawing. We have completed data collection on the art students and will be done with data collection for the non-art students in late Spring. Example results for three perception measures for the art students: mental rotation efficiency increased over the three testing sessions,  $F(1, 36) = 44.1, p < .001, \eta^2 = 0.17$ ; embedded figures efficiency increased between the first and last two sessions,  $F(1, 35) = 6.8, p < .05, \eta^2 = 0.11$ ; there was no improvement for overcoming the Muller-Lyer illusion across sessions,  $F(1, 36) < 1.0$ . These results suggest some changes in perceptual ability are associated with ongoing drawing experience. The observed variability in trends across tasks, as well as low correlations among tasks, suggest that artists' perception is a multi-faceted phenomenon, with no monolithic mechanism driving perceptual changes. Instead, emerging advantages may be specific to particular aspects of training and experience.

## Is it what you hear or how you say it? Phonological iconicity and emotional prosody in poetry

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The literary genre of poetry is closely related to the expression and elicitation of emotions (Hegel, 1986; Winko, 2003). In a similar vein, literary theory as well as empirical research suggests that sound features are particularly important for poetry (Schrott & Jacobs, 2011; Whissell, 2002, 2011). Further supports research on phono-emotional iconicity in language and poetry the idea that a relation between sound and perceived emotion can be considered a cross-linguistic phenomenon (Wiseman & Van Peer, 2003; Albers, 2008; Auracher, Albers, Zhai, Gareeva, & Stavniychuk, 2010). In order to contribute to the question whether and in which way sound and emotional meaning in poetry are related, we conducted two studies. Drawing on poetry production in the first study, we analyzed those acoustic cues that are known to contribute substantially to the identification of joy and sadness. In doing so, we tested whether German native speakers adjust their prosody to the content of the poems when reading poems out loudly. The second study is concerned with the perception of poetry. Using an online survey, German, English and Japanese participants rated eight German poems (four joyful and four sad ones) on different items to classify the poems' main emotion. Poems were read out by manipulated voices with different cues of emotional prosody. With this integrative approach, we aim to discuss both, an iconic, proprioceptive perception of the phonological material during poetry perception, as well as the hypothesis of an adjustment of emotional prosody to a given content during poetry recitation.

## **The aesthetic effects of literary reading and impactful dreams: Sublime Disquietude and Sublime Enthrallment**

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Conceptions of sublime feeling have begun to find a place in empirical aesthetics. Priority sometimes is given to “objects” with sublime qualities (e.g., the grandeur of nature) (Konečni, 2011) and sometimes to “emotions” with sublime magnitude (e.g., wonder and amazement) (Zentner et al., 2008). According to a more traditional (Kantian) conception, sublime feeling involves: (1) recognition of limited conceptual access to an elusive, incongruous, or overwhelming “object”; (2) simultaneous awareness of a preconceptual grasp of that “object”; and (3) simultaneous awareness of the mode of expressive engagement through which that “object” has become partially disclosed. Sublime feeling occurs in two forms, one involving a discordant mode of expressive engagement (sublime disquietude) and another a reverent mode of expressive engagement (sublime enthrallment). Previous research indicates that sublime disquietude emerges while reading “painful” poetry (e.g., Celan’s Death Fugue, while sublime enthrallment emerges while reading “astounding” poetry (e.g., Shelley’s Mont Blanc) (Kuiken et al., 2012). Also, sublime disquietude emerges during “existential dreams” (involving ineffectuality and loss), while sublime enthrallment emerges during “transcendent dreams” (involving flying/floating and magical accomplishment) (Kuiken, 2015). Review of these studies will be followed by discussion of sublime feeling as “disportation” (Burke, 2015), with particular reference to: (1) pre-enactive (rather than re-enactive) simulation (Willems et al., 2009); (2) metaphorically emergent (rather than metaphorically mapped) meanings (Estes & Ward, 2002; Terai & Goldstone, 2012); and (3) being moved to understanding (rather than emotionally) (Lüdtke et al., 2014; Menninghaus et al., 2015).

### **Trait predictors of story world absorption during literary reading**

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Even though the experience of narrative absorption has been studied quite extensively over the past years, relatively little is known about the personality traits that mediate absorbed reading. The present study investigated which personality traits best predict absorbed reading. Because the most widely used measure of trait absorption, the Tellegen Absorption Scale (TAS, 1974), was never validated, we psychometrically investigated it and compared it to other trait measures that are assumed to predict absorption. 264 introductory psychology students described their most memorable reading experience during the preceding year before completing state measures of absorption during reading and trait measures of absorption, openness to experience, need for cognition, emotional coping, and reading ease. Factor analysis was used to investigate the underlying factor structure of the TAS and the reading ease measures. In a second step the different dimensions of each trait measure were included in regression analyses to determine absorption’s main predictors. Four consecutive linear regression models showed that depth of processing (a dimension of the reading ease measure), absorbed attention (a dimension of the TAS) and need for cognition were the best predictors of story world absorption. These results have implications for the study of individual differences involved in absorbing reading experiences. In previous research, the TAS and openness to experience measures were assumed to best capture people’s individual variability in absorption. However, the results of the present study call for a reconsideration of the use of the TAS and openness to experience measure in similar future research projects.

## **Stanislaw Ossowski (1897 – 1963) – Empirical thought in aesthetics at the beginning of the 20th century**

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Among the aestheticians of the pre-WWII generation in Poland Stanislaw Ossowski is the one who, being of non-English origin, is perhaps the most congenial to a sociological style of science in the English-speaking countries in the 20th century because of his empirical, rationalistic, and analytic approach. In 1926, in the journal *Philosophical Review*, Ossowski published an essay “Analysis of the Concept of the Sign” well before similar essays by Charles Morris were published in the United States, and much earlier than Guido Calogero’s “Aesthetics”, which also dealt with semantics of art in Italy. The analysis of the communicative function of the sign let Ossowski notice the sociological point of view in art and aesthetic feelings, as well as it brought about the formation of a sociological orientation in his scientific activity. The fully expressed aesthetic views along with the outline of empirical needs appears in “At the Bases of Aesthetics” (1932). In this work he describes specific examples, takes into consideration the cultural and social contexts. He analyses art through its sexual, socializing and educational role. The author creates the area of research and up to this day determines the current directions of analysis for the discipline of science that was merely developing in the first decades of the previous century.

## **Consensus amongst visual evaluations of novel objects: Approachable, beautiful, dangerous, likable**

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Intentionally meaningless objects were created to explore the extent to which any individual could meaningfully evaluate them. We posit that evaluations reflect reactions to object-characteristics in a systematic and knowable way. We hypothesized that consensus can emerge from independent evaluations across a population and we sought to demonstrate that objective-characteristics can be predictive. One hundred undergraduate students participated in this study. They engaged in one of four kinds of evaluations: approachable, beautiful, dangerous, and likable. The stimuli they evaluated were images of 3D objects that were created using procedural generation. Each object’s form was therefore dictated by constituent parametric values (i.e. object-characteristics). We provide evidence that consensus is dependent upon an interaction between the kind-of-evaluation being made and the kind-of-object being perceived. With instances of consensus, evidence from linear mixed-effects models report the significant object-characteristics governing an evaluation. The findings of this study provides important empirical evidence in support of the notion that all evaluations—even novel 3D objects—can be studied objectively. Subjective-evaluations can be studied as objective-evaluations when consensus exists. Nevertheless, even in the absence of consensus, an exploratory principal component analysis highlights the importance for future research elucidating the crucial individual differences mediating the objective study of all evaluations.

## All liberals like abstract art except for me

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This study investigates how we use our taste, or objects which invite taste evaluations, as tools for social demarcation. Specifically, we explore whether sympathizers of one social group (political parties) can identify how other political parties' members would probably appreciate different types of art, and in turn whether they impose political opponents a difference taste (i.e., liking certain works) that they themselves do not share, or whether group affiliation influences personal art decisions. This study builds on our previous work on social "distinction" (Bourdieu, 1968), whereby we may use our taste affiliations to join or avoid certain groups. Art-naïve participants were asked to rate a set of paintings (divided between nudes, abstract, classic, and kitsch) for liking, using 200 point continuous scales. Subsequently, participants were told that members of different political parties (right, left) had also rated the artworks, and were asked to view the artworks again and assessed how they thought the groups had answered. Results were assessed with linear mixed-effects models. All participants, regardless of party, tended to agree on stereotypical assessments for parties—liberals like abstract art, conservatives like kitsch and classic. However, despite membership, personal taste showed marked differences from the stereotypical assessments. We conclude that people have strong, shared, stereotypical schemas for which artworks different groups may like. However, although belonging to a group, they do not consider themselves to have the same stereotypical taste—adding an intriguing layer to previous social art research. We also report a follow-up study using cell phone (iphone/Android) ownership.

## Visualization of uncertainty

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„Visualization of Uncertainty“ explores physical phenomena of no longer existing building and cities through a visual equivalent of non-precise verbal descriptions. In cases, where precise knowledge of a buildings' characteristics is missing, archaeologists tend to draft their imagined best guesses based upon a snap shot of the current findings of their research, being heavily influenced by the respective spirit of their time. Such conclusions can lead to erroneous results. Other types of reconstructions go beyond factual knowledge and liberally employ fantasy. Inevitably, there is often a dichotomy between factual knowledge and fantasy as we witness in many films portraying historical settings. „Visualization of Uncertainty“ explicitly attempts to visualize hypotheses by employing pictorial methods to improve the emotional impact. It consists of two creative design processes that are interdependent - the design of abstract geometry and virtual photography. These processes involve and rely on three disciplines. Hand-drawings suggest vague ideas without defining details. Photography works on the point of view, the view angle, lighting and exposure. Scale models describe the concept but are deliberately left uncertain in order to allow the spectator to form his own visual interpretations which are naturally hypotheses. This method which allows the observer to form their own mental images will be illustrated by three research examples: Cologne Cathedral, Naga, Pergamon. An empirical study investigated the use of digital zoom as a tool for directing attention while looking at visual material. Eye-tracking techniques analyzed whether digital zoom functions as a cue to focus attention.

## **Shifts in women's facial attractiveness across the menstrual cycle: A critical evaluation of the peri-ovulation paradigm**

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Accumulating evidence seems to suggest a peri-ovulatory increase in various aspects of women's physical attractiveness. For example, men (but not women) find portraits of ovulatory women more attractive than photographs of the same women taken during the luteal phase. However, the adaptational value of such findings is highly debated. Moreover, criticism has been voiced concerning the methodological procedures used: most studies have used a two-alternative forced-choice paradigm. Simultaneous presentation of stimuli collected from ovulatory woman and the luteal version of the same woman is an ecologically invalid setting that never occurs in real life. In the present study, men rated images of women's faces that were either collected around ovulation or during the luteal phase for attractiveness and femininity. The same participants were invited again after one week to repeat the rating, this time including the respective counterparts of the picture pairs. Ovulation of the female models was determined using ovulation test strips and was confirmed by hormone analyses. The ovulatory faces were rated as being significantly more attractive and more feminine than their luteal counterparts. Additional analyses including hormone levels explored the assumed role of female sex hormones in intra- and inter-individual differences in attractiveness. Taken together, our findings suggest that changes in appearance over the cycle might indeed influence attractiveness judgements in a realistic setting. The underlying reasons for such shifts in appearance will be critically discussed.

## **Mechanisms of pleasure in visual and musical domains: An EEG study of everyday aesthetic objects**

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The current study investigates whether the emotional nature of pleasure vs. displeasure, indexed by both self-reports and neural responses, would differ depending on whether the impact was based on stimulus features vs. personal memories. A direct comparison of musical and visual material across mechanisms is carried out to contrast the results between the modalities. Based on prior findings, we have a clear prediction of pleasure varying as a function of memory, and that the neural responses will differentiate the mechanisms at stake. However, we did not have specific predictions for whether the two modalities yield different patterns of results. Each participant (N=30) chose 4 types of visual, and 4 types of music stimuli to be presented to them in a laboratory setting. Neural responses were measured through 64-channel EEG and self-reports of the affective characteristics of the experience were rated on emotion scales that were developed based on a prior survey on the everyday emotions of music and visual objects. Data collection is currently ongoing, and the first results will be available for the conference. We aim to establish links between the type of the stimulus (pleasant vs. unpleasant), the mechanism of the affective impact (stimulus features vs. memories), and the modality (musical vs. visual) using the neural and self-report indicators of the affective experiences. The results contribute to understanding of how pleasure in music and visual arts is constituted, particularly regarding how the pleasurable experience may be understood as an interaction between stimulus properties and proposed mechanisms.

## Semantic and syntactic processing of Art: Perception of paintings and associated distinct neurophysiological brain responses

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The terms „syntax“ and „semantics“ stem from linguistics, where the syntax refers to the structure of a sentence and the semantics to its meaning. The processing of sentences with a violated syntax or violated semantic meaning evokes distinct ERPs, in the P600 and the N300/400 time window, respectively. This has also been shown to be true for the processing of visual depictions of natural scenes, extending the findings to the domain of image processing. To address whether the viewing of artworks also involves an inherent automatic perception of syntax and semantics, we presented participants with paintings which had been edited in order to introduce various syntactic and/or semantic violations, independently altering elements of style and content. Recorded EEG data showed distinct ERP signals in the N300/400 and P600 time windows, depending on painting style and inconsistency type. We conclude that viewing paintings does include automatic syntactic and semantic expectations, analogous to viewing natural scenes, however these expectancies and subsequently differential brain response in ERP signals importantly depend on the specific painting style and content depicted.

## Arousal transfer effects of environmental scenes on self-reported arousal and pleasantness in response to representational paintings

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Visual artworks can induce a wide range of emotions. However, it remains unclear whether these emotions are similar or different to emotions induced by other objects in everyday life. Here, we propose to investigate the nature of aesthetic emotions by applying a priming paradigm with the aim to examine arousal transfer effects induced by environmental scenes on self-reported arousal and pleasantness in response to representational paintings. In Experiment 1, 67 students reported their felt arousal in response to 32 low- and high-arousing targets in a control condition as well as in two priming conditions with 32 low- and high-arousing primes. For high-arousing paintings, males reported higher arousal after high-arousing primes than in the control condition, whereas low-arousing primes led to similar arousal ratings as in the control condition. In females, arousal ratings after high-arousing primes and in the control condition were similar, but low-arousing primes led to lower arousal. For low-arousing paintings, no gender effects were observed. Arousal ratings were lowest in the control condition, increased after low-arousing primes and were highest after high-arousing primes. In Experiment 2, another 66 students provided pleasantness ratings. For pleasant paintings, pleasantness was highest in the control condition, decreased after low-arousing primes and was lowest after high-arousing primes. For unpleasant paintings, pleasantness increased after both low- and high-arousing primes compared to the control condition. These arousal transfer effects of environmental scenes on felt arousal and pleasantness in response to visual art suggest that aesthetic emotions are susceptible to emotional arousal stemming from other sources.

## **Intelligence, complexity and liking for Romantic piano music**

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Music preference has been found to be related to personality, musical parameters and the listening context. Rentfrow and Gosling (2003) reported a relationship between intelligence and preference for complex music genres and argued that more complex music provides the optimal level of stimulation for people with high intelligence. Kanazawa and Perina (2012) argued that more intelligent individuals are more likely to prefer instrumental music to vocal music because instrumental music evolved more recently in humans. Effects of intelligence on the appreciation of an unfamiliar instrumental musical style have not been systematically studied so far. Here, we thus investigated the relationships between intelligence (fluid and crystallized), emotional intelligence, subjective complexity and liking for Romantic piano music. 133 psychology students, all non-musicians, rated 48 musical excerpts (25s) varying in complexity for familiarity, complexity, liking, and arousal. We assessed fluid and crystallized intelligence, the Big Five personality traits, trait emotional intelligence, musical sophistication, as well as the mood prior to the experiment. Results indicated that individuals with high levels of fluid intelligence evaluated the stimuli as significantly lower in complexity than individuals with lower levels. There was no effect of fluid or crystallized intelligence on liking, consequently the hypotheses by Rentfrow and Gosling (2003) and Kanazawa and Perina (2012) were not supported. However, our findings showed that liking for Romantic music correlated significantly with emotional intelligence. Taken together, these results motivate future experiments on how different types of intelligence are related to music preferences in different instrumental and vocal styles.

## **First insights of how modifying the amount of curvature and angularity in architectural façades can influence aesthetic preferences**

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This research explores whether the well-known human preference for curved visual objects (Bar and Neta, 2006, 2007) can be extended to the architectural domain, in particular to architectural façades. Can a different amount of curvature in architectural façades drive our preferences or our judgments of their familiarity, complexity, stability and approachability? We produced four different line drawings of the same façade, varying its curvature: A) high and B) medium curvature; C) rectilinear and D) angular. We collected behavioural data of twenty-four female participants who: 1) performed a preference-forced choice task; 2) evaluated each stimulus for five dimensions: liking, familiarity, complexity, stability, approach; 3) classified the façades from the most to the least preferred. Asymmetric multidimensional scaling on the forced choices task showed that the preference order was: A, B, D and C, with the high curvature façade being the most preferred. Multidimensional unfolding showed the same pattern of results, with the majority of participants assigning higher preferences for the A/B curved façades. An ANOVA showed a significant main effect of liking, complexity, stability and approach, but not of familiarity. Stimuli were processed with a dynamical model of the visual cortex (Penacchio, Otazu & Dempere-Marco, 2013) and a model that characterises discomfort in terms of adherence to the statistics of natural images (Penacchio and Wilkins, 2015). The order of stimuli preference was related with both models and matched the behavioural data (Redies, 2007). Preliminary findings showed that curvature influences preferences also for architectural stimuli, opening new scenarios for future researches.

## Effects of art museums on psychophysiological wellbeing and emotions

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Are art museums settings capable to promote the recovery of psychological well-being, identified through stress reduction, increase in positive emotions, and renewal of cognitive resources? Moreover, are there any differences between different art style museums? Only few studies dealt with this topic (Clow et al., 2006; Mastandrea et. al., 2009; Tschacher et al., 2015). The study was conducted in a real museum setting, the National Gallery of Modern and Contemporary Art of Rome, which hosts two art collections, figurative and modern/contemporary art. Physiological features (blood pressure and heart rate), attentional (Stroop-test) and self-report emotional indicators were measured before and after the visit to the two different art styles collections (experimental conditions) and to an area of the museum offices (control condition). Seventy-three lay participants were randomly assigned to the 3 conditions, according to the art style of the museum halls to be visited. Preliminary analyses have been carried out on the difference of the Systolic Blood Pressure (to detect changes on the emotional arousal) before and after the visit. Considering a difference of 10 mmHg an important variation of the SBP (guidelines from European/Cardiology/Society), we registered such a reduction, before and after the visit, in the 48% of the figurative art participants, in the 33% of the modern/contemporary art, and only in the 25% of the control. These findings suggest a restorative effect of the art museum visit, with a greater effect of the figurative art experience, compared to the modern/contemporary art and control conditions

## The Toolbox for Quantified Aesthetics: Objective measures of visual antecedents of aesthetic preferences

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The visual information we see impacts our emotions and cognitions all the time. We fall in love at first sight. We prefer nicely wrapped holiday gifts. We even depend primarily on visual information when making judgments about music performance. These examples reflect that humans are inherently evaluative beings whose affective system continuously produces immediate preference evaluations very efficiently without any conscious effort, especially in the visual domain. The scope of our research is to understand the antecedents of these immediate and spontaneous aesthetic liking judgments. Moreover, we aim to propose a set of objective measures based on processing fluency that automatically extract those visual stimulus properties that are predictive of aesthetic liking judgements. Our approach links psychological theory with current research on aesthetics, vision research and images statistics and merges insights from several research streams. Using 620 images of abstract art, we show that there are five easy-to-understand fundamental antecedents of spontaneous aesthetic liking judgments: visual symmetry, visual simplicity, visual contrast, visual self-similarity, and visual typicality. Across different types of analyses, we show the simultaneous impact of these five universal measures. All five objective measures can be applied to any set of two-dimensional digital image files that have been produced in a standardized manner. Overall, we provide a simple and easy-to-understand operationalization of visual antecedents of spontaneous aesthetic liking judgements that can be used as a toolbox of objective aesthetic measures in diverse scientific fields.

## **Cross-cultural differences and cross-cultural constancies in aesthetic preferences**

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Studies of aesthetic preferences are mostly carried out within a single culture, and may reflect the interests and values of that culture. Cultures may also differ in psychological modes of processing, Masuda (2006-2015) suggesting East Asian perceptions are more holistic and context-oriented whereas Westerners' perceptions are more analytic and object-oriented, resulting in different aesthetic preferences. This study therefore explicitly compared aesthetic preferences in different cultures. We studied aesthetic preferences in 170 participants in Thailand (n=38), Hong Kong (n=52) and the United Kingdom (n=83). In a paired comparison design, stimuli were works of art from Thailand, China and the West, images from standard tests of aesthetic ability, Mondrian and pseudo-Mondrian paintings, and rectangles of different shapes. Images from Masuda's papers were also used. Preferences for works of art showed highly significant differences between the cultures, confirming cultural differences in aesthetic preference. However despite a clear overall preference for real Mondrians over pseudo-Mondrians, as previously found, there were NO cultural differences, despite such stimuli being less well-known in Thailand and Hong Kong. Similarly, despite overall rectangle preferences there were NO cross-cultural differences. We found no evidence for East Asian samples preferring those images which Masuda said were holistic and context-oriented, and neither did participants preferring such images differ in their preferences for other stimuli. Although aesthetic preferences undoubtedly can differ between cultures, such preferences seem mainly to be for specific content, whereas there are constancies for preferences for formal, compositional properties of images, as with the Mondrians and the rectangles.

## **Dual character art concepts**

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There is an ongoing and apparently irresolvable debate about the concept of art. Some have claimed that the concept is essentially evaluative; applying the concept ART involves making a positive aesthetic evaluation. Some have claimed that the concept is essentially descriptive; the application conditions for the concept involve no evaluative elements. Others say that the concept of art has two distinct senses — one evaluative and one descriptive. Moreover, it is often held that settling this issue is key to answering the central question in philosophical aesthetics: what is art? We aim to dissolve this debate by showing that it stems from an overly limited menu of options: that the concept of art must be either evaluative in the sense described above, descriptive, or both. In fact, through a series of experimental studies, we argue that the concept of art is neither an ordinary evaluative concept nor an ordinary descriptive concept. Instead, the concept of art has a distinctive normative element — it is what Knobe, Prasada, and Newman (2013) call a “dual character concept.” Applying the concept of art does indeed involve making an evaluation, but not about whether a work is good or not. Instead, the evaluation is about whether it embodies, or fails to embody, certain aims. Furthermore, we show that this dual character also holds for other art concepts, such as LITERATURE, PUNK ROCK and STREET ART. Nevertheless, not all art concepts (e.g., SONNET and BREAKDANCING) appear to be dual character.

## Changes in Van Gogh's painting in light of the Evolutionary Theory

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This paper examines the aesthetic experience of the changes in van Gogh's painting technique over a five periods in his career. Characteristic reproductions on a similar topic (landscapes) were chosen. Details of different enlargement were cut out of each painting: a) a detail where the brushstrokes, i.e. the technique, was clearly visible; b) a detail which was clearly recognised (e.g. a bush); and c) the whole reproduction. The three series of stimuli were evaluated by psychology students (N=50) on Martindale's 7-degree scales of arousal potential and primordial content. The results showed that there were the effect of enlargement and the effect of the period on the arousal, but not the interaction between the two. Expectedly, the highest scores were given to the whole reproductions, then to the recognisable detail and the lowest ones to the technique. Regression analysis showed a different trend in the arousal between the three groups of stimuli over the five periods. The arousal potential increased in the evaluation of the technique during the period, which is consistent with Martindale's theory. The opposite trend was noticed during the evaluation of details and the whole paintings. Changes in primordial content over the periods varied in line with the changes in the style of van Gogh's painting. Although the results did not confirm the theory of aesthetic evolution, they corresponded to the characteristics of individual periods and of the respective paintings. Further research should include a greater sample of reproductions and the evaluation of subjects educated in arts.

## The role of aesthetic taste within cultural identity

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Cultural identity has been formed by several internal/external factors, aesthetic taste being one of them. It can be expected people are able to reflect changes of their cultural identities. Can people from cultural management levels reflect their cultural identities? Which are the main factors that form their cultural identities? What is the role of aesthetic taste in the processes? Is semi-structured interview effective tool for research into cultural identity? In this qualitative research semi-structured interviews were held with eight persons involved in cultural management in a small Slovak town "Bytča" from January 2015 to May 2016. Answers were analyzed by Atlas.ti software on the basis of pre-selected categories (some new ones appeared during interviews), e.g. cultural monument, outstanding person, town, countryside, cultural center. Main findings: Respondents proved the same key factors in developing their individual cultural identities (cultural monuments, cultural festivities, personal involvement, etc.). Aesthetic taste appeared to be the most prominent one among them. Current world challenges cultural identity, nevertheless the research shows people are aware of cultural identity changes. If aesthetic taste plays a crucial role here it is time for serious consideration of media and education/schools influences. (The research was covered by the grant "VEGA No. 1/0603/14, Identity formation in time and place.")

## **Influence of sexual orientation and relationship status on processing facial attractiveness**

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Faces, which are highly relevant for humans due to their information value, are usually also associated with aesthetic evaluations. Attractive faces affect our everyday interactions, they attract and bind our gaze and we look at them longer. An explanation for this is that attractiveness is rewarding. From an evolutionary perspective it is reasonable to prefer attractive individuals, since attractive faces signal good features in a (reproduction) partner, like genetic health. We wanted to challenge the evolutionary notion that attractive, other sex faces always have the strongest guidance effect on our visual exploration behavior. In two studies we tested how sexual orientation and relationship status influence the visual exploration towards faces of different attractiveness. We expected that homosexual individuals would prefer same sex faces and that individuals in a relationship would devalue attractive faces in order to not endanger their relationship satisfaction. Study 1 included heterosexual and homosexual men and women, whereas in study 2 only heterosexual men and women who were either single or committed to a romantic relationship participated. We recorded eye movements while participants viewed pictures of real world urban street scenes showing two persons, and acquired attractiveness ratings for the presented faces. In both studies attractive faces were looked at longer. Attractiveness had the largest influence on attention, but sex, sexual orientation, relationship status and sociosexual orientation had modulating effects. These findings suggest that attractiveness does not always have the same influence on the perception of faces; perception is modulated by perceiver characteristics, goals and motifs.

## **EEG-based study on nine emotional states of Indian Rasa theory from popular Bollywood and Hollywood film segments**

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'Natyasastra', the ancient Indian treatise on performing arts, speaks about 'sentiments' or 'Rasas' which are produced when certain 'dominant states', 'transitory states' and 'temperamental states' of emotions come together. There has been no previous work done on the brain responses to emotional states based on Rasa theory. Neuro-cinematics or the neuroscience of film is a fast-developing branch of research in empirical aesthetics. Complex naturalistic stimuli like film-viewing evoke highly reliable brain activity across viewers as per current research works. Our aim was to analyze, through EEG, the patterns of brain activity generated through nine different emotional responses based on Indian Rasa theory while watching films from different cultures (Bollywood and Hollywood) and to find out whether these activities would show specific neural signatures across viewers. We conducted an EEG experiment on 20 participants during which they were asked to view chosen film clips representative of nine different emotional states. To analyze electrical activity of the brain we used 128 channel high density Geodesic EEG Systems™. We conducted a frequency-domain analysis of the EEG signals and based on the trends observed in the EEG data, we conclude that estimating EEG-based functional brain-response study provides a useful tool for studying the relationship between brain activity and the nine emotional states. The rationale behind this study was to carry out an EEG-based systematic analysis of the wide array of emotions evoked during watching a film and to broaden the territory of cross-cultural emotion research by focusing on the Rasa theory of Indian aesthetics.

## The “gist” of beauty: An investigation of aesthetic perception in rapidly presented scenes

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While a work of art can evoke a profound aesthetic experience, the same applies to a grand ballroom or sunset. Like fine art, everyday scenes might contain aesthetic qualities, with some scenes being preferred over others. The meaning or semantic label of a scene, known as scene gist, is extracted rapidly and automatically, with just a brief glance, mainly from the low spatial frequencies (LSF) in the image. The question addressed here is whether such rapid and coarse overall representation also allows a stable aesthetic impression. In a series of experiments, we investigated to what extent intrinsic (image content) and extrinsic (temporal and spatial resolution) factors affect the aesthetic response to real-world images. We varied these factors in different groups of participants who rated sets of images for aesthetic pleasure on a Likert-type scale. Here we show that aesthetic responses are extracted consistently and automatically with just a glance at scene. However, LSF versions of the same scenes do not show this consistency. Moreover, participants preferred natural scenes over urban or indoor scenes, at both rapid and unlimited exposures. There was a significant interaction of this preference with self-similarity and anisotropy, two image statistics previously shown to correlate with aesthetic response to artworks. Although research using works of art have provided important insights in the formation of the aesthetic response, aesthetic judgments extend beyond the art gallery to the real world. The results presented here reveal a deeper understanding of the aesthetic response to our every-day surroundings.

## Preference for Curvature: Past, Present and Future

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Curved lines and forms occupy a special place in the Western traditions of philosophical, psychological, and evolutionary thought on aesthetics. Although such observation has been tested sporadically throughout the history of scientific psychology, only during the last decade has it been the object of systematic research. Here, regarding the origin of this preference, we distinguish approaches positing an evolutionary foundation from those postulating it is the result of learning processes. Second, regarding the mechanisms underlying humans' preference for curvature, we distinguish approaches that base their explanation on features of the sensorimotor systems from those that base it on appraisal processes. We also argue that the lack of a unifying framework and clearly defined concepts might be undermining our efforts towards a better understanding of the nature of preference for curvature. Finally, we point to a series of unresolved matters as the starting point to further develop a consistent research program.

## Emotional response to paintings: An Awe sensation

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The goal of this paper is to determine the type of emotional response to paintings that specifically generate an awe sensation and to identify the critical characteristics of such paintings. Four paintings that provided an awe sensation to the author were initially selected. The paintings were by renowned classical artists that cover different periods of art history: Renaissance, Impressionism, Baroque, and Realism. Experiments were then conducted involving 43 individuals with various backgrounds including a subset of art students. In addition, 14 students from an Understanding the Brain honors class participated in this effort and provided their personality profile scores. All of the participants were asked to rate one of these paintings or their own preferred painting that provided an awe sensation. The data was analyzed for the degree of awe sensation as a function of age, gender, formal training in art, and personality profile. They also identified the elements of the paintings that provided such a sensation. Effect sizes and confidence level of 95% with lower and upper confidence intervals were calculated for the comparisons. More specifically, the awe sensation was greater with females than males, with younger participants, and with those that have formal art training. Students with Openness personality profiles provided the greatest correlation and lowest with Neuroticism personality. This research brings a new dimension to understanding the emotional response to paintings. The findings could provide a starting point for more in depth analysis with significantly larger control groups, and ultimate participation of neuroscientists for verification.

## The construction of visual complexity

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Research on the role of visual complexity in aesthetic appreciation has a long tradition in empirical aesthetics. Berlyne (1974) believed complexity depended “on the relations between physical and statistical properties of stimulus objects and processes within the organism” (Berlyne, 1974, p. 19). The research presented here addresses these relations. Specifically, we aimed to determine the impact of familiarization on ratings of artworks’ visual complexity, liking and understanding. The experiment began with a familiarization phase in which all participants looked at 60 pairs of paintings and chose the most urban or rural one in each pair. Participants in the LC group were shown only low complexity paintings, and those in the HC group were shown only high complexity paintings (according to pre-ratings by another group and computational measures). In the second phase all participants were shown 36 test artworks of intermediate complexity, and rated them on complexity, liking, and understanding using 6-point Likert scales. Linear mixed effects models revealed that LC participants awarded higher complexity ratings to the test artworks than HC participants. Groups did not differ in their overall liking and understanding ratings but, regardless of familiarization, liking was predicted by subjective ratings of complexity. Thus, in line with Berlyne (1974), our perception of visual complexity arises from the interaction between image properties and our own momentary state—familiarization in this case—and it is this subjective perception that influences liking. These results have direct implications for debates on the mechanisms by which image characteristics influence aesthetic appreciation.

## The auditive perception in blindfolded drawing

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Starting from a Roberto Galeotti's project about blindfolded self-portraits (2012) I have deepened the process of creation and "fusion" of different "mental images" in visual sensory deprivation. The noise made by the pencil rubbing on the paper (auditive stimulation) had a great influence on the execution, and even an extremely effective sensorial indicator from which flowed the tactile-kinesthetic perception. In the condition of visual deprivation, the only objective information on which to build the memory/image of the graphic action is mainly mediated by hearing. Being blindfolded, that means "without the possibility to look", I have made (without time limits) a few "thematic" drawings, hypersimplified structures without meaning, using paper supports of different shapes. The results show that visual deprivation conditions enhance the complexity of the sign and increase the imaginative-representative faculties. The effectiveness of auditive perception allows the creation of a different organization of the drawing area. This perception, strengthening in time and in practice, can match in effectiveness the mental representation mediated by vision and, maybe, with a higher degree of evocativeness.

## Falling Man: Resilience and art experience

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The image of the 'Falling Man' by Richard Drew was taken on 11th September 2001: It shows probably Jonathan Briley falling from the World Trade Center after having been trapped by the fire. The photo and its publication have been widely debated raising strong emotions. It has been the blueprint for artistic adaptations and it has provided the title for Don DeLillo's novel of 2007 in which an artist's performance of the 'falling man' plays a key role. In our empirical study on fascination (using eye-tracking, behavioral lab, questionnaire), this picture – being top in the fascination-rating – has been used as a stimulus for figuring out which emotions are involved in fascination as a 'mixed' emotion. The findings show for this image a mix of negative emotions and blended emotions with a predominantly negative valence. This is surprising, considering the (scarce) literature on the topic. The concomitant strength of fascination and the negativity of connected emotions might suggest a link between fascination and coping with trauma which, in turn, may facilitate resilience. It needs to be discussed a) in what way the picture has aesthetic (as compared to the images of other falling people) qualities making it more than a documentary, and why it has so strongly provoked artistic adaptations, and b) how this artistic quality might add to emotional coping (catharsis) performing psychological functions ultimately leading to resilience.

## **The potential of art in hospitals**

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The significance of art in hospitals has a tradition of being studied from a physiological and psychological perspective on patient health outcomes, leaving patients' experience of well-being underexamined. Departing from an interactional and phenomenological perspective that qualitatively investigated patients' experience and use of art during hospitalization, two qualitative experimental case studies were carried out in two hospitals. 68 hospitalized patients situated in 5 dayrooms and 14 single-bedded patient rooms were interviewed and a larger sample was observed. Additionally, quantitative data from thermal cameras, a psycho-physiological EEG-experiment and a survey informed and qualified the analysis of the qualitative data. The study concludes that the presence of visual art in hospitals contributes to health outcomes by improving patient well-being and satisfaction as an extended form of healthcare, thus potentially enhancing the experienced quality of medical treatment, recovery and reducing length of stay. Hospitalized patients were affected physically, socially, emotionally and cognitively, in the context of art supporting an environment and atmosphere to feel safe, socialize, hold a connection to the world outside the hospital and maintain identity. Elements of colour, shape and movement in the artworks indicated an effect on patients' experience and use of art. The study unfolds the potentials of art in hospitals and qualifies current guidelines for the application of art, arguing that, rather than being rooted in the dichotomy between figurative and abstract art, choice of art can be based on the presence of identifiable elements and used as an integrated tool for healing in hospitals.

## **Home Zone: Qualitative und cognitive investigation of the role of art in the public space**

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The interdisciplinary research project HOME ZONE, integrating methods of art (real size model), participative urban planning (interviews) and cognitive science/aesthetics (Leder model), explores the perception of art in urban contexts in terms of their aesthetics and visual display and the impact of these on local places, urban traffic situation and identities. Contemporary knowledge in complex urban planning requires empirical research on perception. For the research, we have defined a specific urban crossing / place with dense traffic situation that will become a home zone (moderate speed zone as a non-hierarchical space for traffic participants) in a small city in Valais (Switzerland). We questioned this urban zone on spatial and aesthetic perception with and without artistic interventions by differentiating qualitative questions on the aesthetic and urban issue. Therefore we implemented in situ 5 artistic interventions – established along a empirically defined typology about form, color, spatial dimensions, performance and participative aspects – in the chosen urban context. The in situ interventions were tested empirically in the field situation (qualitative inquiry) and in the laboratory of cognitive psychology at Humboldt University (qualitative and quantitative inquiries). The results will be published in October 2016; they will provide the foundations for possible artistic urban design interventions, tested through empiric field and laboratory research.

## Joint action aesthetics in dance

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Synchronising movements between individual performers is a central aspect of performing dance. Yet, existing research on dance aesthetics has largely focused on the movements of one performer only. Here, we investigated the role of behavioural coordination in aesthetic appreciation of a live dance performance. We conducted two experiments in which participants performed a set of movement tasks that were either performed as a group or individually. During execution (dancers) and observation (spectators) of these tasks, we assessed cross-recurrence of individual acceleration profiles and psychophysiological responses using wrist sensors. We also recorded continuous ratings of aesthetic appreciation and perceived group characteristics. We predicted that behavioural coordination would increase affiliation among performers and enjoyment among spectators. Using continuous cross-recurrence measures of behavioural coordination and applying granger causality, we show that behavioural coordination of dance movement predicts group affiliation among performers and audience responses to live dance performance. In a follow-up-fMRI study, we identify the neural mechanisms of joint action aesthetics, by assessing inter-subject correlations between spectators as a function of behavioural coordination among performers. We show that moving together produces both increases in group affiliation amongst performers and enjoyment in observers. Our findings thus point to an evolutionary function of dance - and perhaps all performing arts - in promoting social cohesion in societies.

## Mother-infant attachment and the evolutionary origins of musical and religious emotion

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Musical and religious rituals co-exist universally and evoke common emotions, suggesting a common origin. Empirical research in psychology, ethology, therapy, ethnomusicology, and psycholinguistics (Bowlby, Bunt, Dissanayake, Filippa, Gabrielsson, Falk, Fernald, Fifer, Gibson, Granqvist, Hepper, Juslin, Lecanuet, Lorenz, Mastropieri, Oberhoff, Papoušek, Pinker, Scherer, Saffran, Smotherman, Trehub, Trevarthen, Zentner) can clarify this connection. Characteristic strong emotions in both music and religion include wonder, sublimity, magic, transcendence, enchantment, sacredness, spirituality, awe, reverence, glory, majesty, splendor, and mystery. What is the origin, nature, and function of such emotions? Music and religion are not necessarily adaptations: (groups of) humans with more/better music/religion may not be more likely to survive or reproduce. These characteristic emotions may instead originate in mother-infant attachment (bonding). Infant mortality during human prehistory was consistently high, so biological or behavioral changes that reduced mortality rates could become adaptations. Motherese emerged when the brain became larger, gait bipedal, birth earlier, babies more fragile. Infant survival increasingly depended on active contributions of both infant and mother to bonding: the infant's ability to behave appropriately given the mother's current state; the mother's ability to remember the past to imagine the future, to prevent fatal accidents. Maternal attachment behavior is driven by the infant schema; the infant's, by the mother schema (Parncutt, 2009). Ritual situations including prayer and music may activate the mother schema in adults, based on classical/operant conditioning and ecological interaction, which can explain the costly universal worship of gods and spirits.

## Which perceptual properties of music drive genuine aesthetic musical experiences?

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The Neuroaesthetics of Music draws on long traditions of research on Empirical Aesthetics of Music (and Music Perception more widely) and the Cognitive Neuroscience of Music. Aesthetic experience is often conceived as having several components: a perceptual experience that is pleasurable and evaluative. Work to date has tended to adopt one of two approaches. The first uses carefully controlled artificially-constructed musical examples, with the advantage of allowing precise control of the musical parameters that influence the aesthetic experience. A disadvantage is that the stimuli often lack the richness and virtuosity of the music that produces aesthetic experiences for listeners in real life. The alternative approach uses real-world music, often selected by the participants themselves, which has the advantage of moving closer to the power of real-world aesthetic experiences of music. However, a disadvantage is that it becomes difficult to know which properties of the complex musical stimuli are necessary or sufficient for generating the aesthetic experience. Computational modelling provides a theoretical bridge between the two approaches, allowing for empirical research on real-world aesthetic experiences of music that also permits precise experimental measurement of the properties of the music involved in those experiences. Examples from the recent literature include computational models of the relationship between expectation and emotion and audio-based models of polyphonic timbre. Future work should further develop this fruitful combination of cognitive neuroscience and computational modelling in understanding how the details of perceptual experience are related to the pleasurable and evaluative components of the aesthetic experience of music.

## Sequence effects on judgments of face beauty

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Judgments of face beauty are affected by context and experience. While research has shown that judgments of face beauty are influenced by previous trials in a sequence of faces, results as to the direction and nature of sequence effects have been contradictory. In order to better understand how previous trials influence beauty judgments, we developed an experimental design that was able to independently measure two potential sequence effects on ratings of face beauty. In our design, judgments of beauty and hair-darkness were alternated such that we were able to “decouple” and independently measure potential influences from the rating given in the previous trial and from the perceptual experience of the previous trial. In a series of three experiments (using both student and online subject pools), we used this design to show that these two effects occurred simultaneously and in opposite directions: the numerical rating of a face had an assimilative effect on the next rating, while the perception of the face stimulus itself had a contrastive effect on the next rating. We also showed that these effects occurred only within the same visual category and that the contrast effect was the direct result of a perceptual aftereffect. Our results reconcile the contradictory findings across the judgments of face beauty literature and can be applied more broadly in understanding contextual factors that influence aesthetic judgments.

## Aesthetic reception of unknown symbols

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Research tests the appreciation of unknown symbols regarding their simplicity – complexity and subjective meaning. For that purpose, unknown symbols, Chinese ideograms, were presented as aesthetic objects. Subjects were asked to estimate the level of appreciation, to imagine colour that represents the symbol and to create the meaning of ideogram. Research tests relation between complexity and appreciation of symbol. Previous researches demonstrated positive correlation between complexity and appreciation of objects (Berlyne, 1972), and also there are studies that demonstrate sensibility of naïve subjects to meaning of unknown symbols (Osgood et al, 1975). It is expected that more complex symbols will be recognized as more beautiful, and that there will be some agreements between subjects regarding the colour and meaning of symbols. Subjects were 58 students of painting. As stimuli 30 symbols were presented, 10 simple Chinese ideograms (6 or less contours), 10 complex (8–16 contours) and 10 symbols were turned up-side down. Univariate analysis of variance showed no statistically significant differences between simple and complex symbols ( $F=.65$ ,  $p>.05$ ). There is statistically significant difference showing that real symbols are seen as more beautiful than reversed versions ( $F=4.43$ ,  $p<.05$ ). Selection of appropriate colour for symbols showed there is statistically significant tendency to link simple symbol with white and yellow, and complex symbols with green, brown, red and orange. Results show there are systematic factors influencing estimation of unknown symbols, which are probably based on implicit understanding but not complexity of symbol.

## 2D emotions

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This talk is a philosophical sequel of Piolino & Pelletier’s talk in the Symposium. Piolino & Pelletier’s dual process framework intentionally brackets the aesthetic dimension of emotional responses to fictional scenes. In this talk, I attempt to spell out how this aesthetic dimension may be integrated in this framework. In so far as many works of art depict fictional content, it is crucial to disentangle these two aspects—the fictional and the aesthetic—of our emotional responses to a work of art, and also to elucidate their interaction. In my proposal, our emotional responses to a work of art depicting fictional content blend two kinds of emotions – emotional responses to the fictional scenes and to the appearances and arrangements of these scenes - in a unitary emotional rich aesthetic experience with two dimensions, one dimension referring to the content (the fictional dimension), the other to the appearance and arrangement of this content (the extrafictional dimension). In brief, the down-regulation of our emotional subjective feelings – especially of negative ones - in response to the fictional content is instrumental in enabling the reader or spectator to be sensitive to the artistic organisation and to respond emotionally to the appearances and arrangements of the moving scenes. Besides, following Hume who noted that audiences are “pleased in proportion as they are afflicted”, one may speculate that the physiological intensity of our emotional responses to the fictional scenes attaches to, augments and accentuates our emotional responses to the appearance and arrangement of these scenes.

## **But what does the brain do to our experience of art? A new integrated model of aesthetic experience**

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We introduce a new model for viewing art, based on our laboratory members' previous work integrating bottom-up (Leder et al., 2004) and top-down (Pelowski & Akiba, 2011) processing, and underlying correlates of the brain. Art interaction is particularly important due to the wide range of involved psychological topics including emotion, cognition, visual perception, top-down vs. bottom-up information integration, and personality. At the same time, recent empirical studies, and centuries of belletristic discussion, also note that art is specifically capable of inducing a host of more profound response—awe, anger, disgust, novelty, transformation—which are of particular, and only rather recent, interest to psychologists. However, current models have yet only targeted the more basic, stimuli-derived elements of viewing art, and have connected these with discussion of corresponding functionality and regions of the brain. Thus, many of the unique features of art interaction remained beyond the scope of current approaches. Notably, we therefore require the important step of connecting both bottom-up and top-down processes, which may lead to a better understanding of real-life outcomes, and a discussion of key functional brain regions or larger networks, beyond basic appraisal and processing experience. Based on a new model we discuss five major outputs of art viewing, which we argue can be explained by a collection of processing checks. These are connected to existing networks in the brain—e.g., self-identification, default mode network, emotion regulation, as well as appraisal and vision—which may interact to inform our experience, and hopefully raise avenues for future research.

## **But how do we make Art? An analysis of art making and technical, perceptual and neurobiological advantages of artists, compared to previous realistic copying research**

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Art production is one of the most ubiquitous, evolutionarily unique, and psychologically complex activities of the human species. It acts as a “key window” into human perception and thought. However, despite its importance, until now, study of the actual act of producing art has largely been considered only from the perspective of realistic copying. While this research has uncovered making techniques, potential advantages in visual cognition and motor planning, as well as differentiated brain activity in artists, the question remains whether the ability to make good art and to realistically reproduce what one sees in fact correspond, or transversely whether they significantly differ. We present results of a new approach, using a paradigm developed by our team for eliciting art making. Participants (57 lay psychology students) created quick works of art (drawings) from visual cues. This was coupled with standardized personality and perceptual assessments, previously used in realistic copying studies, as well as a standard hand photo copying task. Results confirmed the efficacy of our paradigm for eliciting produced art in a controlled setting, and showed that realistic copying and art making do largely overlap in terms of personality (BFI Openness, creativity) and perceptual ability (visual memory, spatial processing, and gestalt search). We also take the next step of connecting our findings, and video evidence of the act of drawing, to a new model of artistic production and art viewing (Tinio, 2013; Pelowski, Tinio & Leder, 2016), which may further articulate the unique ability of artists, and offer compelling avenues for future research.

## **Aesthetic qualities of the memorable experiences of listening to sad music are predominantly related to beauty**

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Sad music and its effects on the listener have received considerable attention in music and emotion research during the past few years. Previous studies have shed light on the use of sad music in emotion regulation (Taruffi & Koelsch, 2014), but aesthetic pleasure has also been recognised as being one of the appealing aspects of sad music (Juslin, 2013). The present study aims to explore what these aesthetic experiences actually contain and how they relate to everyday music listening. 162 native Finns described a memorable aesthetic experience with nominally sad music via online survey. The descriptions were analysed by using thematic content analysis method, which identified several recurring themes. Contrary to self-regulation, the aesthetic experiences were associated mostly with a certain piece of music that was purposely listened to for enjoyment, but also unexpected musical experiences were described as memorable. The majority (57%) of the experiences were strongly associated with beauty; musical features, the surroundings, or the experienced emotions were described as beautiful. Although sadness is often associated with privacy, nearly a third of the experiences had strong interpersonal qualities, as they took place in public (21%), or were otherwise shared with others (9%). The private experiences were related to solitude and being in the wild (9%), or imagination (19%), or fiction (9%). The results suggest that aesthetic experiences of sadness relate to specific experiential function of music, since they seem to be different from comfort obtained from sad music, and even more different from everyday experience of sadness.

## **Memorization of faces, linked with jobs and characters**

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One hundred and eight 13-year-olds (58 females, 50 males) have seen two videos with 7 pictures of faces. In the first video there are faces and information regarding jobs; in the second video there are the same faces and information regarding characters. Which of the two associations will be best remembered? We hypothesized that students would memorize the faces-professions associations most, identifying a social role model connected to practical purposes and to a model of reality already defined, sufficiently to almost entirely reproduce the information to be stored (passive process). We also hypothesized that the storage of faces-character associations would have detected a high number of incorrect and heterogeneous answers, because we think that each user subconsciously formulates hypotheses of relation to the item to memorise; as a possibility to inspect and dynamically sharpen of the reality (active process). Such aesthetic behavior distances the user from a reality model already determined and dominant. Experimental data confirmed the two hypotheses. We observed a high percentage of correct answers in the memorisation of the faces—jobs links (84.12%). In memorising the faces-characters links we observed a reasonable number of incorrect answers (44.57%) and heterogeneous. In carrying out the requested work, this study is to be considered a didactic tool in the analysis of the variety of cognitive behaviours and of passive and active processes.

## Gradability and multidimensionality in aesthetic adjectives

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Aesthetic adjectives are gradable adjectives: they can be used to rank two objects in terms of the degree to which they possess a relevant property. But must aesthetic gradables, such as beautiful and sublime, be interpreted relative to a comparison class (e.g., “beautiful for a Kinkade”) or do they admit of absolute values and independent interpretation? Recent research suggests that some aesthetic adjectives—beautiful and elegant—behave like relative adjectives according to some diagnostics, but like absolute adjectives according to others. I argue that beautiful and elegant return confusing results because they are multidimensional adjectives (i.e., they map objects along multiple dimensions in a single use). Empirical methods for diagnosing multidimensional adjectives have relied on corpus studies. However, these methods are inappropriate for aesthetic adjectives, which appear relatively rarely within standard English-language corpuses. I develop a behavioral method based on pre-existing corpus studies to support the contention that beautiful and elegant are highly multidimensional. Because of their multidimensionality, I argue, these adjectives constitute poor samples against which to draft an account of the semantics of aesthetic adjectives. In a second part of the paper, I argue that other central aesthetic adjectives (e.g., sublime, poetic) pattern straightforwardly with absolute adjectives. I then offer an account of beautiful and elegant as multidimensional absolute gradables. An additional behavioral response method I develop suggests that beautiful and elegant pattern with one class of multidimensional absolute gradables. Ultimately I argue that aesthetic adjectives are in general absolute gradable adjectives, however some aesthetic adjectives are multidimensional.

## Individual differences in aesthetic pleasure during poetry reading

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In the past decade, there has been increasing interest in the relation between music and language processing. In this study, we examined individual differences in aesthetic responses during silent reading of sonnets – a highly structured literary form in iambic pentameter that shares a number of rhythmic characteristics with music. Participants read sixteen sonnets at their own self-defined pace, first for familiarity and then to make judgments about different characteristics of the poems. For the second reading of each sonnet, participants judged vividness of the poem’s imagery, valence of poem theme, valence of personal feelings about the poem, strength/intensity of their feelings, and aesthetic pleasure (AP). To examine individual differences in poetry perceptions, we also assessed, prior to the first reading, both positive and negative affect using the PANAS, and considered the role of visual and auditory imagery abilities using the VVIQ and BAIS survey measures, respectively. We also considered potential differences associated with music and literary training. As an online measure of AP, literary trained participants highlighted words within the sonnets that they felt were particularly aesthetically pleasing (positive) or displeasing (negative). Results revealed that strength/intensity of feelings, valence of feelings, and positive affect accounted for approximately 76% of the variance in AP ratings. Moreover, we found that positive highlighting was positively correlated with AP ratings; to our surprise, this contrasted with negative highlighting, which had no impact on AP ratings.

## **Art training and personality traits as predictors of aesthetic experience of different art styles**

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The aim of the study was to investigate predictors of aesthetic experience across different artistic styles. The personality traits as well as differences in aesthetic training were presumed to influence various dimensions of aesthetic experience: the evaluation of artistic quality and knowledge about the work, negative and positive emotions and feeling of personal connection with the art. The study partials out the influence of personality traits and art experiences (expertise, art knowledge, art participation) on reactions to figurative, non-figurative and contemporary art. Three groups of participants (N=171) took part in the study. Students enrolled in Sport, Humanities and the Arts declared their art experience, filled out measures of the Big Five, alexithymia and the Need for Cognitive Closure as well as evaluated three paintings by using a tool constructed by the authors. In general, art experience was a better predictor of aesthetic reactions than personality traits. However, when different styles were taken into account, personality played more important role in aesthetic judgement of abstract works, while aesthetic training turned out to be more important for contemporary art. Both artistic quality and understanding of the work by the viewer are strongly related to measures of art training, while the pattern is less clear for emotions perceived and memories evoked by the art. The findings expand our knowledge on the role of individual characteristics in aesthetic judgements of different styles of art as well as shed some light on the multidimensionality of aesthetic experience.

## **A dual-process framework for analysing emotions towards fictions**

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How is it that we are so prompt to watch fictional movies, even when we know that some of them are going to be very frightening? Is our self-engagement, our distance with the characters and their fate, modulated by the fact that they are not real? Two experiments were conducted to study our emotional responses to fictional scenes and their potential relationship with self-relevance. In the first experiment, short video scenes were presented to participants in two conditions, as real or as fictional. The fictional presentation significantly induced a decrease in the subjective intensity of the emotion felt by the participants but had no effect on physiological activation (skin conductance). Moreover, the self-relevance (the degree to which the stimulus was related to autobiographical memories) was positively correlated with the intensity of the subjective emotion. However, this link was not modulated by the fictional presentation, being similar in both conditions. The second study reproduced these results, with emotional pictures instead of videos, pictures whose nature was modulated by descriptions presenting them as real (“dead body of a man”) or as fictional (“make up of a dead body on a man”). This second study also showed that the decrease of felt emotion in the fiction condition was linked to executive functions, in particular working memory updating. Taken together, these results outline a dual process framework for analyzing emotional responses to fictional scenes, with a main down-regulation effect being at the same time subserved by executive functions and countered by self-relevance.

## **The Aesthetic Legacy: Epigenetics as a bridge between genes and culture?**

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Recent research in empirical aesthetics has highlighted the crucial role played by contextual/environmental factors on aesthetic experience. Further confirmation comes today from epigenetics: dealing with the "marks" left by physical and cultural environments on the epigenome, and with their possible transmission to the next generations, Epigenetics provides new insights into the multifaceted relationship between organism and environment. Through a review of recent studies in the field, this paper tries to lay the foundations for the development of a future research program on the epigenetic aspects of aesthetic experience. Mammals seem to possess epigenetic mechanisms that translate environmental exposures and behaviours into inherited phenotypes without affecting the genotype. In a recent study by Dias, Ressler (2014), mice taught to dislike a particular odour transmitted an aversion to the same smell to both their offspring and the next generation. They passed down, in a word, acquired smell preferences. Although empirical studies on human epigenetics are in their infancy and although sensorial preferences - like those discussed in Dias' study - constitute just an early-phase component of that multilevel cluster which is a fully-developed aesthetic experience, we argue here that future studies could significantly deepen our understanding of the relationship between epigenetic variations and perceptual, emotional or cognitive processes underlying aesthetic experience. As a meeting point between organism and environment, beyond the unwieldy nature/culture dichotomy, Epigenetics may add new significance to the "context" in which aesthetic experience and the transmission of aesthetic tastes unfold, to be integrated with standard psychological and neuroimaging evidence.

## **Artistic creativity as cognitive niche construction**

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Cognitive Aesthetics and Neuroaesthetics have difficulty dealing with creative dimensions of cognition, particularly under the information processing paradigm and its computational strategy of approaching a complex phenomenon by breaking it into gradually simpler sub-tasks. Differently, creativity has been treated as an irreducible experience by aestheticians, anthropologists, art scholars and artists, often however suffering from lack of systematicity and referring to non-operational mysterious notions. In our approach, creativity is causally distributed in space and time. It is not to be found neither in a given entity (such as a "creative person") nor in a given point in time (such as a "moment of insight"). We regard creativity as a property of cognitive artifact manipulation and niche construction. More specifically, creativity is distributed as evolutionary opportunities in cognitive niches, i.e. sets of specialized problem-spaces that affect cognitive activities. In Evolutionary Biology, Niche Construction Theory emphasizes a broad processual view on evolution that stresses the environment as an inheritance system, and overall organism behavior as shaping evolutionary pressures. In our approach, the term "creative artist" takes the meaning of an agent who participates in a cognitive process of artistic niche construction. Individual features such as mental abilities or psychological traits, as well as expertise and training, influence the creative artistic process in the sense that they contribute or not to the exploration of such opportunities. We exemplify with the description of the development of novel, creative, approaches in the history of dance.

## **Photobooks and the epistemic function of artistic artifacts**

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Photobooks are artistic artifacts that possess certain properties which allow us to relate scientific empirical models to artworks. They present particular features that distinguishes them from photographic prints, as well as from simple catalogues of artistic images. The most important of these features are the relations between photographs and other visual semiotic resources that can be found in such publications. In this research we approach photobooks as epistemic artifacts. The relations between the semiotic resources are the main responsible factor for allowing artistic artifacts to function as such. Epistemic artifacts are physical entities that provide us with new information about the object they stand for. But this new information remains a potentiality unless the artifacts are physically-mentally manipulated by an agent. Therefore, manipulation is understood as a reasoning process and as the performance of a motor action. For the manipulation of epistemic artifacts to present satisfactory results it must follow a number of specific laws and constraints that are related to how the semiotic resources interact with one another, like: how the pages are ordered in the book; how the resources are distributed in the pages; and how do we get in contact with them. These constraints are of main importance, since they regulate the manipulation possibilities and the consequent discovery of information. This is a fundamentally theoretical approach, that addresses certain persistent problems in the philosophy of science. In special the ones related to the nature of scientific modeling and the epistemic potential of artistic artifacts.

## **Can a phenomenological framework be used to investigate museum visitor engagement?**

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This project examines how a phenomenological framework can be used to investigate museum visitor engagement. Numerous studies in museum engagement consider learning as a primary goal, with minimal research into a more broadly defined visitor experience. This project seeks to explore ways to investigate the nature of visitor experience through the use of a phenomenological frame. Part of this framework draws on Martin Heidegger's ideas of how people encounter and interact with things, specifically *Zuhandenheit* and *Vorhandenheit*. This informed a series of questions developed for in-gallery discussion with visitors to museums. Fourteen semi-structured interviews were undertaken in the Museum of Liverpool, United Kingdom and Jaipur City Palace Museum, India. The interview data were analysed using a grounded theory approach. A number of researchers are using phenomenology to understand visitor interactions in the museum. However, none have yet applied *Zuhandenheit* and *Vorhandenheit* concepts into visitor interviews. This paper explores initial findings from the interviews, specifically two threads that emerged from data analysis. The first concerns the multi-layered responses to a question asking visitors to consider a hypothetical museum with no labels; these raise interesting issues around visitor behaviour and visitor expectations. The second thread relates to how visitors consider tools, and the appropriateness of questions designed by this researcher to investigate a Heideggerian consideration of tools in museums. It is suggested that the research may reveal novel ways to consider engagement, and to create more opportunities for engagement of museum visitors.

## Entropy of edge orientations in visual artworks

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Oriented edges are a basic feature of early visual processing. Does “visual rightness” of artworks manifest itself in a particular arrangement of edge orientations? To address this question, we analyzed how edge orientations relate to each other in images from a collection of >1600 paintings of Western provenance (JenAesthetics dataset). We detected prominent edges with Gabor filters and compared pairwise the orientations of each edge with the orientations of all other edges in each image. Based on the resulting orientation histograms, we measured Shannon entropy, collinearity and overall edge complexity. For comparison, we analyzed photographs of other man-made stimuli (simple objects, building facades, and urban scenes) and of natural patterns (large vistas, plants, lichen, clouds, and human faces). Results showed that, for paintings, Shannon entropy of edge orientations was high and collinearity was low, compared to the other image categories. This result implies that edge orientations exhibit a low degree of correlation across a painting on average. The opposite result was obtained for images of the other man-made visual stimuli. Moreover, confirming earlier studies, the complexity of paintings assumed intermediate values. Results were similar for paintings depicting different content matter and for different art styles. An SVM classifier trained on the three measures reached accuracies of 79% in distinguishing paintings from all the other image categories. In conclusion, our results indicate that a large set of artworks is characterized by a specific lay-out of edge orientations. It remains to be studied how universal this image property is across cultures.

## Cultural differences in appreciation of complexity in visual art: A Japanese-Western comparative eye-tracking experiment

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Complexity and simplicity have been considered to play a major role in aesthetic evaluation. In the West, aesthetic value has been hypothesized to depend on a balance between the complexity and simplicity of the stimulus (Hutcheson 1738). In Japan, however, diverging aesthetic ideals arose, highlighting simplicity and complexity as independent values and prioritizing each of these two poles separately. Despite their art historical importance, complexity and simplicity in visual artworks have so far been under-explored in empirical research that focuses on cultural differences. Thus, the aim of this ongoing study is to identify cultural differences in preference judgments and aesthetic ratings (liking, interest, etc.) as well as gazing behavior (i.e., fixations in regions of interest) with respect to artworks that have different levels of complexity. Compared to Western participants, Japanese respondents are expected to have greater appreciation for both very simple and highly complex compositions and to spend significantly more time on exploring empty areas of images. We therefore presented East Asian (Japanese) and Western (German) participant groups with artworks from both respective traditions that were manipulated in complexity across three dimensions (amount of objects, amount of different textures, amount of filled space). Preliminary results support our hypotheses: first, the complex images are significantly stronger preferred among Japanese participants than among Western respondents [ $F(2, 34) = 5.520, p < 0.01$ ]. Second, the Japanese eye-tracking data show that participants spent a considerable time gazing at empty spaces in images that depict human figures.

## Why and how we use eye-tracking in art history

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Centuries before at the end of the 19th century the saccadic movement of the eye was discovered by ophthalmologists and before devices were developed to track eye movements, many art historians used to describe works of art by discussing the movements of the beholder's eye. This contribution will address the difference between such subjectively sensed and objectively measured eye movements. Arguing that empirical measurements of eye movements can significantly improve knowledge in art history, I will present some recent studies from my eye-tracking lab at the Department for Art History of the University of Vienna (Lab for Cognitive Research in Art History: CReA).

## **Literary empathy and morality: Commonplaces and empirical evidence**

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The intersection between literature, empathy and ethics has long since been a commonplace in literary theory. Scholars from Aristotle to Martha Nussbaum (1997) claim that literature enhances moral and prosocial attitudes. Recent experiments (e.g. Hakemulder 2000, Mar & al. 2006, Kidd & Castano 2013, Johnson 2011/2013, Stansfield/Bunce 2014) seem to confirm this assumption, and our educational system is widely based on it. Importantly, the respective studies focused only on a part of the phenomenon of literary reading and empathy. There are at least three aspects that should additionally be taken into consideration: Many literary texts do not demand an empathic reaction, such as very formalistic poetry (for example *Konkrete Dichtung* in the German tradition) or certain types of theater plays demanding an “estrangement effect”. The history of literature also offers many examples of amoral protagonists in novels and dramas with whom readers are clearly invited to empathize (the problem of empathy with anti-social and even criminal behavior). Furthermore, there are also examples of literature and media consumption where the enjoyment derives from the absence or even suppression of empathic reactions, e.g. horror films, action movies. Interestingly, psychological studies about videogames tend to focus on negative aspects of videogame playing while studies on literary reading seem to overestimate its positive outcomes. The presentation will challenge the bias in literary studies towards understanding empathy exclusively in terms of promoting prosocial responses and behavior.

## Emotions caused by music as multidimensional quantities

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There was carried out an analysis of different scales of emotions caused by music and applied by psychologists and musicologists. Principles of forming such scales are subjective, only conscious emotional reactions being determined. Therefore, the measurement traceability is not provided. Earlier, on the basis of calculations and hypotheses, a measurement model of a nonlinear mechanism of emotional music perception was proposed according to which an emotional reaction is formed by emotion ensembles. The ensembles include basic emotions aroused in the time of beginnings of the life on Earth. Basic emotions are general for people and animals. The aim of this investigation is a theoretical and calculation-experimental substantiation of the scale of emotions that are considered to be multidimensional quantities as applied to the model suggested. Objects of the investigation are both sound signals uttered by animals in situations when their emotions are obvious and the musical fragments with analogous emotional coloration. An instrument of the study is a part of the measurement model realized in a computer. Results of experiments have confirmed the existence of basic emotion markers of in the objects of investigation. A multidimensional scale relied on brain biorhythm parameters, is proposed. A numerical matrix will correspond to scale gradations. There is a plan for the future to give names for them. Combination of names and numerical matrixes makes it possible to provide the traceability of measurements. The investigation has been supported by Russian Foundation for Humanities (grant 15-04-00565a).

## Measurements as the basis for prognosing emotions caused by music

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The paper topic is investigation of the processes of aesthetic perception of music. Earlier, on the basis of calculations and hypotheses there was proposed a model of a mechanism of emotional music perception. This model can be used as a model for measuring expected emotions and aesthetic impressions. The model structure includes three steps. The first step contains a time delay unit, nonlinear converter, frequency selector of the energy maximum zone, selector of oscillations with the frequencies related to a brain biorhythms zone, etc. The aim of investigations is to substantiate experimentally that the human brain performs functions attributed to the main blocks of this model. Experiments included presenting sound impacts (major and minor tonic triads as well as modulated oscillations) to the participants and recording their electroencephalograms. Procedures of performing the experiments and data processing are described. The results of the experiments are given. They show that the main blocks of the first step of the measurement model describe the process of neurophysiologic reaction formation, which cause basic emotions, in the adequate way. The results of the investigations performed make it possible to carry out specific applied studies in the field of musicology and other fields of empirical aesthetics in a future. Some trends in development of devices are shown, which will enable composers and performers of a musical composition to estimate its emotion impact on potential listeners. The research is supported by the Russian Foundation for Humanities (grant 15-04-00565a).

### **3D-shape-perception studied exemplarily with tetrahedron and icosahedron as prototypes of the polarities sharp versus round**

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To enable conscious choices for spatial forms and arrangements in design processes, it is necessary to identify characteristic attributes of three-dimensional shapes. The five platonic solids are the geometrical base for all other three-dimensional shapes, among which tetrahedron and icosahedron provide the clearest representation of the qualities sharp and round. This pair of attributes has already been examined in various surveys in psychology of perception and in neuroscience by means of graphics, images of products of daily use, as well as by photographs or walk-through-videos of landscapes and architecture. To verify a transfer of outcomes of these existing surveys to the perception of 3D-shapes, walk-in models (total height 2.2m) of tetrahedron and icosahedron were set up in a public park in Frankfurt am Main, Germany, to test preferences of park visitors by questionnaire. In summer 2015, we assembled the tetrahedron eight times, the icosahedron seven times. In total 288 participants took part in the study (116 + 172 ratings). Preliminary analyses of the collected data using Wilcoxon Rank-Sum tests show that the perceptions of the two solids differ in respect to several attributes. The findings provide first evidence that the shapes of basic three-dimensional geometrical objects are associated with specific patterns of attributes and associations. Future studies should examine attributes for the three other basic bodies - Octahedron, Cube, and Dodecahedron. Additionally, similarities and differences between the perceptions of two- and three-dimensional shapes as well as shapes that are more complex need further research.

### **Poetics of Desire: The 'shiftology' of desire in Modernism as expressed in the work of Khlebnikov, Quabbani and Cummings**

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Currently, my research explores the formal innovation regarding erotic desire in the poetry of three Modernist poets: Velimir Khlebnikov (Russian-speaking), e.e.cummings (English-speaking), Nizar Quabbani (Arabic-speaking). The paper wishes to provide an illuminating analysis on the liberation of desire between three different forms of Modernism in three national literatures. The poetics of desire analyzed is an attempt to summarize the poetic revolution of Modernism, and how it actually helped liberate from neglect and oblivion the tired poetic expressions of desire. Quantitative measures are utilized for analysis to ascertain certain developments and factors, such as word frequency, sentence length, and syllabication. Quantitative measures applied to poetry, especially to free-verse, forces one to investigate how the text is structured and organized, what kind of language is used and how much it deviates from the traditional and conventional. In Modernism, traditional notions of the continuous, the unified, the coherent, were replaced by a language of the interrupted, the plural, and the incoherent: the relationship that exists between words and things, between the speaker and the beloved, is one of a gap, a gap which is where desire gains root. Therefore, the significant density and complexity within these language experiments provided multiple levels of meaning, also attesting to how poetic activity is a form of desire, whereby the reader is seduced to dissolve into the sonority and sublime strangeness of the poem.

## **Social Surrogacy: How music and other media provide a sense of belonging**

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As social animals we have a need to form and maintain strong interpersonal relationships (Baumeister & Leary, 1995). If direct social interaction is not possible, we resort to temporary substitutes also called social surrogates. Previous studies have shown that those surrogates have different forms and affect us through various mechanisms (Gardner, Pickett, & Knowles, 2005): Some people connect with a collective (group affiliation) by identifying themselves with the character of a narrative (Gabriel & Young, 2011) while others form one-sided (para-social) relationships with media figures (Cohen, 2006). There are hints from empirical investigations that also music could satisfy our need to belong temporarily (Lee, Andrade, & Palmer, 2013; Saarikallio & Erkkilä, 2007), but there is no consensus about the mechanisms behind. The aim of this study was twofold. First, the different surrogacy mechanisms needed to be extracted from the literature and systematized. Second, their relative importance for different media (music, television/movies, and literary fiction) had to be diagnosed. First, three plausible mechanisms were identified: emotional association, para-social, and group affiliation. Second, a set of statements was generated for each mechanism. These 30 statements were rated in an online survey regarding their importance for engaging with different media: TV, fiction in literature, and music. The ratings of the three media were factor analyzed separately in order to identify the relative importance of separate facets of social functions for each medium prior to a comparison. The pilot results suggest that all three mechanisms are relevant across the media with different emphases.

## **Geometric morphometrics: A powerful tool to compare aesthetic experience and biological causes of facial shape variation**

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We exploit the exciting synergy between physical anthropology and evolutionary psychology. By combining these fields with the bracket of a rigid and elegant statistical method (Geometric morphometrics), organismal form (e.g., a human face) can be placed in the middle of a causal chain, as the mediating variable between a biological substrate and human perception. This way, one can quantify and isolate those facial shape characteristics that lead to aesthetic and other judgments and directly compare them to the effects of physical processes (e.g., age, BMI, etc.) on biological form. The main focus will be on aesthetic appraisal as predictor variable. The presented results are based on standardized photographs of 135 children and young adults as well as 38 car fronts. Two-dimensional coordinates of somatometric measurement points were used instead of distances, angles and ratios. This way the relative spatial relationships among measurement points are preserved throughout the analyses. We identified the covariation of shape with physical measures and ratings using (a) regression analyses with single predictors (shape regressions) and (b) a multifactorial approach (partial least squares analysis) together with permutation tests. Thin-plate spline deformation grids and unwarped and averaged images (GM morphs) were used for visualization. The most surprising results were that male facial shape patterns associated with prenatal testosterone corresponded to those predicted by perceived masculinity and dominance but not by attractiveness. This was true even for children. Our approach suggests looking at a wide range of predictions pertinent to the field of Darwinian aesthetics.

## Lyrical speech melody accounts for perceptual and musical preferences

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The song-like character of poetic language has been acknowledged since antiquity. Despite a genuine linguistic interest in intonational contours of prosodic phrases, systematic investigations of lyrical speech melody have remained sparse. Here, we follow an approach sketched in Patel et al. (2006), who derived pitch values from semi-automatically syllable-labeled speech recordings in order to compare rhythm and melody between speech and music in English and French. We take this approach a step further and offer a refined translation of syllable-based pitch estimations from poems into a musical pseudo-notation. Crucially, the discretization of pitch values corresponding to syllables allows us to carry out musical analyses of melody structure. Our focus is on auto-correlations of pitch values (tone heights) between positions that correspond to the functional structures of rhyme and stanza. Our first notable result is that pitch-based auto-correlations as measure of melodic self-similarity show strong sensitivity to rhyme and stanza, thereby providing evidence how lyrical structure governs the implementation of lyrical melody. Further, our correlational analysis of self-similarity values with perceptual measures of melodiousness shows that listener's judgments are indeed based on melodic coherence across rhymes and stanzas. Finally, these coherences seemed to be decisive for musical translations of these poems into Lied forms. Altogether, our study demonstrates the acoustic and perceptual "reality" of lyrical speech melody and its beneficial effect on the likelihood of musical scorings of poems.

## The role of Rich and Poor categories on aesthetic processing

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The field of empirical aesthetics has been dominated by a focus on perceptual qualities and driven by stimulus-based research. However, little is known about the conceptual components and the role of cognitive categorisation. This research addresses the conceptual components and their influence on the aesthetic processing of mundane objects. It does so by using no physical stimuli, relying instead on the cognitive representations of different object categories. Participants included 140 males and females, aged 35-45, with no formal design training in Australia and Taiwan. Participants assessed (online) 6 mundane designed objects on a 7-point Likert scale, indicating frequency of exposure, aesthetic preference and aesthetic appropriateness of colours, materials and contexts of these objects. No stimuli, visual or descriptive, were used. Alternatively, participants were provided with categorical names of objects to assess. The data, currently being gathered, will be subject to an analysis of covariance. Interest will lie in: (1) the role of typicality and novelty in accounting for liking within rich and poor object categories; (2) the extent to which congruent and incongruent novelty account for liking in rich and poor object categories; (3) possible differences between the Australian and Taiwanese participants. The research further integrates designed products into the field of empirical aesthetics. Its focus on the cognitive also reintroduces categorisation into the field. Finally, its recourse to cognitive representations, as distinct from physical stimuli, provides an interesting avenue for research.

## What iconicity tells us about phonaesthetics

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In poetry, a high aesthetic value is attributed particularly to phonological text features (Jakobson, 1960). While the relation between sound and meaning is characterized by de Saussures' principle of arbitrariness, psycholinguistic literature also reports phenomena of iconic sound-meaning mappings violating this premise. This effect of phonological iconicity has been postulated to contribute to the aesthetic appreciation of poetic texts (Fónagy, 1999) by further grounding the phonetic picture of the linguistic sign in somatosensory experience. A similar process has been conjectured from the different angle of emotion theory (Critchley, 2013; Damasio, 2006; Niedenthal, 2007). Our presented study was designed to demonstrate that participants perceive certain phoneme combinations as relating to affective dimensions such as valence or arousal as demonstrated by rating studies. Whereas such "sublexical affective values" were determined on the basis of their relative appearance in the vocabulary depending on words affective connotations, subsequent experiments were designed to further cross-validate the findings by means of reaction time data. Using different behavioral tasks, we showed that phonemes with certain affective connotations also affect response latencies and accuracies in the same direction as predicted based on a vast literature on emotion effects in visual word recognition such as the model of motivated attention (Lang, Bradley, & Cuthbert, 1990, 1997). These results suggest affective meaning to play a crucial role for systematic form-meaning mappings and the processing of language. They may further imply aesthetic appreciation to be based on affective information processing as phylogenetically older antecedents.

## Investigating the effect of urban form on the environmental appraisal of streetscapes

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Urban planning decisions have long-term implications for the appearance and functionality of cities and it is therefore highly important for city planners to understand how urban structure influences the experience of a city's inhabitants. In this study, participants walked through three urban routes (the direction varied between groups) and rated their environmental appraisal both by marking their pleasure continuously on a map, as well as by rating certain checkpoints that revealed different urban scenes along the way on a semantic differential scale. Results are presented for subjective user ratings, as well as in relation to objective, formal measures of spatial qualities via space syntax (e.g. centrality measures integration and choice, as well as isovist properties). A factor analysis of the bipolar adjectives revealed that items were loaded on what we called appeal, activity and spatial experience of the streets. Previous experience in terms of spatial sequence did not appear to influence these evaluations. The combination of global and local spatial properties correlates more strongly with environmental appraisal, or appeal of space, than the use of either one of them. We discuss these results in the light of understanding (and attempting prediction of) to what extent environmental properties relate to users' experience of city streetscapes.

## Constructivist Aesthetics: Gestalt processes as self-test in observing systems

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Any observation can be interpreted as action of an observing systems. Yet, there is no constructivist aesthetics, which has a sufficiently large scope: Neither a restriction to art is necessary, nor that to communication in social systems. Evolutionary aesthetics and neuroaesthetics reveal specific problems as well. Approaches from cybernetics, systems theory or information aesthetics commonly use the logic of bottom-up-processing (input-processing-output), which dominated cognitive psychology since ca. 1950. However, even in visual cortex V1 just ca. 5% of the neurons are connected bottom-up. That challenges the empirical aesthetics. Integrative Aesthetics seems capable to answer those questions – and that it does not subject to that restrictions. A re-coding (from extensional data to an intensional Gestalt code) using invariances constitutes the fundamental process of any aesthetic experience: Due to the thrifter Gestalt coding a neuronal relief occurs. Moreover, the range of validity of the Gestalt code is extended – as a decentering (acc. to Piaget). Subjectively both will be experienced positively. Hence, Integrative Aesthetics offers a consistent methodical frame, which enables bottom-up analysis of perception as well as top-down analysis of subjective motivation (e.g. experienced autonomy or experienced relief) of the agent. The direction of processes will be reversible (what means an additional symmetry in a theory, which is based on symmetries – in the sense of invariances). Finally, this constructivist aesthetics prompts any observational action to be interpreted as a self-test of the observing systems (not only, but also).

## The aesthetics of multisensory data design

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Information aesthetics refers to the way design is used to organize data and define relationships. With interactive computer programs for data analysis, information aesthetics also refers to the interface design and database organization which impact how data is selected for analysis. In the age of “big data,” scientists need new forms of data representation that make it possible to analyze multiple variables simultaneously. Empirical research has shown that there are limits to the number of variables we can process visually, but the brain is capable of processing information from different sensory stimuli simultaneously. Research has also demonstrated that cross-modal perception can enhance our ability to understand data relationships. Multisensory data representation leverages our innate abilities to use different media and sensory modalities to analyze data relationships. These designs are expanding the definition of information aesthetics in data representation. My art presentation includes interactive multimedia programs that illustrate these new dimensions in information aesthetics and how they impact the interpretation of data in scientific research. The artwork represents the complex perceptual and cognitive processes in data analysis by juxtaposing symbols from scientific research, such as mathematical grids and numerical charts, with organic forms as well as sound. Interaction design also adds layers of meaning to the data analysis. The artwork demonstrates how cross-modal stimuli, diverse semiotic structures, and kinesthetic interaction design are defining new perspectives and dimensions in information aesthetics that play a critical role in scientific research and data analysis.

## **Epistemology of photography: Strikkitrikki Palomalamù**

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Photography is usually perceived as a restitution of reality (three-dimensional), but in fact it is a two-dimensional image. Photography is thus a concrete object that affirms its reality. Nevertheless, in representing a fiction it claims the opposite. It is an illusory image that shows itself within the fiction: it offers itself as a simulacrum, as a negative reality. The depth of the perspective is canceled into the two-dimensional image, since the photography defines the space in its orthogonality. To overcome the problem of the "representation of reality", I have superimposed the photographed object with its photograph. I have identified the simulacrum of the photography with the simulacrum of the mountain. A climbing gym lent itself well to the exemplification. I took a frontal picture of a climbing wall that had been specially flattened with the colourful plasticine. Its climbing holds were filled up to cancel the reliefs. The two-dimensional nature of the photographic representation thus coincides with the physical flattening of the three-dimensional space. The photograph of such an object is "logically true": the object deprived of its three-dimensional reality, has become a simulacrum fully equivalent to its photographic image as well as the real space of the simulacrum is equivalent to that of the orthogonal image. According to classical logic this picture has a binary structure, which allows the image to establish itself through the 'mutual reunification of opposites'. What appears is a sign that returns to be a sound, like the title of the work suggests.

## **Emergent states of aesthetic experience**

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These paintings are a recent extension of my Neural Art in which I have organized my art around various properties of the nervous system. The works presented here are based on the idea that aesthetic experiences are states emerging from the interactive activity within the nervous system. Given the complexity involved, different aesthetic experiences can involve a wide variety of more specific emergent elements. From the many possibilities, I have selected four possible elements for development in these paintings: ideas of beauty, thoughts of the past, dreams of glory, and hopes for the future. The black lines remind us that there is a neural framework within which our experiences occur. The words indicate some of the experiences, processes and neural components that could be involved, using the examples mentioned above. Because of uncertainty, I have included only very general references to the nervous system in these examples. The various colors swirl through the black lines, suggesting that the states emerge from uncertain relationships among the elements and the neural framework. Titles are "Ideas Emerging", "Thoughts Emerging", "Dreams Emerging", and "Hopes Emerging". The size of each is 15 x 20 inches.

## Components of art reception in students of visual arts

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Previous research into processes of visual art reception (Amabile, 1996) have identified three basic components of impressions made by observers: creativity, technical skill of the painter and personal appreciation. It has been noticed that estimations of reception made by artists and art-related professionals were more influenced by the skill of the painter than by other two factors. This research paper tests the stability of a three-component structure of art reception and the position of technical skill of the painter in the views of students of visual arts. Subjects were 50 students of painting. As stimuli, 20 reproductions of famous paintings were used. They were balanced regarding motive, style and other formal characteristics. A list of 9 scales (a simplified Amabile model) representing three factors were used as instruments. Factor analysis (Osgood string-out method) confirms three general factors: creativity (13,2% of total variance), technical skill of author (56.2% of variance) and personal appreciation (7.4% of variance). The hypothesis of the three-component process of art reception has been approved for the group of highly sensitive recipients. The technical component appeared as most important, while the creativity of the painting and personal appreciation were seen as less important. This constellation of factors is probably a consequence of long lasting art education and personal artistic development. Probably, by mastering skills and knowledge in art, the distance between professional and personal aspects of impression becomes more visible, stressing formal aspects of painting and minimizing personal aspects of art appreciation.

## Sensory valuation: What have we learned?

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A core ambition of neuroaesthetic research is to explain why the brain produces certain affective values for particular sensory experiences. Or to put it more colloquially; Why do we like some visual, auditory, etc., experience, and dislike others? We now have a rich body of research going back at least 15 years. In my talk I will outline some of key lessons to emerge from this this research enterprise. My focus is on four key lessons. (1) Sensory values are primarily computed by the reward system. This means that "aesthetic" values such as Liking or Beauty must be understood as obeying the laws of the reward system. (2) Sensory valuation is the result of a number of different neurobiological factors, not just the bottom-up response to object features. Experience, expectations, extrinsic information, homeostatic state, and behavioural goals, also play a role in determining the value when experiencing an object. (3) This leads to the third lesson: Sensory values are not universal in the sense that every human being has the same value response to the same object feature every time. In fact, values change for the same feature dependent on the above factors, even for the same individual. (4) Perhaps the biggest lesson is the dawning realization that sensory values are not phenomenal end-points to an experience - "I really like this painting!" - but a functional cog in a much bigger neurobiological machinery carved out by evolution in order to facilitate decisions about behaviour in response to sensory information.

## Personal Connoisseurship: Artist to Viewer

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The concept of personal connoisseurship concerns how individuals develop the ability to appreciate art from their own personal perspective, focusing on what they bring as individuals to their interactions with works of art. Personal connoisseurship is a concept that argues that there is an “aesthetic space” between a work of art and the viewer where the transaction takes place. That space is equally influenced by the the work of art and the viewer. In this paper, I look at how artists across centuries have looked at their art and what they were trying to communicate, using their own words. Thus, this is a presentation analysing the words of artists as they talk about their oeuvre. The approach is to gather the writings of artists from four different periods of art: Renaissance, Impressionist, Hudson River School, and Modern. These writings become the data for this study. The analysis of the writings focuses on what artists say they are saying in their art: who they believe their audience is, what they are trying to communicate, how they depict their ideas in their works, and how they believe viewers will react to their works. The goal of this research is to use the words of artists to better how individuals interact with works of art.

## Communication through image labels: The power of metaphor, relevance, and inquiry

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Images have the potential to provide aesthetic enjoyment, educate, and convey powerful messages. This study extended previous research on public perceptions of the aesthetic appeal, educational value, and communication of underlying messages of deep space images by examining the use of metaphor and leading questions in labels. The research questions were: (1) How do the use of metaphor and leading questions affect the comprehension of the intended message in labels for deep space images? (2) How do metaphor and leading questions in labels affect aesthetic appreciation for deep space images? (3) How do metaphor and leading questions in labels affect levels of engagement with for deep space images? Solicitation from a variety of websites invited participation for an online survey. Stimuli were 4 images: Sagittarius A, the Sun, Cassiopeia A, and M101. Participants were randomly assigned to 1 label condition (metaphor, leading question, original NASA label) for the images. A final item presented 1 image chosen at random, and explored comparisons among all 3 label types. Participants also were randomly assigned to completing a knowledge scale about the topics covered in the labels, either prior to or after viewing the images and accompanying labels. Data are currently being analysed, with the primary analysis a 2 (pre/post knowledge scale) by 3 (label type) multivariate analysis of variance. The significance of this study relates to providing experimentally-generated data to inform how labels can best engage the public in the aesthetic enjoyment of images, while communicating information on important scientific topics.

## Art making and art viewing through the Mirror Model of Art

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This research examined the Mirror Model of Art (Tinio, 2013), which presumes a correspondence between art making and art viewing. Two studies assessed whether the model is a good reflection of how people naturally process art. In Study 1, we assessed whether following the stages of the model in the correct order (vs. the opposite order) enhanced aesthetic experiences and information retention. Since research has shown that level of art expertise can influence the processing of art stimuli (e.g. Augustin & Leder, 2006), we also controlled for art expertise in the analyses. In Study 2, we examined the verbalizations of two groups of participants—one in a lab and the other in a museum—as they reported on their experiences while looking at an artwork. These responses were thematically coded and analysed. Generally, museums and other art institutions have the goals of educating the public and providing their audiences with meaningful experiences with art. This research aimed at determining the efficacy of the Mirror Model in providing a framework for enhancing such aesthetic and educational experiences.

## Aesthetic experience and creativity: Mutual effects

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The goal was to examine, whether creative activity as well as different measures of creativity (DT tests, self-assessment of creativity, creativity of collages) are connected with aesthetic experience of a painting. In everyday life a creative person is usually considered to be a person, who actively creates/performs art. Often, however, it is neglected that experiencing an artwork is a creative act which requires the observers/listeners not only to be active participants but also to be creative. The study involved 82 students, who evaluated beauty and creativity of different styles' paintings. One group, before evaluating the paintings, created collages, while the other group first evaluated the paintings and then created the collages. After this activity the students self-assessed creativity, filled in schizotypy scale and DT tests. A multivariate mixed effects analysis revealed that the participants with higher scores on divergent thinking test (Unusual usage) prefer figural and unpleasant paintings. Doing a creative activity prior to rating artworks, influences judgement of creativity of artworks. Measure of schizotypy "Perceptive distortions" had a positive influence both on stronger preference of beauty and on making more creative collages. A hypothesis has been suggested saying that during practicing a creative activity people become more open for new, unusual experiences, more flexible and act more freely in their decisions, which reflects positively on stronger preference of paintings. Conditions of aesthetic derealisation enable an observer to have a new, more intensive perception of the observed objects, strong focus and the feeling of unity with an object.

## **The process of being moved**

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Typically, critical life events such as death, birth, separation, and reunion elicit the emotional state of being moved. Researchers agree that being moved is a positive emotion going along with negative affects. If sufficiently intense, being moved is accompanied by bodily sensations like moist eyes or even tears. The processing of episodes of being moved in general and the timely relationship of positive and negative affects, so called mixed emotions in particular is still unexplored. We gathered data from 154 individuals watching an animated short film of eight minutes in our mini-cinema. During reception we measured heart rate and skin conductance. Additionally, we recorded facial expressions and body movement with two infrared cameras. After reception, we conducted interviews by confronting the participants with their own reactions. Certified coders analyzed the facial expressions based on the Facial Action Coding System. The film, which is about loss and reunion, evoked strong emotions in many participants; a considerable number of the participants cried; mixed emotions appear very often. The data offer a rich source for describing the particularities of episodes of being moved. As the bandwidth of individual reactions is utterly diverse, the overall facial expressions and associated physiological processes of carefully chosen typical participants will be analyzed. I hope to be able to contribute to the on-going discussion of the emotional state of being moved in aesthetically relevant contexts by using data that are gathered in a situation that is designed to assure ecological validity as far as possible.

## **Therapeutic and transformative experiences of singing a song in literature and art**

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This project is meant as a presentation of the song singing experiences often described as transformative and life changing. Author intends to (1) find examples of healing, transformative experiences induced by singing a song, and (2) analyze the social and aesthetic context and further meaning of these. In many literary sources the song singing experiences are described as uplifting, yet there are other descriptions, in which songs are said to be the source of transformative or therapeutic (healing) changes. The literary tradition proves to be a continuation of the longer tradition of myth and fairy tales, in which such cases can be found. Searching for socially evaluative depictions of certain song singing experiences forms the main part of the project. Author aims to look for these descriptions in Polish literary and folklore material. Additionally Celtic and Lithuanian traditional literary sources will be consulted. Methods further comprise of comparative analyses of literary and philosophical sources, contextual description and interpretation of function of songs (music) as providing individual therapeutic (healing) and transformative experiences. These, author claims, are different from communal functioning of music. They present individual experience through which a deep part of self is changed. Myths and tales of different cultures are full of stories about songs that did just that. It is therefore important to see what are these traditions are and what do they tell us about the immense power of singing a song.

## A causal role for action observation in object valuation

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We commonly like an object more when we see someone else executing an action on it. Similarly, current views in the budding field of embodied aesthetics propose that observing an artist interacting with an artwork increases its likability. The idea behind is that the representation of others' actions in the brain of the beholder — through a mechanism of covert and involuntary simulation — is relevant for the expression of subjective preference, in daily life as well as in art. Previous neuroimaging studies found that the activation yielded by watching actions in the action-observation network (AON) correlates with preference. However, as the correlational nature of neuroimaging cannot provide a direct causal link between brain and function, it is an open question whether AON's activity is an epiphenomenon of action perception or truly reflects a neurocomputational process functionally relevant for the expression of preference for a particular object. Our experiment aimed at deciding between these two alternatives. We compared participants' preference for items that were (or were not) the goal of other individuals' actions, while the AON was stimulated with repetitive transcranial magnetic stimulation (rTMS). Results showed that rTMS selectively changed the likability of objects only when participants saw another individual interacting with them. This outcome functionally relates action observation to object valuation, thus providing first evidence that the former plays a causal role in defining human subjective preference. It also substantiates the view that the attribution of hedonic value to an object is associated with covert simulation of an artist's gestures.

## The constituents of art-induced pleasure – A critical integrative literature review

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Even though in our everyday life we are surrounded by pictorial-art and music, there is surprisingly little knowledge on the fundamental underlying pleasure that drives us to engage with art or music. This review synthesizes the current conceptual understanding of the phenomenon by critically evaluating empirical research on pleasure induced by music and by pictorial art. Seven electronic databases were searched for empirical studies using keywords “pleasure”, “reward”, “enjoyment” or “hedonic”. 20 musical and 11 pictorial-art papers were systematically compared: What are the measures used to operationalize pleasure? Is pleasure studied as an outcome of the perceiver attributes or external factors? A critical analysis revealed that pleasure is conceptualized distinctly within music and pictorial art literature. The brain imaging methods in the music research refer to the idea of intrinsic reward, and the frequently applied measures of valence and arousal reflect dimensional emotion conceptualization. Most music studies focused on the influence of the perceiver's passive internal attributes (e.g., personality and musical background), and on different emotion qualities and intensities. Studies on pictorial art investigated pleasure in relation to external (feature processing) and on active, internal attributes (e.g., viewing modes), conceptually focusing on the cognitive modulation of the pleasurable experience, thus reflecting the idea of pleasure emerging a result of conceptual act. We propose an integration of the two fields towards a more holistic and comprehensive understanding of art-induced pleasure in relation to perception, emotions, cognition and evaluation as well as their person-related modulations.

## Space, Movement and Attention

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The prominence of the term ‘curating’ in the last decade stands at odds with the small amount of empirical research that has been conducted concerning the effects of curatorial work. Based on the psychological concepts of “valence,” “standing patterns of behavior” and “affordance,” this is an explorative and descriptive study investigating how architectural and curatorial settings influence visitor attention to various artworks and how visitors move within the facilities. Using the latest tracking technology, the researchers were able to record the exact positions and movement paths of visitors to the exhibition. The visitors’ complex behavioral and physiological data was translated into cartographies. As a comparative, analytical tool, the cartographies indicate differing spatial behaviors and visitor experience in relation to various experimental re-hangings conducted throughout the course of the project. The tracking technology revealed visitor streams alongside “space-cells” that were found to influence the rhythmicity of the museum visit. Space-cells can be characterized as reference points attracting visitor attention and producing a “stopping moment” followed by cell-specific movement patterns in relation to the composition of the cell. Our findings offer a series of unexpected insights for the fields of curatorial studies, museum management, visitor studies and empirical aesthetics.

**The pleasure of change? Aesthetic responses towards brand logo changes.**

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Brand logos can be seen as aesthetic objects inducing positive affect (Pittard et al., 2007). Companies change their logos every now and then driven by all sorts of positive effects (Van Grinsven & Das, 2015). However, little is known about the pleasure yielded by logos and their redesigns. This study tests Hekkert et al.’s (2003) MAYA principle against Reber et al.’s (2004) fluency theory in the domain of logo design. Do consumers take pleasure in a – more or less extreme - logo redesign or do they prefer the unchanged logo instead? Two experiments (mixed respondent groups; online software Qualtrics) measured the effects of three different levels of logo change in color and form (unchanged, substantial change, big change; the changed logos were created for these experiments based on real-life logos). In Experiment 1 (n=185), the effects of four brand logos (logo change between-subjects) on logo and brand attitude were measured, with subjective fluency and processing pleasure as mediators. ANOVA’s showed the highest logo attitude and processing pleasure for the unchanged logos. In Experiment 2 (n=254), the effects of 15 brand logos changes (logo change within-subjects) on logo and brand attitude, subjective fluency, processing speed, processing pleasure and brand recognition were registered. Again, ANOVA’s showed a preference for the unchanged logos. The logo design domain sets itself apart from the art and advertising domain, and provides support for Reber et al.’s (2004) fluency theory with its preference for the familiar logos. Familiarity and recognizability seem to be preferred over innovation.

## The pleasure of processing visual metaphor in advertising

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In advertising, people often base their judgement on the feelings evoked by processing the advertisement. Pleasurable feelings can be induced by simple stimuli (cf. Reber et al.'s (2004) fluency theory) or more challenging stimuli (cf. Hekkert et al.'s (2003) MAYA principle). These contradictory theories may be aligned in the dual-process theories (e.g., Gawronski & Creighton, 2013): an automatic, fluency-based response to simple stimuli versus a controlled response to challenging stimuli. Exposure time may work as a pivot between these two mechanisms (cf. Jakesch et al., 2013). We tested this assumption in two experiments with Visual Metaphor (with increasing levels of complexity) as a within-subjects factor and Exposure Time as between-subjects factor. In Experiment 1 (n=108, mainly students), the effects of six visual metaphors (juxtaposition < fusion, cf. Phillips & McQuarrie, 2004) and exposure time (100ms, 1000ms, and 5000ms) on aesthetic pleasure, felt fluency, and understanding were measured, using E-Prime. A multilevel analysis showed an interaction effect: more aesthetic pleasure for fusions at 1000ms and 5000ms whilst juxtapositions were considered more pleasurable at 100ms. In Experiment 2 (n=122, mainly students), eight advertisements with visual metaphors (no metaphor < juxtaposition < fusion < replacement) were presented at 100ms or 5000ms, using WebExp2. Aesthetic pleasure, interest, felt fluency, and understanding were measured. Again, an interaction effect was found: the most aesthetic pleasure for fusion ads at 3000ms and the most pleasure for the seemingly simple replacement ads at 100ms. This study therefore supports the dual-process theories reconciling fluency theory with the MAYA principle.

## The role of curvature in preference for visual artworks

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Several studies have shown that people tend to prefer objects (Bar & Neta, 2006, 2007), rooms (Vartanian et al., 2013), design elements (Westerman et al., 2012), and geometric figures (Bertamini, Palumbo, Gheorghes, & Galatsidas, 2016; Palumbo & Bertamini, 2016; Palumbo, Ruta, & Bertamini, 2015; Silvia & Barona, 2009) with curved contours to similar sharp-angled ones (Gómez-Puerto, Munar, & Nadal, 2015). In this study we aimed to determine whether people's preference for curvature extends to their appreciation for artworks. To this end, we created a set of stimuli that included two versions of cubist artworks: the original paintings—with sharp angles—and versions that had been altered by rounding off 6 vertices in the center of the artworks. Participants were presented with both versions for 83 ms in random order, and asked to rate them according to liking on a 7-point Likert scale. The results showed two effects: a negative effect of mere exposure, and an effect of preference for curvature. These results add to the growing literature on the effects of curvature in shaping aesthetic preference, and extend the influence of this factor into the appreciation of visual art.

## **The conundrum of modern art: Prestige driven Coevolutionary Aesthetics trumps Evolutionary Aesthetics among art experts**

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Empirical Aesthetics research has identified intriguing differences between expert and non-expert evaluations of art. In this paper we attempt to contribute to this topic by employing an evolutionary perspective on aesthetics, art and expertise. Based on signaling theory (a body of work examining the evolution of communication) we predict that non-expert appreciation corresponds to naturally selected preferences (Evolutionary Aesthetics), while expert appreciation is shaped by a process of evaluative coevolution (driven by prestige biased social learning), whereby preferences coevolve with artworks (Coevolutionary Aesthetics). In order to test this prediction, we conducted three studies in which we assessed the effects on non-expert and expert appreciation of both the biological relevance of the given artwork's depicted content, and the prestige specific to the artwork's associated context (MoMA; between subjects). In the first two studies (n=151; n=120) Generalized Linear Mixed Models revealed that non-experts appreciate artworks based on biological relevance of their depictions (facial beauty), mediated by aesthetic pleasure. In contrast, experts appreciate the artworks based on the prestige of the associated context, mediated by admiration for the artist. Moreover, experts appreciate artworks depicting moderate faces to a greater degree than artworks depicting attractive faces. Furthermore, preliminary analyses of our third experiment (n=1101) corroborates the predicted effect of biological relevance, but also suggests that full-blown experts are not influenced by prestige (anymore). Overall, our results support our prediction that expertise moderates the Evolutionary and Coevolutionary Aesthetics mechanisms in the art domain, thus providing an explanation for modern arts' deviation from universal intuitive appeal.

## **Behavioral and neural evidence for both domain-general and domain-specific aesthetic processes**

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Individuals can be aesthetically moved by a diverse array of visual objects, from abstract paintings to mountain vistas. Does aesthetic appreciation of widely different visual domains rely on the same underlying processes? In a series of behavioral experiments, we find that the degree of shared versus individual aesthetic preference differs systematically across visual domains, even for photographic images of real-world content. Preferences for images of faces and landscapes contained a high proportion of shared taste, while preferences for images of architecture and artworks reflected strong individual differences. These results suggest that preferences for artifacts of human culture, such as architecture and artwork, rely on more individual aesthetic sensibilities than do preferences for categories of aesthetic objects that have behavioral relevance from a "fitness" perspective, such as faces and natural scenes. Using fMRI, we then measured brain activity as 13 observers made aesthetic judgments about architecture, natural landscapes or artwork. We found evidence for the presence of "domain-general" information about aesthetic appreciation in a portion of the default-mode network (DMN) in the anterior medial prefrontal cortex (MPFC): a series of computational classifiers trained on multi-voxel patterns evoked by one image category and tested on another category performed better than chance for all train/test combinations. We also found evidence for "domain-specific" representations of aesthetic appreciation in other portions of prefrontal cortex. Considered together with other recent behavioral and imaging work, these results provide evidence for both core domain-general processes and for domain-specific representations unique to behaviorally relevant categories such as landscapes.

## **Behavioral relevance shapes preference formation: Shared attractiveness judgments for faces is higher for opposite gender faces**

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Judgments of facial attractiveness affect many forms of social interaction, from the formation of romantic and sexual relationships to implicit judgments of character traits and competence. Overall, different individuals tend to strongly agree on which faces are attractive, much more so than for other visual stimuli. This fact may be taken to suggest that facial preferences are "stimulus" determined, and calls into question the role of personal experience in the development of facial preferences. Here, we present data from a set of experiments in which male and female participants made judgments about both male and female faces. Importantly, there were strong interactions between the gender of the rater and the gender of the stimulus: heterosexual male viewers tended to strongly agree on which beautiful female faces were most attractive, but showed much more individual behavior for judgments of which beautiful male faces were most attractive. Heterosexual female viewers, on the other hand, agreed with each other more on which average-looking males were (or were not) attractive. These results provide evidence that the set of features used to judge attractiveness is not fixed, but is instead shaped by the behavioral relevance of the stimulus class: more behaviorally relevant stimuli tend to show convergence of judgment across people. When considered along with other recent findings on facial preferences and agreement, it is clear that despite the very strong general agreement on whether a face is attractive, this agreement is 1) the product of experience, and 2) is modulated by behavioral relevance.

## **The drama students' aesthetic experience of their singing voice**

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The paper aims at investigating the relationship between aesthetic experience of voice during singing different composition and aesthetic experience of voice while listening to performance of those compositions by drama students. Participants were 32 students of drama department of Academy of art who assessed aesthetic experience of their voice after singing and after listening to recording of their performance of three different songs. The assessments were made on 12 seven-point scales measuring three dimensions of aesthetic experience (dynamism, exceptionality evaluation). The students performed each of three songs live and their performances of the songs were recorded. Later, the students listened their audio recording of the performed songs and then made their evaluations again. The results of the analysis of variance – repeated measures reveal that both Medium (live and recording) and the Song (3 different songs) have significant main effect on assessments of aesthetic experience of singing voice. The different practical and theoretical implications of the results of this research about developing singing voice and contribution of different techniques for improvement of voice to aesthetic experience in the field of music are discussed.

## **Examining the effects of absorption on the hedonic and eudaimonic components of music appreciation**

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Having an aesthetic experience when listening to music has repeatedly been associated with being absorbed by the music. However, due to its illusive nature as well as frequently being measured inadequately, the question whether absorption is indeed influential in making a musical experience an 'aesthetic' one, has not yet been satisfactorily answered. Using a sample of 223 subjects who participated online, the current study investigated the role of both trait and state absorption on the hedonic and eudaimonic components of music appreciation. Two research questions concerning the mediating role of state absorption and the relative predictive power of state and trait aspects of absorption were addressed using structural equation modeling (SEM). The question how to properly model state absorption, operationalized as a multidimensional construct integrating the cognitive-motivational parameters 'attentional focus', 'altered awareness', and 'meta-awareness', was also addressed by comparing three types of models: a correlated model, a 2nd order factor model and a bifactor model. Results suggested that the relationship between trait absorption and appreciation outcomes was completely mediated by state absorption. Another outcome was that state absorption had a moderate positive effect on the eudaimonic component of appreciation. This indicates that absorption particularly had an effect on the 'meaningfulness' part of music appreciation and, unexpectedly, less on the hedonic component of appreciation. Finally, I will argue that absorption may exert additional influence in terms of being a 'catalyst' for other experiential aspects within musical (and aesthetic) experience.

## **The role of gender and education profile of an audience in assessments of aesthetic experience of contemporary dance choreographies**

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The aim of this study was to investigate whether a gender and a different education profile of an audience influence the assessments of aesthetic experience of contemporary dance choreographies, due to the fact that the results of earlier studies do not indicate agreement in findings regarding the impact of audiences' gender and education profile on the assessments of the aesthetic experience. The stimuli consisted of three different contemporary dance choreographies, performed by three different dancers, 9 choreographies in total. In the study participated 73 students, 20 male and 53 female students from different faculties (Faculty of Philosophy - 16; Faculty of Technical Sciences - 24, Novi Sad Business School - 33) who assessed each of the 9 choreography immediately after looking on the instrument for measuring aesthetic experience of dance performance. Results of analysis of variance showed that the effect of the Dancer, effect of Choreography and interaction Dancer x Choreography were statistically significant in all tested dimensions of aesthetic experience. The effect of audiences' gender as well as the effect of participants' education profile on the assessment of aesthetic experience of contemporary dance choreographies is not statistically significant. The results of this study confirm earlier findings of differences in the aesthetic experience of artistically educated and naive observers. The question about the importance of participants' gender in the aesthetic experience of dance has no consistent answer, and it is necessary to carry out further empirical verifications.

## **Aesthetic appreciation of sad music is mediated by feelings of being moved**

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Why do we enjoy listening to music that makes us sad? The paradox of “pleasurable sadness” has attracted significant research interest among music scholars in recent years, but the puzzle remains to be solved. Recent findings from a study on sad films suggest that the enjoyment of sad films can be almost entirely explained by feelings of being moved (Hanich et al., 2014). Thus, the aim of the present study was to investigate whether the same was true for the enjoyment of sad music. Two experiments with a total of 327 participants were carried out. In Experiment 1, participants listened to 5 sad music excerpts, and rated their liking and felt emotions. Ratings of being moved were highly correlated with ratings of liking ( $r = .64$ ) and felt sadness ( $r = .41$ ). A multi-level mediation analysis revealed that the initial positive relationship between liking and felt sadness ( $r = .23$ ) was fully mediated by feelings of being moved. Experiment 2 explored the interconnections of perceived sadness, beauty, and movingness in 27 short music excerpts. Although the musical stimuli represented independently varying levels of sadness and beauty, the two concepts were still correlated ( $r = .26$ ). However, this correlation was eliminated when ratings of movingness were controlled for. These findings suggest that – similarly to the enjoyment of sad films – the aesthetic appreciation of sad music is mediated by feelings of being moved. Felt sadness may contribute to the enjoyment of artistic stimuli by intensifying feelings of being moved.

## **Music: a language "understood all over the world"? – A cross-cultural study on the (mis)understanding of musical expressiveness**

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In the 18th century, European intellectuals like Herder and Rousseau developed the notion of music as a primordial language of feelings that is understood by everybody irrespective of his or her cultural and ethnic background. Joseph Haydn famously alluded to it before departing to England claiming: “My language is understood all over the world.” Though from a cultural-historical perspective, this claim can easily be historicized and deconstructed, it is still held by very many ordinary people and regularly summoned in speeches of politicians and music responsables. In a non-expert context, it is also often evoked as a reason why European classical music is held in such a high esteem by Asian audiences. In addition, several empirical cross-cultural studies recently tried to identify universals of the understanding of musical expressiveness, adapting Paul Ekman’s findings and theories about culture-independent basic emotions. In this talk, I propose to problematize such attempts from an ethnomusicologist’s and empirical perspective alike. I will show results of an ethnomusicologically informed cross-cultural study that presented Ghanaian, Hindustani, European Classical and contemporary Pop repertoires to individuals from the respective countries and asked them to choose from a given set of terms if at all and what they thought the pieces expressed. The design of the experiment was shaped to provide a much more differentiated picture of how and how differently people understand music, which musical cues they utilize for their judgment and in how far they are “right” or “wrong” when it comes to unfamiliar repertoires.

## **The Van Gogh Museum Eye-tracking Project**

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Previous studies have already used eye tracking to explore perceptions of visual art in a laboratory setting. To date, however, very few have investigated eye movements while people were looking at an actual painting. In fact, most laboratory studies use paintings displayed on a computer screen, an experience that does not correspond to the actual aesthetic experience of visitors to a museum. The study presented here – the result of a partnership between VU Amsterdam and Van Gogh Museum Amsterdam - helps to fill this gap, providing what is, to our knowledge, the first analysis of the difference between children's and adults' real-life aesthetic experience when visiting a museum. We recorded the eye movements of adults and children while freely viewing five Van Gogh paintings on display at the museum. Analysis of fixation durations for the two groups shows that children tend to process all paintings in similar ways, while adult processing varies from painting to painting. Bottom-up cues (the visual saliency of individual features in the painting) had a greater influence on children than adults. Taken together, these results suggest that adult's visual behaviour may be more subject to top-down influences from highlevel cognition and that children's behaviour depends to a greater extent on bottom-up factors.

## **The impact of depth of aesthetic processing on recognition memory for artworks and constructed design patterns**

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We conducted two experiments to examine how people perceptually encode and then recognize real artworks (Experiment 1) and constructed design patterns (Experiment 2). In both experiments, we first manipulated depth of processing during an incidental perceptual encoding task (Phase One) wherein participants made both affective/aesthetic and cognitive judgments. For painting stimuli, the contrast was between “liking” (yes/no) and a search for food in the paintings (present/absent). For design stimuli, the comparison was between “liking” and relative similarity of figure and ground in terms of colour or texture. In Phase Two we examined the effects of transforming visual features (i.e., colour and texture) of the original stimuli on performance in a “surprise” recognition-memory task. Consistent with a ‘depth-of-processing’ hypothesis, affective (i.e., liking) processing led to deeper perceptual encoding and better performance in the recognition-memory task. However, this benefit of aesthetic processing was only observed with artworks that contained rich semantic features and was not observed with constructed design patterns that comprised low-level visual features and lacked salient semantic content. Moreover, consistent with a ‘visual-feature-transformation’ hypothesis, texture transformations were discerned more accurately than colour transformations across the different stimulus sets and tasks used in both experiments. These results suggest that a depth of affective processing model applies only when semantic content is available. These findings also speak to a general processing difference between texture and colour for artworks and design patterns regardless of depth of affective processing.

## **Psychophysiology and neural underpinnings of strong emotional responses to poetry**

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Poetry co-existed over millennia alongside other forms of human aesthetic expression due to its unique aesthetic merits. Up to date, however, very little empirical research has been conducted on the emotional effects and the aesthetic pleasure derived from poems. Using psychophysiological measures and neuroimaging, we demonstrate that recited poetry is a very potent emotional stimulus, able to elicit peak emotional experiences. These strong aesthetic responses are governed by mesolimbic brain circuits engaged in primary rewards. Moreover, the occurrence of peak emotional experiences provides insight into structural patterns of poetry.

## **Tears and Goosebumps - Physiological correlates to deeply moving film scenes**

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Emotional experiences to film scenes can be quite intense. At some point, the emotional involvement can exceed a certain threshold resulting in an “aesthetic chill”, which includes visible goosebumps. We investigated the hypothesis that chills indicate emotional states of being-moved. We focused on two prototypical variants of being-moved: one involving sadness as a key component, and the other joy. Thirty participants watched 25 moving clips of either the sadly or the joyfully moving type (e.g., farewell scenarios and reunion scenarios, respectively). They rated how sad, joyful, and moved they felt after each clip. They also reported whether they experienced chills during the exposure. The results of a logistic regression revealed that the higher participants felt moved by a film scene, the more likely they were to experience chills. Moreover, being-moved proved to be the best predictor for chills, compared to sadness and joy. In a second study, we broadened the spectrum of emotional correlates by including a second indicator - tears. In this physiological study, we recorded cardiovascular, electrodermal, facial-electromyographic and respirational signals during the presentation of moving film clips that were self-selected by each participant. Participants indicated the occurrence of tears by button presses. This time, we measured the chills objectively using a self-constructed camera that is attached to the skin surface allowing to record goosebumps objectively. The interrelation of chills and tears and their physiological correlates will be discussed in detail. Finally, the issue of how narrative scenarios elicit feelings of being-moved will be addressed.

## **Aesthetic Research in Architecture and Urban Design**

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While issues of function and technology in architecture and urban design are established subjects in teaching and research, the central core of architecture and city design — form and space and its aesthetic effects — are rarely addressed in a systematic and scientific manner in contemporary architectural discourse. The discipline of architecture has been displaying a more than skeptical, even somewhat rebuffing attitude to the sciences of aesthetics and to normative theories in architectural design since the second half of the 20th century when a radical ideological shift towards the so-called international style took place. Yet, few disciplines concern themselves with aesthetic considerations to the same extent as architecture because aesthetic issues form an important core of any environmental design process. Many of the most fundamental planning-decisions involve decisions about form and space and thus require that aesthetic judgements be made. The introduction to the symposium will begin with an overview of the role of empirical research methods in architecture and urban design and their influences in design practice, then take a look at the history of this relatively young field of architectural aesthetics, proceed to a description of the conflicts between empirical research and design practice and end with a formulation of the goals for a future research agenda for a discipline of architectural science, illustrated with current research.

## **Explicit and implicit liking of symmetry: Are art experts really special?**

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Symmetry is one of the key factors influencing aesthetic evaluation. Symmetric patterns are usually preferred over asymmetric patterns and even a small decrease in symmetry results in less liking. However, recent research has revealed that art experts might evaluate symmetry compared to asymmetry in a different way than non-experts. At least when asked for explicit liking ratings, art experts tend to prefer asymmetric patterns. In our study, we aim to further investigate this finding by measuring implicit in addition to explicit aesthetic evaluations of symmetric and asymmetric abstract patterns by art experts and non-experts. Explicit evaluations will be measured by liking ratings of symmetric and asymmetric patterns. In order to measure the implicit evaluation of the patterns, we will use the implicit association test during which participants are never asked to explicitly indicate their liking of patterns. In addition, an art expertise questionnaire ensures the difference in expertise between the two groups. Understanding the aesthetic evaluation of symmetry by art experts compared to non-experts is an important point to understand the characteristics of art expertise. Is art expertise primarily associated with a better knowledge of art or is art expertise even combined with a different preference for key factors that influence aesthetic evaluations, like symmetry? Also, by questioning the universal preference for symmetry, the results will provide an insight into this key factor of aesthetic evaluation.

## **Beauty for the eye of the beholder: Plane pattern perception and production**

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Abstract visual patterns are a key phenomenon in human aesthetics, reflecting a human “sense of order” (Gombrich, 1984). Social effects on the producer of visual aesthetic output may shed light on intuitive aesthetic knowledge that laypeople can utilise without explicit instructions, with implications for the evolution of aesthetics in humans more generally. We apply all three methods suggested by Gustav Fechner (Preference, Production and Use) to visual geometrical patterns, showing that symmetrical patterns are not only used most frequently in real life, but are also produced spontaneously in the lab and are rated significantly more attractive than random patterns. We demonstrate that an anticipated audience affects the pleasingness of geometrical patterns produced by participants in the laboratory. Visual patterns created by participants instructed to make patterns that others will like are indeed rated more highly than those that were made under the instruction to make patterns that are mainly pleasing to the producer.

## **The untapped potential of studying literature for cognitive neuroscientists**

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Cognitive (neuro)scientists study the neural basis of human cognitive capacities. Most experiments use fabricated stimuli, presented without any context and tightly controlled for confounding variables. A recent trend in cognitive neuroscience is to strive towards studying brain responses to stimuli which are closer to our everyday life experience. I will argue that literary texts provide excellent materials for investigation of topics of interest such as emotions, mentalizing and mental simulation. I will show that research on the brain basis of literary reading is possible, and promises to give a much richer insight into cognition than we get from typical experimentation.

## **The impact of drawing actions on the aesthetic experience**

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Drawing decisions and actions made by artists have been suggested to be directly linked to their own and the imagined viewer's aesthetic experience. Here, we consider this relationship by examining the impact of drawing actions on aesthetic reception using eye-tracking measures. Experiment one included 48 non-artists and 33 artists, experiment two included 48 non-artists and 24 artists; all artists had a minimum of 5 years formal art-training. Participants were assigned to one of three conditions: a) stippling (tap a pencil); b) stroking (draw straight lines); c) control (no action). Note the hand could not be observed. When completing the actions, participants viewed images side by side (geometric shapes and paintings of stipple and stroke form) whilst gaze was recorded in a free-view and drawing decision task ("which would you prefer to draw on a scale of 1 to 7?"). Pleasingness ratings were recorded prior to or after eye-tracking. Positive correlations were found between aesthetic and drawing preference ratings, however congruent action did not impact ratings. In fact, when paintings were displayed then stroke images were rated as more pleasing and were fixated on more regardless of the task. The results suggest that while aesthetic preference is important when making drawing decisions and when viewing images, it is not influenced by simultaneous congruent actions. We examined how drawing action relates to the artist and perceiver with intention to experiment with other drawing activities. It is important to understand these relationships between artist and perceiver considering art-making processes and the aesthetic experience.

## **Investigating typicality and novelty through visual and tactile stimuli**

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The research focuses on the role of two key cognitive variables in aesthetics, typicality and novelty, in predicting affective responses (like-dislike) to designed products. It is part of Project UMA (Unified Model of Aesthetics), a five-year collaboration involving the universities of Cambridge, Delft, Swinburne, and Vienna. Project UMA is framed by the proposition that aesthetic responses involve a trade-off between two opposing sensations, safety (as exemplified by typicality) and risk (as exemplified by novelty). The aim of the present research is to understand the relationship between these variables for two sensory modalities, the visual and the tactile, in predicting affective response. In Experiment 1 two stimulus sets of everyday designed objects were used, toothbrush and computer mouse. These were presented to 31 participants as both visual images and as tactile objects that they experienced by placing their hands through an aperture in a box. 20 stimuli in total were rated on seven point scales for typicality, novelty, and aesthetic liking. Using ANOVA the results indicated that typicality played a more dominant role than novelty in predicting affective responses. Furthermore, typicality was even more dominant for the tactile than for the visual. This suggests a possible evolutionary cause: distal stimuli (visual) may tolerate more novelty (risk) while proximal stimuli (tactile) are risk averse. For Experiment 2 three-dimensional stimuli are being constructed that incorporate different levels of both visual and tactile typicality and novelty, based upon the results of Experiment 1. The intention is to investigate how the two sense modalities interact.

## **Surface similarity and deeper similarity: A reflection on our conception of science and art**

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This study finds its origin in the analysis of the concept of similarity, in the perspective of the cognitive processes of categorization, perception and judgement. I considered studies conducted by different authors: Amos Tversky and Itamar Gati (directionality of similarity and difference, context effects), Emmanuel M. Pothos and Nick Chater (simplicity as a general principle in categorization processes), Robert L. Goldstone (similarity not efficient as cognitive tool but fundamental in daily deduction), and Walter Lippmann (similarity and stereotypes in common perception). My aim is to link this reflection on mental categorization processes to the problematic relation between art and science, whose processes, practices and targets appear so different for common sense but are in fact interestingly similar. I considered the two Italian terms "cerca" (quest) and "ri-cerca" (proper research), two attitudes possible in both artistic and scientific practice. I analyzed the phenomenon of Computer Art and the contexts in which artists saw in technological processes a new way of working (e.g. computer as "high-speed visual thinking"). I finally examined those artists whose inner poetics has a scientific or mathematical approach: Sol LeWitt (idea as machine that makes the art), Joseph Kosuth (multiple layers of information, art as semantics) and John Cage (use of randomness, negation of authorship and of subjective taste). This study does not claim to be exhaustive: it represents the ensemble of suggestions and comparisons possibly useful to discover links between practices usually considered to be "un-similar". It is, instead, a matter of analyzing signs, symbols and processes.

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