

PS4084 Psychology of Visual Art: Aesthetics and individual differences in visual function

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(2016-2017 Semester2 Module Handbook)

Why study art as a part of psychology?

The goal of psychology is to understand how psychological experiences and behaviour derive from underlying mental representations and processes, and how these, in turn, derive from biological substrates. The creation and viewing of artistic objects is a human activity that has existed since prehistoric times, pointing to the fundamental importance of aesthetic experience in human psychology. A scientific understanding of aesthetics and artistic behaviour is therefore a key component of the complete science of the human mind. While aesthetics is an aspect that we need to understand in its own right, the processes and products of art and design can additionally help provide windows to more basic aspects of perceptual and cognitive processes underlying the human mind. Art, or more generally, the creation and appreciation of aesthetic artefacts, engages many important components of psychology including visual perception, memory, motor control, decision making, emotion and social/cultural development. In this module we will examine progress in this relatively recent scientific field

Topical focus of the module

One important observation is the presence of large individual differences in the capacity to create and appreciate aesthetic objects. These differences can be heightened in association with mental disorders (e.g., frontotemporal dementia, autism) and atypical cognitive development (e.g., synaesthesia, dyslexia). Another important observation is the intrinsically ill-defined nature of the differences in aesthetic quality among artefacts. These observations provide both a challenge and an opportunity for a scientific understanding of the reciprocal linkage of perceptual-cognitive function and aesthetics. In this module we will examine this linkage from several different viewpoints.

Format of the module

The first two weeks will involve presentations by the lecturer on introductory material on Art, perception/cognition, hemispheric lateralization, etc., and there will be time for a general discussion after the presentation. In each of the following weeks, we will discuss a selection of 3-6 target papers related to a particular topic or question in the psychology of art and aesthetics. The sessions will start with a short 10-15 minute introduction by the lecturer, followed by the student presentations and a seminar-style discussion. Each student or pair of students will present a summary of one of the papers, and we will then discuss the papers.

Weekly Readings

It is imperative that you read all the papers that are assigned for the week (even if you are also scheduled to do a presentation that week), and note down questions and observations for discussion in class. I will activate a forum on Moodle so that each student contributes at least one substantive point for discussion on each paper.

Student Presentations

Each week, starting in the third week, a summary of each of the assigned reading will be presented by one of the students. It is likely that each of you will do two such presentations, but I may ask for volunteers to do one more, depending on the final size of the class. We will schedule the presentations in the first introductory class (this schedule will then be finalised and posted on Moodle during the second week of class). The student presentations are to be done on PowerPoint following the guidelines to be given in class and posted on Moodle.

Assessment and course requirements

The module is based on 100% continuous assessment which will involve two separate assignments:

- *Assignment 1: Experimental project proposal of 1500 words (40%)
Deadline: Friday March 12th, 23:59 (to be finalised at first class)*
- *Assignment 2: One essay of 2000 words or two Essays of 1000 words each from a choice of questions (60%)
Deadline: Sunday April 23rd, 23:59 (to be finalised at first class)*

Intended Learning Outcomes

On successful completion of this module, the student should have attained the following:

- Appreciate the opportunities and challenges for, and the scope and limits of, an empirical science of the psychology of visual art.
- Become familiar with the psychological processes underlying the creation and appreciation of visual art
- Gain an understanding of existing theoretical and empirical approaches in the psychology of visual art, and develop the ability to engage critically with these.
- Gain an understanding of the methodological challenges posed by experimental work directed at understanding visual art, including behavioural and neuroscientific.
- Gain an understanding of the role of individual differences, including neurological disorders, in the creation of art.

On the basis of active participation in the seminar (including in-class presentations, group engagement) and successful completing of the required assignments, the student is expected to develop some of the following transferable skills:

- Ability to engage critically with primary research material, including independent sourcing of research papers.
- Ability to present clearly, in written form, scientific ideas, theories and findings.
- Ability to construct coherent, logical, arguments in the critical evaluation of existing scientific ideas, theories and findings.
- Demonstrate creativity and independence of thought and reasoning in the critical evaluation of existing scientific ideas, theories and findings.
- Develop skills at applying theoretical ideas and prior empirical work toward the development of new experimental ideas

- Demonstrate ability to engage with and learn from feedback
- Communicate with clarity and accuracy, orally (including presentation) and in writing

List of topics and readings

Note the readings listed below are primary readings. PDFs of additional readings are in the respective “Readings” folder for each week, where applicable.

Week 1 (Jan 25rd) - Introduction: What is Visual Art?

Introduction to the module and aims, followed by a brief overview of Modern Western Art. Modern Western Art, particularly post-war Western art, provides among the clearest examples of a direct dialogue between artistic creation, expression and issues in perception and cognition. We will use it in order to delineate the important aspects of artistic creation and appreciation that may be amenable to the scientific study of visual art, and to uncover the important psychological constructs therein.

- Mann, S; Mann, P; Pepperell, R (2016) Perceptual systems, an inexhaustible reservoir of information and the importance of art. *Art & Perception*, 2016, (Advance online)

Week 2 (Feb 1st) – Understanding perception and cognition in the context of art and aesthetics.

In this lecture we will do an overview of basic mechanisms in visual perception, visual cognition and language processing in order to provide a foundation for the material in the rest of the module. One component will be the issue of cortical hemispheric lateralization of visual and cognitive function and its potential implications for the psychology or art and aesthetics.

- Gazzaniga MS, Sperry RW (1967) Language after section of the cerebral commissures, *Brain* 90:131-148.
- Marinsek N., Turner B. O., Gazzaniga M., Miller M. B. (2014). Divergent hemispheric reasoning strategies: reducing uncertainty versus resolving inconsistency. *Front. Hum. Neurosci.* 8:839.

❖ **Field Trip: Scottish National Gallery of Modern Art, Edinburgh, Saturday February 4th**

Week 3 (Feb 8th) - Psychology of art: Theoretical considerations

The psychology and neuroscience of art and aesthetics is still in its infancy. It has emerged as a recognised scientific endeavour only in the last 2 decades. During this time, a few researchers have attempted to provide broad overviews and theoretical programs for the scientific study of the psychology of art and aesthetics. The aim of this work has been to develop testable scientific hypotheses regarding the link between aesthetics and psychology/neuroscience. We review 3 prominent theoretical treatments that have been very highly cited in the literature.

- Ramachandran, V.S. & Hirstein, W. (1999) The science of art: a neurological theory of aesthetic experience, *Journal of Consciousness Studies*, 6, 15-51
- Leder, H., Belke, B., Oeberst, A. and Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments, *Brit. J. Psychol.* 95, 489–508.
- Chatterjee, A. (2003). Prospects for a cognitive neuroscience of visual aesthetics, *Bull. Psychol. Arts* 4, 55–60.

Week 4 (Feb 15th) - Neuroscientific approaches to studying aesthetics and beauty

Like all other areas of psychology, an important component of the science of aesthetics is to gain an understanding of the neural substrates that underlie the phenomenon. While the idea that there is an aesthetic 'center' in the brain seems far-fetched, neuroimaging could potentially help us understand which neural circuits are involved in the creation and appreciation of art. Furthermore, neuroimaging in the aesthetic domain may provide a way to gain a greater understanding of general aspects of psychology such as emotion and reward.

- Cela-Conde, C. J., Marty, G., Maestú, F., Ortiz, T., Munar, E., Fernández, A., Roca, M., Rosselló, J. and Quesney, F. (2004). Activation of the prefrontal cortex in the human visual aesthetic perception, *Proc. Nat. Acad. Sci. USA* 101, 6321–6325.
- Kawabata, H. and Zeki, S. (2004). Neural correlates of beauty, *J. Neurophysiol.* 91, 1699–1705.
- Vartanian, O. and Goel, V. (2004). Neuroanatomical correlates of aesthetic preference for paintings, *Neuroreport* 15, 893–897.
- Nadal M, Munar E, Capo A, Rossello J and Cela-Conde CJ (2008) Towards a framework for the study of the neural correlates of aesthetic preference, *Spatial Vision*, 21, 379-396.
- Makin ADJ, Wilton M, Pecchinenda A, Bertamini M (2012) Symmetry perception and affective responses: A combined EEG/EMG study. *Neuropsychologia* 50: 3250–3261.

Week 5 (Feb 22nd) - Behavioural approaches to studying aesthetics and beauty.

The creation and appreciation of art is a highly complex phenomenon that is subject to large individual and cultural variation. The key characteristics of what constitutes good or bad art, high or low aesthetic experience, beauty or ugliness, are also difficult to define. How can we go about conducting meaningful empirical studies given this huge ambiguity? We will review a few studies that have attempted to use behavioural measures to get an understanding of underlying psychological processes of aesthetic appreciation and human facial beauty.

- Costa, M. & Corazza, L (2006) Aesthetic phenomena as supernormal stimuli: the case of eye, lip and lower-face size and roundness in artistic portraits, *Perception*, 35, 229-246.
- Rosielle LJ & Hite L (2009) The caricature effect in drawing: evidence for the use of categorical relations when drawing abstract pictures, *Perception*, 38, 229-246
- Leder, H., Bär, S. & Topolinski, S. (2012). Covert Painting Simulations Influence Aesthetic Appreciation of Artworks. *Psychological Science*, 1479-1481.
- R. Reber, N. Schwarz, & P. Winkielman, 2004, Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, Vol. 8, pp. 364-382.
- Pecchinenda A, Bertamini M, Makin ADJ, Ruta N (2014) The Pleasantness of Visual Symmetry: Always, Never or Sometimes. *PLoS ONE* 9(3): e92685.

Week 6 (March 1st) perceptual encoding and its relation to aesthetic understanding and visual preference.

An enduring belief is that aesthetics in art, design and architecture arise from certain fundamental constraints in the way the brain internally encodes visual forms. We examine scientific work that seeks to understand aesthetics and visual preference from the standpoint of the way the brain might encode visual information, and how this manner of encoding could be linked to external visual ecology.

- Redies C, Hasenstein J & Denzler j (2007) Fractal-like image statistics in visual art: similarity to natural scenes, *Spatial Vision*, 21, 137-148.
- R. P. Taylor, B. Spehar, P. V. Donkelaar, C. M. Hagerhall (2011) Perceptual and Physiological Responses to Jackson Pollock's Fractals. *Front Hum Neurosci*. 5: 60.
- G.J. van Tonder, M.J. Lyons & Y. Ejima (2002) Visual Structure of a Japanese Zen Garden, *Nature*, 419:359-360.
- C. Firestone and B. J. Scholl (2014) "Please Tap the Shape, Anywhere You Like": Shape Skeletons in Human Vision Revealed by an Exceedingly Simple Measure. *Psychological Science*.

Week 7 (March 8th) – Student presentations of proposed projects and discussion

❖ **March 12th 11.59pm Project proposal report submission deadline**

❖ **SPRING BREAK: Week of March 13th and Week of March 20th**

Week 8 (March 29th) – Aesthetics and visual discomfort: Image content, regularity, and cortical activity

Certain types of images can induce visual discomfort—particularly in individuals prone to seizures, migraine headaches etc. How is such discomfort related to art and aesthetics? We examine scientific work that seeks to understand the underlying visual properties of artistic and natural scenes that evokes a positive or negative visual/aesthetic experience, the neural signature of symmetry perception, and how these may generally suggest links between aesthetics and cortical excitability

- Fernandez D. & Wilkins, A.J. (2008) Uncomfortable images in art and nature, *Perception*, 37(7), 1098-1113.
- Juricevic I, Land L Wilkins A & Webster M (2010) Visual discomfort and natural images statistics, *Perpception*, 39, 884-899.
- Makin, A. D. J., Wright, D., Rampone, G., Palumbo, L., Guest, M., Sheehan, R., Bertamini, M. (2016). An Electrophysiological Index of Perceptual Goodness. *Cerebral cortex* 26(12), 4416-4434.

Week 9 and 10: Neurological disorders, neurological differences and developmental differences linked to artistic capacity: There is a longstanding belief that those who show great proficiency in the creation of art have important psychological differences compared to the general population. The ability to create art entails a special capacity for perceptual visualization and cognitive introspection. What are the distinctions, and how do they help us understand the nature of aesthetics from a psychological and neuroscientific viewpoint? Some acute atypical psychological and neurological conditions show interesting links to the capacity and drive to create art. This may point to both intrinsic differences between the artistic and typical mind, or may highlight the sorts of differences in typically developed individuals that predispose them to art. In the following weeks we consider some of these cases

Week 9 (April 5th)–Neurological disorders and artistic talents

- Miller BL, Boone K, Cummings JL, Read SL, Mishkin F. (2000). Functional correlates of musical and visual ability in frontotemporal dementia. *British Journal of Psychiatry*. 176:458-63.
- Pring L, Ryder N, Crane L & Hermelin B (2010) Local and global processing in savant artists with autism, *Perception*, 39, 1094-1103.
- Snyder A (2009) Explaining and inducing savant skills: privileged access to lower level, less processed information, *Philosophical Transaction of the Royal Society of London B*, 364, 1399-1405
- Happé, F. & Vital, P (2009) What aspects of autism predispose to talent? *Phil. Trans. R. Soc. B* 364, 1369 –1375.

Week 10 (April 12th) – Dyslexia and visual abilities

- Wolff, U. & Lundberg, I. (2002) The prevalence of dyslexia among art students. *Dyslexia*. 8(1):34-42.
- Ramus, F., Dakin, S., Frith, U. et al. (2003) Theories of developmental dyslexia: insights from a multiple case study of dyslexic adults. *Brain* (2003) 126 (4): 841-865
- von Károlyi, C. & Winner, E (2004). *Dyslexia and Visual Spatial Talents: Are they Connected?* In T. Newman & R. Sternberg (eds.). *Students with both gifts and learning disabilities*. New York: Kluwer Academic/Plenum Publishers. (pp. 95-117)

Week 11 (April 19th) – Summary and General Discussion

❖ **April 23rd 11.59pm Essay Assignment submission deadline**