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# REIMAGINING *IMAGIA*. NEUROCOGNITIVE THEORY OF IMAGE REVISITED WITH THE CONSCIOUSNESS STUDIES PERSPECTIVE

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*Imagia. Towards a neurocognitive theory of image* (Francuz, 2013) defines art perception as a synthesis between acts of perception and visual imagination limited by attentional constraints. The majority of empirical evidence the author referred to in the book focuses on visual processing, attention, and aesthetic judgements. Nevertheless, other mechanisms involved in the subjective experience formation undoubtedly also plays a role in the perception of art. Thus, it seems worth complementing the fundaments of the neurocognitive theory of image with consciousness literature. The research in this domain often reminds us that we see much more than is presented. Our conscious perception is modified, extended, and enriched due to multiple mechanisms, such as prediction, integration, or learning. Here, I review selected examples of work from the consciousness literature to illustrate this claim. Furthermore, I discuss this work in the context of art perception. Finally, I reconstruct the model proposed by Francuz and offer its extension that accounts for the aspects covered by the original work and those addressed in this paper.

**Keywords:** image; theory of image; neuroaesthetics; art experience; consciousness.

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## NEUROCOGNITIVE THEORY OF IMAGE[1]

In his book *Imagia. Towards the neurocognitive theory of image* (2013), Piotr Francuz explains how the image features are combined, forming a subjective experience of seeing visual art masterpieces. To achieve this goal, it is absolutely crucial to lay out how colour, shape or depth experience are created and how they affect the aesthetic judgments. However, we also feel that the perception of beauty extends sensory information processing. Art perception often involves perceiving more than is presented or perceiving differently than others, i.e., subjectively. In his book, Francuz (2013) acknowledged this very fact in the Epilogue, where he lists the issues that were not covered in the book and thus should be included in a new edition. He also recognises that the theory of image will not be completed without having those additional aspects included. The list of missing issues focuses on more recent neuroimaging work linking visual neuroscience of vision and aesthetic judgments (see, e.g., Kawabata & Zeki, 2004; Ishizu & Zeki, 2011; Zeki, 1999).

Nevertheless, in the closing paragraphs, Francuz (2013) postulated that his book should also be complemented by discussing optical illusions and seeing disturbances. I argue that this issue is broadly discussed in the context of consciousness studies. Importantly, in this domain, visual illusions and other distortions of perception are not only a sign of malfunction but also an effect of post-perceptual processing that contributes to and extends the subjective experience. It has been proposed that those kinds of distortions have functional meaning and help us to interpret sensory stimulation (e.g., Lau & Rosenthal, 2011). This work attempts to expand the list of topics covered by the *Imagia* with the consciousness studies literature. I also offer a draft model concluding the approach and extending it beyond the perception, attention, and judgement mechanisms. Before that, in the following sections, I will focus on our understanding of beauty and subjective aspects of art perception: aesthetic experiences.

[1] This paper aims to contribute to the special issue of *Annals of Psychology* in memory of Professor Piotr Francuz. I was privileged to discuss with him on multiple occasions, but sadly, we never delved into his theory. I assumed he was planning to develop a part of the theory related to my area of expertise and that we would have an opportunity to discuss the topic when he focused on this very problem. Regrettably, I can now only reanalyse his work without having his thoughtful comments and suggestions. I am by no means a specialist in neuroaesthetics. Thus, the paper should be seen as an initial proposal aiming to reinterpret *Imagia* from a consciousness studies perspective.

## BEAUTY IS IN THE EYE OF THE BEHOLDER

The neurocognitive theory of image (Francuz, 2013) associates the perception of beauty with perceptual processes, aesthetic judgements, and attentional factors. This approach follows a long-lasting tradition in creativity research: art quality is often associated with judgments, including those made by people trained in the art evaluation—art critics (see e.g., Nęcka, 2012). Multiple models of creativity underscore that a creative work refers to novel products or solutions associated with values (Csikszentmihalyi, 1988; Nęcka, 2012, but also see Weisberg, 2015). The domain of art is not an exception. We appreciate those art pieces that are novel (i.e., changing the rules, resulting in surprise and attracting our attention) and associated with aesthetic value (i.e., providing aesthetic experiences, extending direct perception, and focusing on subjective interpretation). Significantly, aesthetic values could be associated with a physical object (a piece of art, e.g., painting or sculpture) or more fleeting works (as in music, audio-visual arts, theatre, or dance). Note that in the latter case, aesthetic experience arises and changes over time. Thus, the value is, to some extent, independent of a physical stimulus. It is therefore acknowledged by a person who experiences art: the beholder. A well-known phase by Margaret Wolfe Hungerford, a 19th century Irish writer, used as the title of this section emphasises the subjective character of aesthetic experiences. However, the studies investigating art perception often acknowledge the quantitative and qualitative differences between experts and non-experts (Hekkert & van Wieringen, 1996; Francuz et al., 2018; Fudali-Czyż et al., 2018). Both novelty and aesthetic values are less frequently experienced by art experts, resulting in more critical judgements (Francuz, 2013). Consciousness studies provide a more fine-tuned view of this research problem, explaining why each recipient perceives a physical stimulation differently and thus can experience art masterpieces differently, i.e., subjectively. It seems highly probable that those mechanisms may extend our understanding of the subjective aesthetic judgements and, more importantly, shed light on processes that precede the judgment and underlie the very aesthetic experience. We can then focus less on beauty judgements and focus more on the very experience to find a balance between an interpersonal agreement that a given piece of art is a masterpiece and a subjective, aesthetic experience of art.

## THE SUBJECTIVE EXPERIENCE OF BEAUTY

As with any other perceptual stimulus, complex brain networks undoubtedly detect and interpret a piece of art. To simplify the narrative and follow even more closely on Francuz (2013) approach, I will focus on visual art from now on. However, as I argue elsewhere, it is important to generalize the postulated mechanisms of conscious experiences to other contents (Siedlecka et al., 2019; Wierzchoń, 2018[2]). One of the critical issues in conscious perception studies is the veridicality of conscious representations (Block, 2015; Del Pin et al., 2021). In short, it has been extensively discussed whether the conscious visual experience is rich or sparse. The former view postulates our conscious perception represents accurately even a very complex visual stimulation; we perceive the world veridically and with high precision (Block, 2011). On the contrary, the latter view claims our conscious perception is limited. Consequently, we reconstruct the perceptual stimulation based on previous knowledge or expectations (Lau & Rosenthal, 2011). This view inspired much research showing that conscious experience could be very different from actual visual stimulation. To give an example, this has been investigated with visual illusions, binocular rivalry and multiple other paradigms contrasting brain activity when conscious percept changes and sensory stimulation not (e.g., Rees et al., 2002). In those kinds of studies, researchers often aim to apply manipulations that selectively change conscious experience to unravel mechanisms responsible for subjective, conscious perception.

The current theories of consciousness often discuss the mechanisms explaining interindividual and intraindividual differences in perception. In other words, researchers aim to identify the mechanisms that modify the visual processing, so we perceive consciously with significant differences to what is presented. Notably, many of those studies apply subjective ratings assessing different experiential qualities (i.e., clarity of feelings or visibility; see, e.g., Lischetzke et al., 2011; Wierzchoń et al., 2014). This fact also shows how consciousness studies are relevant to the perception of art. The systematic presentation of those studies and theoretical models is well beyond the scope of this paper but let me list a few examples.

[2] This seems also evident in the work of Francuz, who did not limit his interest to visual art and investigated the effects of expertise in music perception (Jaśkiewicz et al., 2016).

### Prediction

Many researchers claim that conscious perception is driven by predictions (e.g., Aru et al., 2016, 2018). According to this view, we see what we predict rather than what is presented. This view has been proposed in the context of a more general theoretical framework, discussing the very function of perception and consciousness: predictive coding (Howhy, 2013). In art perception, predictions may refer to perceptual features but also values associated with an art piece (Van de Cruys & Wagemans, 2011). Both may shape the aesthetic experiences of the recipient.

### Integration

Another body of studies associates conscious perception with the integration of the non-perceptual evidence. It has been argued that non-perceptual information, such as action (Anzulewicz et al., 2019) or bodily self-awareness (Łukowska et al., 2018), may influence the way we experience visual stimulation. In art perception studies, it has been proposed that physical interaction with the masterpiece affects its perception and judgment. This claim could be illustrated with the observation we usually appreciate more the art piece in person than online, even if the quality of reproduction is high (Brieber et al., 2014). Also, contemporary visual art is often based on the interaction between the viewer and the art piece, aiming at weakening the distinction and involving the former in the act of perception.

### Learning

It has also been proposed that previous knowledge and learning may shape our conscious perception (Cleeremans et al., 2020). In the context of art, we not only interpret a piece of art differently depending on the prior knowledge, but we associate values with what we see due to the learning mechanisms. The process of learning shapes our conscious perception and builds subjective experience that represents our unique history of associations with currently perceived objects (i.e., forms qualia; Cleeremans, 2020). It has been shown in multiple studies that experts evaluate art differently than novices (e.g., Hekkert & van Wieringen, 1996; Francuz et al., 2018). It seems possible that such difference would also be observed on the individual level, taking to account individual art experience learning trajectories.

### The Interplay Between Imagery and Perception

Yet another mechanism might be the interaction between imagery and perception. Recent work clearly shows that the imagery affects vision and other way around (Dijkstra et al., 2017; Dijkstra et al., 2021). The importance of the interplay between imagination and perception in art perception has already been pointed out in Francuz (2013) work. Thus, the abovementioned studies may pave a way to investigate this very problem.

I have offered only a glimpse of the body of work on consciousness relevant to the topic. A more extensive analysis will quickly turn into a book rather than an opinion paper. Providing a comprehensive analysis of the consciousness studies literature relevant to the art perception studies was also not a goal. Nevertheless, even this short review clearly illustrates the relevance of the topic and shows how consciousness literature complements our understanding of art perception and judgments. In the final paragraph, I will thus attempt to reconstruct the neurocognitive theory of image proposed by Piotr Francuz in his *Imagia* and discuss how it could be further inspired and developed based on the consciousness studies literature to cover more aspects of the research problem.

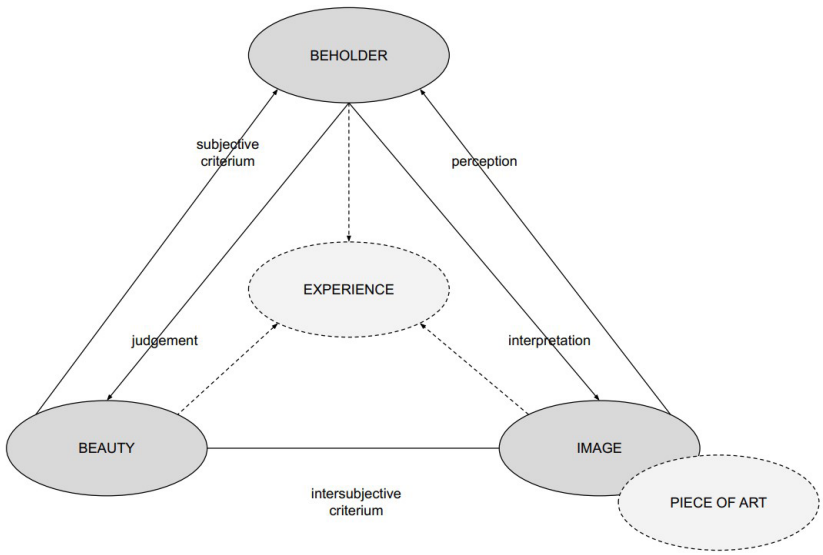
## REIMAGING *IMAGIA*. A NEUROCOGNITIVE MODEL OF ART EXPERIENCE

The preface chapter of *Imagia* pointed out that the book does not present a theory, as the work does not offer a coherent conceptual system that would explain the perception of art (Francuz, 2013). However, one should disentangle between the theories and models (Frigg & Hartmann, 2020). Theories aim to provide a comprehensive explanation of a given scientific concept. However, models can limit their scope and describe a given area of investigation, e.g., discussing its necessary and sufficient components. Models can complement theories; they can also serve as preliminary theories (Frigg & Hartmann, 2020). Especially in the context of more complex phenomena, such an approach was proved to be beneficial. In this context, one may see the neurocognitive theory of image as a descriptive model that describes the mechanisms involved in visual art perception. Let me thus reconstruct the model. *Imagia* offers an extensive review of the cognitive and neural processes involved in the act of seeing a piece of visual art. This description necessarily assumes two nodes of the model: an image and a beholder (a person who perceives the image). The book focuses on the specification of the nodes and the relationship between them

(Jankowski et al., 2020a; Fudali-Czyż et al., 2018). The final chapter introduced the third node: beauty. Note that all nodes are irreducible. Francuz (2003) has centred his model on image and analysed how its form influences vision (focusing especially on shape, colour, and depth perception). The act of seeing has been described in both bottom-up and top-down fashion, so the connections between the nodes are bidirectional (perception and interpretation, see Figure 1). The status of beauty as a separate node is less straightforward, as it undoubtedly consists of a subjective component specific to a given recipient. However, it has also been argued that beauty judgments could be intersubjective, and a definition of beauty has been extensively discussed (e.g., Eco, 2004; Gombrich, 1995; Jankowski, Francuz, Oleś, Chmielnicka-Kuter, & Augustynowicz, 2020). Thus, the beauty node is irreducible neither to the image (i.e., a specific piece of art) nor to the beholder. Importantly, Francuz and colleagues have investigated (Jankowski, Francuz, Oleś, Chmielnicka-Kuter, & Augustynowicz, 2020; Jankowski, Francuz, Oleś, & Chmielnicka-Kuter, 2020; Oleś et al., 2021) the relationship between the beholder (e.g., temperament, expertise in art, personal storytelling), beauty (aesthetic appraisal) and image (formal elements of paintings). Therefore, I believe it is safe to assume the reconstructed model follows his views.

**Figure 1**

*Reconstruction of Neurocognitive Model of Image and Its Reinterpretation*




*Note*. Solid lines represent the original model. Dashed lines are modifications proposed by the author of this paper. Together they constitute the neurocognitive model of art experience.

Seeing the model from the consciousness literature point of view, we should start by clarifying how model generalise to conscious visual experience. Obviously, not all subjective visual experience is associated with the aesthetic experience. Only the interaction between three nodes gives a specific type of experience: art experience. Note that interaction between beholder and non-artistic image will also result in subjective visual experience, but it will not be an art experience.

We can also enrich the meaning of the connections between the beholder and the image (or the piece of art as I will call it to increase model generalisability to non-visual arts). Predictive coding, integration, learning or the interplay between imagery and perception could be seen as a more fine-grained view on mechanisms of an interpretation: theories that complement a general model. They are also involved in the case of conscious experience of a non-artistic object. But with a piece of art and beauty components the subjective experience becomes art experience.

The consciousness literature does not only provide specific theories of one of the aspects of the model. It also allows the model extension by changing its focus. As we remember, Francuz has centred his model on image. However, following the analogy to the enactive cognition accounts (O'Regan et al., 2005; Shapiro & Spaulding, 2021), the experience can be seen as a result of an interaction between agent and environment. Thus, art experience may not be focused on the image. It could arise as a consequence of the interaction between image, beauty and piece of art nodes. The interaction that would miss one component or the one at which some components have been changed (e.g., image will not be an art piece) would not result in art experience. In the proposed version of the model, the experience becomes the focus and is influenced by all other nodes. In other words, the experience changes due to the interaction between the nodes.

If the proposed assumptions are well founded, specific theories of each of the nodes as well as interactions between them should be specified before the general theory of art experience could be formulated. Studies of perception and consciousness offer multiple theories of a perceiving beholder. Theories of creativity try to grab the essence of classifying a given object as a piece of art. The theories of beauty are even less developed, compromising objective (history of art, aesthetics) and subjective criteria of beauty (psychology of emotions, attention, judgments). The model components should be developed further and only then the proposed neurocognitive model of art experience shall be fully specified and validated.

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