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PERCEPTION AND AESTHETIC EXPERIENCE

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INTRODUCTION

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Art as complement of philosophy

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ART AS COMPLEMENT OF PHILOSOPHY*

abstract

Art and aesthetic experience, as well as the nature of depiction, representations and images, are crucial topics in the ongoing multifaceted debate at the interface between philosophy of perception, aesthetics, philosophy of mind and neuroscience.
This issue collects the papers presented at San Raffaele Spring School of Philosophy and International Conference 2017 and investigates the mentioned topics, together with other related ones, by locating them in the more general framework concerning the relation between perception and cognition.
In this introductory chapter, we provide some sketches of this multidisciplinary field of inquiry together with an overview of the materials collected in the issue.

keywords

aesthetic experience, art, pictures, perception

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1. Introduction

This special issue of *Phenomenology and Mind* collects the proceedings of the San Raffaele Spring School of Philosophy and International Conference 2017 (SRSSP 2017) "Perception and Aesthetic Experience. Starting from Noë's *Strange Tools. Art and Human Nature*", which was held at Vita-Salute San Raffaele University – Milan, from May 22nd to May 24th 2017.
The School was jointly organized by the research centers PERSONA and CRESA, in collaboration with the Doctoral School of the Faculty of Philosophy of San Raffaele University. SRSSP 2017 hosted papers presented both by invited speakers and by contributors selected by a double-blind peer review process. In addition, this issue collects two papers by the guest editors.
SRSSP 2017 aimed at fostering the debate on perception and aesthetic experience, which is at the intersection between philosophy of perception, aesthetics, philosophy of mind and neuroscience.
Aesthetic experience turns out to be a crucial topic worth dealing with for all these disciplines. Indeed, it can be fruitfully analyzed on the background of various theories of perception, in order to specify differences and similarities (if any) between perception in general and aesthetic experience (or, arguably, aesthetic perception) in particular. An analysis of the latter helps also fostering a deeper investigation on the nature of depiction and representation, which are crucial topics in contemporary debates on aesthetics and philosophy of perception. Moreover, aesthetic experience constitutes one of the most complex and multifaceted human experiences, arguably based on perceptual, affective and cognitive abilities. It encompasses a wide range of phenomena, from the experience of the aesthetic aspects of the everyday world to the appreciation of art and its works. Investigating the main traits of this peculiar attitude towards the world is therefore of the utmost importance for all the disciplines that are specifically engaged with the study of the mind and its abilities, such as neuroscience and philosophy of mind.
Against this background, SRSSP 2017 brought different approaches together, aiming at shedding light on perception, the role of pictures in shaping our access to the world, the nature of representation and its difference (if any) from depiction, the plausibility of the neuroscientific approaches to art and aesthetic experience, the nature of works of art themselves. Ranging on such various topics, the papers here collected have been organized into three sections, based on the main issues dealt with and on the methodological approaches used.

2. Contents

2.1 Aesthetic Experience and Enactivism

The first session of this issue collects papers that variously deal with Alva Noë's theoretical proposal on perception, aesthetic experience and art. One of the main topics discussed in this section is the enactive theory of perception presented by Noë in several of his works (Noë, 2004, 2009; O'Regan & Noë, 2001). However, the focus is also on the account of art, artistic practice, and aesthetic experience that Noë puts forward in his book *Strange Tools. Art and Human Nature* (Hill & Wang, New York, 2015). One of the main ideas that Noë defends in the book is that artistic practices are *re-organizational* ones, that is, they are practices by means of which we put on display and investigate several *organizational* activities of ours, such as dancing or making pictures. As far as art, according to this interpretation, investigates our practices, it also investigates ourselves. This idea is very well summarized in the following passage by Noë: "Works of art put our making practices [...] on display. Art puts us on display. Art unveils us to ourselves" (Noë, 2015, p. 101). Besides dealing with this issue, the book also addresses some of the main topics of the author's previous production, namely: the nature of perception and the enactive proposal, the nature of pictures and representations, the extended thesis about our minds and cognitive processes, the place of neuroscience in the study of the mind, and so on. This session, therefore, collects papers that mainly deal with this debate, broadly considered.
In the opening paper of this section, thought as an introduction and critical discussion of some of the main topics investigated by Noë's *Strange Tools*, Forlè focuses on Noë's account of aesthetic experience. She stresses the need to better clarify the relation between the author's conceptualization of aesthetic experience as *contemplative* and *detached* seeing (Noë, 2015, pp. 51-52) and the enactive theory of perception the author endorses. Moreover, she addresses the topic of the objective correlate of aesthetic experience, introducing the notion of "tertiary qualities" and claiming that these are crucial features of aesthetic objects.
In his invited paper, Noë comes back to some of the main topics dealt with in *Strange Tools*. In particular, he provides further support in favor of the conceptual distinction he drew there between first-order and second-order activities, and, accordingly, between picture-making and making of pictorial artworks. Artistic practices in general are proposed as the second-order activities that put many of our first-order activities on display. However, in this paper the author also argues for the idea that, even though conceptually distinguishable, first-order and second-order activities are usually *ineliminably entangled* and, on this ground, he presents the topic of *entanglement*.
The paper by Mortu also deals with the account of art and aesthetic experience presented in *Strange Tools*. Arguing that the enactive approach defended in this book has strong affinities with some recent art-historical approaches, the author maintains that the extended mind thesis, which is implied in these approaches, fails to capture important aspects of the cognitive underpinnings of artistic practices. Moreover, Mortu calls into question Noë's conception of the role of perception in aesthetic appreciation.
The enactive and the extended mind theses are at the heart of Wu's paper too. Wu discusses the enactivist attempt to entail the hypothesis of extended conscious mind (ECM). She argues that the enactivist description at the personal level is still open to an internalist challenge at the sub-personal level. In response to this challenge, the author suggests combining enactivism with the concept of predictive processing, in order to delineate a sub-personal characterization of conscious experience that is compatible with the enactivist interpretation at the personal level.
In the last paper of this session, Pace Giannotta presents an enactive theory of color that implies a form of color relationism. Likening this view to Husserl's phenomenology of perception, he argues that it constitutes a better alternative to both color subjectivism and color objectivism. He also extends the enactive and phenomenological account of color to the more general topic of the epistemological and ontological status of sensory qualities (qualia).

2.2 Neuroscience, Aesthetics, and Embodiment

The second session of this issue is devoted to investigating how contemporary neuroscience addresses the topics of aesthetic experience, perception, and cognitive abilities. A specific interest is directed to those neuroscientific theories that underline the way in which the brain areas and circuits that map one's body are crucially involved not just in the preparation and execution of actions, but also in cognitive abilities, such as (aesthetic) perception, language or semantic memory (Barsalou, 2008; Gallese & Di Dio, 2012; Tettamanti *et al*., 2005).
This research line is of great interest for the purposes of the present issue since the role of the body and its movements in perception and experience is a point that also the enactive approach presented and discussed in the first session stresses. Yet, the background is quite different and enactivists are generally skeptical about the neuroscientific approaches to the human mind and, more specifically, about the way neuroscience addresses the issue of the role of the body in accounting for cognitive abilities.
The main aim of this section is to present some neuroscientific models addressing these topics, in order to let divergences and, possibly, affinities with other accounts emerge.
In his invited paper, Gallese's main aim is to address the question concerning the role that images and image-making play for human beings, focusing in particular on what makes images so special for us. This issue is investigated through contemporary neuroscientific method, underlining why and how neuroscience can investigate our relationship with art and aesthetics. In this framework, a new model of perception and cognition is defended – that is, embodied simulation – which highlights the constitutive relationship between brain-body and the reception of human creative expressions.
Fingerhut tackles the issue of the enactivists's skepticism about neuroscience more directly, focusing in particular on the debate on neuroaesthetics. The author reviews recent enactive approaches to art and aesthetic experience, such as the ones by Hutto, Gallagher, Noë. He argues that the dismissal of empirical aesthetics that all these accounts endorse is misguided in several respects.
Concluding this session, the invited paper by Conca and Tettamanti focuses on the involvement of sensory-motor brain systems in semantic memory tasks. The authors argue that semantic memory for an object encompasses multi-modal knowledge gained through one's personal experience over her lifetime and coded in grounded sensory-motor brain systems. They show how linguistic access to semantic memories in verbal format relies on the functional coupling between perisylvian language regions and the grounded brain systems implied by our experience with the concept's referents.

2.3 Art, Depiction, and Perception

The third session of this issue is mainly devoted to two interrelated topics that have already come out in the previous sessions as crucially involved in the discourse on art and aesthetic experience, namely: pictures (and depiction) and perception.
Pictures raise interesting questions for both aesthetics and philosophy of perception specifically for their ability to present objects that are not there in the flesh. How can pictures do that? What is the actual content of a picture? Is it actually presented or rather just represented? These issues turn out to be strictly connected also to the debate about perception, its nature, and the relationship between picture perception and perception in general (Nanay, 2016).
These are the main topics that the papers collected in this session variously address.
In their invited paper, Kulvicki and Nanay argue that the fact that communication has become more and more pictorial not only has produced a deep change in our communicative practices, but it also has changed the world about which we communicate. Increasingly, the authors say, we are making a world that is *worth* depicting using the tools we now possess. In their paper, the authors consider one example of this phenomenon, that is *trompe l'oeil* street art. They

maintain that more and more of this seems to be produced with the intention that it is seen primarily in pictures. It seems that anything someone makes to be seen is made with good photography potential in mind, so that the pictures of the work become more interesting than the pieces seen in the flesh.

The phenomenon of *trompe l'oeil* that Kulvicki and Nanay analyze is crucial in the debate about picture perception, depiction and representations. In his paper, Ferretti considers one of the most debated questions in this field of inquiry, namely: whether, in perceiving an object in a picture, we see only the depicted scene or, rather, simultaneously, both the depicted scene and the picture's surface. After having presented the two main competing views on this topic – the 'simultaneous account of picture perception' (SA) and the 'non-simultaneous account of picture perception' (NA) –, Ferretti provides an argument in support of SA.

The notion of twofoldness, discussed by Ferretti in connection with picture perception, recurs in Arienti's paper too. Arienti considers Walton's definition of pictorial experience as a *visual game of make-believe* and maintains that, for twofoldness to be preserved in this characterization, Walton needs to characterise visual make-believe as involving a propositional imagining. However, Arienti argues that such a strategy does not seem to be successful and shows how in his view Walton's account is ultimately unable to secure the twofold character of pictorial recognition.

Keeping the focus on picture perception, the invited paper by Voltolini has two main aims. The first is to show that picture perception is specifically presentational, hence specifically perceptual. By providing a reinterpretation of Richard Wollheim's conception of seeing-in, Voltolini claims that picture perception is presentational for it only ascribes the presence of the picture's subject in its content, but not in its mode. This amounts to a knowingly illusory perceptual experience of such a presence. The author's second aim is to show how this presentational specificity does not prevent the picture from being properly presentational of the properties that are ascribed, within its perception, to its subject.

The invited paper by Young and Calabi focuses on a specific aspect of some pictures, that is the fact of their being *pictures as of movement*. It is natural, the authors claim, to describe many pictures as of movement. However, how should this "of" be understood? Is movement depicted or merely represented by, or suggested by, pictures? In their paper, the authors argue that movement can be depicted and not merely represented and characterize their view of movement depiction as a version of Hopkins's experienced resemblance theory of perception.

The paper by Di Bona deals with another specific aspect of perception, that is the perception of sound sources and their spatial properties. The author expands the application of a model for the spatial experience of sound sources to musical sounds by analyzing how we experience space in musical listening. In order to do that, Di Bona briefly summarizes how we experience the spatial properties of sound sources in the case of environmental sounds; then, she mentions the different kinds of physical space we can hear in the case of musical listening. Finally, she analyzes two compositions by Luigi Nono to show how the model of the experience of environmental sound sources applies also to these musical cases.

Concluding this session, the paper by Sacchi deals with the issues of perceptual contact and perceptual awareness. In particular, the focus of the paper concerns how perceiving an object makes it possible to think about it in a very direct way. She puts forward her proposal by critically discussing both Gareth Evans's (1982) account of the role of perception in singular thoughts and Michelle Montague's (2016) recent criticism of that account. By opting for a characterization that makes room for appearances as objective and mind-independent features of objects, the author aims at putting forward an account of acquaintance close to Russell's than Evans's was, while avoiding the pitfalls of the sense-datum theory that led Evans to part company from Russell's characterization of such a notion.

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SECTION

SECTION 1

AESTHETIC EXPERIENCE AND ENACTIVISM

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THE "HOW" AND "WHAT" OF AESTHETIC EXPERIENCE. SOME REFLECTIONS BASED ON NOË'S *STRANGE TOOLS. ART AND HUMAN NATURE*

abstract

Being a book on art and its nature, Strange Tools *deals with aesthetic experience as a crucial object of inquiry. Indeed, it offers several interesting insights into what aesthetic experience is and how we should (or should not) account for it. However, some aspects of Noë's analysis raise questions, both about the act and about the object of aesthetic experience itself. In this paper, I will discuss these issues highlighting a potential conflict in the author's analysis of aesthetic experience and providing some hints about the objective correlate of such an experience.*

keywords

aesthetic experience, enactive perception, tertiary qualities

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1. Introduction

Strange Tools by Alva Noë is a book on art and artistic practice. However, since the topic is framed within a more general theory of human practices and (aesthetic) experience, it is also a book on perception, the human mind, and our nature as embodied beings who are embedded in a social and technological world.

Starting from some of the main theses and implications of this book, in this paper I would like to focus on two different aspects of the same topic, i.e. aesthetic experience.

Indeed, being a book on art and its nature, *Strange Tools* has to deal with aesthetic experience as a crucial object of inquiry: it therefore offers several interesting insights into what aesthetic experience is and how we should (or should not) account for it (Noë, 2015, pp. 51-54, 120-133). However, in my view, some points of Noë's analysis seem to require further exploration and development – both *a parte subjecti* (i.e. the analysis of the *act* of aesthetic experience) and *a parte objecti* (i.e. the analysis of the *object* of aesthetic experience).

Regarding the former aspect, in the target book, Noë seems to present aesthetic experience against the background of a general enactive approach to perception, according to which perception is an *active* exploration of the surrounding world (Noë and O'Regan, 2001, p. 940). On the other hand, he presents aesthetic seeing as a kind of *contemplative* and *detached* seeing (Noë, 2015, pp. 51-52). The specific ways in which these two different conceptualizations can be held together and harmonized is not completely focused on by the author but it will turn out to be a crucial point to investigate further.

Regarding the second aspect, my thesis will be that Noë's analysis of the proper object of aesthetic experience fails to consider some crucial features of such object. To be sure, Noë focuses on a specific kind of aesthetic object, i.e. works of art, describing how they should be accounted for and why they particularly matter to us. However, it seems reasonable to admit that there could be aesthetic objects that are not works of art, or, in other terms, that we can have an aesthetic experience of objects that are not works of art. In our everyday life, in fact, a poem or a piece of choreography may be experienced aesthetically as a natural landscape or the atmosphere of a city can. What – if anything – do these experiences have in common, so that we can call all of them "aesthetic experiences"? Moreover, more importantly, is there something that we detect in objects of experience that allows us to speak of various different *aesthetic objects* – some of which are works of art?

Noë's position on this point seems to be compatible with the idea that the peculiarity of aesthetic experience can be explained just by the specific – contemplative and detached – attitude that characterizes it. Such an attitude leads us to see objects in themselves, their

shape and color and size as neutral and pure, free of their everyday practical meanings. I will try to argue that this characterization of the objective correlate of aesthetic experience overlooks some of the specific features of everyday objects that can be crucially detected in aesthetic experiences themselves.
The aim of this paper, therefore, is twofold: to highlight some gaps in Noë's analysis of aesthetic experience *a parte subjecti*, and to provide some hints about the objective correlate of this kind of experience for a more inclusive and multifaceted account *a parte objecti*.

2. An Overview on *Strange Tools*

Before embarking on a critical analysis of Noë's theory, it is worth summarizing some of the main tenets of this proposal, in order to better understand the background of the specific theses I will highlight and discuss.
As we said at the beginning, *Strange Tools* is a book on art and artistic practice, but it also outlines a more general theory of human practices and (aesthetic) experience, perception and the human mind, as well as our nature as embodied beings.
In his book, Noë starts by stressing how our lives are characterized by several organized activities, from breastfeeding to talking, from dancing to driving. Such activities shape us, our way of thinking and acting: in other words, we get organized by means of them. According to the author, organized activities are primitive and natural;[1] they are ways of paying attention, looking, listening, doing, undergoing; they exhibit a structure in time; they are emergent and not deliberately controlled by any individual; they have a social, biological or personal function, and they are (at least potentially) pleasurable (Noë, 2015, pp. 3-10).
But there is another group of activities that are quite different from the ones just described. If dancing is an organized activity, choreography is not. Choreography is not dancing: choreography puts dance on the stage, it focuses and acts on it to show what dancing can be and how it can be worked on and *re-organized.* In this sense, if dancing is an organized activity, choreography is a *re-organizational* one. Indeed, according to Noë, we can think of there being two levels of activities (Noë, 2015, pp. 11-28). Level 1 is that of organized activities (e.g. talking, moving, dancing, singing). Level 2 is the level on which "the nature of the organization at the lower level gets put on display and investigated" (Noë, 2015, p. 29): in this sense, Level-2-activities *re-organize* the lower-level ones. Among such Level-2-activities we can find choreography, as well as art and, interestingly, philosophy.
Coming to the main topic of the book then, art is not technology and artistic practice is not a technical activity (Noë, 2015, pp. 29-48). Activities such as dancing, singing, making pictures or sculptures are organized activities that may require very specific skills but are not artistic practices in themselves – let us think, for example, of children's dancing, our singing to ourselves, or our making non-professional photos at a birthday party among friends. However, such activities can be *re-organized*, that is they can be put on the stage and investigated as a means of investigating ourselves and our nature as technological beings. Art puts our practices on display and shows how new and unfamiliar they can be. In this sense, works of art are *strange tools*: if technical activities produce different kinds of tools aiming at serving several different ends, art does not serve any particular purpose. It investigates what our Level-1-activities produce (e.g. songs, pictures, utensils, dance movements, and so on) and tries to make us see them under a new light: in this sense, when they become works of art, objects lose their practical utility. They do not serve a particular purpose and so they appear *strange* (Noë, 2015, pp. 49-71).

1 Noë underlines that "natural" is not to be intended in opposition to "learned" or "technological". The idea is that natural organized activities are those activities that, even if learned against the background of new settings and technologies, once acquired, can be carried on in a smooth and natural way. See Noë (2015), p. 7.

Philosophy is a Level-2-activity too. Like art, philosophy investigates the mode of our organization and the way we are embedded in different organized activities. More particularly, it is the re-organizational practice that investigates and puts on display Level-1-cognitive undertakings such as reasoning, argument, belief formation, the work of science, and so on (Noë, 2015, p. 29). This characterization of philosophy leads Noë to maintain that "art is a philosophical practice and philosophy an aesthetic one" (Noë, 2015, p. 134).
Noë's book is engaging and provoking. As this brief overview shows, it proposes a broad theory of human practices that tries to make sense not just of all different artistic productions but also of other human activities, such as philosophical work. Moreover, it frames the overall analysis of art in a specific theory of mind that criticizes the neuro-(aesthetic) approach and has its background in the enactive theory of perception and cognition that the author had proposed in previous works (Noë, 2004, 2009). The result is a broad overview that spans from a theory of art, to a theory of human practices, to a theory of mind, in a very captivating way. However, far from being interested in (and capable of) discussing all the themes and research lines Noë has proposed in this book, as I said in the introduction I will concentrate on some specific theoretical issues his analysis of aesthetic experience raises, both *a parte subjecti* and *a parte objecti*.

3. *A Parte Subjecti* Analysis: How to Conceive Aesthetic Experience?

One of the major targets of criticism in Noë's theory is the neuro-aesthetic account of artworks and how they are experienced (Noë, 2015, pp. 120-133).
As for aesthetic experience in particular, the author maintains that even though it could be fruitful to know what happens in our brains while having such experiences, this does not tell us anything about what aesthetic experiences (not to mention works of art) are. Indeed, while every experience does elicit some particular events in the brain, this does not necessarily mean that the experience itself is reducible (both ontologically and epistemologically) to those events (Noë, 2015, pp. 130-131). Against this background, Noë criticizes the neuro-aesthetic approach as unable to account for the complex nature of the aesthetic attitude. Aesthetic experience, in fact, is not a finite and well-circumscribed reaction in the brain that can be measured and captured, at a given point in time, by means of neuroimaging methods. On the contrary, it is a *temporally extended* and multimodal engagement and exploration of the artistic work that can be transformed over time as long as the subject engages with the object and reflects upon it (Noë, 2015, pp. 120-133). Indeed, according to Noë, aesthetic responses are not fixed data points. They are more like the outcomes of an ongoing interaction with the object (or the work of art), which can be continuously shaped and informed by many different factors, such as what friends or critics tell us about that work, what we are interested in or focusing on, and so on. In Noë's words:

> A striking feature of aesthetic responses [...] is that they are cognitive achievements, comparable, if not identical, to getting a joke. [...] Aesthetic responses, then, are not symptoms or reactions or stable quantities. They are actions. They are modes of participation. They are moments of conversation (Noë, 2015, pp. 132-133).

This account of aesthetic experience seems to find its theoretical background in Noë's theory of perception in general. Indeed, as the author himself says, no kinds of perceptual experiences are events «set off as a result of the bombardment of the nervous system from the outside» (Noë, 2015, p. 124). Rather, perceptual experiences are patterns of active interaction between the living being and its world.
As should be clear, therefore, Noë rejects the idea of *aesthetic* experiences as reactions in the brain in the same way as he rejects the idea that *perceptual* experiences are that kind of

reaction. He suggests, on the contrary, that both perception and aesthetic experiences are occurrences of active engagement with the world.
However, what does this actually mean? How does Noë argue for this theoretical position? As I mentioned before, this idea finds its basis in the author's enactive account of perception, so that we can say that Noë develops his account of aesthetic experience against the background of that theoretical proposal. Therefore, in order to understand better Noë's account of aesthetic experience, as well as his criticism to the neuro-aesthetic approach, it is useful to introduce some crucial tenets of the enactive approach.
The enactive approach to (visual) perception has been developed principally by Noë (2004, 2009), also in collaboration with the psychologist Kevin O'Regan (Myin & O'Regan, 2009; Noë & O'Regan, 2001).
One of the main tenets on which this theory is grounded is that having visual experiences does not mean holding a particular representation of the world. Seeing does not arise from having detailed internal representations of the way the world is. On the contrary, it is a way of interacting with the world. It is an activity of the organism that perceives – that is, a "mode of exploration of the world" (Noë & O'Regan, 2001, p. 940).
To explain their position, Noë (2004) and Myin and O'Regan (2009) start with the description of most of our daily visual experiences. When we look at the world around us in the best conditions possible, the objects we see seem to be in sharp focus and high-resolution. We seem to have perceptual access to a spatially and temporarily continuous world, where all things are more or less equally detailed (Myin & O'Regan, 2009, pp. 186-187; Noë, 2004, pp. 35-36).
However, things are not as simple as they might seem in the beginning. Let us consider, for instance, this written page. At first glance, we would say that it is uniformly written, and that it appears in our visual experience as uniformly detailed. However, if we fix our gaze, we will easily notice that we are not able to read many other words around the ones we are actually fixating. This is true even though it seems to us that there are some other distinguishable, readable and detailed words on the page. The same holds for colors. Even though we would say that all objects in our visual field are colored, we are not really able to say which color the things in the periphery of our visual field are. We can only distinguish colors when things move to the center of our visual field.
How can we account for this apparent paradox – that is, the fact that it seems to us that all things in our visual field are equally detailed, while we have a sharply focused and high-resolution visual experience just of the objects in the center of the visual field itself?
According to Noë, we can experience the world around us as detailed and high resolution not because all details are visually detected in a single fixation, but because those details that are not actually seen are nevertheless experienced as *perceptually* (or *virtually*) *present*. When we stare at this written page, for instance, we cannot actually read (and see) all words simultaneously, nonetheless we have a *perceptual sense of the presence* of the now-unreadable words. This perceptual sense makes us have the experience of a uniformly written and detailed page (Noë, 2004, pp. 60-65).
Now, the interesting point for our purposes is that, according to Noë, unseen details can be perceptually present because they are *accessible through movement*. The world is made perceptually available for us thanks to our ability of looking around. Indeed, we can move our eyes or our body and we can gain access to the world in its richness. In this sense, according to the proponents of the enactive theory of perception, the world appears to be detailed not because we can see all the details in a single fixation, but because we find them "whenever we look for them" (Myin & O'Regan, 2009, p. 187). The details in the visual field are *accessible* – that is, they are reachable and explorable thanks to our ability to move. This is the reason why we have a sense of the presence of the world as complete and high-resolution even though we

cannot really see every single detail in each visual fixation.
In this sense, perception depends on my implicit understanding of the way I can access the world by movement. Let us think, for instance, of our perceptual experience of a cat that sits motionless behind a picket fence (Noë, 2004, p. 60). According to Noë, we *do* have a sense of presence of the whole cat – even though we can actually see only those cat-parts that are not occluded by the picket fence – because we implicitly understand that, by moving our eyes, head, or body, we can bring into view those parts of the cat that are now hidden. Those parts of the cat's body, therefore, are *perceptually present* as *accessible by movement* (Noë, 2004, p. 64). In this framework, seeing is conceived as an exploratory activity (Noë & O'Regan, 2001, pp. 939-940). The perceiver has the ability to move around in her environment and has an implicit understanding of how the world changes while she moves. According to the proponents of the enactive theory of perception, it is partly thanks to these abilities that the perceiver can have the visual experiences she has. Our visual experiences are therefore the result of an exploratory activity that, obviously, depends importantly on our embodied nature and our kinetic and practical abilities.
This theoretical background gives us some clues to interpreting Noë's thesis according to which, like perception in general, aesthetic experience too is not a finite and well-circumscribed reaction in the brain, but rather an ongoing interaction with the object (Noë, 2015, pp. 132-133). The idea seems to be that aesthetic experience, like perception, is a multimodal (sensory but also thoughtful) and temporally extended way of *exploring* and investigating the object (e.g. the work of art). In this sense, it cannot be reduced to a kind of instantaneous and fully detailed snapshot of aesthetic objects, just as visual experience cannot be reduced to a high-resolution snapshot of the visual field.
However, the enactive account of visual perception stresses also the *active* nature of the interaction with the objects of perception. I can see the whole cat behind the picket fence – or the entire visual scene as uniformly detailed – because the unseen details are available thanks to my ability to move. I can move around the visual objects, actively exploring all their profiles and then acquiring a visual image of the objects themselves as three-dimensional things. Movement and actions have a crucial role here.
However, what are the characteristics of aesthetic exploration? In what specific sense is aesthetic experience enactive? How much is it based on movement and active engagement? Noë seems not to focus explicitly on these issues in his book, preferring to present aesthetic experience against the background of an enactive theory of perception rather than proposing an enactive theory of aesthetic experience itself (personal communication). However, disentangling these issues can turn out to be crucial in light of the way Noë himself keeps describing the aesthetic experience. Indeed, the author compares and contrasts aesthetic seeing with what he calls "seeing in the wild" (Noë, 2015, pp. 51-56). Seeing in the wild is «active, embedded, subordinate to task, an openness to our world rather than [...] a state of reflection on or contemplation of the world» (Noë, 2015, pp. 51). This is the way in which we are usually directed towards the world in our everyday life: when we drive, prepare dinner or clean our apartment we see the world as the correlate of our practical goals, embedded as we are in the given situation. On the contrary, according to Noë, aesthetic seeing is contemplative and detached, and the world opens up as a set of objects that are there just to be seen. Aesthetic seeing, then, requires the ability to «*dis*engage with the world thoughtfully, or to reflect on the world around [...] as if the world were a picture to be inspected» (Noë, 2015, p. 55). Aesthetic experience, in other words, is a kind of disengaged way of thinking about the world or contemplating it.
However, how can this characterization of aesthetic seeing be compatible with Noë's account of aesthetic perception against the background of a general enactive theory of perception,

which has in the *active engagement* with the world one of its hallmarks? How should we conceive the aesthetic ongoing interaction with objects in order for it to be not at odds with the contemplative, detached and *disengaged* character of aesthetic experience itself?
It seems there are ways in which these two aspects of Noë's characterization of aesthetic experience may be compatible. However, in his book, Noë does not seem to focus on this aspect, leaving a possible issue of his account unresolved.
Moreover, a more developed characterization of the main traits of aesthetic experience as an ongoing interaction and exploration would be crucial. How should we consider such an engagement with respect to the different kinds of objects we can experience aesthetically? Let us think, for instance, of Noë's description of Richard Serra's sculptures (Noë, 2015, pp. 77-79, 85). More than sculptures, these works are *cityscapes* that the observer needs to enter and actively explore in order to really appreciate them. In this case, the aesthetic experience could be described very well by an enactive account. Yet, what about the enactment of a musical piece or a painting, for instance? Could this be of the same kind as the one we perform with Serra's sculptures? If not, what kind of active engagement would it be? Noë does not explicitly focus on these issues: he deals with different works of art, such as sculptures, paintings and musical pieces, but he does not give us a systematic account of the different features that aesthetic active engagement should have in these different cases.
In conclusion, therefore, my hypothesis is that Noë's reading of aesthetic experience against the background of an enactive theory of perception – which is an interesting and potentially very fruitful position – could be more convincing if it explicitly tackled the issues raised here, since they seem to be crucial for an account of the nature of aesthetic experience itself.

4. *A Parte Objecti* Analysis: What Kind of Correlate for Aesthetic Experience?

In the previous paragraph, I tried to show that some points in Noë's analysis of aesthetic experience need to be specified further in order for us to better understand the nature and the main features of the subjective *act* involved (*a parte subjecti* analysis). However, what about the analysis of the *object* of aesthetic experience (*a parte objecti* analysis)?
As I mentioned in the introduction, my thesis is that in Noë's book the analysis of the proper object of aesthetic experience fails to consider some crucial features of such object.
To be sure, Noë mainly focuses on a specific kind of aesthetic objects, i.e. works of art. However, as the author himself admits, the aesthetic sense is not just an *art* sense (Noë, 2015, p. 56). We can experience aesthetically a natural landscape, the atmosphere of a city, the interior design of an apartment, and so on. Potentially, every object can be experienced aesthetically.
In this sense, Noë's analysis does not seem to be committed to a too narrow account of the objects of aesthetic experience. However, the crucial point that has to be addressed is whether there are some peculiar aspects that we detect in the objects of perception when we are aesthetically oriented towards them. In other terms, the point is whether there is a specific objective correlate of the aesthetic attitude that is experienced in aesthetic perception as different, for instance, from general perceptual experience.
In Noë's theory, such an objective correlate seems to be the object *in itself*. Noë maintains that the peculiarity of aesthetic experience is the specific – contemplative and detached – attitude that characterizes it. Indeed, differently from non-human animals, human beings can and do often assume the aesthetic (thoughtful, reflective, and disengaged) attitude towards the world around them (Noë, 2015, pp. 52-57). Such an attitude seems to have its correlate in the *pure* and *neutral* object, free of its everyday practical meanings. In this way, pure shapes, colors and sizes are there just to be seen and inspected (Noë, 2015, pp. 52-53).
My hypothesis, however, is that such a characterization of the objective correlate of aesthetic experience overlooks some of the specific features to be found in everyday objects that can be

detected as being crucial in aesthetic experiences themselves. Let us clarify this point. Experiencing the world aesthetically means also *being affected* by it, in a positive or negative way. We can be attracted or disgusted by the objects around us. We can be struck by the dreamy gracefulness of the *Clair de lune* of Dubussy's *Suite Bergamasque*, as well as by the elegance and delicacy of the movements of a dancer. On the other hand, we can be disgusted by an abandoned and polluted natural landscape or by the violence and aggressiveness of the behavior of a man against a woman. What is that strikes us affectively in these objects? Is it just the pitch and loudness of the notes in Debussy's music or the directions in space of the movements of the dancer or of the man against the woman? Is it just the colors of the natural landscape?

My hypothesis is that it is not the case that the primary or secondary qualities of the objects of our world affect us in aesthetic experience. It is not the shape, the color, or the size *per se* that strike us. Rather, it is their qualities of being *elegant*, or *graceful*, *aggressive* or *violent*.

What kind of qualities are these?

The phenomenological and Gestalt traditions called them "tertiary qualities", to recall the classical distinction between primary and secondary qualities that, as is widely known, has characterized philosophical thought from the beginning and has been stressed by many authors – from Democritus to Galileo to John Locke (Bozzi, 1990). Differently from primary qualities – that pertain to the domain of measureable quantities such as weight and size – and secondary qualities – that pertain to the domain of sensible features such as odours and colours – tertiary qualities appear as the multitude of *expressive*, *aesthetic* qualities that objects may reveal to us. The *brightness* of a shade of red, the *gloominess* of black, the *solemnity* of a public and institutional ceremony, the *melancholy* of a sunset. All of these qualities can affect us, positively or negatively. This is the reason why they have been also labelled the "attractive" and "repulsive" features of the objects in the world around us (Lewin 1935).[2]

If aesthetic experience also means being affected by the seen objects (both sensibly and intellectually), and if aesthetic responses can be characterized as a kind of "visual evaluation" or "judgements", as Noë himself maintains (Noë, 2015, p. 55, 132), then expressive qualities seem to be an adequate correlate of aesthetic experience itself. They are exactly those valuable – positive or negative – features that the objects of our world show and that can affect us because of their power to attract or repel.

In his book, Noë seems to overlook these specific features of the objective correlate of aesthetic perception. Yet, it would have been particularly crucial to consider them also to avoid reducing aesthetic experience merely to a kind of intellectual and detached contemplation. In fact, aesthetic experience can be said to be different, for instance, from scientific observation or meditative contemplation of the world exactly because it is evaluative and because it involves *affective* responses to the objects in the world. In my view, this is possible because aesthetic seeing detects the sensible, attractive or repulsive, features of our world. An account that does not deal with these qualities, therefore, risks ignoring a crucial aspect of the objective correlate of aesthetic seeing itself.

Moreover, a (phenomenological or Gestalt-based) theory of *expressive qualities* actually seems to be compatible with Noë's account of aesthetic seeing and perceptual experience in general. Indeed, Noë maintains that, in perception, we do not just detect colors, shapes, or sounds. We do perceive meanings. We do perceive *affordances*, for instance, in the Gibsonian sense (Gibson

2 Kurt Lewin used the term "Aufforderungscharakter" to refer to the positive and negative valences that characterize the objects in the environment and that orient our behavior. See Lewin, K. (1935). Based on this term, James J. Gibson coined the term "affordance", which is very well-known today in the debate about the philosophy and psychology of perception, and about the relation between perception and action (Gibson 1979).

1979) – that is, we perceive the practical opportunities and obstacles the environment offers to us. Likewise, in music perception we do not perceive mere sounds, but sounds *as* the outcome of the musicians' gestures and actions; just as, in listening to a conversation, we perceive words as meaningful and expressive of one's thoughts (Noë, 2015, pp. 182-190). In Noë's account, therefore, meanings seem to be what is primarily given in perception.
In the phenomenological and Gestalt-based account of expressive qualities (Bozzi, 1990; Scheler, 1923; Köhler, 1938; Ingarden, 1931; Arnheim, 1954), such qualities are described exactly as the primary datum of perception, not just as a set of features subsequently projected on the neutral object of perception. Indeed, expressive qualities can be perceived before – sometimes even without – the recognition of the elements that contribute to their emergence. As Max Scheler says, for instance

> I can tell from the expressive "look" of a person whether he is well or ill disposed towards me, long before I can tell what colour or size his eyes may be (Scheler, 1923, p. 244).

In the same way, when staring at a fireplace we perceive the flowing movement of the fire and the brightness of the colors before or without necessarily focusing on the different shades of red or on the geometrical shapes and the speed of the flames (Arnheim, 1954, pp. 369-375). Likewise, we can perceive the solemnity of a ceremony or the joyful atmosphere of a party long before focusing on the interior design of the place or on the objects' colors.
After having been perceived, expressive qualities can then guide us in analyzing the structural elements from which they have emerged. According to Mikel Dufrenne (1953), for instance, the analysis of the aspects contributing to expressiveness can actually be done only *after* the expressive quality itself has been perceptually grasped. We need, for instance, to experience the *vigor* of César Franck's *Prelude, Chorale and Fugue* in order to recognize that it (partly) depends on the development of the themes, on rhythm and on the final modulation from the minor to the major scale. Similarly, we first recognize the *mysterious grace* of Debussy's *The Girl with the Flaxen Hair* and then we attribute it to the uncertainty of the rhythm and the instability of the tonality (Dufrenne, 1953, p. 441).
These remarks also allow us to highlight another crucial aspect of the phenomenological and Gestalt-theory's analysis of expressive qualities. Such qualities are not projected on objects by the subject who perceives them, but emerge in the objects themselves on the basis of the elements such objects are composed of, and the way in which these elements are structured. Authors such as Moritz Geiger or, more recently, Paolo Bozzi harshly criticized, for instance, the thesis according to which expressive qualities are just affective features projected on objects on the basis of the affective responses of the subject involved (Geiger, 1910, 1911; Bozzi, 1990). Criticizing this idea, indeed, Bozzi (1990) noticed that our affective responses to the objects around us are not necessarily akin to the expressive quality we recognize in the objects themselves. If Anne is sad and not well-disposed and she goes to a cheerful and joyful party, she can be perfectly able to recognize the happy atmosphere of the party without being infected by it in any way; on the contrary, she could be much more bothered and annoyed because of it (Bozzi, 1990, pp. 103-104). In the same way, the brutality of a murder can evoke as many different responses as the different individuals taking a position on it – it can evoke revenge, for example, or forgiveness, or it can also remain completely ignored by some. Yet, the brutal character of the murder or the cheerful and happy atmosphere of the party still remain there, in the objects themselves; they just evoke different affective responses in different people.[3]

3 Songhorian and I previously discussed these examples in Songhorian, S., Forlè, F. (2015).

Expressive qualities, therefore, seem to emerge from objects themselves, based on how these objects are structured. This position tries to recognize what Pinotti called "the object's rights" (Pinotti, 2005, pp. 15-20) – that is, the fact that objects have to present certain distinct features rather than others in order to have specific expressive and aesthetic qualities. In this sense, not any color can be gloomy, just as not any atmosphere can be joyful and cheerful. There are some objective aspects that cannot be easily drowned out by subjective projections.
Gibson said something similar about *affordances*. Affordances are the opportunities and the obstacles that the environment offers to the animal (Gibson, 1979, p. 127). They depend both on the features of the objects and on those of the animal involved – for instance, a little hole in the wall can afford hiding for a butterfly, but not for an elephant.
However, this does not mean that affordances are not in the objects themselves, or that they change according to the animal's need. Affordances are what the environment offers to the animal, regardless of the fact that the animal notices or exploits them or not. Underlining this crucial aspect, Gibson says that "[t]he object offers what it does because it is what it is" (Gibson, 1979, p. 139).
Gibsonian affordances can be recognized as a subset of tertiary qualities: they are valuable aspects of the world, either positive (opportunities) or negative (obstacles), which can attract or repulse us. In addition, they are qualities of the objects themselves, not just projections of our subjective needs or acts.
As this brief presentation tries to show, tertiary qualities are much more widespread than it is usually thought. Some of them emerge particularly in aesthetic experience, making the latter not just a detached and contemplative seeing but also an affectively-connoted and evaluative experience. Recognizing Gibsonian affordances as part of the objective correlate of perception, Noë's position does not seem to be incompatible with a phenomenological and Gestalt-based account of expressive, tertiary qualities. The hypothesis of this paper is that Noë's account of aesthetic experience and its objective correlate could actually benefit from bringing tertiary qualities into the picture.

5. Conclusion

Strange Tools is a very provoking and ambitious work. It presents an overall theory that, because of its strong as well as original theses on the one hand, and its debatable passages on the other, may be a promising candidate for opening a new field of discussion at the interface between aesthetics, the philosophy of mind and the philosophy of action.
What I have stressed in this paper, however, is the need to specify some aspects of aesthetic experience, both *a parte subjecti* and *a parte objecti*. On the one hand, I highlighted a potential conflict between Noë's reading of aesthetic experience against the background of an enactive theory of perception and the aesthetic detached and contemplative attitude. On the other hand, I have suggested how the features of the objective correlate of aesthetic seeing may be specified, trying to find a way to account for the affective and evaluative character of aesthetic experience itself. My thesis is that specifying aesthetic seeing on both the issues I raised here may be useful for Noë's account, also in providing a wider background for one of the main topics of his book, i.e. the aesthetic experience of those peculiar objects that are works of art.

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ART AND ENTANGLEMENT IN *STRANGE TOOLS*

abstract

What is art? Why does it matter? What does it tell us about ourselves? In this essay, I introduce and in some cases extend the basic account of these matters offered in Strange Tools (New York, Hill and Wang: 2016).

keywords

Strange tools, art, pictures, choreography, organization

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There is an old-fashioned party game for children. Each child reaches into a brown paper bag whose contents are hidden from view; the task is to name what you hold in your hand. Even familiar household implements such as a comb, a cork, a thimble, a feather, a sponge, a spoon, and the like, can be delightfully baffling. To the touch they can seem fragmented and disunified, a chain of empty properties. The moment of recognition can be thrilling. Beneath your touch, the properties assemble themselves as integrated wholes. Now *they* – the objects themselves rather than the isolated qualities – show up in your perceiving.

Context plays a similar and similarly invisible role when it comes to pictures. It is rare that we encounter pictures whose pre-assigned task is not evident. Pictures, whether in print or online, or wherever, typically come with captions attached. And even where there is no caption, pictures very frequently have readily apparent rhetorical or communicative functions. The picture of husband and child that adorns your desk, or your Facebook page, the photo in your passport, the pixelated rendition of an oven stuffer in the newspaper circular, the animal figures in children's books. We know in advance what these pictures are for, what they are, in the normal case, used to show. Pictures rarely puzzle us.

Remove the context, however, and what would otherwise serve as a picture, as a display or a presentation, becomes an opacity and, sometimes, a curiosity, a puzzle, or even, a work of art. Why do we find pictures interesting? Why do we make them and use them and look at them? I suspect there are as many different answers to these questions as there are reasons for showing, displaying, looking and studying. Our interests may be personal; they might have to do with science or engineering, with education, with religion or politics. It is not the job of a theory of pictures to tell us why parents can't enjoy the Easter Egg Hunt without filming it, or why lovers, these days, even as they embrace, are liable to keep one arm extended to make the selfie they might later post to social media. Pictures are made and put to work in what can only be described as many different ways. I think of there being a vast picture-psychology, or picture-economy, or picture anthropology, and this is as reticulate and changing, as trending and historical, as our lives themselves.

Which is not to say that we can make no theoretically important generalizations. As I have already indicated, a picture is an instrument for showing, or putting on display. And the relevant context in which pictures succeed or fail to perform their function of showing is a communicative one. We use pictures to show. And, the lure of psychological or neuroscientific models of how pictures work notwithstanding, pictures do not secure their pictorial function by themselves alone, or so I argue in *Strange Tools*. A picture cannot provide its own caption,

and without a caption the picture is not a picture but a blank or a pictorial misfire. Of course explicit captions are very often missing. In that case it is other aspects of the context that do the caption's job of letting you know, in advance, as it were, what you are looking at.
It is worth remembering that even though there have been big changes in pictorial media in the last few decades, and in the last few centuries, resulting in recent very rapid change in what we habitually do with pictures, the fact remains, human beings have been making pictures for about as long as there have been human beings, or rather, for about as long as there have been what are known as psychologically (as distinct from anatomically) modern human beings, that is to say, for more than 40,000 years. Pictures have played a role in organizing our communicative and visual activities of showing since prehistorical times.
Now, as I have already suggested, not all pictures are artworks, nor is it the case that all art painting, photography or sculpture, is pictorial.
Is there a special interest or value attaching to pictorial works of art? And if so, what explains this special standing?
In *Strange Tools,* I make the following proposal: artwork pictures are not themselves moves or gestures or transactions within the complicated, multi-layered, life-embedded economy of pictures to which I have be referring. They are not, in this sense, pictures at all, that is, instruments functioning within and constrained by a communicative context for the purposes of showing. Pictorial artworks are not like the pictures in the family album, or newspaper, or online catalog, or magazine, only better, or more beautiful, or more innovative, or more noble or exalted in their subject matter. But nor are they entirely alien to those more domestic deployments. My proposal is that paintings, photographs and plastic works of art that are pictorial are significant not because they are special pictures, but because of the special importance that pictures have in our lives and because of the distinctive manner in which they, works of art, exhibit the place of pictures in our lives. Moreover, and I'll explain this as I continue, artwork pictures do this, they put us and our picture making activities on display, in a way that enables us to do it all differently.
Art, speaking generally now, is bound up with making, construction, doing, putting together, tinkering and manufacture. Why? Not, I propose, because artists are bent on making special things. But rather because making is so special for us. Making activities – technology in the broadest sense, but also forms of activity that are not conventionally thought of as technological or tool-using activities such as talking and looking – make us what we are. A strange tool, in my sense, is not a tool at all, and its work, its value, is in the way it unveils the way tools make us what we are.
According to the theory of *Strange Tools*, then, picture making as an art has both nothing and everything to do with pictures. Nothing, because pictorial works of art are not, in a way, pictures at all, that is, implements for showing this or that deployed in this or that communicative context.
But also everything! For painting and the other pictorial arts would have no point at all if not for the organizing, central role, of pictures in our lives.
This is not meant to be a piece of dogma. I am trying to describe the phenomenon. Artworks – keeping with pictures – are puzzle objects in all the ways that the picture in the newspaper or in the ad only exceptionally ever are. Indeed, they are, I would go so far as to say, philosophical objects. You can never simply say what the artwork picture shows, in the way you can say what the passport photo shows. Or if you can – as when you say, this is Leonardo's portrait of the Duke's mistress, or this is Nigerian-born New York-based artist Toyin Ojih Odutola's portrait of her brother – you haven't even begun to touch on the meanings of the picture as an artwork. When we are in the setting of art, moreover, there is never a function or set of possible functions that settles the questions, the difficulties, the inabilities to

comprehend; there is never a caption that would be authoritative. In this sense, then, art is disruptive. Always. Everywhere. The artwork picture looks like a picture but doesn't discharge pictorial functions as we would, in a different setting, expect. I don't mean, when I say this, that art always startles or agitates or shocks. That *would* make my position avant-garde-ist or modernist in a parochial way. But that is not the view. Paintings and other pictorial works art stand to the background place of picture making in our lives in something like the way that irony stands to straight talk. They are different, but one presupposes the other. Maybe each presupposes the other, an idea to which I will return.

To recapitulate: I distinguish picture-making from the making of pictorial artworks, and I distinguish the ways we use pictures in our familiar lives (online, in the newspaper, in the family photo album, on billboards, in textbooks, but also in making plans for a construction project, in geometry, and so on), from the way we use pictures when we are interested in them as art. I will mark this contrast as that of first order versus second order. Painting as an art, then, is a second-order activity; it puts picture-making and picture-use, as a first-order activity, on display, and does so, I will try to show, in ways that are liable to change the first-order activity itself, or (and this will prove to be important as we go on) other nearby and related first-order activities.

I propose similar accounts of all the arts. Arts stand to the first-order activities that provide them with their raw materials in the way that painting as an art stands to picture-making activities, and they acquire what significance they possess from the importance of the first-order organized and organizing activities that they take for granted. (A good part of *Strange Tools* is devoted to laying out why these organized activities, these habitual activities, are so important, both culturally, biologically, and philosophically.)

Dancing, for example, is something people habitually do. We do it for many different reasons, in many different ways, in many different settings. Human beings dance. We are dancers. We are, in my parlance, organized by dancing. We find ourselves dancing. Dance as an art, I argue, however, is not just more dancing, not just dancing taken to new heights and deploying new feats of virtuosity combined with all manner of stage craft. Dance as an art, or choreography, I argue in *Strange Tools*, puts dancing, as we know it, on display; it stages it. And in doing so it stages, or displays, us, we human dancers, the fact that we are dancers, that we are organized by dancing, and the different meanings this can have for us. And so it displays us. In this way we might even say that choreography investigates us, or investigates us in one particular neighborhood of our being, namely, that neighborhood, big and messy and sprawling, where we dance.

And so, for these reasons, I argue that choreography has both everything and nothing to do with dancing. Everything, as we have seen, because there is only an art of dance because we are dancing human beings and this is a fact– a personal, a psychological, a political, an anthropological, a biological – fact about us that matters. But nothing, too, because, whatever else is true, dance on the stage is not dancing, not any more than a staged, model rental unit in an apartment complex, is a home. (As with a model unit, the dance on the stage may be materially identical to dancing as we perform it at the wedding, or at a party, although it need not be. The difference between dance art and dancing, like that between a model unit and a home, is a conceptual one.)

Now this account of choreography is made more complicated by the fact that I am oversimplifying when I suggest that choreography targets the first-order activity of dancing *alone*. Dance as an art has other sources than dancing; it works with other raw materials as well. The ballet, for example, has origins in styles of movement that might be characterized as courtly or bound to questions of style that have more to do with manners than dancing; status and bearing and poise are in play; moreover, as I learned from Jennifer Homan's book

on the history of ballet, there was a whole theory of the regimentation and organization of the body at work in ballet's origins, one not unrelated to the history of logic and grammar.[1] Much choreography is also narrative. And a great deal of contemporary choreography takes the whole range of human movement as, as it were, its pallet. And then there is the abiding fact, to which I will return, that choreography, like painting and the other arts, always builds from and refers to other art, other choreographers, other performances. So we are a far cry from a simple scanning of choreography as second-order meta-dancing which takes as its source the first-order dancing that is so prevalent in our lives.

In fact, it is my main objective in *Strange Tools* to bring out the ways in which a simple opposition of first order and second order is inadequate to explain the relation between life and art, technology and art, tools and strange tools. It is only from the standpoint of a clear conception of the difference between levels that we can appreciate what I think of as their ineliminable *entanglement,* the entanglement of first order and second order, of life and art, of tool use and the special value of strange tools. It is this phenomenon of entanglement, I want to show, that we most urgently need to understand and this is my true focus in *Strange Tools* (although I don't use the word "entanglement" there).

Before pursuing this theme of entanglement directly, some preliminaries:

When I say that art aims at unveiling us to ourselves, and that it seeks to do so in ways that lets us reorganize, I do not mean, nor do I see why I should be compelled to mean, that this is what artists intentionally aim at. I mean, rather, that it is this which is the source of art's value, whatever intentions move the artist and whatever an artist might say or believe about her work, or his.

When I say that choreography puts dancing on display, or that painting unveils the place of pictures in our lives, I don't mean that all choreography is *about* dancing (even subject to the qualifications above), or that pictorial artworks are *about,* or have as their subject matter, pictures and pictoriality, or the phenomenology of seeing, or anything else, although they may have (and as a matter of fact have had throughout history; this is, I believe, not a modern preoccupation. Aside: even the cave paintings, it seems to me, seem to suggest a whole unknown art history). Moreover, ass I have already mentioned, picture transactions happen in the vicinity of morality, church, God, sex, money, science, family, and so pictures and their use frequently affect us and are bound up with feeling and emotion. For this reason, an art of pictures, conceived as I do, has available to it, throughout history and across cultural space, a correspondingly enormous, indeed, I would say, an entirely unrestricted range of topics and preoccupations. Just as philosophy does. Neither philosophy nor art can be specified by reference to subject matter. The strange-tools theory makes no predictions about nor draws limits to what picture art may be about. *Mutatis mutandis* for dance and the other art forms.

Art forms (dance, painting, etc) are local to different, distinct, and sometimes plural, first-order organized activities, and it is this locality that gives them their basic meaning as well as their means. Some artists are performers, others are writers, others are plastic modelers and still others are builders. They are all artists and the scope of their concerns in unrestricted. But what makes them artists of one form or the other is the fact that they happen to work (as a result of decision, or, perhaps, less of decision than of their confinement, as a result of contingencies of life and class and situation) with the raw materials of one or another organized activity or tool-using activity.

The thesis is: we make art *out of* organized activities. Art is not *about* organized activities (unless of course it happens to be). And in making art out of organized activities, in making

1 See Jennifer Homans *Apollo's Angels: A History of Ballet*. New York: Random House, 2010.

art with these raw materials, the artist enables us to know ourselves better in relation to those bio-cultural – to borrow a term of John Protevi's – behavioral substrates. Art lets us know ourselves better because it does its work, where, as a matter of habit, we find ourselves.

In *Strange Tools* I begin with puzzlement about the very fact of art. We know that artists may be plumbing matters of social, or moral, or political, or religious importance. But then why in the world are they be so doggedly bound up with activities of making, tinkering, throwing, sewing, marking and building? Why is art, always, so specifically, so concretely, bound up with its own medium (with clay, or mark making, or voice, or movement)? What does art have to do with the tools, technology and first-order making activities that it deploys? My answer: It makes art out of them and this art may be about whatever may happen to matter.

Now let us turn to the phenomenon of entanglement.

The first thing I want us to notice is that art practices arise spontaneously and even necessarily out of first-order activities. Pictures organize our lives, dancing organizes our lives, but we are not the authors of this organization. Like Gregor Samsa in the Kafka story, we simply wake to find ourselves put together by habit, body-schema, expectation, skill and situation, in a variety of ways. We are lost. The impulse to make art, like the impulse to make philosophy, is the impulse to be found, or to orient ourselves. Artworks, I have argued, let us achieve this. Art, like philosophy, aims at or seeks the making of something like a representation of ourselves (or of ourselves dancing or making pictures), what Wittgenstein called a perspicuous representation.

The second point is that the representations of ourselves of the sort that art provides loop down and change the first-order activities of which these are the representation. A good analogy for what I have in mind is the relation of writing and speech. Speech is one thing and writing another, but the existence of writing influences not only how we talk, but how we think about what we do when we talk. Writing, and everything that goes with it, gives us a way of conceptualizing language and speech and thus scaffolds and enhances speech even if it is also always at the same time, to some degree, a falsification of what speech is. We experience our words and speech sounds as things that have spellings, and our lives as readers and writers shapes what we take ourselves to be doing even when we speak in the most informal or intimate of settings. (This is a big topic and one that I explore at some length in *Strange Tools*.)

Turning back to art: Dancing, in a world in which there are in currency choreographic representations of dancing, is made new. I don't mean that we all perform lifts, balancés and arabesques on the dance floor, or that we would ever think of doing that. I mean that the existence of articulated forms of dance-displays shape what we think dancing is or can be and indeed in a way that reorganizes how we experience our dancing bodies in much the way that writing reorganizes our experience of our own talking and what is possible or interesting when it comes to talk. We can't unsee the dance performance we have seen. The image of dance – Ballanchine to Michael Jackson, you name it – provides, to borrow language from the late art historian Anne Hollander, the standard by which the direct perception of ourselves and others dancing is assessed.[2] It loops down and affects the activities of which it was the image.

A few years back I was traveling with a sculpture by Robert Goodnough. It was made of sharp pieces of steel bolted together. The security guard at the airport pulled me out of the line. She set the object down on table and began to study it. Finally, exasperated, she asked me what it was. It's art, I said. She smiled and looked relieved and took a whole new look at the piece. You can go through, she said. And then she added, "there's not a lot of art in this art."

2 Anne Hollander, *Seeing Through Clothes.* New York: Viking. 1978.

What I find remarkable in this episode is that she understood that by framing the object as art, I had removed the legitimacy from, or altered the character of, her demand to know what it is. In learning that it was a work of art, she released herself from the need to figure out what it was for or how it worked.

It is only by appreciating the entanglement of life and art, first order and second order, and so, only by granting the importance of these distinctions that get so deliciously messy in practice, that we can appreciate why art always -- yes, I want to say: always, everywhere -- raises this sort of question about itself, this question of how to frame what it is for, what it is trying to do or why, in a way, it may not be trying to do anything. To insist, as I do, on the legitimacy of this question *Is it art?* is not to insist on there being a decision procedure for supplying an answer. Indeed, and this is a direct consequence of entanglement, it is to insist on the opposite.[3]

3 A longer version of this essay was originally published under the title "Art and Entanglement in *Strange Tools*: Reply to Noël Carroll, Anne Eaton and Paul Guyer" in *Philosophy and Phenomenological Research* (94, 1, January 2017: 238-250). I am grateful to the journal for permission to publish this reworked version here, and to Noël Carroll, Anne Eaton and Paul Guyer, whose valuable critical commentary on *Strange Tools* at the Pacific Division meetings of the American Philosophical Association in April 2016, occasioned me to write it.

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WAYS OF PERCEIVING AND MAPPING HUMAN COGNITION THROUGH ART*

abstract

This paper discusses the question of how art might reveal important aspects of human cognition by taking as a starting point Alva Noë's book Strange Tools. Art and Human Nature (2015). I argue that the enactive approach defended in this book has strong affinities with some recent art-historical approaches that take their cue from cognitive neuroscience, such as neuroarthistory (Onians, 2016). My main claim is that the extended mind thesis, which is implied in both approaches, fails to capture important aspects of the cognitive underpinnings of artistic practices. Finally, I bring into focus Noë's ambiguous position with respect to the role of perception in aesthetic appreciation. What good comes from distinguishing between various ways of seeing while at the same time holding that art appreciation is a matter of value and judgment rather than perception and response?

keywords

enactivism, human cognition, aesthetic perception, neuroarthistory

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1. Introduction

In his book *Strange Tools. Art and Human Nature,* Alva Noë (2015) makes two strong claims with respect to the human engagement with art: the first claim is methodological and refers to the idea that art practices should be regarded as tools of intelligibility of human nature, providing a meta-level understanding of ourselves (p. xii); the second claim, which is related to the first, refers to the nature of perception and to the possibility of there being a particular way of seeing artworks, namely, what Noë calls "aesthetic seeing" as opposed to "wild seeing" (pp. 51-52). In this paper, I will look into these two problems that touch upon human cognition and its relation to the arts. More specifically, I hold that Noë's commitment to the view that art unveils aspects of human nature gains in intelligibility when situated "in the context of its embedding" (p. 29) – just like the strange tools he refers to – and this context is provided by some recent art-historical developments informed by empirical sciences.

In the first part of the paper I focus on the methodological claim that presents art practices as second-order activities, mapping our cognitive life (p. 30). Furthermore, I argue that Noë may have more in common with the very approaches that he sets out to criticize, namely the approaches grounded in cognitive neuroscience. In the last part of the paper I compare John Onians's neurobiological approach to aesthetic appreciation to Noë's enactive approach and highlight some of their inconsistencies. Enactivism, no less than neural approaches to art appreciation in their radical reductionist versions, may neglect important aspects concerning the cognitive underpinnings of appreciative practices.

2. Art and cognitive mapping

First of all, consider the hypothesis that art practices are epistemic, second-order activities mapping the *material* world by sampling carefully the representative parts of it, just as regularly maps do. This epistemic hypothesis is deep-rooted in the tradition of philosophical aesthetics at least since Baumgarten. In his latest book, Alva Noë makes a case for another epistemic virtue of artistic practices, namely the potential of art to map the *inner* world of the art perceiver and to provide a basic sense of self. In other words, art can serve to delineate not only the outer world but also human cognition,[1] operating in a similar manner to the geographer's map; hence the idea of "art as mapmaking" (p. 30). As Noë states in the

1 This point is also made by Noël Carroll (2017, pp. 234-235), who rightfully observes that Noë, in stressing the art's quality of putting on display certain activities, he focuses mostly on cognitive practices, at the expense of other practices, such as moral or political.

following passage: "art provides us an opportunity to catch ourselves in the act of achieving our conscious lives, of bringing the world into focus for perceptual (and other forms of) consciousness" (p. xii). Thus forms of art such as "poetry, choreography, painting and photography and so on" would bring to consciousness and give a sense of basic actions such as "acts of talking, dancing, making pictures etc" (pp. 29-30). The discussion is reframed in terms of a hierarchy of levels, where level 1 comprises these latter, first-order activities, while level 2 comprises the different arts, understood as second-order activities illuminating the first (p. 29). Strikingly, this view parallels Franz Brentano's (1894-1911/2008, p. 101) understanding of the mental act as having two objects, in this case, the *object* of contemplation, say, a canvas or a piece of music, and the contemplation or awareness of the very *act of seeing or listening*. Art would thus trigger self-reflection, allowing us to attain knowledge of our cognitive life, more specifically, of the ways we perceptually engage with the world.

Initially limited to forms of "experientialist art", which are intended to explicitly reveal aspects of the perceiver's experience,[2] thus serving as a means of "first-person phenomenological investigation" (Noë, 2000, p. 133), Noë ultimately extends his argument to all forms of art. A further modification is that it is no longer clear whether the alleged artistic investigation of experience is situated at a personal level. In what sense are we supposed to attain knowledge of our cognitive life through art exposure? What kind of self-knowledge or self-awareness would be in play? Noël Carroll, for instance, takes this form of awareness elicited by art practices to be an act of reflection, occupying the foreground of consciousness (Carroll, 2017, p. 215), but Noë's more general engagement with the embodied approach may contradict this view. Departing from the Brentanian tradition, Noë seems rather to hold that the artistic investigation that gives access to knowledge of the self takes place at the embodiment level; it would be carried out through an immediate bodily engagement with the artworks not through an introspective exercise generating internal representations. As Noë writes, the embodiment level is situated "between subpersonal and conscious level" (Noë, 2015, pp. 8-9, 218), hence any form of introspectionism that would rely on self-reflexive, transparent mental processes would be discarded. Therefore, the level at which activities like dancing, making pictures etc. would be put on display for us is neither the level of the subpersonal biological processes that causally underpin certain behaviors (e.g. sensorimotor abilities), nor the level of conscious awareness, of deliberate, controlled action, since we pay no particular attention to the processes that enable us to see or interact with an environment (Noë, 2004, p. 30). If my understanding of Noë's overall argument is correct, then the appropriate level would be this intermediate, embodiment level, where there is no sharp line between personal and subpersonal processes, between the states of the organism and the conscious experience of the individual.

How could then art "unveil us to ourselves" (Noë, 2015, p. 101) and "reorganize us" (p. 29) while at the same time occupying this intermediate position so elusive to grasp? In order to illuminate this issue it would be helpful to compare the concept of "subpersonal level", in Noë's terms, with the concept of "pre-reflective self-consciousness"[3] in phenomenological terms. On the one hand, the subpersonal level as understood by Noë is concerned with automatic processes such as sensorimotor activity, which do not reach explicit awareness (Noë, 2004, pp. 30-31, 218-219, 228). For instance, I can adjust the movement and the force of

2 Such aspects of experience to which art may draw attention are the perceiver's bodily movements, his or her environmental embedding, the temporal dynamics of perception etc. For instance, Brigitta Zics's project *The Mind Cupola,* which feeds on the spectator's cognitive and affective states, is an extreme example of "experientialist art" that puts literally on display human cognition. See Brigitta Zics (2011, pp. 30-37).

3 I am grateful to an anonymous referee for making this suggestion.

my hand grasp while trying to reach a glass bauble without paying attention to the process of grasping itself. Such process would not be necessarily reflected in the phenomenology of my experience. On the other hand, the notion of "pre-reflective self-consciousness", which has been recently revived by Shaun Gallagher and Dan Zahavi (2008, p. 46), refers to a type of implicit awareness of the self that does not require higher-order, reflective processes such as introspection. This notion leaves open the possibility that some sensorimotor abilities such as one's bodily movement or posture, motor or visual coordination etc. may be after all part of one's conscious awareness, securing some minimal sense of a self (pp. 49-50). The phenomenological approach is consistent with Noë's embodiment approach, which doesn't rule out the possibility that sensorimotor abilities become features of experience; in Noë's terms, a minimal awareness of these abilities would occur at the embodiment level. But surely art unveils aspects of the self other than purely sensorimotor contingencies. What alternative to this view could there be? In what follows I will try to answer this question by drawing on art historical theories inspired by psychology.

3. Embedded Tools and the "Forging of Master Keys..."

The enactive approach to which Noë adheres is based on the assumption that the organism's transactions with the environment are crucial for human cognition. Yet these transactions are not usually transparent to us; "we are organized but are lost in the nesting, massively complicated patterns of organization" (p. 28), as Noë remarks. And this is where art comes in, "investigating the modes of our organization, or rather, the manner of our embedding in different modes of organization" (p. 28), by isolating our basic activities from their settings, by making them peculiar and thus manifest to us (pp. 29-30). As argued above, it not clear to exactly what extent these activities are considered to become manifest through art. Leaving this question open and moving forward, I would like to draw attention to the fact that artworks themselves, as products of skillful activity and modes of reorganization in their own right, are equally embedded within a setting, which we as well take for granted and most of the time disregard. If Noë acknowledges as background setting first-order activities (seeing, walking, talking etc.), out of which art practices arise (2017, pp. 239-240, 242), what I have in mind is the art historical context itself, in which artworks are generally located. To paraphrase Noë, we make art of out art not only out of basic activities (p. 242). In an interpretation of one of Gombrich's most famous aphorism – "there is no such thing as art. There are only artists" – Noë (2015, p. 112) hints at the temporal embedding of artworks, observing that there can be no essential definition of the abstract category that we call "art" but only a "story", a narrative that connects more or less arbitrarily particular art practices and individuals that take part in these practices: "art is always ... an engagement with other art, with artists, and audiences, and teachers and students" (p. 112). Now, it is my contention that if we laid more emphasis on this temporal and contextual embedding rather than on the strangeness or singularity of the individual works of art, we would start to have a good grip on the problem of unveiling us to ourselves through art. What I am suggesting is that we may have to appeal to an explicitly reflective research practice such as art history in order to bring to the foreground of consciousness the distinctive manner in which artworks elicit self-knowledge. Trying to "work this one out for ourselves" (Noë, 2017, p. 249) while rejecting any contribution from available science might not lead us very far (Carroll, 2017, p. 221).

The question how art might reveal important aspect of human cognition was for instance at stake in Gombrich's writings but also in George Kubler's seminal book *The Shape of Time. Remarks on the History of Things* (1962). Kubler had this intriguing idea of a manifold portrayal

of the art historical time, which would be divided according to series and formal sequences,[4] treated as akin to solutions to problems that the artists seek to solve: "every man-made thing arises from a problem as a purposeful solution" (p. 7), he said. The artistic forms would be studied independently of their individual, symbolic meaning, and always in time, they would be appreciated by series, not taken in isolation:

> A pleasure shared by artists, collectors, and historians alike is the discovery that an old and interesting work of art is not unique, but that its type exists in a variety of examples spread early and late in time. Much of our satisfaction in these circumstances arises from the contemplation of a formal sequence, from an intuitive sense of enlargement and completion in the presence of a shape in time (Kubler, 1962, pp. 40-41).

The problems disclosed by these formal sequences, the original quest which lies behind all this would have "enlarged the domain of the aesthetic discourse" (p. 40), a domain which, according to Kubler, "concerns affective states of being" (p. 40). The artistic styles of naturalistic depiction (pictographic, photographic etc.) and the depiction of ornament could be examples of such problems, as are illustrated in Gombrich's writings. Thus, in a certain sense, art is shaping the understanding of various states of mind. By disclosing these problems art historians trace in fact the history of different facets of our cognitive life, different "affective states of being" which lead to the creation of specific art forms. Seen in this light, Gombrich's (1973) famous definition of art history as "the forging of master keys for opening the mysterious locks of our senses to which only nature herself originally held the key" (pp. 201-202) becomes particularly relevant for Noë's thesis regarding human nature as unveiled through art. The definition continues as follows: "Like the burglar who tries to break a safe, the artist has no direct access to the inner mechanism. He can only feel his way with sensitive fingers, probing and adjusting his hook or wire when something gives way" (pp. 201-202). The "keys" or "solutions" that happen to fit into such biological or psychological locks are forged through artistic strategies. In sum, the artist appears as a burglar that tickles our inner mechanisms by these funny keys that we call artistic techniques. For Gombrich, art is a matter of creation rather than imitation (1963, p. 3) or mere transcription of nature; more specifically, art is a matter of creation of "substitutes": thus, a stick that we can ride on qualifies as a hobby horse[5] just as a witty caricature qualifies as a portrait: "There are inventions in the history of art that have something of the character of such an open-sesame, [such as] the clues to expression discovered by humorous art. The question is not whether nature "really looks" like these pictorial devices but whether pictures with such features suggest a reading in terms of natural objects". The reading to which Gombrich refers has nothing of an illusionistic character, in the sense of being fooled by a pictorial device such as perspective, as Noë claims (2015, p. 107-108). Gombrich's psychological understanding of art amounts to saying that we respond in a certain manner when we are "keyed up" by exposure to particular artistic styles. The "keys" that fit into these psychological locks – or strange tools, if you like – are mere

4 "The closest definition of a formal sequence that we now can venture is to affirm it as a historical network of gradually altered repetitions of the same trait. The sequence might therefore be described as having an armature. In cross section let us say that it shows a network, a mesh, or a cluster of subordinate traits; and in long section that it has a fiber-like structure of temporal stages, all recognizably similar, yet altering in their mesh from beginning to end" (Kubler, 1962, p. 33).

5 Other examples: "the cat running after the ball as if it were a mouse, counterfeit coins which make the machine work when dropped into the slot" (Gombrich, 1973, p. 4).

substitutes, second-order representations of the world, becoming more and more refined through artistic strategies. Being keyed up by these techniques does not fall under the "trigger experience conception" of seeing (Noë, 2015, p. 97) deplored by Noë.

In order to illustrate this idea of art as creation of substitutes with a specific example, we can take an extreme case offered by John Onians (1996, p. 206), where culture plays no role, namely, "a story of emulation" set at a dolphinarium. It is a story that tells the natural emergence of a creative behavior that is not the product of the god within the artist, so to speak; moreover, this natural story stands in stark contrast to the canonical art history, as we know it today. We are thus provided with an alternative version of the artistic discourse, one that locates the processes of creativity within broader contexts. Here's a full description of what happens at the dolphinarium: "When a human blew a cloud of cigarette smoke at the pool's glass just as an infant dolphin (Dolly) looked in, "she immediately swam off to her mother (Lady Dimple), returned and released a mouthful of milk which engulfed her head, giving much the same effect as had the cigarette smoke. Dolly subsequently used this behaviour as a regular device to attract attention" (Tayler, Saayman, 1973, pp. 290-291).

This story of emulation refers to the well-debated topic of the origin of art-making and its basis in inborn dispositions or in other words, to the question of knowing what caused the appearance of such behaviors and why they still stand the test of time. The engravings found some 30, 000 years ago imitating the form of animals and later on human figures also nourish this myth concerning the origins and the biological interest of art making. Here we have a case of mimesis presented as an exercise of visuomotor coordination, that is, synchronizing visual information (the puff of cigarette smoke) with physical movement (blowing milk in order to obtain the same effect). The dolphin attains this performance at once, by observational learning (Tayler, Saayman, p. 291).[6] What is interesting is that ethologists rule out individual acquisition by trial-and-error learning whereas art historians, and Gombrich most famously, explain the development of art practices (the representational art more specifically) precisely by such trial-and-error learning also called a "making-and-matching" process.

This example could be a challenge to a theory of creativity that would rely on higher order processes; on the other hand, it would serve well the enactive approach since, after all, it does exemplify a transaction with a given environment. Noë would reject without doubt examples like these on account of the disregard for higher-order process such as "thought, communication, understanding or meaning" that he necessarily takes to play a role in art production (Noë, 2015, pp. 233-234), thus leaving it unclear as to whether he does subscribe after all to a form of representationalism.

4. Enactivism and neuroarthistory

In the introduction I have claimed that Alva Noë's enactive approach might have more affinities with the theories he criticizes than he would like to admit. One of such theories is precisely Onians's natural history of art or "neuroarthistory.

Here are some general characteristics of the natural history of art:

- it gives nature "not an incidental but central role in the shaping of culture and especially artistic culture" (Onians, 2011, p. 79).

The "nature" referred to is related to

6 Onians explains the same phenomenon as follows: "An unconscious feedback process could thus lead to the production of a highly naturalistic representation or artwork, without any teaching, guiding or other social stimulation. A naturalistic image might be produced completely spontaneously, due to nothing more than the normal operation of the human neural make-up" (Onians, 2007, p. 314).

1) human biology
2) physical geography

1. Firstly, the notion of "nature" refers to human biology and psychology and its role in the shaping of artistic practices (e.g. the physiology of the eye and our use of the sense of sight, reference to neural architecture and the particularities of brain's formation etc.) What is problematic here is to know whether there is a historicity of such cognitive capacities, for instance whether there is a "history of seeing" (Onians, 1996, p. 207), of visual experience as such, or whether this logic of development applies only to perceptual displays that become more and more complex due to new techniques increasing manual and representational skills. Noë, for instance, argues that art productions based on such techniques literally "alter the way we see" (Noë, 2015, p. 233), following the lead of art historians who pleaded for the art's potential to give rise to perceptual learning (p. 231). Most famous is Michael Baxandall's concept of "period eye", which relies on the assumption that the history of art changes in response to visual preference among viewers (Onians, 2005, p. 109), these changes and evolution of visual skills being the result of social formation: "The period eye is constituted by the skills of discrimination one acquires by living in a culture, including perceiving the art in that culture, but it is totally different from zeitgeist and has none of the theoretical substructure. [P]eople were very quick to think if one said that people in a culture derive visual skills from that culture that this is a zeitgeist claim. I never persuaded Gombrich" (Obrist, 2008, pp. 43-45). Gombrich accused Baxandall of reintroducing with this notion "a world spirit" through the back door. One may ask here whether it is really the optical reality that changes or whether we're dealing with it just a shift of attention to different areas of interest.

2. On the other hand, the notion of "nature" can also refer to the relation to the lived environment and to the natural materials available in this environment; in this sense art is told to have a natural history when considered as a modification of "physical substances" (Onians, 1996, p. 207), of stuff that is already there. When Noë argues that artistic practices arise out of a "first-level" of organized, basic activities (Noë, 2015, p. 30) which are used as raw materials, he may be following the same line of thought.

- With respect to the objects taken into account, the natural history of art does nor adopt a normative stance in the sense that it redefines and widens the notion of art so as to include products of material culture what were generally regarded as ethnographic material

The natural history of art no longer gives prominence to artworks or masterworks that enter the canon of Western art history (basically, the context of the fine arts) but considers a whole range of worldwide creative practices, ways of doings and man-made things that span a wide variety of places and times (at least 40 000 years). As Onians writes, "the complete range of visually interesting material culture has to be studied, from the Paleolithic to the present, from Portugal to the Ukraine, from folk crafts to palace decoration, and from artists' sketchbooks to consumer videos"(Onians, 1996, p. 207). Note here the visual bias: not all artistic activities have to be absorbed by visual studies. There is no use in replacing a hegemonic model (the linguistic one) by another.

- A more down-to-earth characteristic of the natural history of art is that the ideal of studying art as a worldwide phenomenon is not, or not only, a fantasy of philosophers or of unorthodox art historians but is implemented at the institutional level: we can mention here the School of World Art Studies and Museology at the University of East Anglia in Norwich that opens its doors in 1992; since 2003 there is also a program of World Art Studies at Leiden University, Netherlands (Van Damme, 2012, pp. 219-220). That being said, the transformation of the art history department of the University of East Anglia into World Art Studies was triggered by a collection of objects (Onians, 1996, p. 206) belonging

to a broad spatiotemporal frame and not by some predetermined conceptual convictions or desiderata of the faculty members.
- Finally, another characteristic of the natural history of art is that it aspires to establish "disciplinary metalanguage" (Morphy, 2006, p. 12) by bringing together specialists in art history, anthropology, archaeology, cultural studies, evolutionary cognitive psychology etc.

The general methodology on which the natural history of art is based is described in Onians's most recent book; it comprises the following phases:
- identifying an artistic behavior, whether this is a new form or subject in painting, a composition or expression in sculpture, a material or configuration in architecture, a bodily disposition in the working artist or an implicit response on the part of the viewer
- finding out about the material and social environment of the individual or individuals engaged in the behavior
- establishing which of those individuals' visceral concerns might have been so over-riding that they could have had a salient impact on their neural formation
- relating those saliences of neural formation to the salient aspects of the art-related behavior under investigation
- exploring how a knowledge of the relationship we have inferred between neural formation and that particular behavior adds to, or changes, our understanding of it (Onians, 2016, pp. 16-17)

This lengthy passage shows that Onians lays heavy emphasis on inborn, universal adaptations while deliberately downplaying conscious mental phenomena. This would be the "subpersonal level", in Noë's terms (2015, p. 7). Yet, cognitive phenomena pertaining to cognitive psychology are all-pervasive in his writings despite his tendency to reduce psychology to neurophysiology: take, for instance, his understanding or passive exposure, meant to explain differences in art, which he describes as follows: "Looking at anything with particular *attention* causes the development of neural networks that will help us better deal with it in the future, and this results in the formation of visual preferences that will unconsciously influence us should we start to make or look at art. Thus the knowledge of what precisely people anywhere and at any time were looking at *intently* will reveal a great deal about their preferences"(Onians, 2004, p. 12, emphasis added). What Onians says here is that the more we are exposed to a particular object in our visual field, the better we will get at looking at it and dealing with it. Some explanations in terms of mere exposure are improbable or at least in need of empirical grounding, such as the claim that the spreading of ink in Chinese painting across a sheet of (rice) paper is causally linked to the irrigation of rice soils. In this example, according to Onians, passive exposure to the natural environment would be causally linked to a specific brushstroke (Onians, 2006, p. 534). But there is another difficulty with this extreme externalist view which holds that interaction with an environment blindly drives stylistic, representational and affective choices in art making and aesthetic appreciation. Namely, reference to attention may be problematic for explaining passive exposure, since passive exposure is considered to be an automatic process, operating below the threshold of consciousness while attention operates generally at a conscious level. We can see here not only an ambiguous position toward (cognitive) psychology but also a possible misreading of neuroscience principles.

Now, where does Noë's enactive approach fit into all this? To the extent that it places such emphasis on the extended bounds of cognition and on the transactions with the environment, his approach could be regarded as a transformed version of neuroarthistory,

equally externalist,[7] and true, operating at a less visceral level, but then we should need to learn what exactly that level might be. If it is the embodiment level, we still need an explanation of how this level is connected to experience and reflected in the phenomenology of the individual. Unlike Onians, who tries to limit his claims to the *causal* relation between environment and unconscious processes, Noë seems to hold that there is a *constitutive* relation between environment, bodily skills and perceptual experience (Block, 2005, pp. 264-265). This thesis is yet to receive thorough analysis especially in the context of *art* perception. In a reply to Carroll (Noë, 2017, p. 242; Carroll, 2017, p. 218), Noë argues for instance that art is "not confined to reflexive phenomenology", so I would assume that whatever happens at the embodiment level is subject to being accounted for in pre-reflexive phenomenological terms. But then how could this be compatible with the hierarchy of levels that Noë establishes in order to distinguish ordinary, first-order activities from artistic, second-order activities, since ordinary perception (Noë, 2004, pp. 29-30) is also considered to take place at an embodiment level? What would the phenomenology of *art* perception look like at the embodiment level as compared to the phenomenology of perception tout court?

Furthermore, it seems that Noë presents an ambiguous position with respect to the role of perception in aesthetic appreciation. On the one hand, he claims that one of the limits of neuroscience, and in particular neuroaesthetics, is that it focuses on the ability to *perceive*, which may be irrelevant to the question of valuation of art (pp. 95-97), but on the other hand, he offers a taxonomy of ways of *seeing,* which is meant to illuminate the phenomenology of aesthetic appreciation. The details of this taxonomy could also be questioned: for instance, how could "aesthetic seeing" qualify at the same time as "detached" and self-conscious, pre-reflective and "thoughtful", "contemplative" and "evaluative" (pp. 51-52, 55)? In order to avoid any inconsistency, an option would be to read his taxonomy between "wild seeing" and "aesthetic seeing" (pp. 51-52) metaphorically, as designing two types of attitude (engaging attention in different ways and to different degrees), rather than distinct visual processes. Further analysis should be made in this regard since, after all, it does no justice to art practices to assume that we are experiencing them through alien capacities.

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7 Noë's main criticism of neuroscientific approaches as being "too individualist and too internalist" (Noë, 2017: 212) would not apply here, since Onians's analysis does not stop at the boundaries of the individual organism but also takes into account the environmental embedding. For valuable comments on Noë discussion of the limits of neuroscience, see Ione (2016, pp. 282-283).

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CAN AN ENACTIVIST APPROACH ENTAIL THE EXTENDED CONSCIOUS MIND?

abstract

This paper discusses the enactivist attempt to entail the hypothesis of extended conscious mind (ECM). The enactists suggest that conscious experience is a relational interaction between the subject and the external environment; this personal-level description of conscious experience naturally entails an extended sub-personal characterization of the material basis of conscious experience (i.e. the ECM). However, in this paper, I am going to argue that the enactivist description at the personal level is still open to an internalist challenge at the sub-personal level. In response to this challenge, I suggest combining enactivism with the concept of predictive processing, delineating a sub-personal characterization of conscious experience that corresponds to the enactivist interpretation at the personal level.

keywords

enactivism, extended conscious mind, predictive processing

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1. Introduction

The concept of the 'extended mind' (Clark & Chalmers, 1998) suggests that the material basis of *non-conscious mental states* can be extended beyond the physical substrates of the human brain (i.e. to the external environment). Ever since this proposal was published in 1998, there have been many heated debates on the topic of how we should interpret the function of the human mind in regards of both the human brain and the external environment. Among these debates, the enactivists made an even bolder claim than Clark and Chalmers, claiming that the material basis of *conscious experience* should also be extended to the external world. In particular, the enactivists suggest that conscious experience is made possible by the relational interactions between the subject and the environment. In other words, conscious experience is not only dependent on the physical properties of subject's body and brain, but is also dependent on properties of the external environment. The enactivist approach of explaining the conscious experience is claimed to be able to entail the hypothesis of extended conscious mind (ECM): the physical machinery of conscious experience can be extended to the external environment.

In the following sections, I am going to explain how, from the enactivist perspective, the relational character of conscious experience can entail ECM, and the challenges of supporting this argument. I will firstly analyze the current debate concerning ECM, and point out that the enactivist approach, which focuses mainly on the personal level description,[1] is still wanting at the sub-personal level characterization. After this, I will introduce the concept of predictive processing (PP) and explain why I think combining this concept with the enactivist approach is helpful in the latter's attempt to argue for ECM at the sub-personal level.[1]

2. The debate on ECM

Conscious experience has always been an intriguing subject for researchers in the fields of psychology and philosophy. Many attempts have been made to explain the well-known hard problem: how can the human brain, a physical substance, bring about the phenomenal conscious experience?[2] No consensus has been reached so far. Despite the great difficulty in bridging the gap between phenomenal consciousness and its material basis, some theorists

1 Sub-personal level: the level of explanation about the event itself, for example, the mechanism realizing this event (Drayson, 2012; Ward, 2012); Personal level: the level of explanation that focuses on the causes and consequences of a particular event (Drayson, 2012).

2 Phenomenal conscious experience: the subjective feeling of a human being.

(e.g. Clark & Wheeler) insist that conscious experience can only be realized in the human brain, while the external environment plays only a causal role in triggering conscious experience. Some theorists (e.g. the enactivists), on the other hand, attempt to bridge the gap (or even negating the existence of the "gap", e.g. Noë, 2004) by interpreting the conscious experience as realized by a complete system including both the human brain and the external environment. This latter position sees the external environment as playing a constitutive role in giving rise to conscious experience. These opposing arguments about the role of external environment in conscious experience (causal vs. constitutive) lay the backdrop of the discussion surrounding ECM.

It is important to note that both the extended mind thesis (EM) and the ECM concern only the material basis of conscious experience. Advocates of the EM such as Andy Clark (2009) emphasizes that EM applies only to the machinery of "non-conscious mental states such as states of dispositional believing" (p.5). In the case of conscious experience, the material basis still resides within the brain while the environment is considered as a causal, instead of a constitutive factor. In particular, Clark argues that the enactivists' emphasis on the interaction between the brain and the external environment does not by itself necessarily entail their conclusion that the environment plays a constitutive role in realizing conscious experience. The reason is that this interaction cannot convincingly disprove that neural activities alone are sufficient to realize the consequence of the interaction enactivists propose. Advocates of enactivism such as Ward (2012), in response to Clark, defend the enactivist attempt to entail ECM by pointing out that the enactivist interpretation of conscious experience is not intended to give direct evidence at the *sub-personal level* (that is, the material basis) to justify ECM. Instead, the enactivist interpretation is a *personal level* description that can naturally entail an extended version of the sub-personal level characterization of conscious experience.

In the following subsections, I will discuss the enactivist interpretation of conscious experience in detail and explain how it can naturally entail ECM, as suggested by Ward (2012). In particular, I will be relying on Noë's arguments (2004, 2006, 2008) regarding visual conscious experience as an example.

2.1 The enactivist attempt to entail ECM and its limitation

The enactivist interpretation about conscious experience was originally proposed as an antidote to the cognitivist understanding that regards conscious experience as particular symbols represented by the brain according to the incoming stimuli from the external environment (Varela, Thompson & Rosch, 1991). Instead of regarding it as representing the environmental stimuli, the enactivist position interprets the brain as a regulator of the interaction between the subject and the environment; conscious experience is thus realized through this interaction instead of merely being registered by neural activities. Noë (2004) suggests that this interpretation can explain the inconsistency between the impoverished information encoded by sensory organs and the perceptual experience of details that exceeds the information encoded. For example, despite the poor color-sensitivity of the parafoveal cells in our visual system, our visual field is unaffected and is still considered as colorful. According to Noë, the challenge of this inconsistency can be resolved by the concept of virtual presence (2004; 2006). That is to say, details exceeding the encoded information are virtually presented in our experience; they are not automatically filled in or added on by our brain as a way to make sense of the incomplete information. Instead, they are presented as accessible to us if we move around and turn our attention to them. The content of these exceeding details are made possible by our interactions with the world and our sensorimotor knowledge ("Sensorimotor knowledge": the implicit understanding of the sensory results regarding the perceived target if we take actions on it). In this sense, according to the enactivist approach (Noë, 2004; 2006), sensorimotor knowledge compensates the impoverished information

encoded and enables the subject to properly relate herself to the environment, which then makes her conscious experience as complete as in the phenomenal sense. At the personal level, conscious experience is not something caused by the stimuli from the environment (although it certainly benefits from the external stimuli a lot), but rather, it is an evolving interaction between the subject and the environment based on the subject's mastery of sensorimotor knowledge.

Ward (2012) claims that given the enactivist description of conscious experience at the personal level, it is natural for the enactivist to entail ECM. The reasons given by Ward to justify his claim are based on the need of maintaining a consistency between the personal level description and the sub-personal level characterization (ibid, p.741): if we consider conscious experience at the personal level as a relational interaction between the subject and the environment, it is implausible for us to restrict to neural properties at the sub-personal level; once we accept the view that at the sub-personal level, the environment is merely a causal factor triggering conscious experience, it seems inconsistent for us to view the conscious experience at the personal level as a relationship between the subject and the environment. However, although the personal level explanation of conscious experience put forward by enactivism indeed motivates an externalist characterization of conscious experience at the sub-personal, this account is still susceptible to criticism given the fact that enactivists have not developed any direct supporting claims at the sub-personal level. In particular, the enactivist argument does not specify why the neural activities are insufficient in realizing the consequence of the interaction between the subject and the environment, which is emphasized by the enactivist interpretation as key to conscious experience. The enactivist attempt to entail ECM is still wanting, as can be seen in Ward's comparison of conscious experience to an episode of knowledge (2012):

> ...knowledge is essentially a relationship between a subject and the worldly state of affairs known. Episodes of knowledge thus depend not just on properties of the subject that can be specified independently of the state of the world and their standing in it (...), but also on the way the world is. Given such a conception of knowledge, if we are interested in delineating the material events and processes that underpin an episode of knowing – in giving a sub-personal characterization of a personal-level state of knowing – then we must look further than the internal properties of the knower. (p.13)

In the above description, Ward has tried to demonstrate how the personal-level description is able to circumscribe the sub-personal characterization of particular mental events. When we delineate the material basis of an episode of knowing, it is plausible to include the internal states of the subject as well as the external environment as constitutive to the episode as a whole. However, what we are interested in is the subjective knowing, which focuses mainly on the subjects. The internalists might agree that we should include the external world as part of the material basis that is necessary for the episode of knowing to happen while insisting that the sense of knowing of the subjects is still realized only by their neural activities. For example, to perceive a green apple, it is required for the subject to gain the knowledge that "apples can be green" and the process of knowing is constituted by both the subject's internal properties to grasp the knowledge, as well as the presence of the green apple; but the sense of knowing the fact that "apples can be green" is still plausible to reside internally in the brain as a result of changes in the subject's internal properties caused by the presence of the green apple. A relational interaction between the subject and the world that constitutes knowledge at the personal level is consistent with an internal characterization of the realizer of the subjective knowing at the sub-personal level. Similarly, even if we assume that at the personal

level, conscious experience relies on an interaction between the subject and the environment, it is still plausible to claim that at the sub-personal level, it is the neural activities caused by the interaction that constitute the mechanism that realizes conscious experience.
According to the enactivist approach, we should interpret conscious experience as a way for the subject to relate to the world instead of being constituted by symbols represented by the neural activities within the brain. However, it is not clear how this interpretation can entail the ECM when the mastery of sensorimotor knowledge and the acknowledgment of the accessibility of information[3] can be reasonably realized within the brain (Wheeler, 2015).
Accepting the enactivist understanding does not lead to a direct acceptance of ECM, as it is possible to adopt an internalist view at the sub-personal level in a way that is consistent with the enactivist description of conscious experience at the personal level. Ward's paper is successful in elucidating the point that the enactivist interpretation of conscious experience can entail ECM, but it lacks the necessary arguments to defend this interpretation against opposing opinions. The problem of the enactivist interpretation is that its explanation of conscious experience is primarily at the personal level. In order to justify the enactivist attempt to entail ECM, enactivists need an account of conscious experience that can apply the enactivist approach to a sub-personal level characterization, that is, to the material basis itself. In particular, this account should be helpful in explicitly demonstrating that neural activities alone are insufficient for the content of conscious experience.
In the next section, I will introduce the concept of predictive processing (PP). PP is a concept developed from recent studies in cognitive science about how the brain functions in reaction to changes in the environment. Successful integration of the enactivism with PP helps better demonstrate the enactivist implementation in the sub-personal level characterization of conscious experience and point to new directions to justify ECM by empirical studies.

3. Combining the concept of predictive processing and enactivism

I now introduce the concept of predictive processing from the enactivist perspective (Gallagher & Allen, 2016) in order to help demonstrate the insufficiency of neural activities to constitute the realizer of conscious experience at the sub-personal level. Predictive processing, in general, refers to a process in which the subject generates predictions (base on her past experiences) about incoming environmental stimuli and at the same time interacts with the environment to gather sensory information that conforms to these predictions. In this process, both prediction-generation and actions based on the environmental intake aim at minimizing the disparities between the predictions generated and the actual information in the environment (i.e. minimize predictive errors). According to the "free energy principle" (Friston, 2013), a biological system open to the influences of the environment maximizes its survival rate by minimizing "free energy" (i.e. the unexpected states of the system caused by its interaction with the environment that may overwhelm its integrity). The concept of predictive processing can explain the minimization of free energy of a human being as the subject interacts with the environment. In particular, the biological system of a human subject maintains its integrity – that is, minimizes the free energy – during its dynamical interaction with the environment by either accurately predicting the environmental states, or acting on the environment to render the sensory income unsurprising (Gallagher & Allen, 2016).
What differentiates the enactivist version of predictive processing (EPP) from other interpretations of predictive processing (e.g. Clark, 2016; Hohwy, 2016) is its understanding of the brain as part of the whole body in the process of energy minimization, instead of as the

3 The mastery of sensorimotor knowledge and the acknowledgement of the accessibility of information are regarded as constitutive to the content of conscious experience by enactivism (e.g. Noë, 2004; 2008).

only center of this process. While both Clark (2016) and Hohwy (2016) interpret the predictive processing as a way the subject interacts with the environment to confirm predictions generated by the brain (i.e. predictive patterns of neural activities), EPP demonstrates it as a function of the subject's whole body responding to and shaping the environmental changes by generating predictive models (Gallagher & Allen, 2016). Studies have found that at the earliest stage of visual stimulation processing (that is, before the conscious visual identification of the perceived object), the predictive patterns of activities based on prior encounter with the environment are activated not only within the brain but also throughout the subject's whole body including, for instance, her muscular and hormonal systems (Barrett & Barr, 2009). This suggests that affective responses of the subject's body are not separated from her visual perception. In this case, during the subject's interaction with the environment, the process of minimizing free energy is not only enabled by the predictive pattern of neural activities, but also by the predictive activities in other parts of the subject's body. According to EPP, we should regard the subject's body as a whole biological system actively engaging in worldly interactions by adjusting itself to the environmental changes. In this process, the brain is just one part of the whole body that plays an important role in regulating the responses of the body to the environmental stimuli; the boundary between the brain and the environment is transcended by the actions of the subject's body.

If we apply EPP in the analysis of the material basis of conscious experience, there seems to be no obvious reason for us to prioritize the brain as the only realizer of conscious experience. Although ECM does not immediately follow, the EPP at least suggests that both the brain and other parts of the subject's body are involved in generating predictive models in reaction to the environment. By bringing the rest of the body into the picture, EPP emphasizes active engagement of the whole body in the environment during perceptual activities. That is to say, conscious experience is no longer realized by a particular predictive pattern of neural activities in the brain that wait to be adjusted or to be conformed to; instead, the brain functions as a regulating system that facilitates the body to engage in the interaction with the environment; and it is this interaction that realizes conscious experience. Combining enactivism with the concept of PP thus allow us to successfully stretch the former's personal level description of conscious experience (i.e. conscious experience is a relational interaction between the subject and the world) to encompass a more directly sub-personal characterization, in which the brain alone is no longer sufficient.

It is important to note that, according to EPP, the predictive models generated by the body (including the brain) are not contentful; that is to say, the models are not predictions of the subject as the content of her conscious experience. Rather, they function as the organismic preparations that enable the subject's body (including the brain) to properly react to the environmental stimuli. This interpretation corresponds to the enactivist description at the personal level, as mentioned in section 2.1, that in the process of perceptual activity, details of objects are presented to the subject as "accessible" based on her mastery of sensorimotor knowledge. In particular, her mastery of sensorimotor knowledge is realized by the predictive activities of the biological system of the subject that enable her to relate to the environment properly in the way that minimizes free energy during interaction with the environment. As for the conscious experience of "accessibility", it is derived from the subject's consciousness of her body as constantly situated in a changing environment, which is realized by the body's (including the brain) constant interactions with the environment. On this account, the subject's conscious experience of the world is plausibly interpreted as the result of the dynamical interactions between the subject's body and the environment that are enabled by the predictive body and the changing environment. These interactions are akin to a physical force (conscious experience) arising from a situation where two rocks (the predictive body

and the changing environment) are constantly in collision. Restricting the material basis to the brain, or to the body (including the brain), alone is like explaining the material basis of the physical force as only one of the rocks whilst ignoring the other one. EPP, therefore, provides a way to justify the constitutive role of the environment at the sub-personal level characterization of conscious experience.

One potential objection to EPP's attempt to justify ECM could be derived from the fact that the rest of the subject's body is under the supervision of the brain (Barrett & Bar, 2009), which implies that the brain is the center of the perceptual activity. Adding the fact that the information flowing speed of the brain is significantly faster than that of the rest of the body (Clark, 2009, p.22), the brain might be seen as being more qualified as the realizer of a higher-level function like the conscious experience. A possible response from the proponents of EPP to this objection could be: firstly, the crucial role the brain plays in perceptual activities does not add to the ability to realize conscious experience all by itself. As stated earlier, according to EPP, the brain is an important part of the whole body and regulates the body's interactions with the environment. The predictive activities of the rest of the body are initiated by the brain (e.g. by the medial orbital frontal cortex) and constitute the biological system's predictions about the perceived object. Both the brain and the rest of the body are involved in acts of predictions in the subject's interactions with the environment. The brain's function of regulating the body, therefore, is embedded in the subject's dynamical interaction with the environment. The faster information flow in the brain can be interpreted as serving the purpose of regulating different sensory information and affective responses, which are more demanding than functions in other parts of the body. But this doesn't mean the brain is all that is needed in realizing conscious experience.

So far, we have arrived at a more thorough picture of ECM with the sub-personal characterization of conscious experience by EPP. This picture implies a potential advantage of ECM in explaining the "emergence" of subjective conscious experience from objective physical entities such as the brain and the body. In particular, as mentioned above, ECM's emphasis on interaction between the body and the environment delineates the conscious experience as a force-like entity created by the interaction between the internal states of the subject and the external states of the environment. In this case, the ECM inspires a way to solve the hard problem mentioned at the very beginning of section 2 by sidestepping the puzzling emergence of a phenomenal experience from one single physical substance and explaining the phenomenal experience as realized by the interaction between two physical entities.

4. Conclusion

In this paper, I have explained how the combination of PP with the enactivist approach is helpful to the enactivist attempt to entail ECM. Additionally, with supposition of the delineation of ECM at the sub-personal level, the hard problem of conscious experience seems to be resolvable from this alternative perspective. However, the discussion so far in this paper is based on the assumptions of enactivism and EPP. Different interpretations of the concept of PP (e.g. Hohwy 2016; Clark, 2016) still threaten to restrict the material realizer of conscious experience within the brain by emphasizing the boundary between predictive activities in the brain and the stimulus from the external environment. Despite a number of studies (e.g. Barrett & Bar, 2009; Barrett & Simmons, 2015) that are heuristic in involving more than just the brain in the process of perceptual activity, more details about the exact functions of the brain remain wanting. In particular, empirical studies that demonstrate how the brain regulates the rest of the body and how the presence of environment constitutes the subjective realization of experience are needed in further proving this position suggested by EPP.

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COLOR RELATIONISM AND ENACTIVE ONTOLOGY*

abstract

In this paper, I present the enactive theory of color that implies a form of color relationism. I argue that this view constitutes a better alternative to color subjectivism and color objectivism. I liken the enactive view to Husserl's phenomenology of perception, arguing that both deconstruct the clear duality of subject and object, which is at the basis of the other theories of color, in order to claim the co-constitution of subject and object in the process of experience. I also extend the enactive and phenomenological account of color to the more general topic of the epistemological and ontological status of sensory qualities (qualia), outlining the fields of enactive phenomenology and enactive ontology.

keywords

qualia, perception, enactivism, phenomenology, internalism and externalism

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1. Epistemology and ontology of color

What is the nature of colors? Are they properties of mind-independent objects, as common sense leads us to believe? Alternatively, are they merely subjective appearances, "internal" to a perceiver's mind? These questions regard the specific case of color in a more general inquiry concerning the epistemological and ontological status of the sensory qualities that appear in perception (colors, sounds, smells, etc.). This inquiry is motivated by the reflection on some features of ordinary experience, which give rise to the so-called "problem of perception" (see Crane, 2015): perceptual relativity, illusion and hallucination.

For example, consider the perception of a lemon. One can be aware that the color of the lemon appears differently when moving around it, or in relation to changes in the environmental light. One could also be aware of having had an illusory perception or even a hallucination of the lemon, perhaps caused by the ingestion of a psychedelic drug. These phenomena lead us to question the relationship between perceptual appearance and an "external", mind-independent reality beyond it.

The two main options concerning the epistemological and ontological status of sensory qualities are *internalism* and *externalism*. In the case of color, these options become *color subjectivism* and *color objectivism*. In the following, I shall discuss these views, in order to allow the enactive theory to emerge as an alternative to both.

1.1 Qualia externalism and color objectivism

The externalism of sensory qualities (*qualia externalism*) claims that, notwithstanding the problem of perception, in veridical perception we are acquainted with mind-independent objects, whose intrinsic properties are exactly what they appear to be in perceptual experience. This view – *direct* or *naïve realism* – is the philosophical account of perception that is more faithful to the common sense of the man in the street, who believes that "yellow" is a property of ripe lemons and not something "in the mind". In the case of color, qualia externalism becomes *color objectivism*. According to it, colors are objective properties of things in the environment.

A motivation for color objectivism is *color constancy*: the fact that even if perceptual appearances continuously change, we usually believe that a certain region of an object has a certain color (for e.g. a precise shade of yellow in the surface of the lemon, which remains constant over time and across different viewing conditions). Therefore, according to color objectivism colors are *monadic* properties of objects, which do not depend on a relation with a perceiver.

There are two versions of color objectivism: *physicalism* and *primitivism*.

Color physicalism claims that colors are objective properties of material bodies and light sources. According to this view, we can discover the true nature of colors through scientific investigation, thus establishing an *identity* between colors and certain physical properties. This *identity theory* of color is analogous to the identity theory between mental states and physical states in the philosophy of mind. In particular, concerning physical surfaces, colors are conceived of as identical with their *reflectance profile*, i.e. the capacity to differentially reflect wavelengths from different regions of the incident illumination. However, each color turns out to be associated with many reflectance profiles. In order to account for the problem of "multiple realization" of colors (analogous to the same problem in the philosophy of mind), some authors argue for a version of color physicalism that claims an identity between colors and *types* of reflectance profiles (*type-identity*).
The other form of color objectivism is color primitivism. This view denies that there is a relation of identity between colors and physical properties such as reflectance profiles. On the contrary, it argues that colors are *new*, *sui generis* properties of material objects. This view is analogous to non-reductive theories in the philosophy of mind, such as Chalmers' *naturalistic dualism of properties* (Chalmers, 1996), which claims that phenomenal properties are new properties of physical systems (*strong emergence* or *natural supervenience*).

1.2 Qualia internalism and color subjectivism

Color objectivism comes across an obstacle when accounting for perceptual relativity, illusion, and hallucination. All these phenomena seem to point to a distinction between the way things appear in perception and what they "really" are. A classic option for facing the problem of perception consists in giving up the naïve realism of the man in the street, by distinguishing between qualitative properties such as colors, sounds, smells – conceived of as merely subjective appearances in the mind – and physical-mathematical properties such as shape, mass, energy, etc. – conceived of as objective properties of mind-independent objects. This is the view that was first developed in ancient atomism and that was later adopted by modern philosophers such as Galilei, Descartes and Locke, among others. This internalism concerning sensory qualities (*qualia internalism*), conceives of them as sensations that are merely "in the mind" and that are caused by objective processes in the physical world.
In the case of color, qualia internalism becomes *color subjectivism*. In particular, the received view in the philosophy of color is color *dispositionalism*. According to it, "objective colors" are dispositions to cause certain effects ("phenomenal colors", i.e. color sensations) in the visual system of a perceiver in certain conditions (for e.g., the objective "red" is the disposition, defined in physical terms, to cause sensations of red in a perceiver's mind). According to color subjectivism, colors are not monadic but *relational*, since they involve a relation between perceivers, objects and circumstances.[1]

1.3 Perceptual relativity and color relationalism

Color subjectivism is developed as an answer to the problem of perception. In particular, it accounts for different forms of perceptual relativity: intrapersonal, interpersonal and interspecies.
For example, I can become aware that a single region of the lemon that is in front of me appears differently in different conditions, for e.g. under different environmental lights, or in relation to changes in my physiological conditions (e.g. after ingesting santonin, which makes everything to look yellowish; see Husserl, 1989, pp. 62 ff.). These are forms of *intrapersonal relativity*.

1 Color subjectivism presupposes that perceivers, objects and circumstances can be defined independently from the relation in which they enter into perception. I shall later present the enactive view as a stronger form of relationism, which denies the independent existence of subjective and objective poles of perceptual relation.

Various experiments point to forms of *interpersonal variation* in color vision. In relation to the same object and the same circumstances, the experiments show that different perceivers might have different color experiences. This is argued by referring to the concept of *color space*: the structure of the appearance of colors in the dimensions of hue, saturation and brightness. In fact, we can express phenomenal judgments that refer to the structural features of our experience of colors. In particular, we can distinguish between *unique hues*, which do not contain other chromatic components (in specific shades of blue, yellow, green and red) and *binary hues* (for e.g. orange, which contains both yellow and red). The point is that in an experimental setting, different perceivers, that are presented with a certain range of stimuli, might pick up different ones when asked to point out unique hues. For e.g., whereas one person recognizes a "unique green", another person might recognize a "bluish green" (see Cohen, 2004, p. 464). The difference in the phenomenal judgments of different people in front of the same objects in the same circumstances, shows that they have different color experiences.[2] This claim leads us to the central thesis of color subjectivism: "phenomenal colors" are not objective properties of material objects; they are subjective sensations that arise in a subject's experience as a consequence of certain events in the physical world (i.e., the world that is described by mathematical physics).

The classic version of color dispositionalism defines the "objective" color (e.g. red_{19}) as the disposition to cause certain sensations to *normal observers* in *normal circumstances*. A different version of color dispositionalism is J. Cohen's *color relationalism* (Cohen, 2009). Cohen highlights the fact that the definition of what counts as a normal observer in normal circumstances is somewhat arbitrary. For this reason, he develops a stronger form of *relationalism* regarding color. By considering the different forms of relativity in color vision (intrapersonal, interpersonal and interspecies), Cohen argues that there is no independent and well-motivated reason to pick one of the variants as the veridical perception of a certain color. For this reason, we must reconcile the apparently incompatible variants by relativizing colors to different values of certain parameters (Cohen, 2004, p. 454).

For e.g., consider the phenomenon of *color induction*: two grey squares with the same reflectance profile turn out to appear differently when placed against different backgrounds: darker when placed against a light background, lighter when placed against a dark background (see Cohen, 2004, pp. 455, 505). Which is the "normal circumstance" and therefore the true judgement concerning the perceptual appearance of the square? Is the perceived color of the square light grey or dark grey? Cohen's proposal is to consider both judgements as true, conceiving of colors as relational properties that vary in relation to background configurations and to various other factors (viewing conditions, physiological conditions of the perceiver, etc.). According to Cohen's color relationalism, "colors are not monadic properties like *red* or *green*, but rather relational properties like *red for* S_1 *in* C_1, or *green for* S_2 *in* C_2" (Cohen, 2012, p. 293).

Cohen's relationalism is still a form of color subjectivism. In fact, it is based on the distinction between "experiences of red/green/etc." (Cohen, 2012, p. 293), which are "type of mental states of subjects" (Cohen, 2012, p. 293) and the physical causes of these experiences: visual systems, objects, circumstances.[3]

2 This conclusion must leave aside the possible doubt concerning the presence of any phenomenal experience in another person. In the words of Chalmers (1996), the other person could be a "phenomenal zombie".

3 For this reason, this view leaves open the so-called "hard problem" of consciousness (Chalmers, 1995), i.e. the difficulty found in explaining how and why certain physical processes give rise to our "colourful" experience.

2. The enactive theory of color

So far, we have seen the two main options in the philosophy of color: subjectivism (classic dispositionalism or Cohen's relationalism) and objectivism (physicalism or primitivism). In turn, these views constitute the application to the case of color of two more general strategies concerning the epistemological and ontological status of sensory qualities: qualia internalism and qualia externalism. These views are opposed to each other and they each play on the difficulties of the other. Qualia internalism tries to account for the problem of perception (relativity, illusion, hallucination), but it enters into conflict with the naïve realism of common sense. Qualia externalism is more faithful to common sense, but has difficulties in accounting for perceptual relativity, illusions and hallucinations. However, internalism and externalism have something in common: they are both based on the duality of subject and object, conceived of as independent and pre-constituted poles of the cognitive relation. In particular, in both views, the "external" world is conceived of as an ontological domain that is mind-independent and that is known, directly or indirectly, in perception. According to externalism/objectivism, the external world is faithfully described by common sense. According to internalism/subjectivism, it is described by mathematical physics. In the following, I shall argue that the enactive view of color challenges the common presuppositions of both internalism/subjectivism and externalism/objectivism, deconstructing the clear duality of subject and object that they both presuppose.

The investigation of color vision has a central role in the development of the enactive approach, being conceived of as "a case study in the foundations of cognitive science" (Varela & Thompson, 1990). From this analysis, the proponents of the enactive view draw some radical consequences concerning the nature of cognition in general. F. Varela and E. Thompson (Varela & Thompson, 1990; Thompson *et al.*, 1992) develop their enactive theory of color in the context of a new paradigm for the cognitive sciences, which is especially developed in *The Embodied Mind* (Varela *et al.*, 1991). At the base of this framework there is a *comparative argument*, which is based on the analysis of the *interspecies* variation in color vision. The comparative argument starts by distinguishing the *color space* (the structure of the appearance of colors, constituted by the dimensions of hue, saturation and brightness, as we have seen) from the *chromatic domain*, which is the physiological basis of color vision and is relative to the embodiment of a perceiver. In human beings, the chromatic domain can be represented in a mathematical space with three independent variables, which result from the combination of the sensitivity curves of the photopigments in the retinal cones, giving us a *trichromatic domain*. The comparative argument unfolds in two steps. Firstly, it establishes a correspondence between the structure of the chromatic domain and the structure of the color space. Secondly, it claims that "since chromatic domains are relative to the embodiment in a given perceiver class, so too is color space." (Varela & Thompson, 1990: 134). In fact, the physiological basis of color vision varies amongst different classes of animals, which range from dichromats to even pentachromats (in certain diurnal birds like pigeons and ducks). By detecting these physiological differences, we can infer radical differences in the respective experience of colors. An important point is that there is a *radical incommensurability* between color spaces with different *dimensions*. We cannot imagine of a tetrachromat perceiver as one that can make finer distinction between, for e.g. red and yellow hues, because this would only be an increase in *resolution* within our own chromatic domain. On the contrary, the difference between trichromatic and tetrachromatic vision consists in the fact that there is a completely new dimension in the color space. Therefore, we cannot map one color space into the other (see Varela & Thompson, 1990, p. 135).

The consequence of the comparative argument is that different animals have a different experience of colors. For example, a tetrachromat perceiver can see a difference between certain items, whereas we see a perceptual match. They can see qualitative discontinuities,

whereas we see a homogeneously colored region of space. For this reason, these animals perceive "novel hues" within "color hyperspaces" with four or five dimensions.[4]
At this point, in order to appreciate the specificity of the enactive account of color, we must compare it with color subjectivism and color objectivism.

2.1 Not subjectivism

The comparative argument could seem to imply a form of color subjectivism, which conceives of colors as subjective sensations that vary between different classes of animals. However, the enactive account of color is explicitly developed as an alternative to color subjectivism, criticizing "the'internalist' view that perceptual content is provided by subjective qualities (qualia)" (Thompson *et al.*, 1992, p. 401). The internalist view is based on the distinction between "primary properties" of objects, investigated by mathematical physics and secondary properties, which are merely subjective appearances. In contrast with this distinction, the proponents of the enactive approach argue for the *interdependency between color vision and spatial segmentation* (Thompson *et al.*, 1992, p. 402).[5] In fact, the segmentation of a visual scene, which allows one to detect different surfaces and objects, presupposes the ability to perceive qualitative discontinuities, i.e. chromatic differences. We can visually perceive an object with a certain shape, that emerges as a salient object of perception, by perceiving its boundaries, which differentiate it from the background and from other objects and we perceive these boundaries by detecting chromatic differences. Therefore, spatial properties such as shapes and boundaries cannot be conceived of as objective properties of a pre-constituted, mind-independent world, since they depend on the perception of colors. This perception, in turn, is relative to the embodiment of a perceiver. According to the enactive view, both "primary" and "secondary" properties must be conceived within a process of co-emergence of perceiver and environment in reciprocal dependence.
The latter thesis is explicitly stated in the framework of *The Embodied Mind*: "Knower and known, mind and world, stand in relation to each other through mutual specification or dependent coorigination." (Varela *et al.*, 1991, p. 150). As we will see below, this thesis implies a deconstruction of the clear duality of subject and object, in order to investigate their co-emergence in the process of experience.

2.2 Not objectivism

The enactive view of color is also different from color objectivism. In order to highlight this difference we can compare the enactive approach with J. Gibson's ecological theory of perception. In fact, there are significant affinities but also differences between these views. Varela and Thompson agree with Gibson's "deep insight that perception must be understood within the ecological context of guided activity" (Thompson *et al.*, 1992, p. 399) and his account of perception in terms of sensorimotor coupling between organism and environment. Furthermore, the notion of *affordance*, which is central to Gibson's view, involves a complementarity of animal and environment and, for this reason, is *relational*. Affordances are properties of objects in the environment that appear to a certain animal in virtue of its sensorimotor capacities (for e.g. a handle affords holding for an animal that can hold it, a chair affords sitting for an animal that can seat on it, etc.). However, the relational notion of affordance goes together, in Gibson, with a form of direct or naïve realism (see Gibson, 1967, p. 168). According to Gibson, perception consists in the direct picking up of information that is

4 See Thompson *et al.*, (1992) for the mathematical details of the kind of incommensurability that we must admit between different color spaces. The consequence of this incommensurability is that we cannot have any idea of the different hues that are perceived, for e.g., by a pigeon or a duck (Thompson *et al.*, 1992, p. 377).
5 These authors refer to Berkeley's critique to the distinction between primary and secondary properties (see Thompson *et al.*, 1992, p. 387 n. 13).

enclosed in the environment, without involving any sensation or sense datum (Gibson, 1972, p. 77). However, on this point Thompson et al. (1992, p. 399) criticize "Gibson's belief that the only alternative to the mistaken sense-data view of perception is direct realism". In contrast to Gibson's direct realism, these authors consider the environment that is inhabited and perceived by an animal, not as a pre-given ontological domain, endowed with certain objective properties and directly grasped in perceptual activity, but also as "something determined by that very activity" (Thompson *et al.*, 1992, p. 399).

The latter passage could be interpreted as just referring to the fact, which is crucial for the enactive view, that an animal's activity modifies the environment and, in turn, the environment modifies the animal's behaviour. Concerning color vision, Varela and Thompson stress its ecological dimension by referring to examples that point to a co-determination and co-selection of sensory-motor capacities of animals and environmental features. For example, the trichromatic color vision of bees, which is shifted towards the ultra-violet, seems to have been "co-evolved with the colors of flowers, which often have contrasting patterns in the ultraviolet light" (Thompson *et al.*, 1992, p. 392). This thesis could be read as still presupposing an objectivist view of the environment, conceived of as an ontological domain that is pre-constituted and independent from the cognitive relation. However, as we will see below, the enactive view is more radically *relationist*, since it conceives of the enactive relation between perceiver and environment as a "dependent co-origination", which does not presuppose the independent and substantial existence of the two poles of cognition.

For this reason, the original formulation of the enactive approach must be distinguished from some other strands of "enactivism" in the contemporary debate that are more near to Gibson's direct realism.[6] In particular, the so-called "sensorimotor enactivism" of K. O'Regan and A. Noë (O'Regan & Noë, 2001; Noë & O'Regan, 2002) takes from the enactive approach the understanding of cognition in terms of sensorimotor activities. For these authors, seeing is an exploratory activity of the animal that is mediated by its mastery of rules of interdependence between stimulation and movement (Noë & O'Regan, 2002, p. 568). By being "attuned" to the structure of sensorimotor contingencies, the animal is "*perceptually coupled* with its environment" (Noë & O'Regan, 2002, p. 569). However, the notion of *environment* that comes into play in the sensorimotor approach seems to refer to an objective pole of the cognitive relation that is pre-constituted and directly perceived. When raising the issue of the ontological status of "qualia" and, specifically, the ontological status of colors, these authors express an objectivist/externalist position: "when you see a red wall there are just the different things you do when you interact with the *redness of the wall*" (Noë & O'Regan, 2002, p. 572, emphasis added). In this view, red turns out to be an objective property of the environment that is directly perceived: "you have access to the redness by the most minute of eye movements or attentional shifts. The redness is there, in the environment. The slightest eye, head, or attention movement reveals further information about its character [...] you have continuous *access* to the redness in the environment." (Noë & O'Regan, 2002, p. 580).

On the contrary, the enactive view argues for a stronger correlation between perceptual contents and ecological properties: "the contents of perceptual states are to be type-identified by way of the ecological properties perceived, and these ecological properties are to be type-identified by way of the states that perceive them" (Thompson *et al.,* 1992, p. 401). On this point, one could object that this definition of ecological properties and perceptual states is

6 See Vörös *et al.* (2016) for the differences between the non-metaphysical framework of *The Embodied Mind* and some subsequent forms of "enactivism" that are characterized by a "*shift towards realism*" (Vörös *et al.*, 2016, p. 194).

circular. However, the enactivist answer is that it is exactly this *fundamental circularity* that is expressed in the concept of *enaction*.

2.3 Enaction as dependent co-origination

The enactive view of color is at the basis of a general framework that constitutes a new paradigm for the cognitive science. This framework is centred on the rethinking of the relationship between subject and object. In the enactive view, subject and object are not pre-constituted, substantial domains that somehow enter into cognitive relation. On the contrary, they are conceived of as co-emergent or co-dependently arising in the process of experience. The concept of co-dependent arising is taken from the Madhyamaka (Middle Way), which is one of the classic schools of Buddhist philosophy (see Varela *et al.*, 1991, p. 221 ff.). Nagarjuna – the founder of this school of thought – developed a radically relationist view that denies the substantial and independent reality of subject and object. Nagarjuna argues that in our experience we cannot find anything that is substantial and not dependent on something else. Every moment of experience is related to something other than itself and every object of cognition is related to mental processes. For this reason, neither of the poles of cognition can be conceived of as independent from the other. Subjects and objects are non-substantial poles of a process of dependent co-origination. In the words of M. Bitbol, in Nagarjuna's view "The duality of subject and object, of perceiving and perceived, is not denied; but it is shown to be empty, namely to arise from a symmetric relation of mutual dependence." (Bitbol, 2003, p. 339). Bitbol likens the relationism of the Middle Way to Kant's philosophy, that also conceives of subject and object not as pre-given substances but as functional poles of a correlation. In Kant's view, the object of knowledge is not independent from the cognitive relation, being the correlate of a process of *constitution* in which the subject itself comes to be constituted (see esp. Kant, 1781-87/1998, A158/B197). In both Kant's philosophy and the Middle Way, the two relata of cognition do not pre-exist as independent domains but co-arise in the process of experience.[7] This form of relationism constitutes the theoretical core of the enactive approach in its original version.

3. Enactive phenomenology and ontology

At this point, I would like to show that enactive relationism converges with some central aspects of Husserl's phenomenology. I shall do so by considering, firstly, Husserl's theory of perception, with special reference to color vision.
The phenomenological analysis of perception is centred on the concepts of *intentional form* and *sensory matter*. The act of perceiving consists in the intentional animation (*morphè*) of sensory matters (*hyle*), through which the object of perception is *constituted*. This analysis of perception in terms of constitution is aimed at accounting for two aspects of perception, which we have already seen in regard to color vision: perceptual *relativity* and perceptual *constancy*. For e.g., the lemon appears to me as endowed with certain constant properties, such as shape and color (e.g. a specific shade of yellow in a certain region of its surface). However, I perceive these objectual properties *through* a continuous flow of experiences that constantly changes. For e.g., the yellowness of the lemon appears through a continuous multiplicity of *adumbrations* of yellow. For this reason, Husserl distinguishes between color as objectual property (the yellowness of the lemon) and color as sensation, which is a component of consciousness:

> The color of the seen physical thing is, of essential necessity, not a really inherent moment of the consciousness of color; it appears, but while it is appearing the

7 Bitbol refers to the development of Kantian philosophy in the Marburg school and especially to Cassirer, who "recommended that one not construe subject and object as a pair of ontologically closed entities" and stated "after Cohen, the idea of a 'reciprocal co-belonging' of the concepts of subject and object'." (Bitbol, 2003, p. 340).

> appearance can and must, in the case of a legitimating experience, be continually changing. The same color appears 'in' continuous multiplicities of color adumbrations (Husserl, 1983, p. 74).
>
> It must be borne clearly in mind that the Data of sensation which exercise the function of adumbrations of color, of smoothness, of shape, etc. (the function of 'presentation') are, of essential necessity, entirely different from color simpliciter, smoothness simpliciter, shape simpliciter, and, in short, from all kinds of moments belonging to physical things. The adumbration, though called by the same name, of essential necessity is not of the same genus as the one to which the adumbrated belongs (Husserl, 1983, p. 75).

This analysis of perception is centered on the distinction, and *correlation*, between sensations (which are *immanent*, i.e. "internal") and sensory properties (which are *transcendent*, i.e. "external"). In this way, this account constitutes an alternative to the two opposite views that we have already seen in the philosophy of mind and the philosophy of perception: qualia internalism and qualia externalism. As a criticism of qualia internalism, Husserl criticizes the hypostatization of the "physical thing", i.e. the object of mathematical physics, which conceives of it as an absolute reality "in itself" that would be the "real" cause of subjective appearances (metaphysical realism). In the phenomenological view, the so-called primary properties are the result of a theoretical abstraction from the concrete phenomenon that is constituted as the correlate of intentional acts (see esp. Husserl, 1970, pp. 30 ff.). The phenomenological account of perception as constitution through the intentional animation of hyletic contents is also different from qualia externalism (and direct realism, such as Gibson's), because of its denial of the role of sensations in perception and its idea of the object as a mind-independent and pre-constituted reality (see Gibson, 1967, p. 67).[8]
Concerning the epistemology and ontology of color, the phenomenological account of perception is an alternative to both color subjectivism and color objectivism, since it admits both color as sensation (e.g. the adumbration of yellow) and color as objectual property (e.g. the yellowness of the lemon). However, one could object that this account, which does not overlap with neither internalism nor externalism, also implies a problematic duplication of properties. In particular, according to K. Mulligan (1995, p. 47) Husserl's claim that between sensations and sensory properties there is a relation of "similarity" remains "obscure" (Mulligan 1995, p. 47).[9] In my opinion, in order to shed light on this difficulty we must take into account the distinction between two levels of the phenomenological inquiry: *static* and *genetic*. Static phenomenology conceives of the experiences as "unitary temporal processes" (Husserl, 1983, p. 171) and investigates their correlation with objects. As we have seen, this correlation in conceived of in terms of the intentional animation of sensory contents. However, when developing this analysis, Husserl also states that it must be considered as *preliminary* to a genetic "deepening".[10]

8 See Zhok (2013) for a comparison between Gibson's direct realism and Husserl's phenomenology. Zhok stresses affinities but also important differences between them concerning the ontological status of percepts.
9 Mulligan also claims that Husserl "remained attached to the thesis without ever explaining just what it is supposed to involve." (Mulligan, 1995, p. 47).
10 The explicit distinction between the two levels of the phenomenological inquiry, static and genetic, was at the heart of Husserl's philosophy after publishing *Ideas I*. However, this distinction was implicitly present also before, especially in the lectures on time-consciousness (Husserl 1991; see also Husserl 1999) and in some passages of *Ideas I* (see Husserl, 1983, p. 171).

Genetic phenomenology investigates the temporal micro-structure of experiences. In the light of this inquiry, experiences turn out to be constituted by a continuous flow of *primal impressions* (*Urimpressionen*) that are interlaced with two forms of proto-intentionality: retention and protention.[11] In this way, genetic phenomenology investigates the "genesis of constitution" (Husserl, 2001, p. 644), i.e. the micro-genesis of the process through which experiences come to constitute objects.

An important implication of the genetic broadening of phenomenology is that it reveals the genesis of both *subject* and *object* of experience, i.e. their *co-constitution* in reciprocal dependence. In fact, the process through which an object is constituted as the correlate of perceptual experiences is at the same time the process through which the subject itself comes to be constituted as a subjective pole of cognition. The process of perceiving consists in the intentional "animation", through retentions and protentions, of primal impressions. From the static point of view, these impressions constitute the phenomenal contents of perceptual "states", which ground the constitution of perceptual "objects". However, the genetic inquiry deconstructs this static duality of "states" and "objects", revealing a process of co-emergence of experiences and objects in reciprocal dependence. At the basis of this process, there is a primary qualitative process: the flow of primal impressions in inner time-consciousness and their proto-intentional animation through retentions and protentions.

The process-oriented and relationist account of experience in genetic phenomenology converges with the enactivist notion of cognition as dependent co-origination of subject and object. It also converges with the enactive approach in revealing the essentially embodied character of consciousness, acknowledging the essential role of bodily features in shaping the experience of a perceiver.[12] This closeness between the original version of the enactive approach and Husserl's phenomenology is particularly evident in Varela's project of *neurophenomenology* (Varela, 1996), which is continuous with the enactive framework. In fact, Varela argues that the phenomenological inquiry "does not sustain the basic subject-object duality but opens into a field of phenomena where it becomes less and less obvious how to distinguish between subject and object (this is what Husserl called the 'fundamental correlation'." (Varela, 1996, p. 339).[13]

The combination of the enactive approach and phenomenology leads us to define the fields of *enactive phenomenology* and *enactive ontology*, which investigate the constitution of objects in terms of the correlation and co-emergence of subject and object in reciprocal dependence.[14] This approach can investigate the constitution of different domains of empirical reality, or *regional ontologies*, by accounting for their emergence from a primal process of co-constitution of subject and object in reciprocal dependence.

Concerning the epistemology and ontology of color, enactive phenomenology and ontology gives support to *color relationism*, i.e. the thesis that colors are relational properties in a strong sense. According to this view, the experience of color is to be found in the process of co-emergence of the perceiver and the perceived. When asked the questions "where is the color?"

11 Here I must leave aside the details of Husserl's analysis of inner time-consciousness, in order to focus on some of its central aspects.

12 See especially the analyses developed by Husserl in *Ideas II* (Husserl, 1989) and further developed by Merleau-Ponty (2005).

13 C. Petitmengin (2017: 146) stresses the continuity between Husserl's genetic phenomenology and Varela's neurophenomenology, arguing that they both investigate the "*process of co-constitution*" (ibid: 142) of the "objective and subjective poles [...] within lived experience" (ibid: 141). On the relationship between Husserl's phenomenology and Varela's neurophenomenology see also (Bitbol, 2008, 2012; Pace Giannotta, 2017).

14 I pointed out some lines of development of an enactive ontology in (Pace Giannotta, 2016).

and "is it internal or external?" the relationist answer is that there is not a monadic property such as "phenomenal property" or "quale" (for qualia internalism and color subjectivism), or objectual property (for qualia externalism and color objectivism). The experience of color emerges from the process of dependent co-origination of the perceiver and the perceived.

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SECTION 2

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NEUROSCIENCE, AESTHETICS, AND EMBODIMENT

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THE PROBLEM OF IMAGES: A VIEW FROM THE BRAIN-BODY*

abstract

Why do humans create images and what are their features that make them special? How are image-making and the uses of images related? What is the purpose of images? The "problem of images" is addressed through the lens of contemporary neuroscience, arguing why and how neuroscience can investigate our relationship with art and aesthetics, framing this empirical approach as "experimental aesthetics." Recent discoveries are presented that changed our ideas about perception, action, and cognition and the relationship among them, allowing a new look—complementary to the humanistic approach—at the problem of images. A new model of perception and cognition is proposed, called embodied simulation, which reveals the constitutive relationship between brain-body and the reception of human creative expressions.

keywords

aesthetics, embodied simulation, images, neuroscience, vision

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1. Introduction

The production of images and their reception are specific features of the human species. Why do humans produce images? What are the distinctive features making man-made images special? What is the relationship between image-making and the use of images, their purpose and experience? Is there any privileged perspective to address these issues? These and many more questions show how problematic is our relation to images. Indeed, the "problem of images" and its inherent related questions have accompanied human beings since they started asking themselves what it means to be human.

In the last two decades neuroscience has sought to address these issues with its empirical approach. Many scholars in the humanities have argued that the neuroscientific approach to the problem of images, and – more broadly – to art and aesthetics is, on the one hand, unable to reveal anything new and, on the other, may even hinder and/or destroy the wonder and awe normally accompanying our appreciation of art works. Alva Noë's most recent book, *Strange Tools: Art and Human Nature* (2016), constitutes a telling example of this negative attitude. Noë downplays the heuristic value of neuroscience in general, minimizing or even neglecting important results accomplished in a variety of domains. He also argues that neuroscience totally misses the point on art inasmuch it fails to answer the relevant questions, such as why do works of art move us, or why do we value works of art. It is not the purpose of this short essay to offer a detailed reply to Noë's utterly negative stance. It may suffice here to say two things: First, the way Noë portrays neuroscience is, at best, a caricature; second, he seems to conflate a variety of approaches and *explananda*.

Indeed, cognitive neuroscience empirically investigates art and aesthetics using many different approaches, to address different issues and questions: a) by using artistic expressions to understand how the brain works; b) by localizing in the brain -and/or reducing to its functioning- aesthetic concepts (beauty, the sublime, etc.); c) by studying the brain to explain art; d) by studying the brain-body in relation to artistic expressions, in order to understand the constitutive elements of aesthetic experience and the genesis of aesthetic concepts.

I posit that neuroscience can be highly relevant to address the problem of man-made images and aesthetics, particularly if spelled out as in d). In the present article, I suggest – *pace* Noë – why and how neuroscience can investigate our relationship with man-made images, framing this empirical approach as "experimental aesthetics." Experimental aesthetics addresses the problem of man-made images by investigating the physiological correlates of the *aesthetic experience* humans make of works of art. I use the notion of aesthetics according to its etymology from *aesthesis*, that is, by privileging the sensorimotor and affective

features of our experience of perceptual objects. Of course, the sensorimotor components of aesthetic experience are just one of the many levels at which images can be experienced and understood. Experimental aesthetics aims to shed new light on the bodily aspects of our reception of images. A further aim is to investigate whether and to which extent even the reportedly most 'detached' aspects of aesthetic experience, like the explicit evaluation of the formal artistic quality of works of art, are related to embodiment.

As argued by John Dewey, "In order to understand the meaning of artistic products, we have to forget them for a time, to turn aside from them and have recourse to the ordinary forces and conditions of experience that we do not usually regard as aesthetic." (Dewey, 1934, 4). The problem of man-made images can be initially framed as a particular case of the broader problem of images *qua* images (Freedberg & Gallese, 2007). From that it follows that neuroscience by itself is not sufficient to provide a full account of art and artistic images, as they are both strongly culturally and historically determined and situated (Shiner, 2001). Neuroscience, nevertheless, can shed new light on the bodily components of the complex manifold we designate as "aesthetic experience." By means of neuroscience, used as a sort of "cognitive archeology" (Gallese, 1999), we can empirically investigate the neurophysiological brain-body mechanisms enabling our interactions with the world, detect possible functional antecedents of our cognitive skills, and measure the sociocultural influence exerted by human cultural evolution onto the very same cognitive skills. In so doing, we can explain - and eventually revise - with a new sub-personal level of description some of the concepts we normally use when referring to intersubjectivity, aesthetics, and art, as well as to the experience we make of them.

The proposal I am defending here is that the experience of man-made images can be fruitfully approached by clarifying its bodily and neurobiological grounding elements. In so doing, we might eventually acquire a better understanding of what the concepts we normally use when referring to aesthetics and art are made of.

In the following sections, I illustrate how recent discoveries of neuroscience revolutionized our ideas about perception, action, and cognition and the relationship among them, allowing a fresher look—complementary to the humanistic approach—at the problem of images.

My purpose is not to reduce aesthetics to the mere working of neurons, but to enrich our perspective on distinctive aspects defining our human nature.

The new model of perception and cognition I propose, *embodied simulation*, reveals the constitutive relationship between body and creative expression and its reception. Embodied simulation shows that human experience—broadly speaking—should always be understood as a natural form of relational experience. As Siri Hustvedt wrote: "Visual art exists only to be seen. It is the silent encounter between the viewer, 'I', and the object, 'it'. That 'it', however, is the material trace of another human consciousness. [. . .] The painting carries within it the residue of an 'I' or a 'you'. In art, the meeting between viewer and thing implies intersubjectivity. [. . .] The intersubjectivity inherent in looking at art means that it is a personal, not impersonal act" (Hustvedt, 2005, xix).

The first important contribution of neuroscience to the problem of images is a novel notion of visual perception.

2. Against *Visual Imperialism*: Vision as Multimodality

Our vision of the world is complex and – most importantly – it exceeds the mere activation of the so-called visual part of the brain. Neuroscience has shown that vision is multimodal: it encompasses the activation of motor, somatosensory, and emotion-related brain networks. Motor neurons not only cause movements and actions but they also respond to body-related visual, tactile, and auditory stimuli, mapping the space around us, the objects at hand in that very same space, and the actions of others. Cortical motor networks thus provide the bodily-

formatted motor representational content of space, objects, and actions.
The space surrounding our body—peripersonal space—whose limits are the working limits of our arm, is defined by the motor potentialities of our body. Premotor neurons controlling the movements of the upper arm also respond to tactile stimuli applied to it, to visual stimuli moved within the arm's peripersonal space, or to auditory stimuli also originating from the same peripersonal space (Fogassi *et al*., 1996; Rizzolatti *et al*., 1997).
Manipulable objects, when observed, are mapped by the motor brain as potential targets of the interactions we might entertain with them. Premotor and parietal "canonical neurons" control the grasping and manipulation of objects, but also respond to their mere observation (Murata *et al*., 1997; Raos *et al*., 2006).
Finally, mirror neurons (Gallese *et al*., 1996), motor neurons activated during the execution of action and its observation when performed by someone else, map the action of others on the observers' motor representation of the same action (for review, see Rizzolatti *et al*., 2001).
The human brain is also endowed with a mechanism directly mapping action perception and action execution, defined as "Mirror Mechanism" (MM, for further review, see Gallese *et al*., 2004; Gallese, 2014a, b; Gallese and Guerra, 2015; Gallese and Cuccio, 2015). In humans too, the motor brain is multimodal. The brain circuits displaying the MM connect frontal and posterior parietal multimodal motor neurons, most likely analogous to macaques' mirror neurons. These brain circuits map a given motor content like "reach out," "grasp," or "hold" not only when controlling its performance, but also during its perception when performed by someone else, when imitating it, or when imagining performing it, while being perfectly still. In sum, the cortical motor system is not just a mere muscles controller, but an integral part of our cognitive system, the key element of our 'motor cognition' (Gallese *et al.*, 2009).
When acting or imitating someone else's action, the corticospinal pathway is activated, causing the excitation of muscles and the ensuing movements. When, instead, we observe or imagine movements and actions, actual action execution is inhibited. The motor system is activated, but not in all of its components and not with the same intensity as when we actively move our body: action is not produced but only simulated.
The embodied simulation of action likely provides the conditions allowing for the phenomenal quality of the experience of imagined or observed actions. Embodied simulation thus allows a direct apprehension of the relational quality linking to our body space, objects, and the actions of others. The primordial quality turning space, objects, and behavior into intentional objects is their constitution as the objects of the motor intentionality expressed by the motor potentialities of our body (Gallese, 2000, 2014a, 2016; Gallese & Sinigaglia, 2010).
Further research showed that other types of MMs underpin our capacity to directly apprehend the emotions and sensations of others because of a shared representational bodily format. When perceiving others expressing disgust or experiencing touch or pain, some of the same brain areas are activated as when we subjectively experience the same emotion or sensation. We do not fully experience their qualitative content, which remains largely opaque to us; however, embodied simulation enables us to experience others *as* experiencing emotions or sensations we know from the inside, as it were.

3. Embodied Simulation: Intersubjectivity as Intercorporeality

The discovery of mirror neurons gives us a new empirically founded notion of intersubjectivity, first and foremost conceived as intercorporeality—the mutual resonance of intentionally meaningful sensorimotor behaviors. Our understanding of others as intentional agents does not exclusively depend on language, but also on the relational nature of action. In many situations, we can directly grasp the meaning of other people's basic actions thanks to the motor equivalence between what others do and what we can do.
Intercorporeality thus becomes the main source of the basic knowledge we entertain of others.

Motor simulation instantiated by neurons endowed with the MM is probably the neural correlate of this human faculty, describable in functional terms as "embodied simulation" (Gallese, 2005, 2014a, 2016; Gallese & Sinigaglia, 2011). The variety of MMs present in our brain, thanks to the "intentional attunement" they generate, allows us to recognize others as other bodily selves, enabling basic forms of intersubjective communication and mutual implicit understanding (Gallese, 2014a, 2016).

Embodied simulation provides a unified theoretical framework for all of these phenomena. Our social interactions become meaningful by means of reusing our own mental states or processes in functionally attributing them to others (for the notion of reuse, see Gallese, 2014a, 2016). In this context, simulation is conceived of as a nonconscious, pre-reflective functional mechanism of the brain–body system whose function is to model objects, agents, and events. This mechanism can be triggered during our interactions with others, being plastically modulated by contextual, cognitive, and personal identity-related factors.

As we have seen in the previous section, embodied simulation is also triggered during the experience of spatiality around our body and during the contemplation of objects. The functional architecture of embodied simulation seems to constitute a basic characteristic of our brain, making possible our rich and diversified experiences of space, objects, and other individuals, being at the basis of our capacity to empathize with them.

Altogether these results suggest that empathy, or at the very least many of its bodily qualities, might be underpinned by embodied simulation mechanisms. Empathy can be conceived of as the consequence of our natural tendency to experience interpersonal relations first and foremost at the implicit level of intercorporeality.

Embodied simulation not only connects us to others; it connects us to our world, a world populated by natural objects, man-made objects, and other individuals, a world in which most of the time we feel at home. The sense we attribute to our lived experience of the world is grounded on the affective-laden relational quality of our bodily action potentialities, enabled by the way they are mapped in our brains.

4. Embodied Simulation and Experimental Aesthetics

Experimental aesthetics emphasizes the social performative nature of human creative expressions. By addressing human forms of creative expression in terms of social performativity, experimental aesthetics can fully exploit the heuristic value of embodied simulation.

Indeed, embodied simulation can be relevant to aesthetic experience in at least two ways: first, because of the bodily feelings triggered by the works of art we relate to, by means of the MMs they evoke. In such a way, embodied simulation generates the peculiar "seeing-as" characterizing our aesthetic experience of the images we look at. Second, because of the potential intimate relationship between the symbol-making gesture and its reception by beholders. The embodied simulation of the hand gestures that produced the image enables its experience (Freedberg & Gallese, 2007; see also Gallese & Di Dio, 2012; Gallese, 2012, 2014a, b; Gallese & Gattara, 2015).

Our scientific investigation of visual arts began with this second aspect. We investigated the link between the expressive gestures of the hand and the images those gestures produced in three distinct experiments with high-density electroencephalography (EEG). We recorded beholders' brain responses to graphic signs like letters, ideograms, and scribbles, or to abstract artwork by Lucio Fontana and Franz Kline.

The results of the first study showed that observing a letter of the Roman alphabet, a Chinese ideogram, or a meaningless scribble, all written by hand, activates the beholders' motor representation of their hand (Heimann, Umiltà & Gallese, 2013). In the two other studies, we demonstrated that a similar motor simulation of hand gestures is evoked when looking at the

cuts on canvas by Lucio Fontana (Umiltà *et al*., 2012), or at the dynamic brushstrokes on canvas by Franz Kline (Sbriscia-Fioretti *et al*., 2013).

The visible traces of the creative gestures activate in the observer the specific motor areas controlling the execution of the same gestures. Beholders' eyes catch not only information about the shape, direction, and texture of the cuts or strokes; by means of embodied simulation they breach into the actual motor expression of the artist when creating the artwork. The sensorimotor component of image perception, together with the jointly evoked sensory and emotional reactions, allow beholders to *feel* the artwork in an embodied manner.

A possible criticism of this model could point out the supposed passivity of its account of aesthetic experience, where beholders seem to be relegated to a deterministic empathic receptivity, hence losing sight of the peculiar individual quality of aesthetic experience, largely determined by one's individual taste, background, memories, education, and expertise. A second objection frequently raised against empathic–mimetic accounts of aesthetic experience consists of opposing the ambiguity and indeterminacy of art's symbolic content to the supposedly mechanistic quality of empathic responses, hence incapable of capturing the potential intrinsic ambiguity and polysemic quality of works of art.

It is possible to challenge these criticisms by arguing that there is ample proof that MMs and embodied simulation are dynamically modulated and affected by contingent and idiosyncratic factors. Indeed, several studies showed that one's previous experiences, memories, and expertise strongly determine the intensity of activation of MMs and the ensuing perceptual contents. (For recent reviews, see Gallese, 2014a, 2016; Ammaniti & Gallese, 2014; Gallese & Guerra, 2015.)

Embodied simulation, by virtue of its diachronic plasticity and modulation, might also be the vehicle of the projective qualities of our aesthetic experience, where our personal and social identity, the context, our mood and disposition literally shape the way we relate to perceptual objects. Embodied simulation, if conceived of as the dynamic instantiation of our implicit memories, can relate perceptual objects to beholders with a specific, unique, and historically determined quality. I submit that this projective quality of embodied simulation can do justice to both objections.

5. Liberated Embodied Simulation and Aesthetic Experience

Being human not only means to experience physical reality, but also to conceive possible worlds, to surrender to imagination and fictional worlds. An interesting topic for neuroscience to investigate is how our brain–body enables us to navigate in real and fictional worlds, constantly switching between them. Embodied simulation, a new model of perception and cognition, also reveals that the human experience of man-made images—broadly speaking—should always be understood as a natural form of relational experience. We live in relation to other people and objects present in our real world, but we live as well in relation to people and objects that are part of imaginary fictional worlds, which in the course of our cultural history we came to identify as art. Both kinds of relationships are rooted in our brain–body. The very same forms of sociality enabling artistic expressions and their reception are, at their basis, a further exemplification of intersubjectivity, conceived of as intercorporeality.

Neuroscience allows us to understand how the line between what we call reality and the imaginary and imagined worlds of fiction is much less sharp and clear than one might think. Indeed, experiencing an emotion and imagining it are both underpinned by the activation of partly identical brain circuits, although differently connected, when engaged in these different cognitive and phenomenal situations. Similarly, to see something and to imagine it, to act and imagining to act, share the activation of partly common brain circuits. A recent high-density EEG study showed that the brain circuits that inhibit action execution are partly the same as those that allow us to imagine to act (Angelini *et al*., 2015). All these examples of

dual activation patterns of the same brain circuits represent a further expression of embodied simulation and neural reuse (Gallese, 2014a, 2016).

A further advantage of embodied simulation consists of the possibility of addressing human forms of creative expression in terms of social performativity. Indeed, the biocultural approach to art and aesthetics, heavily influenced by cultural anthropology, emphasizes the performative character of human creativity. The anthropologist Tim Ingold wrote: "Hunters and gatherers of the past were painting and carving, but they were not "producing art." ... We must cease thinking of painting and carving as modalities of the production of art, and view art instead as one rather peculiar, and historically very specific objectification of the activities of painting and carving" (Ingold, 2000, 131). Similarly, Ellen Dissanayake wrote: "Art is not an ornamental and dispensable luxury, but intrinsic to our species. ... Art as a behavioral complex is an inherited tendency to act in a certain way, given appropriate circumstances" (Dissanayake, 1992, 224).

However, there is a clear distinction between how we experience the real world and the worlds of fiction. Our relationship with fictional worlds is double-edged: on the one hand, we pretend them to be true, while, on the other, we are fully aware they are not.

In spite of the fact that the body is at the core of our perceptions, of our understanding, and of our imagination, the relationship with fictional worlds is still mainly explained in purely cognitive terms, that is, following Coleridge, in terms of suspension of disbelief. This explanation, however, is at best partial. It was proposed that embodied simulation can be relevant to our experience of fictional worlds because of the feeling of body they evoke, by means of the potentiation of the mirroring mechanisms they activate (Wojciehowski & Gallese, 2011; see also Gallese, 2011, 2012, 2014b; Gallese & Guerra, 2015). Through this potentiation, embodied simulation generates the specific attitude informing our aesthetic experience, boosting the bodily memories and imaginative associations fictional content can awake in our minds, thus providing the idiosyncratic character of its appreciation.

How is such potentiation achieved? One important context-dependent aspect characterizing our relationship to fictional worlds deals with our distancing from the unrelated external world, which remains at the periphery of our attentional focus, very much like the frames surrounding the images we are beholding. According to my hypothesis, such distancing, this temporary suspension of the active grip on our daily occupations, liberates new simulative energies. Our experience of fictional worlds, besides being a suspension of disbelief, can thus be interpreted as a sort of "liberated embodied simulation." When adopting such aesthetic attitude, our embodied simulation becomes liberated, that is, it is to a large extent freed from the burden of modeling our actual presence in daily life (Gallese, 2011, 2012; Wojciehowski & Gallese, 2011; Gallese & Guerra, 2015). Through an immersive state, in which our attention is focused on the fictional world, we can fully deploy our simulative resources, letting our defensive guard against daily reality slip for a while.

Finally, I posit that when engaged with fictional worlds, the contextual bodily framing — our being still— additionally boosts our embodied simulation. Being still enables us to fully deploy our simulative resources at the service of the immersive relationship with the fictional world, thus generating a greater feeling of body. Being forced to inaction, we are more open to feelings and emotions. The specific and moving experience generated when immersed in fictional worlds is thus likely also driven by the sense of safe intimacy with a world we not only imagine, but also literally embody.

When we relate to fictional worlds, our attitude towards their content can be characterized as a sort of "neotenic look," somehow similar to the way we are looking at the world during that early period of our development in which, because of our poor motor autonomy, our interactions with the world are mainly mediated by the embodied simulation of events,

actions, and emotions animating our social landscape. During the first months of our extra-uterine life, while observing others' behaviors, thanks to embodied simulation and its plasticity we learn to calibrate gestures and expressions and to match them with experiences of pleasure and displeasure.

When we relate to fictional worlds, as when we contemplate works of art, our relative immobility is no longer the consequence of the immaturity of our sensorimotor development, but the outcome of our deliberate decision. However, immobility, that is, motor inhibition, probably allows us to allocate more neural resources to the service of our beholding, intensifying the activation of bodily formatted representations and, in so doing, making us adhere more intensely to what we are simulating. Perhaps it is no coincidence that some of the most vivid fictional experiences we entertain, as those occurring during dreams, are paralleled by the massive inhibition of our muscles.

During the aesthetic experience of fictional worlds, our experience is mediated by the simulative perception of the events, actions, and emotions that form the content of fiction. For example, when watching a movie or reading a novel, we not only focus our attention on them, but our immobility enables us to fully deploy our embodied simulation resources and put them at the service of our immersive relationship with the story. This hypothesis can plausibly contribute to explaining the difference between our "aesthetic attitude" towards fictional worlds and our ordinary consciousness of prosaic reality.

6. Conclusions

The creative processes characterizing our species, in spite of their progressive abstraction and externalization from the body, keep intact their bodily ties. Creative expression, through image-making, is tied to the body not only because the body is the image-making instrument, but also because the body is the main medium allowing the experience of man-made images. Through the lens of neuroscience, we can now look at the human aesthetic–symbolic dimension also from the dimension of bodily presence. According to Hans Gumbrecht (2004), aesthetic experience involves two components: one deals with meaning, the other with presence. The notion of presence entails the bodily involvement of image beholders through a synesthetic multimodal relationship with the artistic/cultural artifact, whose perception is qualified by Gumbrecht as "haptic vision." According to Gumbrecht, every culture can be analyzed and studied from the double perspective of meaning and presence, because both can be found in variable percentages in every cultural object. When presence predominates, world objects chiefly acquire their sense by virtue of their intrinsic sensorimotor inherence to perceivers. The added value experimental aesthetics can bring to the debate in aesthetics consists in revitalizing the scientific study of artistic styles, focusing on their biological bodily roots. By empirically investigating aesthetic experience, the outcomes of human creative expression can be viewed and interpreted in ways less conditioned by the contemporary Western cultural and aesthetic canon, because such influences can be specifically studied, thus granting their thorough understanding.

Contemporary neuroscience shows that what we see is not the simple "visual" recording in our brain of what stands in front of our eyes, but the result of a complex construction, whose outcome is the result of the fundamental contribution of our body with its motor potentialities, our senses and emotions, our imagination, and our memories. We must definitely abandon the outdated concept of solipsistic and "purely visual" vision. Vision is a complex experience, intrinsically synesthetic, that is, made of attributes that largely exceed the mere transposition in visual coordinates of what we experience any time we lay our eyes on something. The expression "laying the eyes" indeed betrays the haptic quality of vision: our eyes are not just optical instruments, but are also a "hand" touching and exploring the visible, turning it into something *seen by someone*.

With the aid of neuroscience, we can better test the supposed universality of human artistic expression and, most importantly, challenge its allegedly unique logocentric origin. Cognitive neuroscience can surrender us from the forced choice between the totalizing relativism of social constructivism, which doesn't leave any room for the constitutive role of the body in cognition, and the deterministic scientism of some quarters of evolutionary psychology, which aims at explaining art exclusively in terms of adaptation and modularity.
Experimental aesthetics can shed new light -from its own peculiar perspective and methodology- on the aesthetic quality of human nature and its natural creative inclination. In so doing, it will help us understand why and how creative expression, and what we now designate as art, are among the most fundamental expressions of our species.

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ENACTIVE AESTHETICS AND NEUROAESTHETICS*

abstract

In this paper, I review recent enactive approaches to art and aesthetic experience. Radical enactivists (Hutto, 2015) claim that our engagement with art is extensive, in the sense that it is non-contentful and artifact-including. Gallagher (2011) defends an embodied-enactive account of the specific kind of affordances artworks provide. For Noë (2015) art is a reorganizational practice. Each of these accounts claims that empirical (neuro)aesthetics is incapable of capturing the art-related engagement they want to highlight. While I agree on the relational and enactive nature of the mind and see the presented theories as important contributions to our understanding of art and aesthetics, I will argue that their dismissal of empirical aesthetics is misguided on several counts. A more qualified look can reveal relevant empirical research for claims enactive theorists should be interested in. Their criticism is either too general regarding the empirical methods employed or based on philosophical claims that themselves should be subjected to empirical scrutiny.

keywords

art, embodied cognition, enactivism, externalism, neuroaesthetics

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1. Introduction

In what ways do philosophical theories of our engagement with art and cultural artifacts relate to biological factors and recent scientific insights into our cognitive systems? One widely quoted, founding papers of neuroaesthetics claims:

> Aesthetics, like all other human activities, must obey the rules of the brain of whose activity it is a product, and it is my conviction that no theory of aesthetics is likely to be complete, let alone profound, unless it is based on an understanding of the workings of the brain. (Zeki, 1999, p. 94)

On the one hand, this can be seen as trivially true, since seemingly nobody would deny the central contribution of the human brain and nervous system to artistic creativity and aesthetic responses (hence the need to include them in any complete theory). On the other hand, some philosophers of art take issue with the implications such a focus on "rules of the brain" has for the profoundness of a theory of art. The artwork seems unduly pushed into the background by a science that aims to advance by focusing on internal, psychological facts (Davies, 2014). Any adequate theory should therefore especially make sure to sufficiently account for both sides of the artifact-organism relation.[1]

Embodied-enactive accounts agree on this latter point. They highlight the relational nature of our mind and concur that it is impossible to study this relation without centrally including processes in the body and features of the environment and artifacts in the sciences of the mind. Including the manifold aspects of cultural artifacts seems also central to capture the aesthetic experiences among our mental states, including those that constitute processes of the evaluation of art. Enactivists here also relate the (neural) internalism prevalent in neuroaesthetics to the disregard of theorizing about the artworks themselves. They, in turn, aim to include the artwork and the unique interactions it affords more prominently in their accounts. They do this by either promoting an especially strong

1 Zeki's account, as well as Ramachandran and Hirstein's (1999) claims regarding a neuroscience of art, have been criticized by other neuro-aestheticians for already being overly focused on artifacts and art. According to such critics, a proper foundation of neuroaesthetics should rely upon general appraisals of more mundane objects and social situations such as food and the evaluation of the attractiveness of mating partners (see Brown *et al*., 2011, p. 250). This is an example of the struggle with uniqueness claims with respect to our engagement with art in the field of empirical aesthetics, that I will address later in the paper.

version of externalism that treats the artifact in certain cases as constituent part of the supervenience base of the respective mental states (see section 2). Or, they highlight another enactive mainstay, namely the focus on praxis and active engagement. Here one could argue that cultural artifacts afford specific kinds of practices different from our everyday encounters. (see sections 3 & 4).

In this paper, I will address objections to empirical (neuro-)aesthetics issued by three prominent defenders of enactivism.[2] Dan Hutto's radical enactive account objects to what he ultimately sees as a problematic neural essentialism. He proposes an "extensive" reading of our interaction with cultural artifacts that goes beyond the possible purview of neuroaesthetics (Hutto, 2015). Shaun Gallagher's enactive-embodied interpretation of motor theories of our engagement with art (Gallagher, 2011) criticizes mirror neuron accounts of aesthetics, such as Freedberg and Gallese (2007), for their inability to address the difference between actual objects and the representations of such objects produced by artists. Whereas Hutto's criticism is mostly focused on neuroaesthetics' misconstrual of the relation between perceiving organism and artifact, Gallagher also proposes an initial theory of the value of art. Art transcends our everyday encounters and enables us to engage with the purely possible or even impossible. Alva Noë (2015) develops a positive theory as well. He capitalizes on what he calls the "work of art" in a specific way. The work of art is not the material object. It rather is a particular form of engagement with artifacts and with our artifactual practices, namely one in which we undergo a transformation or re-organization regarding these very practices. Neuroaesthetics' stimulus-response model gets this all wrong in several ways: it investigates neural activity independent of the possible ways body and artifacts co-constitute this activity (this is its horizontal mistake, so to say), and neuroaesthetics ignores, as Noë highlights, the role the discursive context plays for the right kind of interactions (this being the vertical mistake, ignoring higher level elements). Based on his own theory Noë brushes off empirical aesthetics more generally because he sees it as concerned with responses to art – such as beauty and preference judgments – that do not figure in the discursive contexts that define the practices we employ when we truly engage with art.

What unifies these accounts is their rejection of internalism. Yet, they provide various versions of externalism and diverging theories of what constitutes an aesthetic interaction. They, therefore, reject the existent empirical approaches to art and aesthetics for different reasons. The present paper aims to identify these reasons and shows that each of them is misconceived to some extent. It is true that empirical studies focus on local, testable hypotheses and in the case of neuroaesthetics are biased towards the inner workings of the brain. They often also focus on responses (such as preference and liking) that are not among the main interests of philosophers interested in the arts. The claims they derive concerning the nature of cultural phenomena might be tainted by those biases. Yet, neither the focus on neural responses (in neuroaesthetics), nor the focus on more generic responses to art (as in empirical aesthetics more generally) is based on principles that cannot be corrected. While adhering to enactive insights about the relational and active nature of our mind, I will argue that in order to arrive at a sounder picture of what empirical aesthetics can contribute to our understanding of art, we should not succumb to a too pessimistic view. I, therefore, will defend

2 The theories discussed in the present paper identify themselves as subscribing to an enactive theory of the mind and address art and the limits of neuroaesthetics explicitly. This was the reason to include them in a joint treatment. Moreover, the accounts I discuss do focus on empirical research on the visual arts (although they discuss other artforms) and I to a large extent follow them in this. For a broader discussion regarding aesthetics and enactivism that also includes biological autonomy as a key concept (see Varela, Thompson & Rosch, 1991; Thompson, 2007) see the collection of papers in Scarinzi (2015) as well as a recent application of enactivism to architecture in Jelić (2016).

motor accounts of the arts against the criticism by Gallagher and reject the more radical dismissal of empirical aesthetics prevalent in Hutto and Noë.

2. Art and our extensive mind

Work on the ontology of the artwork in aesthetic theories is only one way that artworks and cultural artifacts can gain center stage. Situated accounts of aesthetics (see Manzotti, 2011a, for an overview), address ontological questions from the perspective of philosophy of mind and provide an assessment of the ways objects, artifacts, and also artworks relate to our mental states that is initially independent of the aesthetic claims one wants to subscribe to. Manzotti (2006, 2011b), for example, defends a phenomenal externalism and claims that the mind is spread: "objects and their phenomenal representations are only two incomplete perspectives and descriptions of the same physical process." (Manzotti, 2011b, 29). According to such a theory, objects gain center-stage and frame our reality beyond being simply input to our sensory processing: they are part and parcel of the respective experience in the sense that they constitute one aspect of a wide supervenience base of mental states (the way in which they do so is subject to a controversial debate that I will not go into in the present paper). Hutto's paper on enactive aesthetics (2015) presents a position that can be seen as a corollary of the above, with the addition that he also does away with the relata as they are framed by Manzotti. To his mind the reference to phenomenal representations is dispensable. As he defends elsewhere: basic mental states are contentless (this is what makes them self-proclaimed *radical* enactivists, see Hutto & Myin, 2013).

Both, Manzotti and Hutto, also see aesthetics as a particularly good touchstone for their theories. They do not make it sufficiently explicit why that should be the case, although one can derive some possible reasons from passages in which they identify the limits of neuroaesthetics. There they claim that aesthetics requires a more artifact-including perspective because aesthetic experiences are precarious in a certain sense: without the rich perceptual affordances of the actual artwork they either might not come into existence at all or not develop fully to an aesthetically valuable experience. What they might have in mind could be something along the following lines: in order to appropriately experience the luminance in Van Gogh's *The Night Café* or the smeared colors on the canvases of William Turner, it might be reasonable to assume that a suitable observer has to interact physically with the artwork, approach it, and engage with it in the flesh (think of the physically protruding clumps of paint in some Turner paintings). What's more, such artworks themselves seem to engage the observer, guiding her in a trajectory that makes the experience worthwhile (and the same reasoning might hold for music, dance, architecture); elevating cultural artifacts to the status of agents in this respect (Kirchhoff, 2012). By ignoring the details of our interaction and the sensorimotor engagements that specific artworks afford, or so especially Hutto argues, neuroaesthetics only can turn out to be explicitly anti-enactivist. He therefore formulates the desiderata of a theory of aesthetic experiences as follows:

> what is needed is a de-intellectualized characterization of mind that rethinks basic mentality, uncompromisingly, in terms of extended interactions with an environment. On such an account, engaged interactions of the right kind – but nothing short of them – would suffice for the occurrence of the relevant aesthetic phenomena. (Hutto, 2015, p. 226)

Thus, only such uncompromising and ontologically more committed views, which treat the relevant mental states as "extensive" and artifact-including (Hutto *et al.* 2014), can be the foundation of an enactive view of our artful minds.

The way Hutto presents neuroaesthetics' neural essentialism makes it incompatible with such truly enactive endeavors. As Hutto claims this essentialism is based on a representational

theory of mind and accompanied with a strong cognitivist leaning. Zeki (1999), for example, defines the function of art as providing us with essential information about the environment (art is successful when it dispenses with non-essential information). Zeki initially formulated this theory independent of any empirical validation, yet what is troublesome for Hutto is that the empirical data that such a theory aims to gather are limited to internal responses (for example of the visual system that has been geared to accurately represent constancies in the environment and the reward centers related to such successful access).[3] To summarize Hutto's points: the responses Zeki is looking for are of the wrong sort (they are cognitive states, in the sense that they aim at knowledge), and Zeki is looking for naturalization in the wrong area, so to speak, by assuming that the neural responses that underlie those cognitive states are necessary and sufficient for aesthetic experience and thereby do not include the artwork in a way that displays its central importance. I will focus on the latter problem and the ensuing disregard of the artwork in neuraesthetics, but I will touch upon the question of cognitivism towards the end of the section as well.

One can, for example, mourn the fact that reproductions rather than actual artworks, are the stimuli in most lab settings. One should also highlight that only limited possibilities to engage with those reproductions are provided. Both are a consequence of the focus on neural activity in such studies. Yet there already exist commendable attempts to make experiments more ecologically valid, for example, by comparing museum experiences of original artworks to lab experiences and by using physiological measures, motion- and eye-tracking techniques that capture elements of our embodied engagements in museums (Tschacher *et al*., 2012; Brieber *et al*., 2014; Walker *et al*., 2017). Such attempts are on top of those to directly manipulate different (visual) properties of artworks that are also prevalent in empirical aesthetics (see Locher, 2014 for an overview). The latter can be readily employed also in neuroaesthetic research based on fMRI analysis, whereas more situated approaches 'in the wild' that aim to track neural responses are so far confined to fNIRS and EEG measurements. Some of the above studies indeed found significant effects of context and originality of the artworks (compared to artificial settings and interaction with reproduction). Yet, interestingly enough, other studies could not establish such differences with respect to relevant measures such as aesthetic liking for artworks (Brieber *et al*., 2015). My main objection to Hutto's rejection therefore is that, independent of the specific results of those studies, it remains a matter of empirical fact and for future studies to determine, which elements of our aesthetic interaction with artworks *de facto* contribute to our appreciation. Dismissing all studies that undercut what Hutto, in an armchair attempt, has identified as the relevant fine-grained components of aesthetic experience and appreciation of art, leaves no room for such scientific exploration. Thus, it is far from clear what the alleged "engaged interactions of the right kind" are, and therefore whether only studies that address these kinds of engagements and "nothing short of them" can contribute to scientific progress in the field (Hutto, 2015, p. 226). Hutto has to be careful not to overshoot and to end up with a low-level (i.e. fine-grained) externalist chauvinism regarding the relevant properties of artworks and respectively of our experiences, as the aforementioned quote suggests.[4]

3 Zeki's (1999) paper rather focuses on the experimental character of the artists themselves and how they explored via visual experiments the possibility of visual arrangements to best stimulate or recognitional or perceptual capacities. In general, early neuroaesthetics is purely descriptive and experimental work only started later with studies on the neural correlates of the perception of beautiful artworks and geometrical shapes (Kawabata & Zeki, 2004; Jacobsen *et al.,* 2006).

4 This extends also to what has been labeled the "acquaintance principle" with respect to artworks. The principle states that artworks cannot be judged in lack of perceptual encounters with them (Wollheim, 1980, p. 233). Yet even if

To be clear, this is not to deny that details of the physical artifacts, as well as the specific settings of experiments with respect to our embodied responses, are often not specified enough in empirical studies. This holds for research on object perception and experience more generally. In a meta-analysis of 116 articles papers on object cognition, Chemero and Heyser (2009) showed that many of them did not sufficiently detail the very objects used in the studies and therefore miss out on the specific affordances that might differ even with slightly different objects; a confound that significantly impacts the viability of these studies and that renders many conclusions drawn from them problematic at least. Yet, although this might be proof of an 'internalist bias' in large areas of research, one still can account for this with more embodiment-sensitive accounts and studies (that have become more and more prevalent and already guide many studies in the cognitive science) and therefore correct this without dismissing the field as a whole. Most neuroaesthetic studies provide complete lists of stimuli and specify the presentation methods, others just manipulate one stimulus feature in order to explore its effect on aesthetic experiences. In a sense the stimulus has never been ignored and is a major part of the experimental procedure. This not to say that such settings cannot be improved and controlled for situated and embodied aspects. Empirical research thrives on criticism that focuses on the explanatory value (or lack thereof) of existent research.

One could therefore argue for ways neural activity should be understood as part of a larger enactive engagement and how that could alter study designs and interpretation of data. This is not the direction Hutto chooses. He rather aims to find neuroaesthetics guilty of ontological fraud: he claims that it disregards the necessary extensive nature of aesthetic experiences. Whether neuroaesthetic research, despite this purported metaphysical oversight, might be able to produce interesting research is not even discussed as a possibility.

Overcoming internalist as well as the aforementioned cognitive biases also requires something beyond a theory of perceptual encounters that simply takes the brain-body-artifact nexus more serious. It seems to demand a theory that more directly includes embodied processes of valuing. Such processes might comprise experiences of beauty and even constitute states of appreciation (Hutto himself writes of "appreciation" as one of the relevant aesthetic states), and here bodily feedback as well as details of the artifact might be crucial. Such research could, for example, aim to specify in what ways such a valuing might have an affective, sensorimotor profile related to bodily posture and is influenced by presentational factors of artworks (Seidel & Prinz, 2017). By not discussing any research that might follow such a path, Hutto's theory threatens to slide into an unqualified anti-naturalistic position regarding what could constitute relevant engagements with art. Accounts of the emotions that underlie our valuing of art as well as accounts of how our aesthetic concepts might be embodied might be possible directions here (see Fingerhut & Prinz, 2018a,b).

Yet also theories that aim to explain in which ways perception might be embellished by particular contextual features of the artwork could be helpful in this respect. There already exist enactive accounts that aim to show how an externalist might be better equipped not only to include material aspects of the artifacts but also cognitive elements and the history of their making as part and parcel of perceptual encounters, accounting thereby for the richness of aesthetic experience (Myin & Veldemann, 2011; see also Stokes, 2014).

Moreover, the discussion in this section has shown to some extent that the criticism raised against neuroaesthetics is not specific to the field of aesthetics and the arts. Hutto (2015) remains obscure what his contribution to a science of the artful mind might in the end consist

such a principle holds (see Budd 2003, for a critical assessment) there still remains a lot to be said about what we value in those artworks and why.

of. In general, it does not leave enough room for an anti-cognitivist (neuro-)aesthetics, i.e. one that avoids the aforementioned biases and that nonetheless could test predictions about the processes of valuing art and allows for novel discoveries that are not accessible for armchair philosophy. One could wish for a more cooperative attitude in this respect and Hutto's positive claims regarding our art engagement could be instrumental in correcting some cognitivist and internalist leanings of neuroaesthetics. This is despite the fact that he gives no decidedly art-specific reason for doing this and he provides more ontological reproach than guidance for future theory building.

3. Motor engagement and the uniqueness claim

Hutto's criticism remained underspecified concerning the ways neuroaesthetics might progress beyond its cognitivist beginnings and confines it to some extent to some of its inaugural texts. In passing Hutto discusses another empirical approach that might prove helpful, though. Vittorio Gallese's work on motor engagement as the basis of our emotional engagement with visual art, according to Hutto, avoids the perceptual-cognitive bias of neuroaestheticians such as Zeki, but still is dismissed as being neuro-essentialist.[5] More specifically, Gallese proposes that activation of the mirror neuron system (MNS) is a central component in the engagement with representations of human bodies and traces of embodied action on the surface of such representations (such as brushstrokes and cuts on canvases, see Freedberg & Gallese, 2007; Umilta *et al*., 2012).

In this section I will discuss the more comprehensive criticism of the Freedberg/Gallese account in Gallagher (2011) in order to assess how it might nonetheless contribute to an enactive understanding of our relation to artworks. Gallagher mainly takes issue with two things: the concept of 'simulation' and the lack of any art-specific claim in Freedberg and Gallese (2007). Let's start with the first point. Gallagher argues that reference to 'simulation' in the MNS account of social cognition requires a notion of pretense that assumes a differentiation between one's own and the other person's agency as part of the account. Yet, such a demarcation between 1st and 3rd person representations is nothing the MNS can sustain by itself. And neither does it have to. As Gallagher suggests, one can entertain a more enactive reading without dismissing the relevance of the MNS. It indeed plays a crucial role: it prepares for action, and its activation is correlated to anticipatory embodied planning of such actions. It thereby complements the (social, perceptual) affordances the environment offers and prepares the organism for possible engagements. Such "anticipatory kinaesthetics" (Gallagher 2011) in the sense of subpersonal mechanisms of preparation for future actions dovetails nicely with the enactive idea that we bring forth our experiential encounters based on rules incorporated in embodied skills (skills that we have developed throughout our history of interactions with the environment as well as with cultural artifacts).

I will not go into the details of the simulation debate (Gallagher, 2001; 2007 develops this more fully), because the criticism specific to the aesthetic domain lies elsewhere. I included it here, though, because I think that it provides a way to integrate neural activity into a more enactive system of engagement by highlighting its relation to action.[6] The above paves

5 Hutto slightly misrepresents Gallese as one that deals with explicit aesthetic appraisals while, in fact, Gallese unambiguously aims to avoid a focus on explicit, internal value appraisal and highlights direct emotional-perceptual encounters with artworks. Hutto quotes Gallese and DiDio (2012) who propose a theory that "capitalizes upon the discovery of the mirror neuron mechanism [and focuses on] the dimensions of reward and explicit appraisal of the esthetic [sic] experience" (ibid, p. 688). The latter is actually what they object to and what rather comes, to their mind, in the way of truly aesthetic encounters.

6 This therefore constitutes an account that challenges neuroaesthetics by questioning the way it uses neural data. I think this, *pace* Hutto, nonetheless provides a possible way to move forward by avoiding the biases I identify above.

the ground for Gallagher's more specific criticism: embodied-empathic motor-accounts of art and aesthetic engagement crucially fall short of addressing the differences between representations of action affordances in art and cultural artifacts and the role such affordances play in direct encounters with people, scenes and objects (see Brincker, 2015, for a similar criticism). From an enactive perspective, this is where the explanatory beef enters the soup: what action possibilities are actually provided in a social situation? How do they compare to a situation in an art setting or to actions and emotions portrayed in artistic representations? If mirror neuron activation accounts for both situation, real vs. representation, in the same way, we would have to look for such differences elsewhere (for example in higher cognitive processing) and the MNS would be uninformative on this count. If it indeed can account for the differences, Freedberg and Gallese should have made this difference more explicit or at least hint towards ways it can prove explanatory.

To me it seems that Freedberg and Gallese have a different agenda, though. Their aim is a general defense of the importance of empathic–motor responses for our interaction with art against what they perceive as a prevalent cognitivist orientation in art criticism and philosophical theorizing about art. Here they see in the MNS a basic biological mechanism that is able to underwrite the empathy literature that originated in the late 19th and early 20th century (think of the concept of 'Einfühlung' in R. Vischer, Wölfflin, Lipps, among others, and see Mallgrave & Ikonomou, 1994, for an overview) with a neurological basis: "no esthetic judgment is possible without a consideration of the role of mirroring mechanisms in the forms of simulated embodiment and empathetic engagement that follow upon visual observation" (Gallese & Freedberg, 2007, p. 411). We already saw how Gallagher corrected what he saw as at fault with the simulation part of the explanation.[7] What he additionally demands from Freedberg/Gallese to drive home their message of the centrality of the MNS for aesthetic experiences is that they should detail its contribution to making an experience an aesthetic versus, say, a pragmatic one. But Gallagher is not shy of a solution here either. Since visual representations and artworks do not primarily afford social or practical interaction, they might instead turn this lack of interaction into an advantage, not by

> priming for action or interaction, but for an experience of the purely possible or maybe even the impossible. This kind of affordance short circuits – it does so in a way that comes back to me and makes me aware of my possibilities, and does so in a way that disrupts my ordinary engagements. This is a positive accomplishment of art. (Gallagher, 2011, p. 109)

I think this is a promising account of what art can do. Good art interrupts, challenges and engages us in a way that is directed at something beyond the ordinary, and it might be indeed this perspectival change that we value in art. As a criticism of the Freedberg/Gallese account it seems misdirected, though. This is for several reasons.

(a) As mentioned, their initial aim in the cited paper is more basic: they claim a crucial role of the MNS in explanations of how and why we engage with pictorial artworks at all (to

Gallagher is no less critical of accounts that claim to be embodied and then exclusively focus on neural representations (e.g., representation of the body in the fusi-form body area (FBA), see Gallagher, 2012).

7 An enactivist might also object to the temporal order presented: embodied engagement is part and parcel of visual perception and does not "follow upon" visual observation as if the observation would be a completed process prior and independent of the motor assessment. Yet, this seems to be a problem that could also be amended by a more enactive reading.

explain how we engage with emotions outside of social situations) and do not claim to sufficiently describe aesthetic experiences.

(b) Freedberg and Gallese are also careful to emphasize that MNS activity can modulated by a "wide variety of contextual factors" (ibid, p. 199).[8] They thereby make room for the possibility that our responses to cultural artifacts are specific learned embodied skills. Such skills would be employed in artifact interactions in a systematic manner that differs from everyday encounters. The idea here is that certain cultural artifacts have hijacked our embodied engagements and expanded them. As I have argued elsewhere more extensively (Fingerhut & Heimann, 2017), representational media require artifact-specific perceptual and emotional skills. The focus there was film, but also static images require skills related to, among other things, use of perspective and framings in depictions of a scene (plus camera movements and edits, for the case of film) and that those skills have become integrated into our cognitive repertoire. The implication of such artifact-related motor schemas could also be seen as a way to account for the specificity of the artwork-organism relation that builds upon to plasticity of the MNS.[9]

(c) Closely related to this is a third point: motor activity does not only correlate to the different features of the depicted scene but to those of the medium (e.g., the canvas) and the traces of facture in the medium at the same time. It could therefore be employed to capture how we experience the 'twofoldness' of picture perception and how this experience contributes to aesthetic evaluation.[10] Both parts of experience, those that cover the means of depiction (often referred to as 'configurational fold') and those that cover the depicted scene and the figures depicted (the 'recognitional fold') are present in the Freedberg/Gallese account of motor engagements. Although they do not discuss how these engagements do overlay in picture perception – as them subserving a 'twofold' seeing-in experience would require – they nonetheless provide some interesting means that might help us understand the specific processes regarding the two elements of such an experience. Regarding the first fold (surface and design properties) it has been shown that motor congruency of self-executed and primed movements with the movement that have been used to produce the artworks enhances the liking of these artworks (Leder *et al.*, 2012; Ticini *et al.*, 2014). Motor priming is one way to conduct such research that more generally aims to understand the aesthetic appeal of a specific way to portray a scene. Another example comes from the realm of film. Heimann and Gallese conducted neuroscientific studies to investigate how filmic means (e.g. different edits of the same scene or different camera movements to approach it) differentially engage the motor system.[11] For both

8 Others have rightly emphasized that the focus on biological mechanisms works to some extent at the dispense of art historical context. They criticize especially Freedberg's insistence on foundational claims regarding basic empathic mechanisms (see Kesner *et al.*, 2017 for this and an account of the multiple modulating factors of our empathic responses to artworks).

9 In Fingerhut & Heimann (2017) we argue, by making ample reference to motor accounts, that in such artifact interactions we entertain the body schema of a "filmic body" that is constituted by habits of perceiving that we have developed through our exposure to the conditions and syntax of film.

10 'Twofoldness' is an important element of Richard Wollheim's account of the picture-specific capacity of 'seeing-in' and has been subject to a large and controversial debate (see Hopkins, 2010, for a critical summary and Lopes, 2005, for an account of how seeing-in might relate to aesthetic valuing). I cannot go into details here, but it stands to argue whether such accounts can be extended to questions of how formal features and the marks of the artist, such as brushstrokes and cuts, interact with posture and emotions of persons depicted in order to foster aesthetically more interesting experiences.

11 Heimann *et al.* (2014) investigate differential motor engagement for presentational features of film, such as zoom, dolly shots (with the camera mounted to a dolly that is placed on rails), and steady cam (a handheld camera device), while controlling what elements are displayed in the scene. A next step will be to extend this research to include aesthetic measures (such as interest and aesthetic liking).

realms (static and moving images) it would be interesting to explore in what ways a certain motor engagement with configurational features makes the presented scene more salient, interesting, challenging, or beautiful. With the relevant modifications – treating activity in the motor cortex as only one part of a larger body-brain-artifact nexus and as being anticipatory rather than representational – this could be a relevant element of an enactive understanding of how specific artistic decisions in the ways pictures and films display a scene constitute aesthetic values for the perceiver.

All this might not satisfy Gallagher's interest in the specific affordances of art – of what makes art special. Yet, one could in turn wonder whether Gallagher himself provides sufficient criteria to separate our interaction with an everyday representation from representations that are artistically successful. The potential of art to especially display action possibilities that are not realizable, can also be seen as a quality of all representations (that *qua* representation differ from everyday action affordances). He could respond and anchor an account of art in the specific ways artists put "pure possibilities" on display in artistic images, on how artists use the means of representations in more intense, challenging, liberating ways (Gallagher, 2015, might be seem as an attempt to do something along these lines for literature). Interestingly, also Gallese, in recent writings, hints at an account that can be seen as providing the basis for some of the ideas Gallagher seems interested in:

(d) Gallese's concept of "liberated embodied simulation" (Gallese 2011; Gallese & Guerra, 2012) can be seen as a proposal regarding the kinds of motor engagements that we value in art. Here we also find another more explicit reference to the fact that the affordances in art differ from those of everyday encounters. Gallese's ideas of experimental aesthetics based on liberated embodied simulations are not fully developed to date, but he suggests a deeper connection to fictional or representations worlds based on the inhibition of actual actions, claiming that we can allocate more neural resources to the motor system and body formatted representations in such situations. He thereby indicates how both could become important elements in a theory of the embodied-enactive (sensorimotor and affective) features that characterize our aesthetic experiences of human cultural artifacts as well as the evaluation of those experiences and artifacts.

In sum, I argued in this section that motor accounts might provide enough material to capture some of the differences between everyday affordance and pictorial representations as well as the artistic usage of such differences. They could – with the aforementioned enactive modifications – be seen as closer to Gallagher's own proposal than he acknowledges.

4. Art as re-organizational practice

Let's finally turn to Alva Noë's *Strange Tools* (2015) and his wholehearted dismissal of empirical accounts to the arts. He generally objects to the idea that neural responses could be used as explanatory *readymades* that, without being related to our body- and world-including engagement, tell us anything about our mental states. Neuroscience provides the wrong model of the mind: it misses out on the organismic active engagement in the different "modes of investigation" through which we gain access to the world.[12] World-involving practices (which are constrained by very diverse things, spanning from embodied engagement to linguistic conventions) is what takes explanatory priority. The result is the same as with Hutto's extensive externalism: the internalism that is at the heart of neuroscience gets in the way of it

12 Within such modes of interaction "we act right back" on the world (Noë, 2015, p. 196). Noë recently also started to characterize his position as "actionist" (ibid., p. 8). One of the interesting components of Hutto's externalism is that he remains more impartial with respect to which side of the artifact-organism takes the leading part. See also Kirchoff (2012) as a proponent of the idea that agency in some accounts of externalism should rather be attributed to the artifacts themselves.

becoming a proper science of the mind. I have indicated above that certain ways of embedding neural activity might provide ways around Hutto's problem and that his insistence on low-level features might be misguided. Noë's focus on practice-guided activity targets explanations at other levels of description, which differ from the extensive account of artifact interaction. Noë's art-specific claims take us even one step further by identifying art as a second-order practice and apparently fully outside the realm of neuroscience. I will use the remainder of this paper to introduce his view and argue that neuroaesthetics and empirical approaches, within their confines, might contribute to our understanding of such a practice.

It should be clear that for Noë seeing art as a "mode of investigation" would not make it special: every mental state is an instantiation of such a mode. The relevant *aesthetic* engagements are characterized by two things:

1) Art[13] is only successful as a re-organizational practice: it makes first-order practices (such as artifact-related technologies, for example the ubiquitous practice of pictorial engagement and picture making) visible to us on a second-order level by putting them on display and thereby unveiling us to ourselves.
2) Aesthetic experiences are emphatic judgments and happen in a communicative situation: "Art is experienced in the setting of argument, criticism, and persuasion. [...] Aesthetic responses, then, are not symptoms or reactions or stable quantities. They are actions. They are modes of participation." (Noë, 2015, p. 132f.).

I cannot discuss Noë's view in detail but will rather emphasize how it relates to the previously discussed accounts.

Claim (1) provides a clearer answer to the problem I raised for Gallagher regarding the lack of a distinction of a representation from a representation that is an artwork. One could say that for Noë first-order artifactual or representational practices are part of our fundamental constitution: as bio-cultural beings we are confined to technologies and organized activities that include a variety of tool-uses. Among those are centrally the picture-practices of perceiving, producing and sharing representations. Art presupposes such technologies and makes something "out of" those practices. Although it is intimately entangled with them, it also contributes something very different and novel by displaying, de-familiarizing, and re-arranging them.[14] The opposition of social (real affordances) versus artifactual engagements we found in Gallagher is therefore enriched by the insight that most of our social encounters are already part of an artifactually mediated praxis, and the relevant distinction is now between such first-order practices and those that put these first-order practices on display in art.

Claim (2) makes Noë's theory one that has aesthetic judgments, appreciation, and the value of art at its heart. He is not interested in simple aesthetic responses – such as liking or enjoying an artwork – but rather evaluations and engagements of a different kind. Aesthetic experiences, therefore, differ from other experiential states: "Aesthetic seeing, in contrast, is something more like the entertainment of thoughts about what one is looking at" (Noë,

13 I have throughout this paper avoided addressing the relation of art and aesthetics and I will not attempt to define their relation now. The theories I discussed so far, focused on relational accounts of our experience of art and cultural artifacts. Also in Noë's account the concept of art and aesthetic experience largely collapse because both are described as a practice of reorganization.

14 This "ineliminable entanglement" of art with its media and first order practices is especially addressed in Noë (2017) and his contribution to the present volume. He therein claims that it has also been the hidden though true focus in *Strange Tools* (2015). As before, I will deal mostly with practices related to visual art; Noë's view explicitly highlights language, dance, and other practices that can become art. The empirical approaches he discusses remain confined to the visual domain though.

2015, p. 51f.). Although not made explicit, his second point brings him close to conversational theories about aesthetics that can at least be traced back to Wittgenstein posthumously published *Lectures and Conversations on Aesthetics, Psychology and Religious Belief* (1966). Wittgenstein emphasizes the necessary dialogical dimension when it comes to questions regarding aesthetics: such questions are settled by availing oneself of further descriptions, and by demonstrative and comparative criticism of particular artworks (see Carroll, 2011). From such a perspective, experimental approaches in psychology look ill-suited to contribute to this conversation.[15] In a similar vein Noë criticizes empirical aesthetics for focusing too much on how we *perceive* artworks and for not properly addressing the question of *why we value* art, and how we engage in such a discursive context. The closest neuroscience comes to answering the question of the value of art, or so he argues, is by looking into preference or beauty judgments (Noë, 2011; 2015, p. 96). Yet, as already also Wittgenstein argued, referring to beauty is not helpful in demonstrating the quality of an artwork, and, as Noë additionally remarks, since not all art is beautiful and not everything that is beautiful should be valued as art, such a focus misses the mark.

What Noë proposes as a theory of art is an interesting step beyond the enactivist accounts discussed so far. Yet also here I will try to push back against his dismissal of empirical aesthetics on two counts.

(a) I want to start with beauty as part of our appreciative practice. Noë is in good company dismissing beauty as a relevant response to art.[16] But, even if it is obvious that beauty does not constitute the most important candidate to capture our appreciative practices, this does not completely disqualify its role for a study of art appreciation. Beauty may not be the foundation of aesthetic experience, but it is a real, important, and often puzzling aspect of it. Ignoring the hedonic aspect inherent to beauty might therefore be a mistake. One has to be careful to distinguish different components or variants of beauty, though. As Levinson (2011) has claimed, beauty comprises attractiveness (physical beauty), artifactual beauty (perceived beauty of an artifact that fulfills the function it was designed for), and others, which all might be different from artistic beauty. Empirical aesthetics has started to devise paradigms that dissociate different beauty responses and aim to identify what the respective beauty concepts track and how they relate to other measures.[17] On the basis of such distinctions one could therefore progress to address whether some beauty responses might be more relevant than others. And, in general, such distinction should precede consideration of a general dismissal of beauty as irrelevant in all contexts of our appreciative practice.

Moreover, beauty does not seem to merely guide the responses of more art-naïve participant. In a study we conducted in our group, we compared ratings of art professionals and laymen on randomly chosen examples of renaissance and 20th century art (taken from a textbook on art history). We found that for both groups beauty ratings highly correlated with liking, indicating that beauty might indeed capture something about the evaluation of art (Prinz et al., *forthc.).* The interpretation of these data is complicated, but one general

15 "Aesthetic questions have nothing to do with psychological experiments but are answered in an entirely different way." (Wittgenstein 1966, p. 17)

16 It is almost a truism that 20th century art severed the link between beauty and artistic success. For a proper defense of this position, see Danto (1997).

17 Schulz and Hayn-Leichsenring (2017), for example, explore our evaluation of portraits in art and found that attractiveness ratings require less time to be settled than artistic beauty judgments (the latter are also subject to greater revisions). Such an experiment on its own does not say much about an appropriate appreciative practice, yet it contributes to an understanding of what different evaluative beauty judgments might track in art.

line of thought is that beauty experiences might be a consequence of our successful cognitive evaluation of an artwork (and therefore also of a successful re-organizational practice) and constitute a category we apply after we had an understanding of a specific artwork, artform or style.[18] This is expressed in the correlation of liking and beauty even for 20th century art, art that often has an even anti-aesthetic bias. There is some acknowledgement of a related point even in Noë. In the endnotes to his book he discusses the possibility that "the works of an artist—think Andy Warhol, for example—can become beautiful; for these works can contribute to the changing of the very criteria of evaluation by which we aesthetically assess this work itself" (Noë, 2015, p. 327).

Yet, beauty remains a too wide response for Noë. It belongs more to the first order practice of valuing than specific to the re-organizational quality of art. I concede this point. But what I would argue instead is that Noë's view on art might, in turn, be too narrow and demanding. It therefore misses out on important elements of our appreciative practice. In other words, he seems to provide a normative theory of what good art is supposed to do without looking into how our actual practices of appreciation unfold. He therefore posits an axiology, a theory of the values employed in art, that is an auto-axiology, so to speak, while empirical aesthetics aims to identify such values in a bottom-up fashion. This might turn out to be a more tedious, incremental endeavor than some philosophers interested in art are willing to undergo. It might contain sidesteps and dead-end experiments that in many cases neither get the proper art object (to go back to the point of Hutto) or the work of art (in Noë's sense of a form of practice) into view. Despite all this, I still believe that our evaluative practice of art can and has to be studied empirically. To illustrate this: many claims about factors that influence aesthetic judgment (motor engagement, posture, mood, culture, social class, background beliefs) are empirical and require testing to confirm. Philosophy and empirical approaches therefore have to interact in order to advance the understanding of why we value art.[19]

(b) The final point I want to make is that empirical (neuro-) aesthetics is not confined to either perceptual states or to beauty and preference judgments. Take an example Noë discusses himself: neuroimaging studies on "intense aesthetic experiences". Vessel and colleagues (2012) presented participants with reproductions of visual artworks and asked them to rate them (from 1-4) based on "how moving" they found them. It turned out that only artworks that where rated highest elicited activations of the "default mode network" (DMN). This is a network whose activity normally correlates with states of rest, day-dreaming or processes related to the self and whose activity is suppressed in exteroceptive-oriented tasks.
The finding therefore is surprising: interacting with highly moving visual art generates processes that seem to be inward-oriented and to implicate the self. Noë takes this study as an example of how neuroaesthetics misses out on what characterizes aesthetic experiences ("I doubt that we can operationalize aesthetic experience this way [in ratings from 1-4]", Noë, 2015, p. 131) and how it overreaches by making essentialist claims about our aesthetic experiences and processes of the self ("it is unclear what we should make of the putative correlation between such activation and [...], aesthetic experience", ibid.).

18 In favor of such a position speaks that with higher art expertise higher beauty ratings are given for more contemporary art, e.g. artworks that are more abstract (Pihko *et al.,* 2011).

19 One could therefore see Noë's position on second order practice as an important contribution to this kind of interaction and not as a conversation stopper. As such it could contribute to a "cooperative naturalism" as it is defended in Smith (2017). Such a position differs from the reductive naturalistic philosopher, on the one hand, or the "cherry picking" type, on the other, that includes "isolated scientific discoveries for the purposes of decorating non- or anti-scientific speculations than in combining the methods and insights of the human and natural sciences." (Ibid, p. 3).

> Regarding the very same study one could also arrive at a quite different assessment. First of all, I don't see it as just another study on aesthetic experience. Participants had a more complicated task: they were supposed to consider whether they would recommend artworks to an art museum based on their personal experiences.[20] Those value ratings where then correlated to neural processing (they, e.g., implicated stronger activation in certain neural networks that have been correlated to specific practices of valuing in previous studies). The main outcome of such research does not have to be essentialist by targeting the 'neural correlates of aesthetic value' (or aesthetic experience respectively). It rather could be used to support claims regarding processes of valuing and those components that play a role in art evaluation (altering our understanding of those components). As such, the finding that only highest ratings implement a specific network of brain regions normally not correlated to exteroceptive engagements invites interpretation. Does something change when we highly value art? How does such valuing relate to preference or beauty judgments? Neuroaesthetics here could contribute to the conversation on art as well. Just take the DMN: Its activity is not only correlated to processes of the self, it recently has been suggested to be involved in the re-structuring of concepts and the evaluations of what could be considered pure possibilities (Feldman-Barrett, 2016, pp. 312-320). Both, re-evaluation of processes central for our identities and the exploration of possibilities through art, are also elements that enactivists have been ascribing to art (see the discussions of Noë and Gallagher above). It is true that identifying neural correlates is in itself seldom informative, but situating these finding and relating them to different practices of valuing should be within the conversational moves also of philosophers of art.

The cursory treatments in the last paragraphs might not have been enough to convince philosophers that insist on the precariousness of aesthetic experiences or the radical re-organizational character of art of the value of empirical approaches to the arts. I agree that in lab settings and given the reliance on averaging data across participants, one should also not expect to find more than traces of such activities.[21] Yet even if such engagements are rather elusive, this should not prevent us from devising more studies to further our understanding of aesthetic experiences as well as the appreciation of *art as art* using a multitude of paradigms, including neuroaesthetics.

5. Conclusion

In this paper I argued that enactive theories of art do away with empirical approaches to the arts too easily. I reviewed radical enactivists' (Hutto, 2015) claims that our engagement with art is extensive and artifact-including, an embodied-enactive account of the different kind of affordances artworks provide (Gallagher, 2011), and an account of art as a second-order practice (Noë, 2015). Common to all enactivist accounts is their dismissal of internalist tendencies in empirical approaches to the mind. They propose different versions of externalisms against it. For art experience and evaluation they claim that the specific object we engage with (including its material properties) as well as the specific kinds of engagement (pertaining to what makes and encounter aesthetic or of an artwork in a relevant sense)

20 Vessel *et al.* therefore also refer to those ratings as "recommendations" (2012, pp. 2-10). The experiences that participants where instructed to take into consideration for this task include the 'beauty' but also the 'ugliness' of the stimuli (both as putative positive features), and other quite disparate states. with a focus on how moved they personally were.

21 Many studies in neuroaesthetics additionally go beyond such a generalization by differentiating the responses of the whole participant group from more individual responses (or those of subgroups), providing thereby two forms of analysis; see e.g. Jacobsen *et al.* (2006).

should gain center stage. Especially neuroaesthetic approaches to the arts, so they argue, ignore the co-constitutive role of the artworks for the aesthetic experiences states and undercut the relevant levels of engagement. They therefore commit horizontal (i.e., ignorance regarding extra-neural properties of body and cultural artifacts) as well as vertical mistakes (i.e., ignorance regarding the more high-level, governing structures of our art engagement). Although I agree with many lines of this criticism, I have argued that a more qualified look at the field of empirical aesthetics reveals explanatory relevant research also for claims enactivism should be interested in. As I have shown, Gallagher's criticism of motor accounts in aesthetics ignores certain traits of those accounts that could be employed to answer his worries. In general, I argued for a more inclusive treatment of neuroaesthetics that avoids the, in my view, overgeneralizing dismissals found in Hutto and Noë. The specific properties of cultural artifacts and artworks as well as our extensive, embodied engagements with them can be studied in neuroscientific projects, and empirical approaches to valuing should inform our theories of evaluative practices in the arts.

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CONCEPTUAL SEMANTICS AS GROUNDED IN PERSONAL EXPERIENCE*

abstract

Semantic memory for an object encompasses multi-modal knowledge gained through personal experience over the lifetime, and coded in grounded sensory-motor brain systems, independently of the level of subjective awareness. Linguistic access to semantic memories in verbal format relies on the functional coupling between perisylvian language regions and the grounded brain systems implied by our lifetime experience with the concept's referents. Linguistic structure exerts modulatory influences on this functional coupling, as in the case of sentential negation, which reduces the interactions between perisylvian language regions and the grounded brain systems.

keywords

semantic memory; grounded cognition; language; personal experience; action-related brain system

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1. Introduction: theories of semantic memory

Semantic memory encompasses all the knowledge acquired over the lifetime and stored in a generalized form, independently of the actual time and space (Patterson *et al.*, 2007). The content of semantic knowledge enables a wide variety of human actions, from the ability to move, perceive and interact with the external world, to higher cognitive functions including the possibility to speak, plan and decide (Binder & Desai, 2011). The nature of conceptual representations, and in particular their relation with sensory and motor experiences, has long constituted a matter of debate, which dates back to Greek philosophers. Rationalist philosophers have traditionally been skeptical about the role of perceptual experience in shaping conceptual knowledge, asserting that veridical knowledge is only gained through reason and is based on the existence of a priori categories, independently from external sources of information. On the other hand, Empiricist philosophers have strongly rejected this assumption, stating that concepts are strictly based upon sensory experience (Markie, 2017). In the last decades, this debate has been revitalized by contrasting neuroscientific theories of semantic memory (Binder & Desai, 2011). At one extreme are disembodied or amodal theories, which propose a complete separation between perception and cognition. At the other extreme are grounded cognition and embodied theories, which assume that a common system underlies both sensory-motor and conceptual-semantic representations. As for the latter class of theories, Barsalou (1999, 2008) argued that the neural states subtending perception are stored in long-term semantic memory as modal symbols for external referents. Such perceptual symbols originate in all modalities of experience, including vision, gustation, olfaction, haptics, audition, proprioception, and introspection, and are thought to be distributed throughout the brain. As Wernicke affirmed more than a century ago (1874):

> ...the memory images of a bell... are deposited in the cortex and located according to the sensory organs. These would then include the acoustic imagery aroused by the sound of the bell, visual imagery established by means of form and color, tactile imagery acquired by cutaneous sensation, and finally, motor imagery gained by exploratory movements of the fingers and eyes (p.117).

Rather than being fixed, the subsequent re-activation of a perceptual symbol is endowed with a dynamical organization through which, for example, different contexts may bias the neural activity towards some properties more than others (Barsalou 1999, 2008). Following this proposal, the transduction of a perceptual state into an arbitrary symbol is not warranted

and the existence of amodal systems appears to be redundant, given that perceptual symbols provide both sensory and cognitive representations of external referents. A major objection moved to grounded cognition theories concerns the lack of compelling evidence able to demonstrate the causal role of the grounding mechanisms in concepts representation (Mahon & Caramazza, 2008). For instance, numerous findings reporting sensory-motor brain activity during conceptual processing offer support to the central claims of grounded cognition theories, but are nevertheless consistent with disembodied theories as well (Caramazza, 2014). Authors supporting this latter class of theories claim that it is ultimately unknown whether the activity in sensory-motor cortices follows or rather anticipates the access to symbolic representations (Mahon & Caramazza, 2008). From this perspective, sensory and motor brain activation merely accompanies and is epiphenomenal to conceptual processing, which is instead amodal and symbolic. One of the arguments in support of the amodal view emerges from neuropsychological data, in that impairments connected with objects usage (e.g., apraxia) are not necessarily paralleled by corresponding impairments in conceptual knowledge related to either the objects or their functional properties (Mahon & Caramazza, 2005; Vannuscorps & Caramazza, 2016). In contrast to both strictly embodied and disembodied theories, other models propose that modality-specific brain areas interact with one or more amodal abstract systems during semantic processing. Among these models, Damasio and colleagues proposed that multiple convergence zones exist and are differentially engaged depending on the specific conceptual domains and contextual constraints (A. Damasio, 1989; H. Damasio *et al*., 1996). Convergence zones are defined as amodal regions, in that they do not map information in an embodied or feature-based manner (i.e. preserving sensory-motor patterns of experience), but they nonetheless strictly interact with sensory-motor cortices and prompt their co-activation through back-projections. More generally, the central function of high-level convergence zones is to unify the representations gained through different modalities, such as visual shape and action-related properties of tools. A related, yet different, proposal is the hub-and-spoke model (Rogers *et al.*, 2004; Patterson *et al.*, 2007). At least two main factors differentiate the two models: firstly, the convergence zone model suggests the existence of multiple convergence zones in semantic processing; secondly, it implies a differential activation in these areas based on differences in stimuli and tasks requests. The hub-and-spoke model assumes that concepts are mainly assembled through the contribution of multimodal experiences encoded in widespread modality-selective brain areas. Crucially, a single trans-modal hub, placed bilaterally in the anterior temporal lobes (ATLs), integrates these sources of information. In this view, the spokes, or units, generate several inputs, which all converge to the ATLs, where they are assembled into an unified semantic concept. As direct prediction of the hub-and-spoke model, damage to the ATLs hub should determine a general semantic impairment, which is neither dependent of the input or output modalities (i.e. pictures, words, sounds), nor limited to a specific semantic category (i.e. animals, tools) (Lambon Ralph & Patterson, 2008). This idea is strengthened by clinical observation that patients with semantic dementia, associated with atrophy and hypo-metabolism in anterior temporal regions (Gorno-Tempini *et al.*, 2011), show a consistent pattern of deficits across modalities, stimuli types, response modalities, and tasks. However, new evidence has prompted a slight revision of the original hub-and-spoke model, with the ventrolateral ATL assuming the role of the hub core-component (Rice *et al.*, 2015; Lambon Ralph *et al.*, 2017). For instance, cytoarchitectonic studies revealed a graded variation in function and structure within the anterior temporal lobe (Ding *et al.*, 2009) that matches differences in functional connectivity (Pascual *et al.,* 2013) and structural white matter connectivity (Binney *et al.,* 2012) patterns across ATL sub-regions. Moreover, neuroimaging studies reported that the ventrolateral ATL activates strongly in semantic tasks, irrespectively of input or output

modalities or stimuli category (Spitsyna *et al.,* 2006; Visser *et al.,* 2012). A further related model of semantic memory is the so called "embodied abstraction" (Binder & Desai, 2011; Kiefer & Pulvermüller, 2012), which asserts that multiple levels of abstraction exist in conceptual knowledge, from sensory-motor information to schematic and abstract representations. The contribution of each level varies flexibly in accordance with numerous factors, encompassing task demands, contextual constraints, and familiarity. For example, van Dam and colleagues (2012) observed that the activity in motor brain areas elicited by action-related words strongly depended on the context in which the words were presented. More specifically, BOLD response in inferior parietal region increased when participants focused on the action versus perceptual features associated with a word's referent object (e.g., *tennis ball*: play tennis versus yellow color). These results contrast the idea of a lexical entry invariably triggering a rigid semantic representation, and rather emphasize representational flexibility. Similarly, Hoenig *et al.* (2008) claimed that a variety of non-dominant object features can differentially contribute in conveying different nuances of meaning, while leaving the core meaning relatively unaffected. Familiarity is another key factor modulating the involvement of sensory-motor areas in conceptual processing, as less familiar concepts appear to be more dependent on detailed information encoded by modality-selective regions (Desai *et al.*, 2011).

2. Concepts in semantic memory

Category-specific semantic deficits, in which the identification of a category of items can be selectively damaged despite the relatively intact performance in other domains, have been particularly informative in unraveling the organization of conceptual knowledge in the human brain (Warrington, 1975; Capitani *et al.,* 2003; Cree & McCrae, 2003). One of the earliest recognized neuropsychological dissociations was the one distinguishing living (e.g., animals, plants) from non-living (e.g., inanimate objects) semantic categories. For instance, patients with Alzheimer's Disease generally show a spared performance with artifacts and non-living items, but a selective impairment with living entities (Silveri *et al.,* 1991; Garrard *et al.,* 1998; Chan *et al.,* 2001; Catricalà *et al.,* 2014). The opposite pattern, characterized by selectively impaired knowledge of artifacts, has been reported in cases of general brain atrophy (Moss *et al.,* 2000) and cerebrovascular accidents (Sacchett & Humphreys, 1992). However, a note of caution has been raised against the generalization of these effects, claiming for the necessity of a more controlled analysis of the different tasks and stimuli employed in existing studies (Laws *et al.,* 2005). Recent proposals suggested a continuum rather than a dichotomous distinction between living and non-living items. For example, Sha and colleagues (2015) proposed that a graded level of animacy discriminated between inanimate and animate entities, but then also between different animate exemplars, such as animals. In this view, higher animacy levels characterize those animals which more closely resemble the animate prototype of humans (e.g., monkeys), whereas the lower animacy bound encompasses the more phylogenetically distant ones (e.g., fishes). fMRI BOLD responses found in the ventral visual pathway mirrored this graded rather than dichotomous representational dimension for living and non-living entities (Sha *et al.*, 2015). A related and more general assumption states that the core of category-specific semantic deficits does not reflect a true category impairment but encompasses impairments in the modalities and features which mostly contribute to the acquisition, storing, and identification of a certain domain of concepts (Nastase & Haxby, 2017). For instance, greater importance of visual versus functional-motor information in the interaction with, respectively, animals and artifacts. In this view, categorical distinctions emerge as a complex combination of attributes.

Among non-living entities, manipulable objects have received particular attention, as several studies have been devoted to explore the constitutive dimensions that subtend their conceptual knowledge. The ability to use simple tools to extend motor skills constitutes

a shared ability between humans and certain animals (Johnson-Frey, 2004). For instance, non-human primates generally use sticks to reach distant objects. However, in humans this ability has achieved the most sophisticated level of complexity. At the beginning of the twentieth century, Liepmann and colleagues (1900) first described cases of ideomotor apraxia, manifested as the inability to use everyday objects and attributed to a loss of knowledge about tools. In most patients, ideomotor apraxia is caused by lesions in left premotor and parietal cortices or results from the disconnection of the right from the left hemisphere after damage to the corpus callosum. More recently, neuroimaging techniques have begun to precisely describe the brain underpinnings that subtend tools-related knowledge. A recent meta-analysis by Ishibashi *et al.* (2016) differentiated the neural substrates mediating the identification of tools from those subtending planning and executing actions toward tools. The former involve the bilateral fusiform gyrus and the left occipito-temporal cortex, whereas the latter involve the left dorsal and ventral premotor cortices and the left superior and inferior parietal cortices. In particular, motor-based properties, coding for object-directed actions, are crucial in the semantic representation of manipulable objects. Viewing and naming pictures of tools, but not pictures of other categories (i.e. animals, faces, houses), entails brain activations in left ventral premotor and posterior parietal cortices (Chao & Martin, 2000), despite the absence of motor task requests. Canonical neurons, located in premotor-parietal circuits, constitute an anatomical basis for the visuo-motor encoding of tools. As affirmed by Rizzolatti *et al.* (2014): "...when an object is seen, the discharge of canonical neurons encode a potential motor act congruent with the properties of the presented object, independently of whether the act will be executed or not" (p. 667).

Two aspects of motor-based manipulability properties are usually distinguished (Salmon *et al.,* 2010). The first one pertains to grasping, picking up, and lifting an object with one or both hands. This is the case with most manipulable artifacts, but can also occur with natural entities, for example small animals. The second one is the functional aspect of manipulability, which is coded independently of the object's dimension. For example, a grand piano requires both hands to fulfill its specific function, in spite of the fact that we typically not interact with it by picking it up and lifting it by the hands. Generally, semantic representation of manipulable objects conjointly involve both aspects, but partially distinct neural bases subtend each of them. In a semantic categorization task performed during fMRI scanning, Canessa *et al.* (2007) asked participants to indicate whether a pair of manipulable man-made objects shared, respectively, the same action-related pattern (i.e. grasping properties) or the same function (i.e. context of use). Direct comparison highlighted selective activation for action-related judgment in a left fronto-parietal system encompassing intraparietal sulcus, rostral part of the inferior parietal lobule, and dorsal premotor cortex. Function-specific activation was found in retrosplenial and parahippocampal regions, extending to inferotemporal cortex.

Recently, several studies have begun to explore the role of personal experience and context in modulating the access to tools' motor-based properties, both action- and function-related. Barsalou (1982) distinguished two types of properties in building conceptual representations and influencing the associations and similarities between concepts. On the one end, context-independent properties refer to those features whose memory access is unaffected by contextual constrains. For example, distinguishing properties for a given category fall into this domain (e.g., *gills* are diagnostic properties for identifying fishes). Crucially, context-independent properties include all the features that are particularly salient when people interact with the concept's referent (e.g., the property of being edible is central in interacting with an apple). On the contrary, context-dependent properties are not part of the concept's core meaning and constitute a source of variability in semantic representations, as they are only recruited in relevant contexts. For example, weight does not constitute a central

component in representing the meaning of a grand piano, but when we are required to move the grand piano, its weight becomes more salient than its functional properties and, consequently, we are more likely to perceive a stronger association between the grand piano and a couch compared to a guitar. Yee & Thomson-Schill (2016) claimed that conceptual knowledge is fluid and inextricably linked to specific contexts, which include for example long-term and recent experience, and the concurrent task demands. Although not directly referred to manipulable objects, several lines of research outlined the importance of personal long-term motor experience and acquired motor skills in modulating brain processes subtending action observation and representation. For example, in Calvo-Merino *et al.*'s fMRI study (2004), experts in classical ballet, experts in capoeira, and a group of inexpert controls viewed videos with actions taken from ballet and capoeira dances. The results suggested that the action observation system is tuned to the observer's acquired motor repertoire. For instance, enhanced activations in premotor and superior parietal cortices, intraparietal sulcus, and superior temporal sulcus were found when experts viewed videos of their own dance style, whereas no differences emerged in inexpert controls. In a subsequent study, Calvo-Merino *et al.* (2006) reported the impact of gender-specific expertise in influencing brain responses in classical ballet dancers. The authors compared brain activity when male and female participants viewed gender-specific movements (i.e. usually performed primarily by males or females dancers). Premotor, parietal, and cerebellar brain responses were selectively reported when participants viewed the movements which were specific of their own gender motor expertise. Other lines of research highlighted the structural brain changes induced by long-term motor expertise, possibly with a more direct link with tool-related knowledge. For example, Jäncke and colleagues (2009) explored the neuroanatomical reorganization in professional golfers by means of voxel-based morphometry. Playing golf requires the coordination of several movements of the upper and lower limbs, head and hips, also in relation to an instrument: precise hand postures and grips have to be adapted to the length, weight, and size of the different club types. In professional, high-proficiency golfers compared to naive participants, gray matter increases were found in a fronto-parietal network, comprising mainly dorsal premotor and posterior parietal cortices. Taken together, the aforementioned findings support the hypothesis that expertise and specific manipulation skills are capable of shaping the neural representation of a specific action type. One limitation of these studies, however, is that no direct causality can be established based on the mere association between motor skills and brain measures. To do so, one would require the possibility to monitor neural changes as they are shaped by the progressive acquisition of novel motor skills. At the structural brain level, this has been shown for instance by a longitudinal morphometry study in subjects required to learn juggling (Draganski *et al.*, 2004), which induced gray matter volume increases in area hMT/V5 and in the posterior intraparietal sulcus. At the brain functional, semantic level, a methodological innovation has consisted in employing newly invented objects without similarities with existing tools, and thus not endowed with pre-existing memory representations, as experimental stimuli to directly assess the role of experience in building tool specific semantic knowledge. Weisberg *et al.* (2006), who first introduced this method, investigated whether manipulation experience acquired in a training session with novel objects induced activation increases in the fronto-parieto-temporal neural system. In the motor training, participants learned the object's function and were trained in the execution of specific actions associated with the objects (e.g., lifting a wooden block by means of the invented object). Two fMRI sessions were conducted, respectively, one before and one after training, during which the participants were presented with pictures of the trained objects and of control untrained objects in a visual perception task. Following training, enhanced brain activity was reported for trained versus untrained

objects in the middle temporal gyrus, posterior parietal cortex, and premotor cortex. Thus, tool-like experience with previously unencountered invented objects leads to the formation of a neural signature in semantic memory akin to that of real tools. A subsequent fMRI study by Bellebaum *et al.* (2013) aimed at disentangling the specific role of different types of experience in building semantic representations for novel tools. Participants were trained on different sets of novel tool objects with, respectively, a manipulation or a visual training. The former closely resembled the procedure applied by Weisberg and colleagues (2006), whereas the latter involved visually inspecting the novel objects without any direct or observed manipulation. Post-training increased activations were specifically found for manipulation versus visual experience in the left inferior/middle frontal gyrus and posterior parietal cortex, and for visual versus manipulation experience in the left middle temporal cortex. Effective connectivity analysis by means of Dynamical Causal Modelling in these brain regions revealed a fine-tuned combination of inter-regional modulatory effects, with an increase of connection strengths in regions specific to each experience type (fronto-parietal for manipulation, and temporal for visual experience), and a concomitant reciprocal decrease of experience type-specific connection strengths (temporal for manipulation, and fronto-parietal for visual experience). These results suggest that the experience-dependent neural signature formation in semantic memory is not rigidly determined by the object's physical properties, but very much depends on the type of interactions we gain with that object. In contrast to the previously mentioned studies (Weisberg *et al.,* 2006; Bellebaum *et al.*, 2013) and to other studies (Creem-Regehr *et al.,* 2007; Cross *et al.*, 2012), which involved direct manipulation of previously unencountered objects as an integral part of the training procedure, Rüther *et al.* (2014) demonstrated that even indirect manipulation experience, gained by observing another person interacting with a novel object, can promote semantic memory encoding in the sensorimotor system. Observed manipulation training, compared to visual training, specifically induced an activation increase in the left inferior frontal gyrus. These findings bear direct relevance to the observation-execution matching system implied in the evolutionary and developmental emergence of tool-related skills (Rizzolatti *et al.*, 2014; Johnson-Frey, 2004). Taken together, the results just reviewed suggest that the neural representation of tools is progressively acquired and shaped according to the type of interactions that we directly or indirectly experience with them. Accordingly, functional and motor-related properties represent a constitutive component of the conceptual knowledge about tools.

Recently, Tettamanti *et al.* (2017) demonstrated that the visual appearance of a manipulable object, even when escaping perceptual awareness, entails activations in the action representation system. The authors selected colored photographs depicting manipulable and, as a control, non-manipulable objects matched for visual complexity (Brodeur *et al.,* 2014). The authors adopted a Continuous Flash Suppression (CFS, Yang *et al.,* 2014) paradigm in order to make the stimuli subliminal. In CFS stimulation, the experimental subjects wear anaglyph glasses, with a cyan-colored lens placed over their dominant eye and a red-colored lens over the non-dominant eye. This permits the selective presentation of, respectively, rapidly flashing mask images with a cyan hue to the dominant eye, and a target stationary picture with a red hue to the non-dominant eye. Below an individually tailored perceptual threshold, the conscious perception of the target stationary picture is suppressed by the rapidly flashing masks, thus effectively implementing subliminal stimulus presentation. The subjective level of target image perception was evaluated by requiring the participants to rate their degree of perception along a 4-points perceptual awareness scale (PAS; Ramsøy & Overgaard, 2004). An objective control for the true absence of perception was provided by the inclusion of void stimuli (i.e. flashing masks but no target picture). Based on the individual perceptual

threshold, which was determined in a behavioral session prior to fMRI scanning, the authors used five incremental target picture contrast levels: two below, one equal to, and two above the individual perceptual threshold. The crucial issue was the evaluation of brain activations elicited by unaware processing of manipulable versus non-manipulable object pictures in a set of a priori selected brain regions, comprising a left-lateralized premotor-parietal network (Ishibashi *et al.,* 2016). The results provided positive evidence showing that manipulable object pictures presented below contrast threshold and escaping subjective awareness significantly activated the targeted brain regions, including the ventral premotor cortex, the inferior and superior parietal cortices, and the lateral middle temporal gyrus. This result was further supported by a searchlight Multivariate Pattern Analysis (MVPA), showing that a supporting vector machine classifier was able to distinguish above chance level manipulable and non-manipulable object pictures, presented below perceptual threshold and escaping subjective awareness. Taken together, these findings demonstrate that visuomotor coding represents a constitutive component of the conceptual knowledge about tools, one that is automatically activated by the visual perception of manipulable objects, even in the absence of awareness.

3. Concepts in language format

As shown by convergent evidence, the traditional language system comprises a set of core brain regions, mainly housed in inferior frontal and temporal cortices and also referred to as Broca and Wernicke areas, which contribute to a variety of linguistic functions, from comprehension to production (Friederici, 2011). In contrast, the role of additional brain regions in coding for specific semantic properties still remains controversial. According to embodied semantic theories, word meaning is coded in sensory-perceptual, motor, and emotion-related brain systems (Barsalou, 1999). For instance, words referring to entities with a strong relevance for color features (e.g., *taxi*, *grass*) elicit activations in brain regions involved in color perception, mainly located in the fusiform gyrus (Simmons *et al.,* 2007), whereas reading odor-related words (e.g., *garlic*, *cinnamon*) produces brain activation in the olfactory cortex (Gonzalez *et al.,* 2006). In addition, processing words with highly-relevant acoustic features (e.g., *telephone*) engages brain system for sound perception, encompassing the left posterior and middle temporal gyri (Kiefer *et al.,* 2008). Extended work has similarly revealed that the elaboration of words indicating both actions (e.g., action verbs such as *to grasp*) and manipulable items (e.g., nouns referring to tools such as *screwdriver*) relies on the neural system subtending action execution and observation. Vitali *et al.* (2005) investigated functional connectivity during a semantic fluency task requiring the retrieval of nouns referring to tools, in one fMRI scan, and to animals, in another fMRI scan. Tool word generation was specifically associated with increased functional connectivity in a left-hemispheric network, encompassing the inferior frontal and premotor cortices, the inferior parietal lobule, and the temporo-occipital junction. Rueschemeyer *et al.* (2010) investigated whether words indicating objects associated with different kinds of manipulability elicited distinguishable neural responses. A main distinction was made between volumetrically manipulable objects (i.e. items that could be lifted and moved, such as *clock*) and functionally manipulable objects (i.e. items that had to be picked up to use, and were closer to the common description of tools, for example *cup*). The words were presented in a go/no-go lexical decision task performed within the MRI scanner. Whole-brain analysis yielded stronger activations for functionally compared to volumetrically manipulable objects in the fronto-parietal system, encompassing pre-supplementary motor area and inferior parietal lobule. No regions were more active in the opposite contrast. These findings indicated that the specific way in which an object is manipulated constitutes an integral part of the neural semantic representation of the word denoting it. More recently, Yang and colleagues (2011) designed a fMRI passive reading task, in which participants were presented with verbs indicating an action performed with the

hand (e.g., *to touch)* or an action that required the use of a tool (e.g., *to cut*). Both conditions, compared to rest, yielded similar activations in a left lateralized system, encompassing middle and inferior frontal gyri, inferior parietal lobule, and premotor cortex. Crucially, tool-related compared to hand-related verbs elicited stronger activation as well as greater functional connectivity in these fronto-parietal regions. In yet another study, nouns referring to tools yielded activations in the hand sector of the premotor area (Carota *et al.,* 2012).
Different lines of research further emphasized the close link existing between the brain system mediating action and the comprehension of linguistic materials expressing an action-related content. Specifically, recent findings indicated the existence of interference effects exerted by the processing of words or sentences referring to both actions and manipulable entities on motor system activity. The study by Yee *et al.* (2013) suggested that the amount of interference in semantic tasks is proportional to the degree of motor practice with the object referents. Participants were engaged in a hand motion task, while they had to perform, respectively, a naming or an abstract/concrete categorization task. Each target word was also subjectively rated for the amount of manual experience generally associated with it. Crucially, the more manipulating experience with an object, the greater the interference effect between the motion task and both the concomitant semantic categorization and naming tasks. Moreover, Zarr *et al.* (2013) showed a motor system adaptation after reading sentences indicating actions carried out in the direction of the subject (e.g., *Liam kicked the stone towards you*) or in the opposite direction to it (e.g., *You kicked the stone towards Liam*). Participants were presented with a sentence, followed by a video showing an hand-object interaction, in which the object was placed in a container, respectively close to or distant from the volunteer's body and that could be either congruent or incongruent with the movement described by the sentence. The task required to indicate, as accurately and quickly as possible, the moment when the object exceeded the container's edge. Adaptation effects, with slower reaction times, were found when the sentence and the video were congruent (i.e. both referring to a movement in the same direction). Similarly, in the study of Marino *et al.* (2014), participants were presented with words indicating, respectively, graspable and non-graspable items and were instructed to press a button as soon as a change in the color of the square containing the words was detected. Slower motor responses were reported for graspable object words. The phenomenon was explained taking into account the recruitment of the motor system in accessing the conceptual-semantic representation of manipulable objects, leading to a reduced availability (i.e. interference) of the motor system itself for carrying out the behavioral response task.
Other studies explored the desynchronization of the *mu* (8-13 Hz) brain wave rhythm, which is traditionally associated with the activation of the motor and premotor cortices elicited by executed or observed actions (Coudè *et al.,* 2014). Moreno *et al.* (2015) investigated whether the *mu* desynchronization is also observed in processing sentences describing actions (e.g., *You will cut the strawberry cake*). Participants were presented with action-related, abstract, or perceptual-state-related sentences, while the EEG signal was recorded. A desynchronization of the *mu* rhythm was specifically found for sentences denoting actions, and it was confined to the fronto-central electrodes corresponding to the premotor cortex. Cattaneo *et al.* (2010) used state-dependent transcranial magnetic stimulation (TMS) in order to investigate the causal role of the left ventral premotor cortex in representing tool-related words (e.g., *scissors*). Specifically, state-dependent TMS paradigms employ the interaction between the initial state of a neural population and the application of TMS pulses. The initial activation state was experimentally determined by means of a priming task. A differential TMS effect for primed versus non-primed trials could reveal neural specificity, indicating that the stimulated region is susceptible to the initial manipulation state (Silvanto *et al.*, 2008). Specifically, Cattaneo and colleagues (2010) set the initial activation state of left ventral premotor cortex through

a priming task, in which the prime was a category name (*tool* or *animal*) and the participants were required to categorize a target word presented immediately after. When the target word belonged to the tool category, TMS applied over the ventral premotor cortex facilitated reaction times for incongruent compared to congruent primes. This finding supports the causal involvement of the left ventral premotor cortex in encoding tool word meanings. Consistent evidence demonstrates that the activity produced by action-related linguistic meanings in the premotor cortex reflects a somatotopic organization, mirroring the bodily effector's homuncular motor maps. Somatotopically organized responses in the left premotor cortex were observed for isolated verbs referring to arm, face, and leg actions (e.g., *to pick*, *to lick*, *to kick*) in a fMRI passive reading task (Hauk *et al.,* 2004), and in the selective interference exerted by TMS on differential premotor cortex sectors during a lexical decision task (Pulvermüller *et al.,* 2005). Similar findings were reported by Tettamanti *et al.* (2005) during the auditory presentation of action-related sentences related to mouth (e.g., *I bite an apple*), hand (e.g., *I grasp a knife*), and leg (e.g., *I kick the ball*). More specifically, mouth-related sentences produced responses confined to the ventral-most sector, hand-related sentences in a medio-dorsal sector, and leg-related sentences in the dorsal-most sector of the premotor cortex.
In contrast to words referring to concrete entities, abstract concepts are still largely unexplored and they are often assumed to rely on a linguistic-mediated definition (Hoffman, 2015). Traditionally, concrete concepts refer to tangible items placed in the external world than can be directly experienced through the senses, a feature that cannot be applied to abstract concepts, which are not provided with physical referents. Concrete and abstract words can be differentiated along multiple psycholinguistic dimensions, including age of acquisition, familiarity, context availability, and imageability (Della Rosa *et al.,* 2010). Recently, a growing body of studies systematically explored other distinguishing aspects and features lying at the core of abstract semantic meanings, in particular various kinds of experiential information. According to grounded cognition theories, experiential information is crucial for both concrete and abstract concepts, albeit operating in different ways: concrete concepts mainly rely on sensory-motor information, whereas abstract concepts mainly rely on introspective and inner state information (Barsalou & Wiemer-Hastings, 2005). This view is supported by a limited, but growing body of neuroimaging studies. Ghio & Tettamanti (2010) explored the functional integration between perisylvian language regions and modality-specific brain regions involved in elaborating, respectively, action-related and abstract sentences. Using Dynamic Causal Modelling as a measure of functional integration, the authors found greater connection strengths for action-related versus abstract sentences in the left-hemispheric action representation system, encompassing sensorimotor areas. In turn, abstract sentences selectively modulated the effective connectivity of temporal and inferior frontal regions with the retrosplenial cingulate cortex, a region of the default mode network which has indeed been implicated in internal state monitoring (Raichle, 2010), and conjoint mapping of internal and external spaces (Alexander & Nitz, 2015).
At a more fine-grained level of distinction among different types of abstract concepts, converging findings supported the role of affective, social, and magnitude information as relevant distinctive dimensions (Ghio *et al.*, 2013; Troche *et al.,* 2014, 2017), with the first two of them associated, respectively, with the anterior cingulate cortex (Vigliocco *et al.,* 2014) and the superior anterior temporal lobe (Zahn *et al.,* 2007), i.e. brain regions involved in emotion processing and social cognition. In turn, magnitude-related concepts encompass numerical-arithmetical knowledge and linguistic terms roughly corresponding to quantity, time and space (Ghio *et al.*, 2013; Troche *et al.,* 2014, 2017). The intraparietal sulcus has been postulated as a potential neural basis supporting the processing of arithmetical concepts, given its role in representing numerical magnitude (Wilson-Mendenhall *et al.,* 2013). Recently, by applying

MVPA to fMRI data, Ghio *et al.* (2016) found that inferior frontal gyrus and insular regions selectively contributed to the discrimination of fine-grained types of abstract (mental states-, emotion-, and mathematics-related) and concrete (mouth action-, hand action-, and leg action-related) concepts. Brain hubs in which conceptual-semantic information converges and maintains fine-grained, category-specific selectivity, such as the inferior frontal and the insular cortices, most likely operate by means of combined local anatomical specialization and large scale connections. Fine-grained connectivity-based parcellation within the insula region has been clearly demonstrated, with a tripartite subdivision into cognitive, affective, and sensorimotor selective modules (Chang *et al.,* 2012).

Taken together, the aforementioned results provide compelling evidence that the neural representation subtending different semantic concepts expressed by linguistic stimuli is determined by the type of experience that we commonly have with the concepts' referents. This experience may come from either the external world, in the case of action-related and tool concepts, or from introspective, emotion-related, and inner mental states, in the case of abstract concepts.

As we have seen, in the context of grounded cognition theories, the qualities and degrees of personal experience with objects, feelings, and facts play a major role in the formation of distinctive semantic memories. Studies that challenge experimentally the role of personal experience are therefore vital to provide the theories with solid bases. Beilock and colleagues (2008) explored whether the degree of individual experience in specific actions was capable of modulating the neural resources which subtended the comprehension of language describing the same action. Ice-hockey players, fans (without direct experience but with extensive hockey viewing) and novices (without direct or indirect experience) participated in the experiment. During fMRI, participants were acoustically presented with sentences describing, respectively, ice-hockey actions (e.g., *The hockey player finished the stride*) and common everyday actions (e.g., *The individual pushed the bell*). Following each sentence, a picture was displayed and participants had to indicate whether it correctly matched the sentence by button press. As for everyday actions, all the three groups of participants responded faster to the pictures that matched the sentences, compared to those pictures that did not. In contrast, only ice-hockey players and fans showed a similar facilitatory effect for hockey-related sentences. The authors next explored whether the brain regions involved in sentence comprehension were also related to hockey experience. Specifically, activity within left dorsal premotor cortex positively correlated with hockey experience, and, in turn, bilateral dorsal primary sensory-motor cortex displayed a negative correlation. These findings provided evidence that individual sport experience influences action-specific language comprehension.

Although remarkable, Beilock *et al.*'s (2008) study was characterized by a cross-sectional comparison between different populations (i.e. players, fans, novices), a feature that does not allow to draw strong conclusions as to the decisive role of motor experience, as opposed to other types of experiences (e.g., specialistic language use) or even individual predispositions leading to greater search and accumulation of motor experience. To overcome these limitations, a longitudinal study by Locatelli *et al.* (2012) was designed to train participants in performing previously unencountered manual actions, and to assess semantic language performance in pre and post training sessions. Over a period of three weeks, participants were trained in three different manual actions (e.g., origami, prestidigitation, tying sailors' knots). Before and after training they were tested on a semantic congruency task, similar to Beilock *et al.'s* (2008) study. Sentences and pictures could be congruent or incongruent and either related or unrelated to the trained actions. Reaction times of both trained and untrained congruent trials significantly decreased after compared to before training. Noteworthy, however, the post training reduction of reaction times was greater for trained compared to untrained

action-related concepts. The results suggested that manual expertise leads to an improvement in semantic processing specifically for concepts related to trained actions.
Since we rarely use abstract or concrete words in isolation, but rather use them in combination with other words in sentences and discourse, a crucial matter of investigation is how linguistic structure shapes semantic composition and the underlying neural dynamics. In the context of embodied and grounded cognition theories, a prototypical example, which we will only superficially deal with here, is that of figurative action-related expressions, as in the contrast between *I grasp the knife*, with a clear reference to motor action (i.e. *prehend*), versus *I grasp the idea*, in which a more metaphorical, abstract meaning is conveyed (i.e. *comprehend*). The complexity and diversity of figurative language constructions (e.g., metaphors, idioms, fictive motion expressions), diverging for global meaning access versus lexical decomposition, has not permitted until now to reach a general consensus with respect to the involvement of experience-dependent sensory-motor systems (for a review, see Ghio & Tettamanti, 2015).
A further quite interesting example of linguistic structural composition, which has recently fallen under increased scrutiny in the field of grounded cognition, is that of sentential negation. Sentential negation is a property embedded in syntactic structure, which is able to reverse the truth value of a declarative sentence (Horn, 1989; MacDonald & Just, 1989). The neural underpinnings subtending syntactic negation are still largely unexplored, although in previous years several psycholinguistic studies have been devoted to unravel how negation affects the processing of meanings. Several mental computations are required to understand linguistic utterances that include a negation marker such as *no* or *not*. Specifically, negation has to be linked to the mental representation of the concept or scope on which it operates. In sentence-picture matching tasks, longer reaction times have been traditionally found for negative (e.g., *The dots aren't red*) compared to affirmative (e.g., *The dots are black*) sentences (Just & Carpenter, 1971). Early proposals interpreted these effects as evidence that negated information is more difficult to process and requires additional computational resources than its affirmative counterpart. Subsequently, other approaches have also suggested that negation reduces the mental accessibility of the meanings expressed in its scope. MacDonald & Just (1989) investigated in three behavioral experiments the effects of negation during noun processing. In the first experiment, participants were presented with simple sentences containing a negation (e.g., *Almost every weekend, Elizabeth bakes no bread but only cookies for the children*) and were required to judge the truth value of a verification statement (e.g., *Elizabeth bakes cookies for the children*). Response times to negated nouns target were slower compared to non-negated ones. Similar results were obtained in the second and third experiments, where the interference effect of negation was investigated in naming tasks. The authors suggested that negating a noun exerts an influence on its semantic representation and, more specifically, reduces the strength of activation of the concept representation.
This body of behavioral observations led Tettamanti *et al.* (2008) to make predictions on the neural effects of negation on the semantic representation of action-related meanings from a grounded cognition perspective. These predictions were tested in an fMRI study involving sentential negation in a passive-listening task. The experimental stimuli were sentences characterized by the manipulation of negation polarity (i.e. negative vs. affirmative) and semantic concreteness (i.e. abstract, for example: *Now I appreciate loyalty*, vs. concrete, action-related, for example: *Now I push the button*). Independently of the level of concreteness, negative sentences compared to affirmative ones, yielded stronger inhibitory deactivations in the right middle frontal gyrus, right middle occipital gyrus, and left pallidum. As a main effect of concreteness, action-related sentences induced widespread activation in the left hemispheric fronto-parieto-temporal network underlying action representation, whereas abstract sentences yielded stronger brain responses in the left ventral inferior frontal gyrus,

in the inferior and middle temporal gyri, and in the posterior cingulate cortex. Crucially, the interaction between polarity and concreteness yielded significant modulatory effects in both networks, revealing a semantic category-specific BOLD signal reduction for negative compared to affirmative sentences. As for negative abstract sentences, an activity reduction was found in the posterior cingulate cortex, whereas for negative action-related sentences the reduced responses encompassed the left fronto-parieto-temporal network. Functional connectivity tested in the left fronto-parieto-temporal network by means of Dynamic Causal Modelling showed a significant reduction of connection strengths (i.e. of functional integration) specific for negative versus affirmative action-related sentences. These findings suggested a reduced access to the negated semantic information coded in experience-dependent, category-specific grounded representations, and led the authors to propose a "disembodiment effect" for sentential negation (Bartoli *et al.*, 2013). Subsequent experiments provided further evidence in support of this proposal. For instance, Tomasino *et al.* (2010) found that neural activity in the bilateral motor and premotor cortices was reduced when imperative verbs were presented in negative (e.g., *Don't write!*) compared to affirmative form (e.g., *Write!*). In a similar vein, Liuzza and colleagues (2011) applied paired-pulses Transcranial Magnetic Stimulation to the primary motor cortex, which at baseline exerts a facilitatory motor effect that is revealed by an increased amplitude of motor-evoked potentials (MEPs) in peripheral muscles. Simultaneously, participants were required to perform a passive reading task, including either abstract or hand-action related sentences, in both negative and affirmative forms. Crucially, reading action-related affirmative sentences suppressed MEPs, whereas this effect was absent for action-related negative sentences. The aforementioned results were recently corroborated by Bartoli *et al.* (2013), who tested the simultaneous recruitment of shared neural resources by semantic and motor tasks. The authors measured proximal (i.e. reach) and distal (i.e. grasp) upper limb movement kinematics during a motor task with simultaneous presentation of action-related sentences, including, respectively, either proximal (e.g., *I grasp*) or distal (e.g., *I pinch*) arm movements, in both affirmative and negative forms. Crucially, sentences describing actions in the negative, compared to the affirmative form exerted less interfering effects on kinematic parameters in the congruent conditions (e.g., proximal movement with proximal action-related negative sentence). These findings suggested that the comprehension of negative action-related sentences is characterized by a reduced computational load in embodied conceptual representations which, in turn, leaves more neural resources available to perform the concurrent motor task.

4. Conclusions

Far-reaching progress across all branches of the modern neurosciences has revealed the remarkable plasticity of the brain, as a learning organ that adaptively responds across the lifetime to stimuli, sensations, and experiences, and even insults. Evidence of brain plasticity confutes the view of the brain as an isolated, central storage and calculation machine, disconnected from the rest of the body and from the external world. In turn, it promotes a view of life as an integrated mind and body experience that is deeply rooted in the physical, social, and cultural environment. At the cognitive level, grounded cognition theories emphasize such plastic brain-body-environment integration, leading to a view of our mnemonic, linguistic, and more in general intellectual abilities as the product of our lifetime personal experiences, which ultimately shape our uniqueness as individuals.

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SECTION 3

SECTION 3

ART, DEPICTION, AND PERCEPTION

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ART MADE FOR PICTURES

abstract

Over the last fifteen years, communication has become pictorial in a manner that it never was before. Billions of people have smart phones that enable them to take, edit, and share pictures easily whenever they choose to do so. This has created expressive niches within which new activities, with their own norms, continue to develop. Ready availability of these pictorial modes of communication, we claim, not only constitutes a change in the range of our communicative practices, but also changes the world about which we communicate. Increasingly, we are making a world that's worth depicting, using the tools we now possess.

This paper will unpack one example of this phenomenon, trompe l'oeil street art. More and more of this seems to be produced with the intention that it is seen primarily in pictures. It makes sense that anything someone makes, and wants to be seen, would be made with decent photography potential in mind. You want photos to be able to, as they say, do justice to your work no matter what kind of visual work you make. In these cases, however, the pictures of the work are reliably more interesting than the pieces seen in the flesh.

keywords

trompe l'oeil, picture perception, instagram, pictures

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I. Introduction

Over the last fifteen years, communication has become pictorial in a manner that it never was before. Billions of people have smart phones that enable them to take, edit, and share pictures easily whenever they choose to do so.[1] This has created expressive niches within which new activities, with their own norms, continue to develop. Ready availability of these pictorial modes of communication, we claim, not only constitutes a change in the range of our communicative practices, but also changes the world about which we communicate. Increasingly, we are making a world that's worth depicting, using the tools we now possess. This paper will unpack one example of this phenomenon, trompe l'oeil street art. More and more of this seems to be produced with the intention that it is seen primarily in pictures. It makes sense that anything someone makes, and wants to be seen, would be made with decent photography potential in mind. You want photos to be able to, as they say, do justice to your work no matter what kind of visual work you make. In these cases, however, the pictures of the work are reliably more interesting than the pieces seen in the flesh.

Given the grand claims about changing the world in order to be pictured, this focus on clever street art might strike readers as unreasonably narrow. Street art of this sort is important for two reasons. First, one thing smartphones will continue to do is bring impressively complex expressive and communicative possibilities into the streets, and, perhaps, out of museums. Augmented reality, for example, is bound to lead to even more changes in the world, as it is made more and more augmentable. Second, this case sheds some light on depiction, which has occupied philosophers of art for quite some time. In fact, we claim that developments in street art practice lean on features of depiction that have been around as long as we have been making pictures. It's just that these aspects of depiction were not salient or important to us until picture making took its current form.

Section II describes the phenomenon we have in mind. Section III tries to establish how such art is meant to be experienced and show why this is a philosophically compelling phenomenon. Section IV then tries to explain this phenomenon and suggests that it reveals something very interesting about depiction. The final section situates these practices with respect to related ones.

1 https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/ [Accessed Nov 21, 2017.]

II. Trompe l'oeil street art

Though talk of the imitation of nature animates many discussions of picture making, particularly in the West, trompe l'oeil per se has never been a focus for artists. It was a popular thing in ancient Rome, if the frescoes at Pompeii are any indication, and in ancient Greece, if we can take Pliny at his word (Lehmann, 1953; Ling 1991). It was somewhat popular in Italy, France, and the Low Countries in and around the eighteenth century, and there are some notable outliers here and there. Andrea Pozzo's ceiling (1685-1694) at St Ignazio in Rome is one impressive example. As we will discuss, a decent amount of contemporary street art is aimed at fooling the eyes too.

Trompe l'oeil pictures are meant to elicit at least two experiences, typically in a specific order. First, you mistakenly believe a twodimensional picture to be the threedimensional scene it depicts. Second, you notice that it is not in fact the threedimensional scene, but a twodimensional depiction thereof. Seeing the picture as a picture might include being aware of the scene it depicts. So, it's not as though we can only see trompe l'oeil pictures as the scenes they depict or as meaningless patterns of pigment. The trompe here is in the state where one fails to notice that it's a picture. Often, one is able to flip back and forth between these two states, knowingly entertaining a kind of visual illusion that's not characteristic of encounters with ordinary pictures. (See Wollheim, 1980, 1998; Levinson, 2002; Feagin, 2002; Kulvicki, 2009; Boldt-Irons, 2009; Nanay, 2011, 2015, 2016; Voltolini, 2015; Levine, 1998; Ferretti, 2016, forthcoming on experiences of pictures.) We needn't worry about giving anything like a definition of trompe l'oeil here. Some pictures might be made with the intention that they are enduring illusions, and so never seen as ordinary patterns of pigment. Some might be made so that they fool you once, impressively, but never do so again. Typically, however, the fun in trompe l'oeil is found in the fact that we are fooled, and then confronted with that fact. This, in turn, can lead one to appreciate the artist's skill in bringing about such an effect.

Contemporary street art takes advantage of the back and forth typical of trompe l'oeil art. A chalk drawing, seen from a very specific vantage point, makes it look as though the pavement has collapsed, revealing a compelling scene beneath the street. A building's façade is patterned to give the impression that it has collapsed, or that it bends around in a way the architecture does not support. Good examples of this are very popular, even if they don't catch the eyes of critics. They are more akin to busking than concert hall performances, though Pliny describes exactly these kinds of reactions to the greats of Greek painting.[2]

Street art differs from typical 18th Century trompe l'oeil painting in that it is almost impossible to be genuinely deceived. And even if it is, it is quite rare that this is the first experience one has. You see the chalk marks long before you are in the one very specific vantage point from which it would deceive your eye. Paintings, by contrast, can be positioned so that naïve viewers first see them from the preferred standpoint, in the preferred lighting, and so on. Circumstances stack the deck against realizing it's a picture and not a shelf packed with books. Discovering the ruse is delightful.

What it lacks in the ability to deceive, street art makes up in its surprising appearance from other angles. Street art is not meant to be viewed head-on, as a painting in a museum is, and you can readily occupy radically divergent angles on the work as you walk around it. As a result, what looks like a waterfall into the center of Manhattan from one perspective looks like an abstract tangle from another. In that sense, these pieces have much in common with

2 See Pliny the Elder's *Natural History* XXXV 79-83 for his retelling of the story of Apelles and Protognes and XXXVI, where he describes two trompe l'oeil paintings by Zeuxis: one of grapes that deceive hungry birds and another one of a curtain that deceives Zeuxis's rival Parrhasius, who reaches out to pull back the curtain in order to see the painting behind.

anamorphic pictures, in which things make sense only from a rather distinctive, and usually uncommon, perspective on the picture one sees. Death lurks in Holbein's *Ambassadors* (1533), but it only rears its head from the high right or low left. These street scenes are thus an interesting blend of trompe l'oeil and anamorphosis.

The diminished potential for misperception, combined with the anamorphic element, have serious aesthetic consequences. Because of where and how these pieces are made, achieving an initial deception plus the surprise accompanying its discovery is off the table. When we first see, say, an 18th Century trompe l'oeil, we have no expectations about what we will see. That's why it is so easy to fall for these illusions. But in the case of the trompe l'oeil street art, by the time we are in the position to undergo this illusion, we know very well that this is a trompe l'oeil picture that we are looking at. So, the street art cases we have been considering reverse the typical order of experiences around which earlier practices had been built. Part of the interest of such paintings is their anamorphic aspects, of course, and this is no part of ordinary trompe l'oeil. But there is another feature of these street art pictures that can make them good. This could not have been what motivated earlier efforts at trompe l'oeil, but it helps make sense of the increasing popularity of its younger relative.

When photographed from the proper perspective, these works look like much better examples of trompe l'oeil than they really are. As we mentioned, you're rarely deceived by these pieces, and even if you are it's not the first impression you have. But photograph the piece and the result is surprisingly compelling. Part of the explanation for this should be clear. The photographer fixes an angle from which the work can be viewed, undoing one of the clearest contrasts between these cases and traditional trompe l'oeil. But that cannot be the whole story. Seen face-to-face, even if one views them initially from the preferred angle (we have tried this!), these works are not as good examples of trompe l'oeil as they look to be in pictures of them.

We haven't yet introduced a photo of such work because it would have undermined our claims about them being poor examples of trompe l'oeil. Consider two examples that were part of the Tizarte Street Art Festival in Antwerp, September 2017 (Figures 2.1, 2.2, 2.3, 2.4).

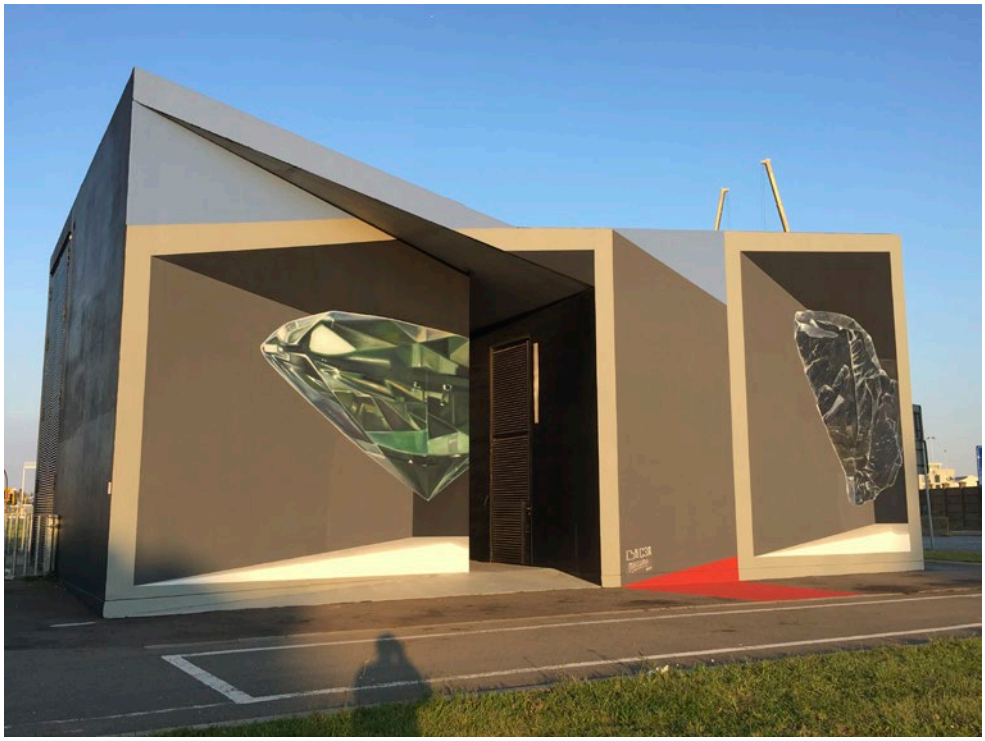
There is no magic in ordinary encounters with street art comparable to what one finds with trompe l'oeil painting. There is magic, by contrast, in photographs of street art, even though the photos themselves are not trompe l'oeil. They seem to reveal an impressive example of trompe l'oeil, even there is no such thing to be photographed. In that sense we might call these pieces examples of *trompe la caméra*. It's as though the camera thought it saw a great piece, and sent it along to us, while in reality it was not very impressive.

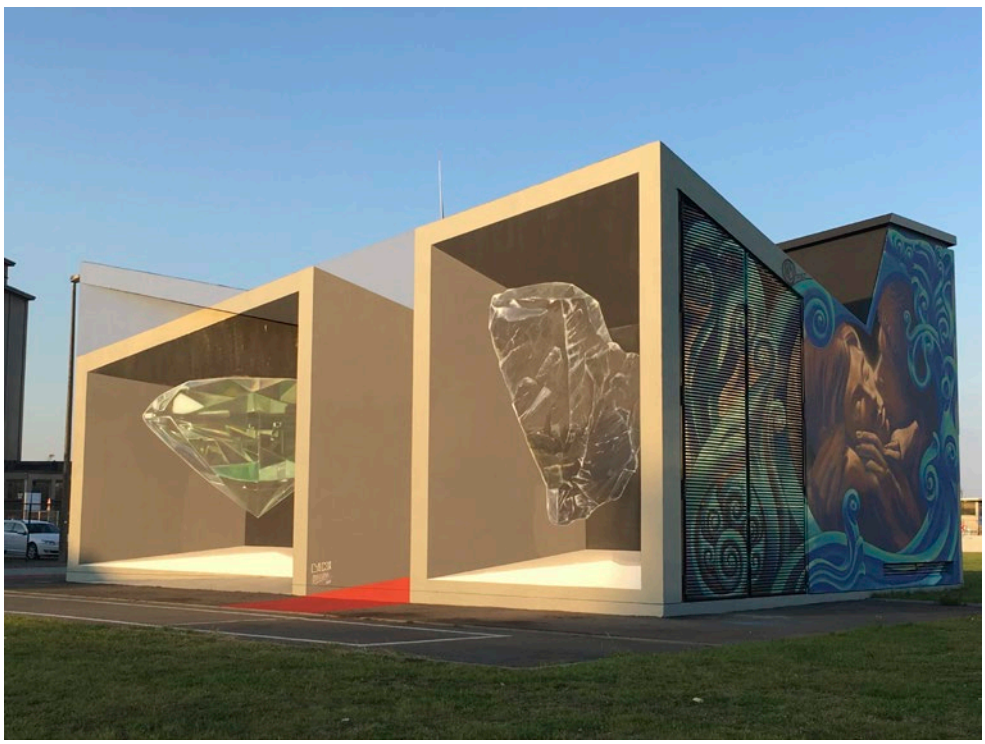
This phenomenon is not limited to chalk drawings on the street. Some examples that lack the anamorphic element also present themselves as much more compelling examples of illusion when looked at through photographs (Figure 2.5).

So, the anamorphic element is not prerequisite to eliciting this effect.

If the work is any good at all, and well placed, there is likely to be a crowd around the ideal vantage point. It is very unlikely that you will only be able to see it from somewhere close to that spot, and even if you do, it won't be as good an example of trompe l'oeil as you can find in your local museum. Those lucky enough to be at the best viewing spot, will, as we are all likely to do these days, take pictures of it. This isn't the place to complain about the recent museumgoer habit of snapping photos rather than taking a long hard look. It's increasingly unlikely that anyone will ever get a moment of peace with famous works like the Mona Lisa anyway. One way art can adjust to otherwise awful viewing habits is for it to be normed to being viewed in pictures. The spectators snapping photos of the chalk drawing are doing exactly the right thing. In fact, absent the ability to make or at least view pictures of the piece, it's fair to say they are not even in a position to appreciate it.

Figures 2.1 and 2.2: Two views of a drawing on the ground by Remko van Schaik (2017) in Antwerp, Belgium.





Figures 2.3 and 2.4: Two views of the Aquafin Pumpstation's front by Leon Keer (2017), Antwerp, Belgium.

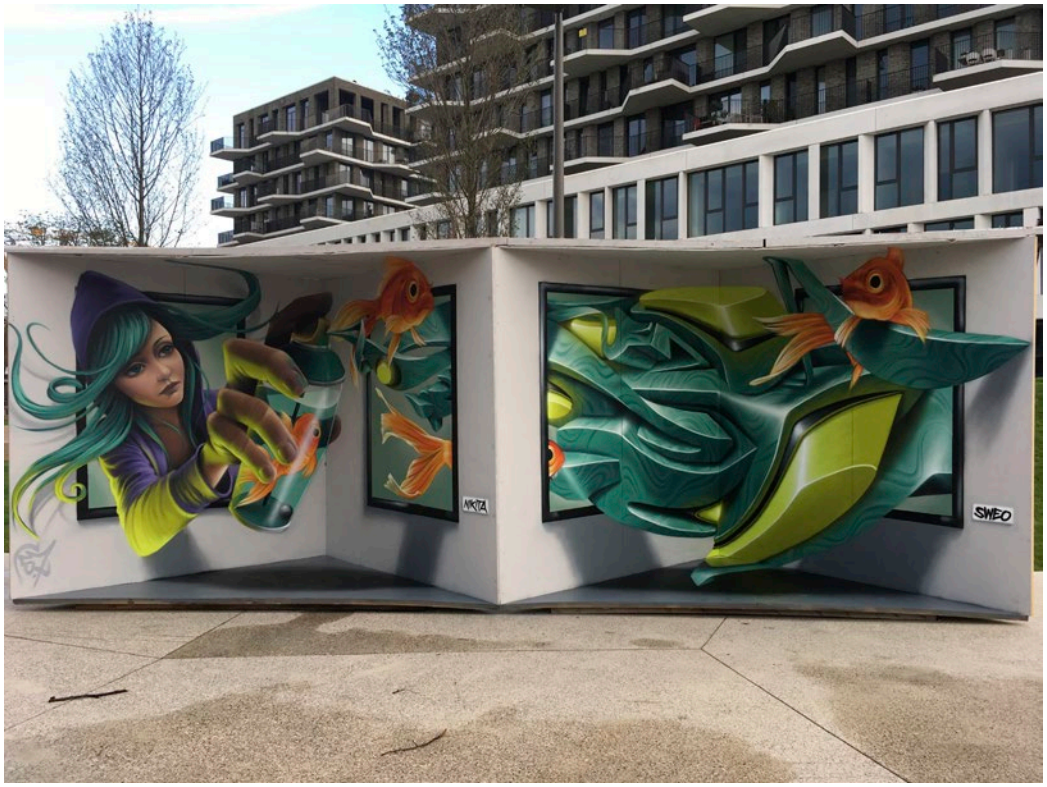


Figure 2.5: Painting on an angled surface, which lacks a pronounced anamorphic element, but looks like a trompe l'oeil only in the photograph. Sweo & Nikita 5.7 Crew, 2017. Antwerp, Belgium.

The next section tries to make sense of the kinds of experience we have when engaging with such pictures, before the final sections explain and contextualize these cases. That discussion will reveal a sense in which this phenomenon has been endemic to pictures for as long as there have been pictures, even though it took a cultural context like ours to enfranchise it as significant.

III. Trompe l'oeil and trompe la caméra

The last section leaves us with a number of interesting questions. There is a substantial literature focused on what makes experiences of pictures distinctive, but the cases considered here are special. The original work is a picture, which has a highly specific point from which it ought to be viewed if it is to be interpreted. From that viewpoint, the work has aspects of trompe l'oeil. Artists often make use of patterns in the concrete, or paving stones as parts of the picture, making is difficult to distinguish features in the depicted scene from those on the street. But their pictures don't fool us, not really. They are at best approximations to true trompe l'oeil.

What about the pictures of these works? They are pictures of pictures, which are complicated for many reasons (Lopes, 1996; Kulvicki, 2006; Newall, 2003). But they are also pictures that in some sense seem to misrepresent the scenes they ostensibly depict. They are not obvious examples of trompe l'oeil, since few photographs are, at least when viewed under ordinary circumstances. Nevertheless, there is magic in our experiences of such photos, and it is the

task of this section to explain that. Because that magic might be precisely what such works aim at, we cannot understand the aesthetics of such encounters without a clearer sense of what is going on.

Trompe l'oeil aims to trigger the experience of taking a twodimensional surface to be the threedimensional depicted scene. But this is not what happens when we look at a picture of a trompe l'oeil picture. Pictorial experience is, as we noted above, a complicated and contested topic. So, without trying to settle exactly what kinds of experiences we have when seeing pictures, let's see if we can contrast the present case with more ordinary ones. This might allow us to make progress without deciding between competing accounts of pictorial experience.

One thought is that when viewing pictures we have visual experiences that are in some rich sense *as of* the objects depicted. Some might think that these experiences are partly illusory, since the depicted scene is not present, while some might think that we are in no way deceived, even though a depicted object somehow figures in experience. In at least many cases, then, the thought is that we somehow experience two objects: a picture and the scene it depicts. These are related to one another, and they might be experienced as being related to one another. In successful trompe l'oeil, the picture surface does not figure in your experience, at least not right away, while in cases of failed depiction no depicted scene appears, and we are left with nothing but a colored plane. Ordinary depiction happens, as it were, between these two extremes (see Wollheim, 1980, 1987, 1998 for the classic exposition of this).

How does this ordinary case, of an admittedly extraordinary phenomenon, differ from the case we are considering? The obvious thing to say is that there are three things that show up in this perceptual state: the twodimensional photograph, the 3d street scene, including the chalk on pavement, and the threedimensional scene depicted by the chalk. That, at least, seems like the obvious thing to say because we know that the experience of a picture typically involves two things, and it thus makes sense that the experience of a picture of a picture would involve three. Moreover, this description is plausible, at least in many cases where a picture has been depicted. Van Gogh, for example, made three paintings of his bedroom in Arles (1888 – 1889). They all depict a number of his own canvases hanging on the walls. The sense one gets is that we experience the painting and van Gogh's heavy brushwork, the bedroom, and the scenes depicted by his canvases.

So far, however, breaking the experience of a picture in three, instead of two, does not tell us why a photograph might elevate a poor trompe l'oeil to something impressive. Van Gogh, for example, did not aim at trompe l'oeil, and his paintings of his paintings don't make it seem as though he did.

To review, when a trompe l'oeil picture manages to deceive your eye, what happens is that you experience the threedimensional depicted scene as if you perceived it face to face. In this case, however, it seems more plausible to say that you confuse something threedimensional (the scene depicted on the pavement, as depicted in the photo) with something else threedimensional (the pavement, as depicted in the photo). We need to be careful here, but let's stick to this way of describing the experience, because it seems to capture the thing happening in these cases that might be absent when looking at the van Gogh. So, we can experience both the chalk drawing and the scene that it depicts, but somehow those two scenes are not clearly distinguished from one another. In fact, it seems accurate to say that when seen in the photo it's harder to distinguish the street scene from the depicted scene than it is to distinguish them when seen face to face. But if the experience of a photo of a trompe l'oeil is such that it's hard to distinguish the chalk from the scene it depicts, then it makes sense to say that the experience of the photo is the experience of an excellent trompe l'oeil. In fact, that's the goal of a trompe l'oeil in the first place.

Remember, the photo we see is not a trompe l'oeil. It doesn't aspire to be one, either. So, one is not, in viewing the photo, shuttling attention back and forth between features of the photo surface and features of the depicted scene. But one is shuttling attention back and forth between two depicted scenes. The depicted chalk drawing looks like a good trompe l'oeil, so one vacillates between the scene the chalk depicts, and the chalk. And we note that it's hard to keep them apart. In one sense, this is more like experiencing Jastrow's duck-rabbit than it is like experiencing the back and forth Wollheim emphasized between features of the picture surface and features of the depicted scene (Wollheim, 1963). In another sense, however, the experience is quite unlike the duck-rabbit. In this case, it's clear that the chalk pattern relates in an important, indeed depictive manner, to the scene it depicts, and it's precisely sorting out where the depicted scene starts and the pattern of chalk ends that makes the experience confusing.

The special experiences afforded by these street art scenes thus seem built around making it hard to distinguish the depicted chalk from the scene the chalk depicts. They are both available to viewers, as is the fact that they are looking at a photo. But it is the fact that we are apt to have a hard time sorting out these two that seems at the core of this interesting phenomenon. Because this happens, and because practically everyone these days has a camera at the ready, there is a niche for artists to exploit. These chalk drawings are made to be looked at in pictures, because doing so makes them seem like much better trompe l'oeils than they seem to be in person. That's a bit of magic, indeed. And because we are unable to reorient ourselves with respect to the scenes we photograph, there is no room for this enhanced trompe l'oeil phenomenon to be broken. Not only do they seem better from the preferred viewpoint, but the absence of other viewpoints leaves us unable to assess how they look from them.

This seems like a helpful description of the experience of seeing such photos, but so far we have not tried to explain why such photos work the magic that they do. We attempt to do that in the next section, and as we will see, it will force a reconsideration of the van Gogh case.

IV. Explaining the phenomenon

Trompe l'oeil pictures always work in a context. Sometimes, the picture takes up most or all of the visual field, and it is rendered in such a manner that the viewer doesn't notice that she's really seeing a plane surface. One classic way to make this happen is to choose a pictorial subject that is not very deep. Papers and other things affixed to a board, for example, as in Johann Heinrich Füssli's (1749) painting shown in Figure 4.1, are standard subjects of trompe l'oeil paintings and drawings.

Sometimes, the illusion succeeds because the painting is seamlessly worked into its environment. Pozzo's ceiling is so far away that you can't see its surface features, and so even though the depicted scene is deep, and continuous with the walls of the cathedral, you can convince yourself that you are looking into a deep space. The street art examples we have been considering are of the latter sort. They are on the street, they can clearly be seen to be part of the street, and they are meant to suggest that we are seeing into or below the street. A photograph of such a scene will include parts of the surrounding environment, like the street, and perhaps even spectators. Given that, we can break the picture into two parts. One part represents the chalk drawing, and another represents the rest of the scene. It can, as we mentioned earlier, be hard to see exactly where one part ends and the other begins, but leave that to one side for now. Let's say that the photograph accurately represents both the drawing and the scene around it.

Now let's focus on the part of the photo that represents the chalk. It's accurate, by hypothesis, so the photo represents a pattern of chalk as being the way that it is. That's not to say it represents the pattern in all of its detail, of course. The only claim is that it accurately

Figure 4.1: Johann Heinrich Füssli, Hermitage Museum, St. Petersberg.
Source: The Yorck Project: *10.000 Meisterwerke der Malerei.* DVD-ROM, 2002. ISBN 3936122202. Distributed by DIRECTMEDIA Publishing GmbH.

represents the pattern. (We'll have occasion to come back and reconsider whether the photo is completely accurate in a moment.) It's doubtful, for example, that the photo represents the pattern as being made of chalk, as opposed to some other superficially similar substance. Now note that the photo is also a pattern of pigment. It's not a pattern made of chalk, of course, but it's a pattern of color. In addition, the scene the chalk drawing represents is, inter alia, a pattern of color.[3]

To call these things patterns is to suggest that they are organized in space – we aren't focused on things organized in time here – so we can also ask what kind of spatial pattern it is. Just as the color pattern that matters is one undecided between colors of objects and colors of illuminants, etc., the spatial pattern that matters is one specified in two, not three, spatial dimensions. The photo, the chalk, and the scene the chalk depicts occupy 3d space, and things in 3d space instantiate many 2d patterns. The only point being made here is that the pattern that matters for the photo being the photo it is, the chalk drawing being the drawing it is, and so on, is a 2d pattern. Being flat is a way of occupying 3d space, and while the photo might be, the drawing on the street probably is not flat, or it need not be. And ditto for the scenes depicted by the chalk.

What makes the viewpoint from which the photo is taken ideal? In part, it is because from that viewpoint, the chalk instantiates a 2d pattern that is readily interpreted as a representation of a recognizable 3d scene. You can certainly interpret an anamorphic picture at some distance from its ideal viewpoint, but the scene you interpret it as representing will not be filled with recognizable objects. The picture will strike one as abstract, or perhaps surreal. Contrast the two viewpoints from which the first example in Figure 1 above was photographed. The photo of the chalk, taken from the ideal viewpoint, will accurately represent a pattern of color that is readily interpreted as a representation of a recognizable 3d scene. But the photo is itself a pattern of color, and from the ideal viewpoint it will pretty much instantiate the same 2d pattern as the chalk does, from that viewpoint. So, the photo, too, will manifest a pattern that is readily interpreted as a representation of a recognizable 3d scene. But in this case the scene is the one the chalk depicts. It's also true that the pattern on the photo represents the somewhat less readily recognizable 3d layout of chalk, on a street at an oblique angle. Remember also that we have been talking about just one part of the photo. There is another part, corresponding to the elements of the scene that are not part of the chalk drawing. They are readily understood in only one way: as representations of parts of a street, perhaps with spectators, and so on.

The foregoing constitutes not a description of the kinds of experiences one might have when engaging with photos of street trompe l'oeil. Instead, it's the start of an explanation for how a photo of a mediocre trompe l'oeil might seem to be a photo of a very impressive one. The photo is accurately interpretable in two ways: as a street scene with a chalk drawing in it, or as a street scene with a hole in the pavement and something going on down below. The part of the picture representing the drawing is accurately interpretable in both ways. The interpretation that includes a complex scene is actually the more compelling of the two, because the alternative is a street with oddly shaped color patches on it. In fact, if you only were able to see the part of the picture corresponding to the chalk drawing, the street interpretation would be impressively implausible. The only thing that makes the street interpretation plausible is the part of the picture that clearly depicts a street scene.

3 The photo, the chalk, and the scene the chalk depicts are also patterns of colored things, but for present purposes what matters is that they are patterns of color. So the notion of color being used here is one that does not distinguish between the colors of objects, the colors of illuminants, and abstractions over them.

What is the most plausible interpretation of the whole? Well, a street scene with a chalk drawing on it. But because the part of the photo corresponding to the chalk is more readily interpreted as a picture of the scene represented by the chalk, the most plausible overall interpretation is that we have an impressive trompe l'oeil on our hands. Or, at least, the chalk is apt to seem like an impressive trompe l'oeil for someone trying to interpret the photo of it. When seen face-to-face, the chalk drawing is quite visually compelling as just that, a chalk drawing. It's not terrible as trompe l'oeil, but it's not fooling anyone.

It's important that the artist tries to make the trompe l'oeil work in situ, because without the connection to the rest of the picture the photo might not seem like a picture of an impressive trompe l'oeil. For example, try drawing a border the picture in Figure 1, the result is something that looks like two photos, one on top of the other, rather than a photo of a single scene.

There is doubtless more one could say about this phenomenon, but we hope that this sketch of an explanation is compelling enough to shed some light on the way in which artistic practice can find a niche that makes it more compelling in a world increasingly built around pictorial communication.

V. Generalizing the phenomenon

The fact that pictures of pictures can be much more aesthetically interesting than the pictures themselves has been rendered interesting and compelling by the contemporary situation with picture making technology. But the thing about pictures that makes this way of seeing them available is quite old. Nothing in the previous section appealed to special features of smartphone cameras, for example. These works made to be photographed bring this fact about pictures into high relief. They suggest places to look for relatives of this phenomenon, with the end result being a richer understanding of pictorial representation. The following looks at some straightforward and some less obvious extensions of the thoughts from the previous section.

Barbara Savedoff, for example, suggested that there is something aesthetically important about the ways in which photographs of other photographs enliven their subjects. Walker Evans's *Torn Movie Poster* (1930), for example, is a photo of a poster depicting a man and a woman, but the poster has been torn revealing a wall behind it, through the part that depicts the woman's face. For Savedoff (1992, p. 94), "We read the photographed picture of a woman as a photographed woman; we read the torn picture as a torn woman." In person, "we would probably not find it arresting or disturbing" because the torn poster does not strike us as in any way depicting a grotesque scene. Her idea, in general, is that pictures usually depict 3d scenes. When they do so, the scene is reduced in some way to a 2d pattern of pigment. But no such reduction accompanies photographed photos, which are already 2d patterns (Savedoff, 1992, p. 94). This seems to have been a thing for Evans. His *Billboard Painters, Florida* (1934) makes a picture in the process of being painted look like a better trompe l'oeil than it is, for example, and so it's closely related to the phenomena we have been discussing.

Savedoff's examples depart from ours in one important respect. The objects of these photos are not art made for picturing. They are impressive photographs, but the main thing that makes them impressive is Evans's hand in choosing the scenes. The scenes are not works of art, and were not made to be photographed. If would be odd for them to have been made for that in the 1930s because photography was expensive and relatively rare back then. Evans is the artist here. The explanation offered for this phenomenon in the previous section appeals to features of pictures that they have always had, or so we suggest. Savedoff's examples are helpful in that they illustrate a different way to capitalize on features of pictures that long predate smartphones.

But is photography, per se, the real driver of this phenomenon? Savedoff goes on to suggest that paintings like Magritte's famous *La condition humaine* (1934) do not lead to the same

magical transformations of their objects. She connects this to the sense we have that photographs "are perceived to possess an objectivity unavailable to painting" (1992, p. 103 and see 2000, Ch 2). While that might be true of photography, we are inclined to disagree with her. This phenomenon is not limited to photographic pictures of other pictures, though it might be at its most compelling in such cases.

In imaginative paintings we will never be in a position to compare the depicted scene with the scene in the flesh. So it will make no sense to say that the painting of an imagined scene depicts its object as being a better trompe l'oeil than it actually is. That said, the painting depicted in *La condition humaine* looks like a fairly solid trompe l'oeil. It is integrated with the depicted scene surrounding it to make its borders unclear in a manner reminiscent of much street art. Of course, this imagined scene, too, cannot itself be a bit of art made for picturing, but the picture disappears in much the same way as the earlier examples do. Now imagine a related case. Imagine a carefully rendered chalk drawing of the scene photographed in Figure 1. In that case, if anything, the original chalk drawing will fade even more convincingly into the scene as a whole.

In fact, depending on how the drawing is executed, the depicted drawing might disappear altogether. When you match media – photos of photos, chalk drawings of chalk drawings, etc. – you make it evident how readily one picture can fade into the scene of another. Indeed, as one of us has suggested (Kulvicki, 2006, Ch3), if all you depict is another picture, using the same kind of representation, the result is just like the original. The foregoing gives another way of thinking about that phenomenon. The photo of a photo of X, without remainder, makes its object seem like such a convincing trompe l'oeil that it looks just like you've got a photo of X on your hands.

The Chinese artist, Liu Bolin, has developed a body of work based on pictures dissolving into scenes when they are photographed. Bolin installs himself in front of various different backgrounds and has himself painted in such a way that he matches the background from a specific point of view. In effect, he is painted with a picture of the scene behind him. These installations are made for photography. Neither of us has seen him in situ, but it's plausible that he hides better in the photographs than he does in the flesh. So, this is very much art for picturing, even though it's not trompe l'oeil traditionally conceived. The ideal effect is that you fail to see Bolin himself at first. But on close inspection, you notice that what you took to be, say, a vegetable stand, is in fact Bolin standing in front of the vegetable stand.

This experience is somewhat similar to the experience of trompe l'oeil street art in the way it unfolds temporally. The ideal experience would be the temporal sequence of first being fooled into experiencing the vegetable stand (without experiencing anyone in front of it) and second, noticing that there is a person, painted cleverly in such a way as to conceal him in front of this specific background, standing in front of the vegetable stand. This is very similar, in terms of its temporal unfolding, to first being fooled into experiencing the threedimensional depicted scene as if seen face to face and then noticing that it is merely a twodimensional depiction of this three-dimensional scene.

Crucially, the considerations about the visibility of trompe l'oeil street art apply in the case of Bolin's installations as well, almost word by word. The Bolin installation manages to deceive you only when seen from a very specific and restricted point of view. If seen from a point of view a little bit off, then you are no longer deceived into having a Bolin-free experience (of experiencing the vegetable stand only). Bolin seems to regard his artwork as being the photos, rather than the staged scenes he photographs, however. As he says:

> some people already asked me if I considered myself as a performer or as a photographer. In general, I answer that I create 'staged photographs' for my artworks

> differ from 'landscape photography' and its pursuit of peculiar form, light, and color. Contrarily mine can be regarded as documents, as realist descriptions, as if they were a sequence from a film in which the camera only focuses on the actors' oral performance.[4]

Given that, Bolin fits as a nice contrast to both Evans and the trompe l'oeil street art on which we have focused. Evans found improbably good scenes to photograph, and so the photos were the work. The street art is made to be photographed, but the work is still the street art. It's just made to be engaged with through the photos. Bolin constructs analogs of the highly improbable scenes that Evans tried to find, but, like Evans, the work is the photos that result. He builds the world so he can photograph it, but that's not the same as making artwork to be photographed. While Bolin is a special case for the reasons enumerated here, it could be argued that many examples of performance art are created in such a way that they photograph well. This is a major departure from the origins of performance art and happening when considerations about whether the performance would be preserved at all, and if so how were supposed to be irrelevant. This change is very salient if we look at the work of performance artists whose work encompasses several decades, like Marina Abramovic or Jan Fabre. While in their early work the fact that the performances may or may not be photographed does not seem to make a significant difference, the work they produced in the last decade or so is very explicitly made to be photographed.[5]

And this point could be generalized even further. Classic art forms such as theatre, architecture or sculpture may also not be completely free from the pressure to photograph well. If a sculptor creates works that do not look good when photographed (only when the spectator can move around it freely), this puts limits on this artist's Instagram exposure, but also on coverage of her work in various art magazines. We learn about most things, including art, primarily by means of pictures. This can change how art is made.[6]

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4 http://photographyofchina.com/blog/interview-liu-bolin [Accessed 12/3/17]

5 It is also important to point out some artists who buck this trend and even work against it. One salient example is Olafur Eliasson's *Room for One Color* (1997): a white room lit entirely by monofrequency lighting making you experience everything (yourself, your partner, the other visitors) in black and white (or, rather, in black and yellow). This is a very strong visual experience, but any kind of photographic documentation of it is completely trivial as they just look as if they were monochrome photographs. Eliasson actively encourages visitors to take photos – one wonders whether that is a tongue in cheek remark as any such photo would fail to document the experience of being there and then. Eliasson's other works as well as some of James Turrell's installations work in a similar way.

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THE NATURE OF PICTORIAL REPRESENTATIONS*

abstract

A crucial question in the study of picture perception asks about whether, when perceiving an object in a picture, we see only the depicted scene or, rather, we simultaneously see both the depicted scene and the surface. Two different views have fueled the debate since a long time. According to Wollheim, we see both the depicted scene and the picture's surface simultaneously. Call this the 'simultaneous account of picture perception' (SA). SA is in contrast with Gombrich's view that, during picture perception, we do not simultaneously see both the depicted scene and the surface, but we alternate between these two visual states. Call this the 'non-simultaneous account of picture perception' (NA). The debate between these two positions still persists in the contemporary literature on picture perception. In this paper, I first analyze the notion of vision SA and NA are committed to. Then, by discussing empirical evidence from vision science, I offer an argument that supports SA.

keywords

seeing-in, vision science, Gombrich, Wollheim, twofoldness

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1. Introduction

You are looking at the wonderful '*Calling of Saint Matthew*' by Caravaggio. The painting is very inspiring and you are intensely focusing on the wonderful depicted scene. Here is a question: are you visually representing only the depicted scene or, rather, are you also visually representing the picture's surface?

This is a crucial question for the study of picture perception (Nanay, 2017) and "much of the philosophical literature on picture perception is about how these two perceptual states are related to each other" (Nanay, 2012, p. 440). Two different views have fueled the debate since a long time. For Wollheim, when a subject perceives an object in a picture (what is called 'seeing-in'), she/he is in a peculiar visual state of 'twofoldness': she/he "is, and remains, visually aware not only of what is represented but also of the surface qualities of the representation" (1980, pp. 214–215; 1998; 1987; see also Lopes, 2005; Nanay, 2011). Call this the 'simultaneous account of picture perception' (henceforth: SA). SA is in contrast with the idea proposed by Gombrich (1960) that, during picture perception (or, following the terminology proposed by Wollheim, during seeing-in) we cannot see both the picture's surface/vehicle and the depicted object at the same time: "is it possible to 'see' both the plane surface and the battle horse at the same time? (...) the demand is for the impossible. To understand the battle horse is for a moment to disregard the plane surface. We cannot have it both ways" (Ibid., p. 279). This view suggests that our visual system can only alternate between the picture's surface and the depicted object. Call this the 'non-simultaneous account of picture perception' (henceforth: NA).

Clearly, "Gombrich's account of our experience of pictures is inconsistent with the idea of twofoldness" (Nanay 2011, p. 462, footnote 2). Indeed, "Gombrich held that seeing-in precludes, while Wollheim held it requires, seeing a picture's design properties (i.e. those properties of the picture's surface in virtue of which seeing-in is elicited)" (Cavedon-Taylor, 2011). Note that both philosophical positions hold that seeing-in involves the occurrence of two *visual operations*: the perception of the picture's surface and the perception of the depicted object. The debate is about whether these two *visual operations* occur simultaneously or, rather, are disjointed visual phenomena.

The dichotomy between these two positions still persists in the contemporary literature on picture perception (Newall, 2011; Lopes, 2005; Kulvicki, 2006; Ferretti, 2017b; Hopkins, 2003; Nanay, 2017; Chasid, 2014; Nanay, 2010, 2011, 2015, 2017 for a review). Indeed, "the nature of seeing-in is a matter of controversy" (Cavedon-Taylor, 2011, p. 1). Thus, we still need a final argument in order to decide between SA and NA. This paper offers an argument in support of SA.

First, I analyze SA and NA and the notion of vision they are committed to (§2). Then, I offer an argument that supports SA. This argument grounds on empirical evidence from vision science (§3).

2. The Nature of Seeing-In

Before developing my account, I need to discuss the specific ideas at the basis of NA and SA. We can start from SA.

Nanay has suggested (2011, p. 463) that Wollheim's idea about seeing-in that, during picture perception, a subject "is, and remains, visually aware not only of what is represented but also of the surface qualities of the representation" (1980, pp. 214–215) can be interpreted in two different ways:

- SA1) We consciously see, *(or consciously visually attend to)*[1] both the depicted object and some of the properties of the surface.

- SA2) We visually represent *(or see)* both the depicted object and some of the properties of the surface (while we may or may not attend to the surface).

It seems that we should select SA2 (*contra* SA1) for different reasons (Nanay, 2011, 2017). First, empirical evidence shows that we can see "objects in pictures even if we are not conscious of either the surface or the depicted object" (Nanay 2011, footnote 1). Thus, the idea that we need to be conscious of both the picture's surface and the depicted object during picture perception goes against the evidence above reported, i.e. about the possibility of the unconscious perception of objects in a picture in those cases in which we unconsciously perceive either the surface or the depicted object. Second, following Levinson (1998), Nanay (2011, p. 463; see also Lopes, 1996) suggests that, most of the time, during picture perception, our visual consciousness ignores the picture's surface. Accordingly, following Lopes (2005, p. 28), it is true that we see the surface when we see something visually encoded in it, but this does not entail that we consciously see the design as a design (see Nanay 2011, p. 464). Thus, the scenario described by SA1 is not necessary in order to enter pictorial experience (Id.; Lopes, 2005). Those who endorse SA2 also specify that, in picture perception, we consciously see the depicted object while unconsciously seeing the surface (for a review see Nanay, 2010, 2011, 2017). That said, while someone suggested that SA1 is a condition not needed to enter pictorial experience, but can be realized in special cases (Ibid.), someone else suggested that the scenario described by SA1 is not possible. Here is the reason. If both the surface and the depicted object were simultaneously part of our visual phenomenological experience, pictorial experience would lead us to a very odd perceptual situation (Hopkins, 2012; Nanay, 2017): since the pictorial space and the real space have a different nature, we would enter a disjointed visual experience concerning the different spatial qualities of the surface and of the depicted object. For these reasons, "if we are simultaneously attending to both the depicted scene and the picture's surface, then there seems to be something contradictory or disjoint about our simultaneous experience of both of these. But, crucially, this objection does not apply if pictorial twofoldness[2] is understood not as simultaneous attention, but as simultaneous (conscious or unconscious) representations" (Nanay, 2015, 192). I want to bypass here the debate about whether, in normal picture perception, we do not consciously *need*

1 I use the notions of 'conscious vision' and 'conscious visual attention' interchangeably. I do not take part on the debate on their relation (Wu, 2014; Prinz, 2012) when talking about picture perception. This move is not controversial (see Nanay, 2011, 2017).

2 In his (2015) Nanay uses the notions of 'seeing-in' and 'twofoldness' interchangeably, while in his (2011) he distinguishes between them. Here I use them interchangeably. However, while 'seeing-in' might usually denote SA2, 'twofoldness' might usually denote SA1.

to visually represent both the surface and the depiction simultaneously or, rather, we *can't consciously* visually represent both of them simultaneously. I simply follow SA2 in saying that, in ordinary picture perception, we consciously see the depicted object while unconsciously seeing the surface.[3]

All I am saying seems to suggest that SA2 is the best candidate for the notion of seeing-in: during seeing-in, we visually represent both the depicted object and the picture's surface. The *simultaneity* defended by SA2 is about the presence of two (conscious or unconscious) visual states respectively attuned to the picture's surface and to the depicted object. Thus, endorsing this notion of simultaneity does not entail endorsing the idea that we consciously see both of them, as suggested by SA1: we *need to simultaneously* see both of them (SA2), but we do *not need to simultaneously consciously* see (or visually attend to) both of them (as suggested by SA1). This notion perfectly explains how endorsing SA2 rules out the *necessity* of reaching the perceptual scenario described by SA1 in order to enter picture perception – though we can remain open about whether SA1 is possible or not. In this respect, as explained, the idea maintained here is that we simultaneously consciously see the depicted object, while unconsciously seeing the surface (Nanay, 2011, 2017; Ferretti, 2017b).

Summing up, here SA is interpreted by following the notion of seeing-in offered by SA2. This notion is, as we saw, nowise related to the notion of seeing-in *à la* SA1.

We can now focus on NA. Differently from SA, NA suggests that we cannot 'see' (visually represent) both the picture's surface and the depicted object at the same time (i.e. simultaneously). Crucially, the reader may note that, as for SA, even for NA there are two possible interpretations (though the literature mainly analyzed SA and its possible interpretations, see Nanay, 2017; Lopes, 2005; Chasid, 2014):

- NA1) We do not simultaneously 'consciously see' (or consciously visually attend to) both the depicted object and (to) some of the properties of the surface.

- NA2) We do not simultaneously 'see'[4] (or visually represent) both the depicted object and some of the properties of the surface.

SA1 is in evident contrast with NA1, while SA2 is in evident contrast with NA2. The disagreement between NA2 and SA2 is about the notion of simultaneous visual representation of both the depicted object and the picture's surface. The disagreement between NA1 and SA1 is about the notion of simultaneous conscious vision (and conscious attention) (see Nanay, 2011, 2017 for this relation). In other words, for SA2 at the same time t, we can see both the picture's surface and the depicted object. For NA2, either at time t1 we see the picture's surface and at time t2 we see the depicted object, or *viceversa*, but we never see both of them simultaneously, i.e. within the same time interval. Conversely, for SA1 at the same time t we can *consciously* see both the picture's surface and the depicted object. For NA1, either at time t1 we *consciously* see the picture's surface and at time t2 we *consciously* see the depicted object, or *viceversa*, but we never *consciously* see both of them simultaneously, i.e. within the same time interval. Note that NA2 suggests that neither SA1 nor SA2 are the case (see the passage by Gombrich in (§ 1)): neither can we consciously see, simultaneously, both the surface and the depiction, nor can we see, simultaneously, (consciously or unconsciously) both of them. SA2 and NA1 are perfectly compatible: NA1 follows the idea, also endorsed by some of those

3 Note that even Nanay, who initially suggested the possibility of consciously perceiving both the surface and the depiction (2010, 2011), has recently followed the argument by Hopkins (2012) against the possibility of reaching this perceptual scenario in usual picture perception. However, this possibility is maintained by Nanay (2017) in relation to the aesthetic appreciation of pictures. I do not focus on this aspect of picture perception here.

4 Here 'seeing' might be conscious or unconscious, in line with SA2.

who defend SA2, that SA1 is not possible: we can't simultaneously consciously see both the surface and the depiction. Thus, for SA1, we can only alternate our visual consciousness between them.
It has been suggested that this paper follows SA2. Thus, it rejects the idea that SA1 is necessary for seeing-in – remember that here I bypass the debate about whether SA1 can be realized. Note also that NA2 is the notion usually mentioned when talking about NA – cfr. with the quote by Gombrich reported at the beginning of the paper in order to mainly characterize NA.[5] As Nanay (2017) suggests, there are two main views in picture perception: one according to which "we see both the picture's surface and the depicted object but we alternate between seeing the surface and seeing the depicted object" (Sect. 1) and another one according to which "we see both the picture's surface and the depicted object and we see them simultaneously" (Ibid.). The first option "is normally attributed (rightly or wrongly) to Ernst Gombrich.[6] His account of picture perception is that we 'see' both the surface and the depicted object, but we never 'see' the two at the same time. We oscillate between seeing the canvas and seeing the depicted scene" (Ibid.). This is the notion described by NA2. The second option is "the most widely discussed way of thinking about picture perception" (Ibid.) and is often attributed to Wollheim. According to this second option "when we see something in a picture we have a twofold perceptual state: we see the surface and the depicted object simultaneously" (Ibid.). This is the notion described by SA2.
So, when focusing on the dichotomy between SA and NA, this paper refers to the specific dichotomy between NA2 and SA2. The next section reports the argument, based on empirical evidence from vision science, in favor of SA2 and against NA2. In order to defend SA2, I need to show that we always 'see' (visually represent, consciously or unconsciously) both the picture's surface and the depicted object.

3. Vision and SA

This paper defends SA2, namely, the view that, during picture perception, we *do* 'see' – or visually represent – *simultaneously* both the picture's surface and the depicted object: our visual brain simultaneously builds a visual representation of the picture's surface and a visual representation of the depicted object. Furthermore, the former representation is usually unconscious, whereas the latter is usually conscious (§ 2). In order to defend SA2, it is sufficient to effectively show that we (the different activities of our visual system) do indeed build these two visual representations during picture perception or, in other words, that we *see* both the picture's surface and the depicted object – though the representation of the picture's surface does not need to be conscious.
It has been clearly shown, by vision science, that when we do not visually represent both the depicted object and the surface, but only the depicted object, without (the possibility of) visually representing the picture's surface, the depicted object is able to foster in us the *visual feeling of presence* (Vishwanath, 2014; see also Ferretti, 2016b, 2017b); that is, it looks like a real, present object we can interact with, as in the case of the famous *trompe l'oeil* pictures; see below. Conversely, when we do not represent the depicted object as present, we are visually representing the surface. In this respect, we also know that normal pictures do not, in *normal conditions,* foster in us the visual feeling of presence: what we see is a depicted object, not a normal, present object (Ferretti, 2016b). Therefore, if when we do not see the picture's surface the depicted object looks real and present, if, when the depicted object does not look real and present, that means that we see the surface, and if in *normal conditions*, the depicted object is

5 For a more complex analysis of Gombrich's position see (Hopkins, 2012; Briscoe, forthcoming).
6 See footnote 5.

seen as such, and not as a normal, present object we can interact with, then, in normal/usual picture perception, we *always see* also the surface.
Now, saying that, in *normal conditions*, the depicted object is seen as such, and not as a normal, present object is an uncontroversial visual phenomenological evidence concerning ordinary picture perception (Nanay, 2017; Lopes, 2005; Matthen, 2005; Voltolini, 2013; Ferretti, 2016a, 2016b, 2017a, 2017b; someone suggested that the depicted object is *present as absent*, Noë, 2012). If so, in order to defend SA2, I just need to show that when we do not see the picture's surface, the depicted object looks real and present and that, thus, when the depicted object does not look present, we are seeing the surface.
Experimental results seem to support this point. When a depicted scene is viewed with one eye (i.e., monocularly) through an oval aperture that occludes the rectangular boundary/frame of the image, the depicted object is indeed visually perceived as a present object we can interact with (Vishwanath and Hibbard, 2013, p. 1674; Vishwanath, 2014, p. 153). This evidence is also supported from both the *psychophysical* and the *phenomenological* point of view (Vishwanath, 2014, pp. 174, 224, 225; Vishwanath and Hibbard, 2010, 2013; Ferretti, 2016b, 2.4; forthcoming). Therefore, when the surface is not visible, even depicted objects can look present to the observer (Vishwanath, 2014; Ferretti, 2016c, 2017b):

> When a picture is viewed normally with both eyes, the picture's surface is visible because of cues such as binocular disparity and the visible frame of the picture (...). Distance cues such as binocular convergence, vertical disparity, and the accommodative state of the lens specify the distance of this visible picture surface (...) rather than the pictorial contents (...). There are no known optical cues that specify the distance of pictorial objects from the observer. Therefore, under binocular viewing of pictures, although 3-D object shapes can be clearly perceived, their scale and absolute depth should remain optically unspecified. Monocular aperture viewing removes the main cues that specify the presence of the picture surface (binocular disparity and the visible frame), as well as binocular cues specifying its distance (convergence and vertical disparity). However, subsidiary distance cues, such as the accommodation state of the lens, are still present. In the absence of visible picture surfaces, it is plausible that the brain attributes the accommodation response to the pictorial objects, and assigns any associated distance information to them, allowing absolute depth values[7] to be derived (...) (Vishwanath and Hibbard, 2013, pp. 1682-1683).

This evidence suggests that we do not visually represent, during picture perception, the depicted object as present, because the visibility of the surface avoids the possibility of reaching this feeling: our visual representation of the picture's vehicle/surface as present hinders (the possibility of visually representing) the visual feeling of presence of the depicted object (Vishwanath, 2014, p. 164; Ferretti, 2016c, 2.2, 2017b, forthcoming). Conversely, when there is no visual representation of the surface, the depicted object looks present. Thus, this evidence also suggests that, when we visually represent the surface, the depicted object cannot be perceived as present and, thus, that when it is perceived as present, we are not visually representing the surface.
Therefore, since in everyday life, during picture perception, we can always visually represent the picture's surface, we do not visually represent the depicted object as present. All this

7 Egocentric absolute depth concerns the fact that the "observer has knowledge of the depth relations scaled in some meaningful way to her/his actions" (Vishwanath 2011: 222, 206).

suggests that the temporal relation between the perception of the surface/vehicle and the perception of the depicted object is crucial for ordinary (that is, non-illusory) picture perception (see below). These two perceptual states must occur simultaneously.
However, there are situations in which we deal with a picture, but we are fooled that the depicted object is a real, present one. Following the evidence above reported, it seems that, in these situations, we cannot visually represent the picture's surface. An example is *trompe l'oeil seeing-in*, in which the painting is skillfully realized in such a way that (even in binocular conditions and without oval apertures to see through) the visual system of the observer cannot properly detect (or 'find') the picture's surface and is, thus, fooled by the illusory presence of very enhanced visual depth cues related to the depicted object. In this case, even if for a moment, we cannot rely on any visual representation of the surface. Thus, the depicted object perfectly looks as a present one we can interact with (Ferretti 2016b, 2017b, forthcoming; Nanay, 2015).
Here is an important point suggesting that we do not represent (consciously or unconsciously) the surface when perceiving trompe l'oeil. In the literature it is claimed that, during picture perception, we simultaneously unconsciously see the surface while consciously seeing the depicted object. Empirical evidence from vision science suggests that if we do not represent the surface, we enter into the illusion that what is a pictorial object looks like a real and present object we can interact with and that, thus, when we do not enter such an illusion, we are seeing the surface. But it also suggests that when we see the surface, we are not visually fooled that the depicted object is present and, thus, that when we are fooled that the depicted object is present, we do not see the surface. If so, while the representation of the surface is unconscious during normal picture perception, in the perception of trompe l'oeil we cannot rely on any visual representation of the surface. If also in trompe l'oeil perception we were having an unconscious representation of the surface, we could not distinguish between normal and trompe l'oeil picture perception: both, indeed, would involve an unconscious representation of the surface and a conscious representation of the depiction. Also, this would go against the literature on vision science that suggests that representing the surface allows avoiding the impression of presence of the depiction. This evidence suggests that if we are representing the surface (even if unconsciously), we can't have a feeling of presence of the depicted object. Only when we cannot rely on such a visual representation we can enter such a feeling (for a complete analysis of this argument concerning the perception of *trompe l'oeil* see Ferretti 2016b, 2017c, forthcoming).
Here is another important point. Though I bypass the debate about the possibility of reaching the scenario described by SA1, here I endorse that we can consciously perceive the surface once we do not consciously perceive the depicted object anymore (at this point, we might perceive the depicted object, of course, unconsciously) – this indeed does not constitute a problem for my point. In this respect, note that with *trompe l'oeil* pictures we cannot even shift our conscious vision (or, one may say, our conscious visual attention) to the surface because we have no visual representation (either conscious or unconscious) of it. Having this visual representation, even unconscious, of the surface is what allows us, with normal pictures, to remain consciously visually interested and focused on the depicted object, without experiencing any visual feeling of presence of it, *but* with the possibility of shifting our conscious vision (or, one may say, our conscious visual attention) even to the surface – and, as explained, at this point the depicted object is not consciously perceived anymore. All this further suggests that the visual representation of the surface needed in order not to be fooled that the depicted object is present is of an unconscious nature.
Summing up, first, according to the literature, we consciously see only the depicted object and we visually ignore, from the point of view of conscious visual experience and attention,

the surface, as suggested by those who defend SA2 – this holds independently of whether SA1 can be realized or not (§1). Second, we need to build a visual representation of the surface, or we fall into the visual feeling of presence of the depicted object. These two perceptual facts are explained only by suggesting that, in picture perception, we have a conscious visual representation of the depicted object and an unconscious visual representation of the picture's surface and that the possibility of relying on this unconscious representation concerning the presence of the surface allows us to be consciously focused on the depicted object, without having any illusory impression of presence of the depicted object. However, as anticipated a few lines above, there is the additional possibility of shifting our conscious attention to the picture's surface, which is, then, consciously seen (visually represented) – while, at this point, the depicted object is not consciously seen anymore. This representational shift is perfectly compatible with SA2, independently of whether we claim that SA1 can be realized or not (§1). Indeed, following SA2 and *contra* NA2, we visually represent *(or see)* both the depicted object and the picture's surface – and, in particular, we consciously see the depicted object while unconsciously seeing the surface. But we can also alternate between our conscious visual (attentive) states related, respectively, to the surface and to the depicted object. This is neither in contrast with SA2, nor with NA1. NA1 endorses that we alternate our conscious vision, which is endorsed also by SA2.[8] To this extent, remember that SA2 and NA1 are perfectly compatible: NA1 follows the idea, also endorsed by some of those who defend SA2, that SA1 is not possible (§2): we can't simultaneously consciously see both the surface and the depiction. Thus, for SA1, we can only alternate our visual consciousness between them (§2).

To conclude, we saw that when appropriate experimental settings make the picture's surface invisible, the depicted object looks present. This can also happen with trompe l'oeil perception. Therefore, if in usual pictorial experience the depicted object does not look present when we consciously see it, then, we are also seeing (or visually representing) the surface (as present) unconsciously (Ferretti 2016b, 2017b, forthcoming). This is in line with the notion of simultaneity defended in the literature (§2). This is clearly sufficient in order to defend SA2. Thus, *contra* NA2, the best philosophical theory of seeing-in is SA2: during everyday (non *trompe l'oeil*) picture perception, we consciously visually represent the depicted object and we cannot avoid visually unconsciously representing the presence of a surface. This is the crucial *visual* condition in order to correctly enter ordinary (i.e. non-*trompe l'oeil*) picture perception.

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TWOFOLD PICTORIAL EXPERIENCE, PROPOSITIONAL IMAGINING AND RECOGNITIONAL CONCEPTS: A CRITIQUE OF WALTON'S VISUAL MAKE-BELIEVE

abstract

Kendall Walton has defined pictorial experience as a visual game of make-believe, which consists in imagining our actual seeing the representational prop to be a fictional face to face seeing the represented subject. To maintain a twofold awareness of these two visual aspects while avoiding a phenomenal clash between them, Walton needs to characterise visual make-believe as involving a propositional imagining. Unfortunately, the strategy does not seem to be successful. Whether propositional imagination is taken as a simple descriptive report or as conceptually penetrating our perception, Walton's account is not able to secure the visual and the twofold character of pictorial recognition.

keywords

Walton, depiction, make-believe, twofoldness, image recognition

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Among the various attempts to define which kind of experience corresponds to pictorial representations, a very important contribution has been offered by Kendall Walton with his notion of "visual game of make believe" (Walton, 1973; 1990; 1992; 2008). Differently from the other theories on that issue, Walton has argued that imagination plays a central role in recognising the depicted subject. In his view, seeing a picture is a matter of *fictionally seeing*, that is, of imagining that seeing the material prop of the image is seeing the corresponding fictional subject. More concretely, following one among Walton's examples (1990, p. 215), the spectator imagines his actual experience of admiring the painted canvas of Van Der Velde's *The Shore at Scheveningen* to be another experience, namely the one of facing the depicted nautical scene itself.

This theory aims to preserve and better explain some important intuitions about how pictorial recognition works. In particular, Walton claims that it should clarify how perceivers are able to reconcile their *twofold* visual awareness of the image material *medium* and the image subject itself into the unitary experience of *seeing a picture of* that subject. The heart of his proposal is exactly that the two sides are held together by means of an imaginative switch, converting the perception of the mere prop into a fictional experience of the depicted scene.

In this paper I will examine this strategy, to finally argue that it fails to maintain its explanatory *desiderata*. The reason, as I will show, is that a composite perceptual experience intermingled with imagination is not able to preserve both the *visual* and the *twofold* character of image experience. I will start with Section 1 by clarifying how Walton's visual make-believe bids to accommodate the idea of pictorial twofoldness in terms of imagining the visual experience itself of the prop to be a visual experience of the subject. In the light of some objections advanced by Richard Wollheim, I will claim that Walton's project is better served by a notion of propositional imagination rather than by a notion of visual imagination, or visualisation. In Section 2 I will examine the suggestion that propositional imagination provides visual make-believe with a report concerning the subject to be recognised in the picture. My objection is that image recognition seems here deprived of visual character: its content is not treated as offered by our visual experience, directed simply at the prop *qua* prop, but only by our propositional imagination. In Section 3 I will explore an alternative reading of visual make-believe as a case of cognitive penetration on vision. Just as it happens with recognitional concepts acquired through perceptual learning tasks, the content of our propositional imagining the subject can directly alter the content of our seeing the prop. However, I will argue that this proposal is of no help for Walton. Imaginative penetration is

not suited to capture pictorial twofoldness: the dual experience of the picture surface and the picture subject cannot be equated with the shift from a not penetrated to a conceptually penetrated perception. As I will finally point out in Section 4, these difficulties undermine Walton's account of depictive experience.

1. Twofoldness and visual make-believe

The most detailed account of the dual character of pictorial experience has been given by the philosopher Richard Wollheim, who coined the term *twofoldness* (Wollheim, 1980; 1987; 1998). Twofoldness is the main feature of the distinctive experience directed at pictorial representations. According to the author, it consists in simultaneously noticing the arrangement of the material properties belonging to the two-dimensional picture surface (like the brushstrokes or the thickness of the canvas) and the properties of the three-dimensional appearing scene itself. These two attitudes are treated by Wollheim as two *aspects* of the same perceptual experience, defined as a *seeing-in* experience: the *configurational aspect*, focused on the medium, and the *recognitional aspect*, concerning the depicted subject. It is important to underline here that these aspects are not just accidentally retained together in the spectator's awareness, but they are rather integrated in a single but still complex whole state. Twofold seeing-in is both a composite and an unitary experience, so that being aware of one of its constituents does not prevent the awareness of the other.

Although many philosophers have questioned Wollheim's proposal to define depiction as the experience of seeing-in, his intuition about twofoldness has been more widely accepted. For his part, Walton appeals to the issue in a quite distinctive way. Not only, in fact, he acknowledges the relevance of the twofold structure of pictorial experience;[1] he also claims that his theory has the resources to explain it even more clearly than Wollheim's account, often taken to not go in deeply enough on this point. Thus, Walton conceives the experience of visual make-believe as a tight nexus between the mere perception of the prop and the imaginary grasping of the subject: the latter is sustained by the former, while the former is in turn re-shaped by being "colored" by the latter (Walton, 1992, p. 138).

Walton explicitly warns about a misguided interpretation of this dual structure of visual make-believe, according to which seeing and imagining would simply alternate themselves as two different co-occurring experiences. As he argues, this misunderstanding actually results in some objections raised by Wollheim himself to the visual make-believe hypothesis. According to Wollheim's reconstruction (1991, pp. 404-405), our perception of the material prop just prompts us to visually imagine, namely to visualise, the fictional world represented. However, in that case, there could well be no connection between the perceptual and the imaginary sides of visual make-believe, so that the two states would just accidentally happen to be entertained together. Such an account would thus fail to capture the difference between actually recognising the beach depicted by *The Shore at Scheveningen* and, as an example, visualising, while seeing the picture, a beach visited in Italy many years before. Walton's reply points out that a visual game of make-believe consists in imagining the *experience* of seeing the pictorial prop to be *another experience*, namely the one of seeing the full-blown scene. The fictional shift provided by visual make believe, he explains, does not just concern the objects, but the "intentional contents" itself of the two visual experiences (Walton, 2002, p. 32). Walton does not really develop the terminological distinction between "objects" and "contents" of experience which he is relying on; nevertheless, talking about contents is undoubtedly a way of putting more stress on the structure of the experiential states constituting visual

1 «Twofoldness is important. I'm sure that it has a lot to do with the interest that visual representation has for us» (Walton, 1992, p. 135).

make-believe. The expression "intentional contents" seems here to refer broadly to how an experience provides access to and characterises its object:[2] in other terms, to the phenomenal features of that experience (the sense modality employed, the kind of properties attributed, the aspectual features manifested, and so on). Such remarks clarify what Walton means by claiming that the two sides of visual make-believe are connected the one to the other in a single complex experience: *our imagining is about our act of seeing itself*. This is the crucial difference between imagining that seeing the canvas is facing the shore of Scheveningen and simply imagining that the canvas itself is the shore. What serves as prop in the game of make-believe is not just the material object seen, but the overall visual perception of it.
Nonetheless, there still lies a challenge for Walton to suitably characterise the nature of the imaginative act involved in the experience of fictionally seeing. What Wollheim's objection actually points out is the problem of integrating the experiences of seeing something and *visualising* it as something else into one and the same twofold experience. In fact, in a visual game of make-believe our imagination is supposed to alter the value of our perception of the actual prop, allowing us to get in touch with the depicted scene. However, following this line, it seems hard to retain in a unitary experience both the contents of seeing the prop and visualising the fictional subject, since they attribute two conflicting visual appearances to the same object (Wollheim, 1998 pp. 224-225; see also Nanay, 2004, pp. 287-288). The problem here is with visualisation as a *perceptual* form of imagining. Staring at the pictorial surface counts as if it were an imaginary look on the flesh-and-blood subject, but this means nothing more than replacing our visual awareness of the former with a visual awareness of the latter.
Walton has a double counter-objection to this criticism. First, the problem outlined threatens no less Wollheim's concept of seeing-in, which takes the contents of two incompatible visual perceptions to be integrated as two aspects of a single experience (Walton, 2002, p. 33). Second, the visual make-believe theory can still be amended so as to escape the trouble, because it is in no way committed to explain pictorial experience by appealing to some *visual* form of imagination (Walton, 1991, p. 404). However, this strategy simply begs another question for Walton: if any appeal to visualising is off-limits, which kind of imagination appropriately defines a visual game of make-believe?

2. Propositional imagining and image recognition

The only move still available to Walton is to understand visual make-believe as a matter of *propositional imagining*. Such a possibility is not actually explored by the author himself, so he gives almost no clues about how his theory can benefit from this suggestion: nevertheless, it seems worth going deeper into the matter. For one thing, differently from visualising, propositional imagination seems more similar to a verbal narration or a description than to a quasi-perception. For example, imagining propositionally the shore at Scheveningen is not like conjuring up its visual appearance as if we were seeing it with our own eyes, but rather like reporting how it might look like.[3] Along this line, the imaginary contents of visual make-believe should not have a perceptual-like nature, but a conceptual and belief-like one. The strategy could seem odd at first glance, but it is not inconsistent in principle: the trick is all about explaining how this form of imagining integrates with visual perceiving in the whole twofold pictorial seeing.
It could be thought, for instance, that propositional imagination just makes our seeing the material image *count* as facing the represented subject. The actual experience would be taken to be the fictional one by *imagining that* it is a different experience. In that case, entertaining

2 As Bence Nanay (2004, p. 286) proposes to understand, too.
3 For a more detailed account of the features of propositional imagination, see Currie and Ravescroft (2002).

the contents of perception and the contents of propositional imagining in one single twofold experience seems less difficult to conceive: it is just to imagine that our seeing the prop is seeing the depicted subject. It is not required here to reconcile two conflicting perceptual-like contents (seeing the prop and imagining seeing the pictorial subject), but rather a perceptual content (seeing the prop) with a propositional content (imagining, about that seeing, that it is seeing the pictorial subject). On the one hand, what we imagine about the fictional world would be visually "fleshed out" by seeing the configuration of the depicted canvas; on the other hand, our experience of the material prop is reconsidered in accordance with the propositional content of imagination. Such an interaction appears to match with what can be called the "twofold claim": the perceptual and the imaginary aspects of the whole experience play distinct roles but they are also deeply interconnected the one with the other.
Nonetheless, this proposal needs also to accommodate our intuitions about the genuinely visual character of pictorial images. Unfortunately, the appeal to propositional imagining risks to misreport our most basilar intuitions about the experience of recognising depictions. It seems uncontroversial that we recognise the scene depicted by a picture *by seeing it*: a "visual representation" makes its subject available precisely exhibiting its appearance. This captures an obvious difference between pictures and words: the latter ones do not surely enable us to get a view on the objects they refer to. A satisfactory theory of depiction, even when calling propositional imagination into play, has to preserve this evidence.
It might be supposed that the visual character of the whole pictorial make-believe experience is basically granted by our perception of the pictorial prop. The recognition of the represented subject should consist in turning our actual seeing the prop, which is undoubtedly a visual kind of experience, into our fictional seeing the depicted scene. The conversion is still operated by our propositional imagining, but the resulting twofold experience borrows its visual phenomenology from our seeing the prop. Yet, this hypothesis is precisely meant to make clear how the *recognition* of the image is obtained by engaging in a visual game of make-believe. The strategy seems to imply that the content of our visual recognition of the pictorial subject is not essentially granted by our visual perception, which targets the material prop *as the material prop*, but rather by the propositional imagining, which re-interprets that perception as our seeing the depicted scene. However, this account does not fit with our shared intuition about the visual character of pictorial recognition. The subject recognised in a picture is *visually* specified by our experience, not just *propositionally*. It is highly implausible to spell image experience out as the relation between an imaginary propositional content, corresponding to the recognition of the depicted subject, and a visual perception of the physical prop; this strategy appears to distort the phenomenon to explain. *Recognising* the pictorial subject, by an appeal to our propositional imagination, is here outlined as a prior condition, independently assessable, to be able to *see* that subject depicted by the image. Put otherwise, it is as if it were required to recognise the represented scene in order to visually perceive it, rather than the opposite.
The troubling question for this reading of visual make-believe is how propositional imagination gets its content, informing us about the pictorial subject to be recognized. This problem is brought to light more clearly by considering Walton's general definition of what a game of make-believe is. According to him, in this kind of activities imagination is not running totally unconstrained, but it has to be governed by some *principles of generation* (Walton, 1990) prescribed by the prop itself. Those principles state what is part of the content of the fictional work (to use Walton's expression, part of the "world of the work"). Relating this idea to depictive representations, one might wonder how the relevant principles of generation, specifying the content of propositional imaging (and thus of recognising the pictorial subject), can be identified in visual make-believe contexts. Apparently, they would not seem derived by

our *seeing the prop*, given that this state is meant to be only about the concrete pictorial surface and not about the scene represented. However, if we concede that propositional imagination is not sustained by our experience of the prop, Walton's idea of visual game of make-believe turns out to be in conflict with his same fundamental definition of game of make-believe. Those considerations about the principles of generation also show how visual make-believe, conceived as a matter of propositional imagining, fails to capture the distinctiveness of pictorial experience. According to such an interpretation, in fact, the content of visually perceiving the material prop, taken at face value, is not informative about the content of the imaginary experience of the subject, thus the former state is not related in any intrinsic way to the latter. Surely, as Robert Hopkins (1998, p. 21) points out, this claim is too loose to rule out many different practices of a clear non-pictorial kind: for example, it would also be appropriate to describe an activity like considering a verbal description of a scene (perhaps by following some instructions or by reading a book), then looking at a not depictive surface (like a white wall), and imagining that our seeing it is our facing what has been described. In this case, no depictive representation is obviously involved, neither the experience is in itself twofold, because the perceptual and the imaginary states are just accidentally tied together; no features of our seeing a not depictive surface play an essential role in making us imagining that we are seeing a fictional scene.

3. Recognitional concepts and twofold experiences

At this point, one might worry that the arguments proposed so far do not give a fair sketch of the interaction between imagination and perception in visual make-believe, because they basically rely on a not fair sketch of the interaction between complex cognitive states and perception in visual recognition. Embedded in a game of visual make-believe, propositional imagination enables us to grasp complex meaningful scenes on a suitably marked surface; in other words, it helps turning our perception of some indeterminate material configuration into the recognition of the pictorial subject. The question is then how new perceptual determinations can be brought about by a propositional kind of imagining. The natural suggestion would be that the concepts involved by the propositional imaginary content of make-believe can to some extent affect our perceptual recognition of the depicted subject. Those concepts could be considered as *recognitional concepts*, that is, in a broad sense,[4] concepts specifying which features of a scene can be visually recognised when we look at it.[5] Possessing such concepts would allow us to be visually sensitive to certain high-level properties of objects, like quite abstract or complex kind-properties (for example, the property of "being a wardrobe"): put otherwise, we would be able to *see* those objects *as* objects of a particular kind (for example, to see an object as a wardrobe). Therefore, for what concerns pictorial experience, it seems plausible to think that, in a similar vein, the conceptual content of some cognitive states can determine what we recognise to be the subject of a picture.
This idea is not without some appeal; Wollheim himself appears in many passages to endorse it (1987, p. 66; 1998, p. 223; 2003, pp. 11-13), by allowing that a picture can either depict an individual (like Monet's wife) or a subject merely of some general kind (like *a* woman not individually specified). Since all that is depicted by the picture coincides for Wollheim with what can be seen in it, it should be possible to distinguish by sight between depictions of

4 Using the label "recognitional concepts" does not purport here to discuss the stronger claim that recognitional concepts are *only* those concept which *must* include in their possession conditions the ability of perceptually recognise something as an instance of that concept (see for example Fodor, 1998). "Recognitional concepts" is taken here, in a more open spirit, as any concept playing a substantial role in the visual recognition of objects as falling under it.
5 A similar idea about the role of recognitionally-based concepts in pictorial recognition is defended in Roelofs (2001).

particulars and depictions of non-particulars. Put differently, what artists have to do when producing a *depictive* representation is to make their representational intentions (like the intention of representing a particular woman rather than a woman in general) clearly visible in it, but this presupposes that the spectator's experience has to be sufficiently informed to visually pick out those intentions. Therefore, Wollheim concludes, concepts referring to individuals and to kinds must permeate and influence pictorial seeing, if we need to account for a perceptual difference in recognising pictures of particular and generic subjects.

To support this line it could also be noticed that, on a general level, the case for the impenetrability of perception to thought is far from being settled in an uncontroversial way. Without any expectation to exhaust such a debated topic, it will be enough here to point out that, when it comes to analyse our ordinary visual experiences, a divide between non-conceptual seeing and conceptually fine-grained recognition does not seem to be drawn in a sharp way. It is not clear at all what could be for us to perceive first exclusively elementary properties like shapes, hues or contours as such, and then, separately, to come up with a classification of an object according to some concept; the two aspects tend rather to integrate each other. Consider as an example, an instance of visually recognising a wardrobe by perceiving properties like "being a dark region of space", "being a brown big mass", "being a brown big parallelepiped", "being a wooden wardrobe", "being a wooden empire-waist wardrobe": can a general criterion be deployed here to determine precisely at which stage basic perception gives way to informed recognition? According to this "conceptual Sorite test", acquiring conceptual determinacy appears as a matter of grades, rather than a clear-cut switch from low-level to high-level visual awareness. Such an intuition seems exactly to comply with the worries of those sceptical about the idea of an "innocent eye",[6] completely free from theoretical influences.

What all these considerations suggest is thus to understand Walton's notion of visual make-believe in the light of a distinctive kind of interaction between a complex cognitive state and a perceptual state. More specifically, pictorial recognition would result from a case of *cognitive penetration*, insofar as our visual perception of the material prop is affected by our propositional imagination. This interpretive proposal has been indeed put forward by many authors, like Fabian Dorsch (2016) and Alon Chasid (2016). Chasid's reconstruction in particular relies on a general claim about the influence of *recognitional beliefs* on our visual experience of high-order properties, as it is most notably provided by Susanna Siegel (2006; 2012, ch. 4). According to Siegel's hypothesis, learning to recognise complex kinds of objects, by association of a perceptual configuration to some kind of instruction (expressed by a proposition like, in Siegel's example, "this is a pine tree"), determines a substantial change in the content and the phenomenal character of our perception. The visual experience occurring after having acquired such recognitional belief is not just phenomenally different from the one which was not yet cognitively penetrated; it also comes to represent some high-level properties (like "being a pine tree") formerly not included in its perceptual content.

Since propositional imagination is similar to recognitional belief in referring to its objects in a conceptual way, the notion of cognitive penetration can be extended to explain the interaction of seeing and imagining in visual make-believe. The early perception of the material pictorial surface can be considered to be conceptually unspecified to a certain degree, at least to the extent that our seeing does not yet convey information about the depicted scene. The intervention of propositional imagining modifies this experience, whose content is enriched so as to make visible the properties of the pictorial subject.

6 As Walton (1990, p. 294) admittedly considers himself.

It is easy to see how such a reading in terms of imaginative penetration enables Walton's theory to overcome the difficulty to account for the visual character of image recognition. The integration of perception and imagination in this whole experience is tighter than it might be in a mere imaginary interpretation of a given sensory state.[7] As a cognitively penetrated state, visual recognition is not only an assessment on what is seen in the light of some separate thoughts, but it is a perceptual achievement in its own right. The content of visual experience is extended by cognitive penetration; our imagining brings about a change in the perceived properties, so that the features of the depicted scene become genuinely seen. Therefore, it is not just propositional imagination which does all the work required by image recognition: the subject is still presented in our experience in a strong visual way.

Note however, that the propositional imagining involved in a visual game of make-believe has a more complex content than the recognitional belief which classical examples of cognitive penetration rely on. In the latter cases, certain thoughts about a particular *object* put us in the position of perceptually detecting it and its characteristic features, resulting in a suitably modified experience. On the contrary for Walton an imaginative state about an overall *experience*, namely seeing an object, determines the actual experience of another object (the pictorial prop) to change accordingly. The contrast between the two statements is not merely a matter of lexical choices. First of all, Walton's account needs to set out unambiguously the idea that experiencing a picture does not allow to attribute to the surface itself the properties of the represented subject. Moreover, the notion of visual make-believe relates two experiences, rather than two objects, to stress the non-accidental nature of pictorial recognition. To clarify the point, consider this case based on a standard example of cognitive penetration: Jill's belief that her friend Jack is angry makes her seeing his face as expressing anger. Jill's resulting experience of Jack's facial expression does not bear any important relation to Jill's ordinary experience of Jack as not angry. It is just her idiosyncratic belief, which is simply about Jack rather than about an experience of him, to drive her to perceive the friend as angry. Were Jill convinced, for some reason or other, that Jack was happy or amused, she would perceive traces of happiness or amusement on his face. On the other hand, recognising the subject of a depictive representation is a radically different kind of experience from Jill's example. The content of visually perceiving the depicted subject is dependent in a relevant way from the one of perceiving the pictorial surface: as Alberto Voltolini rightly points out, "the fact that we see a certain scene as being present before us [...] is *justified* by our perception of a suitably enriched vehicle" (2015, p.149). Recalling Walton's own terms, the experience of the prop provides us with the principles of generation influencing, by means of imagination, our recognition of the represented item.

In the light of these requirements, an attempt to develop pictorial make-believe as an instance of imaginatively penetrated recognition seems hard to carry on. According to Walton's statements, the content of our perceiving the pictorial surface should be modified by our imagination about an experience of seeing the depicted subject. However, it is not entirely clear what could mean for a perceptual experience to come to represent in its content the properties of another experience, rather than simply of an object. Of course, "having a certain content" could be maintained as a property of a perceptual state. Nevertheless, the content of a visual experience represents basically the properties of a visual object. Therefore, representing the content of an experience in the content of another experience should amount to nothing else than representing the object of the former in the content of the latter.

7 See also Voltolini for the claim that recognising the pictorial subject is not «a mere interpretative byproduct of an already perceptual state» (2015, p. 155).

Such a result appears to neglect the idea that the imaginative penetration involved in visual-make believe brings about a change in the properties of the experience itself.
This problem might induce to suspect that imaginatively penetrated visual recognition does not exhaust the explanatory demands entailed by the twofold character of pictorial experience. After all, Walton's clarification about imagining the experience itself of the prop to be the experience of the fictional scene is introduced to explain twofoldness away in terms of visual make-believe. However, the core idea behind twofoldness is that two mutually incompatible kinds of perceptual properties, namely two-dimensional marks and three-dimensional shapes, are experienced as instantiated by the same object without any irreconcilable phenomenal conflict. This seems to obtain because, when the two aspects get integrated in a twofold state, they are no longer the same as when occurring separately.
On the other hand, appealing to cognitive penetrability may be a strategy to secure that a certain perceptual experience is rich enough to include in its content more determinate kind-properties other than low-level visual features. According to Siegel's account, the cognitively penetrated state differs from the original one in being enriched in its representational scope and undergoing a change in its phenomenology. Nothing in this model entails that there should be a principled tension between low-level and the high-level properties to be reconciled in a complex cognitively penetrated perception. This suggests that pictorial twofoldness cannot just be reduced to an instance of imaginative penetration; the latter consists simply in an *extended* or in a *modified* perception, while the former requires to combine two competing visual aspects in a peculiar but still tenable single experience.[8]
To illustrate the point with an example, the scene depicted by *The Shore at Scheveningen* appears with an entirely *sui generis* phenomenology compared to any face to face encounter with a similar scene. Such distinctiveness lies in the fact that one and the same twofold experience individuates two conflicting kinds of visual features, and thus it opens up the possibility to recognise its object according to two intentional characterisations: as a two-dimensional marked surface and as a three-dimensional scene. In contrast, instances of cognitively penetrated visual recognition, like Siegel's example of training to spot pine trees, do not appear as radically distinctive kind of phenomenal states, compared to cases of seeing not affected by conceptual thoughts. In fact, there is no feeling of visual clash between the high-level and the low-level properties of the resulting experience. Recognitional concepts alter the content of our perception, but they do not introduce any kind of twofold awareness of competing aspects.
Clearly, such a conclusion does not prevent in principle cognitive penetration from playing any role at all in other theories of pictorial experience. As shown before, Wollheim holds that the recognition of the depicted subject is influenced by complex cognitive states and background information.[9] However, he also maintains that our overall engagement with depictive representations has to be characterised as an irreducible perceptual state, namely seeing-in, whose distinctive mark is twofoldness. This account exploits the idea of cognitive penetration to explain how figurative recognition takes place in a twofold seeing-in; therefore, Wollheim's strategy takes this latter notion as prior in order to define pictorial seeing. On the other hand, Walton does not entirely reject the intuition of twofoldness, but he aims at reassessing it in terms of a visual game of make-believe, that is, a visual experience affected

8 Dorsch (2016) appears to endorse a similar point when he claims that «while cognitive penetration involves only one object of awareness, seeing-in involves two distinct ones (i.e. the picture and the depicted)» (p. 224).
9 Voltolini (2015, p. 157) also talks about the recognitional fold of a seeing-in experience as being cognitively penetrated for what concerns both its content and its phenomenal character.

by the concepts provided by an imaginative state. As I have tried to show, there are strong reasons to question this project. The point, as Dominic Lopes (2003 p. 221) rightly argues, is that the divide between non-conceptual and conceptual contents of experience does not match with the one between being aware of the pictorial surface and of the depicted subject. If we do not possess a relevant concept to define what we are seeing, we fail in recognising it according to that concept. This does not entail, however, that we fail to recognise a picture *as a picture* just because we do not possess the concept of what is depicted: we are simply failing to recognise its subject.

4. Conclusions

Rather than escaping Wollheim's objections about visual make-believe, Walton's appeal to propositional imagination ends up running into trouble. Taken as just a descriptive interpretation of the depicted scene, this kind of imagining fails to provide the right connection between the actual experience of the prop and the fictional experience of the subject: such an account seems unable to capture the *visual* character of pictorial recognition. It does not get much better if visual make-believe is construed as imaginatively penetrated perceptual recognition. Here, our experience of the depictive surface is influenced by the conceptual content of our propositional imagination, so that the properties of the subject become visually salient to us. However, this strategy faces problems in accommodating the twofold character of pictorial make-believe, which according to Walton lies in imagining *an experience*, and not just an object, as another one. When it comes to pictorial phenomena, our intertwined visual awareness of both the marked surface and the subject cannot be explained solely in terms of a passage from non-conceptualised to conceptualised experience. Given the relevance of our intuitions concerning the visual nature and the twofoldness of pictorial experience, the difficulty to preserve them casts serious doubts on Walton's theory of visual make-believe.

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VISUALLY-BASED KNOWINGLY ILLUSORY PRESENCE AND PICTURE DISPLAY

abstract

The aim of this paper is twofold. First, I want to show how picture perception is specifically presentational, hence specifically perceptual, by suitably reinterpreting Richard Wollheim's conception of seeing-in. Picture perception is such for it only ascribes the presence of the picture's subject in its content, but not in its mode, for the subject is visually known not to be there: thus, it amounts to a knowingly illusory perceptual experience of such a presence. Second, I want to show how this presentational specificity does not prevent the picture itself from being properly presentational of the properties that are ascribed, within its perception, to its subject: the design properties of the picture's vehicle present the perceivable properties ascribed to the picture's subject just as the sensory features of a standard perceptual experience present the perceivable properties of its object.

keywords

pictorial perception, seeing-in, presentational character, knowingly illusory presence

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1. Introduction

The aim of this paper is twofold. First, I want to show how picture perception is specifically presentational, hence specifically perceptual, by suitably reinterpreting Richard Wollheim's conception of seeing-in. Picture perception is such for it only ascribes the presence of the picture's subject in its content, but not in its mode, for the subject is visually known not to be there: thus, it amounts to a knowingly illusory perceptual experience of such a presence. Second, I want to show how this presentational specificity does not prevent the picture itself from being properly presentational of the properties that are ascribed, within its perception, to its subject: the design properties of the picture's vehicle present the perceivable properties ascribed to the picture's subject just as the sensory features of a standard perceptual experience present the perceivable properties of its object. As a consequence, the fact that the picture's vehicle displays the picture's subject allows for a derivative way for pictorial perception to be properly presentational.

2. Pictorial perception as a *sui generis* perception that is specifically presentational

In several occasions (1980[2], 1987, 1998, 2003a), Richard Wollheim has claimed that pictorial perception is a *sui generis* form of perception, *seeing-in*. For Wollheim, this means that pictorial perception is a *twofold* perceptual experience whose folds, the *configurational* and the *recognitional*, respectively grasp the picture's *vehicle* (the physical basis of the picture) and the picture's *subject* (what is seen in the picture, or in other and less technical terms, what the picture displays). Those folds are however intrinsically connected, so that they do not correspond to the respective perceptions of the vehicle and of the subject given in isolation. Unfortunately, Wollheim did not explicitly say *how* seeing-in amounts to a *perceptual* experience, even a *sui generis* one. Yet an alternative but compatible way of capturing the proprietary character of pictorial perception as seeing-in consists in reflecting on its specific way to be a *presentational* experience. According to Crane and French (2015), the phenomenal character of our standard perceptual experiences gives their objects and the properties ascribed to them as *present*, i.e., as being *out there*, in a way that is responsive of such a presentness (unlike imagination, one cannot modify at will what one perceives). This immediately means that, unlike any standard perceptual experience, seeing-in is not *properly* presentational. For in its *overall* phenomenal character, hence in its *mode*, i.e., the factor that settles what kind of state a mental state is (Crane 2001), the picture's subject and the properties that are ascribed to it in its recognitional fold are *not* given to us as present. Indeed, as many people have underlined (Matthen, 2005; Dokic, 2012; Voltolini, 2015; Ferretti 2018), *qua* pictorial perception, seeing-in involves no feeling of presence with respect to that subject.

Yet it remains a *perceptual* experience. For, unlike imagination (or thought), its subject is *present as absent* (Noë, 2012, 2015). How can one cash out this idea in detail?
Here Husserl (2006) enters the stage. For Husserl, a picture involves three layers: the picture's *carrier* – again, the physical basis of a picture – the *image-object* of the picture – again, what the picture displays[1] – and the picture's *referent*, what the picture is about (Wiesing, 2010). Basically, Husserl's first two layers respectively correspond to Wollheim's picture's vehicle and picture's subject, once one tells that subject from the picture's referent. This distinction actually does not occur in Wollheim, but it is compatible with what he says, provided that one takes what is seen in the picture as a *generic* subject that remains the same across the different referents the picture has, or may have (Voltolini, 2015). For example, in seeing *La Gioconda*, one merely sees a charming woman on the background of an Italian landscape. Yet *La Gioconda* is allegedly the portrait *of* Lisa Ghirlandini, wife of Francesco del Giocondo, as Giorgio Vasari himself testifies. Yet, without any change in what one sees in it, it might as well be the portrait *of* Caterina Sforza, or *of* Isabella of Aragon, or even a selfportrait *of* Leonardo, as some other people claim. Once things are put this way, one may say that the picture's carrier and the image-object are experientially captured by the two folds Wollheim postulates for seeing-in, the configurational and the recognitional fold respectively. It is disputable whether the third Husserlian pictorial layer, the picture's referent, involves, in the overall pictorial experience, a further perception-like fold (a move that some Husserlians – Brough, 2012; Kurg, 2014; Nanay, 2016, 2018 – endorse; for some reasons against it, see Voltolini, 2018), but I will remain here neutral about that. For what counts here is that, by appealing to the role of the image-object, the Husserlian account tries to explain how pictorial perception is specifically presentational. However, I think that such an account, in its possible variants, does not manage to provide a successful explanation of how that perception is specifically presentational. Hence, it does not explain the proprietary perceptual character of picture perception. Let me expand on this.
First, a proponent of threefoldness may endorse Wiesing's (2010) account, according to which the image-object is *artificially* present. To be sure, here "artificially" cannot be meant literally. Clearly enough, a painter intends its audience to see something in the picture, yet that intention is not successful unless one really so sees that very something (Hopkins, 1998). Yet the capacity of seeing things in other things is a natural, not an artefactual, capacity (Wollheim, 1980[2], 1987). In other words, the capacity that allows one to see a woman in *La Gioconda* is the very same capacity that allows one to see a face in a rock, which is to say, to have what Cutting and Massironi (1998) called a *fortuitous image*.[2] Yet if "artificially" is not meant literally, it is hard to see what it may mean. One might, with Eldridge (2018), retort that artificial presence amounts to a *fictional* presence in which it is *as if* something were out there. But a fictional presence is hardly perceived. At most, if it were an imagined presence (which Eldridge denies, for fictional presence is not the outcome of a mere presentifying experience of imagination), it would be quasi-perceived.
Second, a proponent of threefoldness may appeal to Aasen's (2015, 2016) idea that what is seen in a picture is a universal. To be sure, this idea sounds problematic. Independently of the general problem of how one can perceive universals, a specific problem arises as to how we can perceive *the* universal that pictorial perception allegedly mobilizes, which is *not* what the picture's vehicle instantiates. Suppose that one faces the picture of an apple. In that case, the universal that one allegedly sees in the picture is *appleness*. Yet appleness is not instantiated by

1 As Wiesing himself (2010) stresses.
2 Wiesing himself (personal communication) agrees that here "artificial" does not convey the idea of being purposively produced.

that picture's vehicle: no part of it is an apple. In the vehicle, universals of colours and shapes are instantiated, insofar as it contains, say, a red round spot. Yet even if this problem could be solved, it is unclear how seeing a universal in a picture might account for the presentational character of that experience. Whatever one's conception of universals, out-there-ness is not attributed to such a universal. If one has a Platonic conception, universals are not out there, but are *beyond* out-there-ness. If one has an Aristotelian conception, there certainly are universals that are instantiated out there but, as we have just seen, they are not the relevant universals: when we have a pictorial perception of an apple, *appleness* is not even instantiated out there. Thus, a universal cannot be present in the relevant perceptual sense.

Third, a proponent of threefoldness may appeal to Briscoe's (2016) claim that the perception of the vehicle merely *causes* not only the imagining of the image-object (a *virtual* object, as Briscoe takes it), but also a perceptual experience of it. Granted, if this were the case, one might account for the presentational character of pictorial perception. For pictorial experience would amount to a sort of hallucination-like experience, that is, a hallucination that is prompted by the perception of the picture's vehicle.[3] Definitely, hallucinations are standard perceptual experiences, to be taken on a par, *qua* such experiences, with genuine perceptions, whether veridical or not (illusions).[4] Yet one would then be implausibly forced to allow for *hallucinatory pictures*, that is, to take as *pictorial* perceptions cases in which, by looking at a thing, one hallucinates something else.[5] For example, by looking at a canvas, one may hallucinate an apple; yet it does not seem that the canvas becomes a picture of an apple, or at least acquires that figurative value, in virtue of such a hallucination. As a matter of fact, Briscoe thinks that his view does not allow for hallucinatory pictures. For, he says, "a surface *S* is a picture only if looking at it causes the experience of virtual depth and 3D structure in the right way", that is, by being "systematically guided by sources of optical information in the light reflected (or emitted) by *S* to the eye" (2016, p. 63). Yet even adding this constraint does not seem to provide a sufficient condition for something to be a picture. For – as Goodman (1968) originally suggested – a twin of a certain individual *X* may cause the experience of virtual depth and 3D structure in the right way and still it is not a picture of *X*.

Fourth, according to Nanay (2016), who is an explicit defender of threefoldness, 'aspect dawning' pictures show that the experience of an item that is intermediate between the picture's vehicle and the picture's referent, namely, what Husserl called the image-object, is perceptual. After all, consider the experiential shift that occurs when one grasps the figurative value of such a picture. In that shift, one suddenly sees a subject (say, a Dalmatian dog) in what originally seemed to be a mere blob of 2D forms and colours (say, black and white spots). Now, says Nanay, that shift is best accommodated by saying that it amounts to coming to perceive the intermediate item. For in that switch, the perceptual experience of the picture's vehicle changes (in the Dalmatian case, we come to see some illusory contours in the vehicle's surface). Yet to begin with, how can the intermediate item in question be encoded in a *perceptual* sense? Nanay's account does not explain how and why the intermediate item is perceived. For it is not the case that the perceptual change in the apprehension of the vehicle depends on the sudden perception of that item, as Nanay holds. Instead, it is the other way round (Voltolini, 2013, 2015): the fact that the perception of the vehicle suitably changes, in

3 Briscoe seems to accept this characterization of his point of view when, by following Gombrich (1972, p. 208), he says that picture perception is akin to a visual hallucination (2017).

4 This is something even a disjunctivist on perceptual experiences, i.e., someone maintaining that genuine perceptions and hallucinations belong to different fundamental kinds of mental states, may agree on. Simply, for a disjunctivist *being a perceptual experience* does not amount to a fundamental kind of mental state.

5 For this notion, see Casati (2010).

virtue of appropriately grouping the elements of such a vehicle, allows for something else, the intermediate item, to be discerned in it.[6] Moreover and more importantly for our present purposes, if the intermediate item is visually encoded as Nanay wishes, out-there-ness is even more scarcely ascribed to it. So again, the presentational character of picture perception remains unexplained.

At this point, it is better to come back to Wollheim's seeing-in account of pictorial perception, by trying to see whether it may be reinterpreted in such a way as to account for the specific presentational character of such a perception. Here comes my new proposal: the picture's subject, as given in the recognitional fold of pictorial perception *qua* seeing-in, is (for visual reasons) *knowingly illusorily present*.

To begin with, as we have already seen before, the way in which the picture's subject is present in pictorial perception cannot affect the phenomenal character, hence the *mode*, of that perception. For the subject is not felt as present. Yet it affects the *content* of pictorial perception, in particular the content of its recognitional fold. Indeed in that fold, the subject is represented as present, or, which is the same, the subject is ascribed out-there-ness.[7] Actually, the fact that out-there-ness lies in the content of an experience is a necessary condition for its being a properly presentational experience. Nevertheless, it is not a sufficient one; this is why pictorial perception is a *sui generis* form of a presentational experience, hence of a perceptual experience as well.

However, the fact that the subject's presence affects just the content of pictorial perception transpires in the mode of that perception, in particular in how the recognitional fold of that perception contributes to the determination of that mode. To begin with, the subject's presence is *illusory*, so that the recognitional fold of pictorial perception is perceptual, though nonveridical. In the content of pictorial perception, the subject is ascribed outthereness, yet clearly enough the subject is not out there.[8] Yet such a false ascription is not doxastic, or merely imaginative; rather, the subject is *seen as* being out there, although it is not such.

Yet moreover, if pictorial perception were a mere illusory perception, then the way the picture's subject is present would affect the mode of such a perception. For in a standard illusory perception, its object is given as present not only in the content, but also in the mode of that perception. Yet pictorial perception is different from a mere standard illusory perception of something. For first, in the latter case, there is just one 'kind'-attribution that is *withdrawn* in favour of another such attribution that is provided when the illusion is discovered. Consider what happens when one mistakes a rope for a snake, the paradigmatic case of what some people call a *cognitive* illusion (Fish, 2009). In such a case, once one recovers from the illusion, one's original ascription to something of a certain kind – *being a snake* – is withdrawn in favour of another such attribution to that very something – *being a rope*. Yet in the former case, the illusory ascription of a certain kind to something, i.e., the picture's subject – say, the ascription of *being a snake* to the subject of a snake picture – is preserved, along with the ascription of another kind to another something, i.e., the picture's vehicle – say, the

6 To be sure, it may be the case that such a perceptual change is prompted by a *weak* form of cognitive penetration, that is, a form that just affects the *phenomenal character* but not the *content* of a perceptual experience (Macpherson 2012, 2015): knowing that one can see *a Dalmatian* in the picture may indeed prompt a suitable perceptual reorganization of the elements of that picture's vehicle. Cf. Voltolini (2015). But this does not amount to saying that *perceiving* a Dalmatian induces one to perceive the properly grouped organization of the canvas' elements.

7 More precisely, «out there» here means *in the space that intersects the picture's vehicle* – normally, the space that starts from where the vehicle is. For the reasons why this is the case, cf. Voltolini (2017b).

8 More precisely, the subject actually has no spatiotemporal location that overlaps with that of the picture's vehicle. See the previous footnote.

ascription of *being a paper canvas*.[9] Second and more importantly for my present purposes, what explains this 'double kind' attribution is the fact that, unlike standard illusions, the illusoriness of the subject's presence is *visually known as such*: the bearer of a pictorial perception not only illusorily sees the subject as being out there, but she also visually knows that it is not there. To be sure, also socalled *optical* illusions (Fish, 2009), i.e., those illusions that are cognitively impenetrable for their percept is impermeable to beliefs, such as e.g. the Müller-Lyer illusion (Fodor, 1983), are illusions that are known as such. Yet, unlike such illusions, the illusoriness of the subject's presence is known as such for a *visual* reason, not for a modally different reason (say, a tactile experience) or even for testimony. Indeed, in the configurational fold of pictorial perception the picture's vehicle is instead not only felt, but also *visually* known, as present. This perceptual situation not only prevents the bearer of a pictorial perception from also feeling the picture's subject as present, but also lets her visually know that it is not present. Indeed, whenever the vehicle is neither felt nor visually known as present, the subject may be both felt and believed to be present, so that the perception of it no longer counts as a pictorial perception, but as a standard illusory perception (Voltolini, 2013, 2015). This typically happens in the case of genuine *trompe-l'oeils* (Voltolini, 2013, 2015), as well as in some particular optical conditions (e.g., when the perceiver only perceives aperture colors and shapes of the subject, Ferretti, 2018).

One may put things this way. When one is deceived by a genuine *trompe-l'oeil*, say a *trompe-l'oeil* of a snake, one has a standard illusory perception of what actually is a pictorial subject, a snake in this case: one mistakes the *trompe-l'oeil* for that subject, by illusorily perceiving it to be out there. Yet when one realizes that one faces a *trompe l'oeil*, one is still under the illusion that one perceives that subject, the snake, as being out there, but that illusory perception is now not only known as such, it is also visually known as such, in what turns out to be the recognitional fold of a pictorial perception. For one now also knowingly perceives, in virtue of what turns out to be the configurational fold of that pictorial perception, that what constitutes the *trompe l'oeil* as the physical object it is, i.e., a certain pictorial vehicle, is out there. My claim is that *this*, admittedly complex, perceptual situation is what affects pictorial perception in general *qua* Wollheimian seeing-in, thereby qualifying the apprehension of the presence of the picture's subject as a (visually based) knowingly illusory perception of that presence. In a nutshell, in its mode pictorial perception *qua* seeing-in is a visually known illusion of the pictorial subject's presence, as so grasped in the recognitional fold of such a *sui generis* perception.

3. The picture displays its subject

I said before that the picture's subject is what the picture *displays*. This ascribes to the picture itself, or better to its vehicle, a presentational value as well. In what follows, I will try to show that the relevant perceivable properties of the picture's vehicle and the relevant perceivable properties ascribed to the picture's subject stand in the very same relationship as that holding between the sensory features of a standard perceptual experience and the perceivable properties of its object. Since this relationship shows in which sense a standard perceptual experience is properly presentational, it also shows how a picture may display its subject, insofar as its vehicle presents that subject.

As we saw before, a standard perceptual experience is properly presentational in its

9 This is one of the reasons why pictorial perception cannot be a 'onefold' perceptual experience, as Briscoe (2017) maintains. For a 'onefold' perceptual experience is not sufficient for a pictorial perception, since merely entertaining it does not explain why the pictorial perception is also *at the same time* an experience of an object of a *different* kind from the picture's vehicle, i.e., the picture's subject, rather than a mere experience of the vehicle itself.

phenomenal character insofar as it is responsive of the fact that its object and its properties are given as present, i.e., as being out there, in such a character. But what does it mean to say that a standard perceptual experience is so responsive?

Different answers can be given to such a question, yet I will here choose one that justifies a *direct realist* approach to perception. Notoriously, unlike *naïve* realism, direct realism claims that *all* standard perceptual experiences, not just genuine perceptions, are properly presentational. Yet unlike *indirect* realism, it also claims that the presentational character of such experiences immediately addresses them to *mind-independent* objects, not to sense-data, whose main metaphysical feature is that of being mind-dependent objects instead. Now, how can the two claims be simultaneously justified?

A possibility that originally traces back to Smith (2002) is the following (Voltolini, 2017a). All standard perceptual experiences are properly presentational insofar as they possess sensory features, basically colours and shapes, which present the corresponding perceivable properties of the objects they are about. In the case of genuine perceptions, whether veridical or not (illusions), this presentation relation is *causally-based*, for the fact that they are caused by the existent objects they are about belongs to their specific mode (Recanati, 2007). Thus, the colours and shapes that feature a genuine perception present the corresponding properties that are instantiated by the existent object it is about. For example, both a veridical perception of a red and round object and an illusory perception that (mis)represents that object as blue and oblong present the properties of *being red* and *being round* that such an object instantiates, insofar as such experiences are both caused by that object, with the perceivable properties it indeed instantiates. Yet in the case of a hallucination, whose specific mode does not refer to causality for its object does not exist, the presentation relation between the features of the experience and the properties that are ascribed to that object is *similarity*-based. For example, a hallucination of a red and round object presents again the properties of *being red* and *being round*. Yet since these properties are not instantiated since that object does not exist, that presentation holds in virtue of the fact that the hallucination itself is reddish and roundish.

This way of putting things opens the way to understand how a picture may display its subject. In order for such a display to occur, a presentation relation must hold again between the design properties of the picture's vehicle and the corresponding perceivable properties that are ascribed to the picture's subject. According to Lopes (2005), among the surface properties of a picture's vehicle one must draw a distinction between the *mere surface properties* of that vehicle, typically those responsible for its constitution (*being a piece of paper*, *being made of plastic* etc.), and its *design properties*, those surface properties of the vehicle that are responsible for the fact that a certain subject is seen in it: typically, its colour and shapes.[10] For example, in containing certain yellowish and roundish spots, Vincent Van Gogh's *Sunflowers* present their subjects, i.e., sunflowers indeed, which are seen in them as being mostly yellow and having a round corolla.[11]

10 This distinction is more functional than ontological. It is quite likely that e.g. *being cracked*, which seems to be a material surface property of a vehicle, is exploited for letting one see in that vehicle a subject of a certain kind, as it happens with many of Alberto Burri's paintings.

11 Noë (2015) defends a similar idea: pictures are *visual* models that are used to display the subject's visual appearance (in my approach, the vehicle's colors display the subject's ascribed colors, the vehicle's forms display the subject's ascribed forms, etc.). Yet *pace* Noë, it is not in virtue of their being models that pictures display the subject's visual appearance. Their being models accounts for the *representational* value of pictures: their being about certain individuals and their (possibly isomorfically) structurally mirroring the possible relations in which those individuals stand. This may be proved in two ways: i) fortuitous images display their subjects even though they have no representational value; ii) *symbols* may represent individuals and their possible relations without being *depictions*, for they do not display their subjects' visual appearances.

Obviously, there is no causal relation between a picture's subject and a picture's vehicle. As I said before, the picture's subject is a *generic* item, so even in cases in which the picture's referent may have a causal impact on the corresponding vehicle, as with *transparent* pictures (photos, whether static or dynamic, shadows, mirror images etc.: Walton, 1984), no such impact affects the relation between the picture's subject and the picture's vehicle. So, it may seem that the presentation relation between the vehicle's design properties and the perceivable properties with which a subject is seen in it is again similarity-based, as in the case of hallucinations. In point of fact, as to fortuitous images this is precisely the case. When one sees an elephant in a cloud, the fact that the cloud is whitish and elephant-shaped presents the whiteness and the shape of the elephant as this is seen in it.

Yet there are many cases in which there is no similarity between the design properties of the picture's vehicle and the corresponding perceivable properties that the picture's subject is seen as having. Take for example Henry Matisse's *The Green Stripe*. In such a case, as Wollheim himself (2003b) stresses, a normally flesh and blood woman is seen in a painting whose vehicle instantiates a long and narrow green stripe. Now, there is definitely no similarity in colour between the greenish part of the vehicle and the corresponding part of the woman's face. The point may be generalized. As Wittgenstein (1977, III § 117) remarks, in a black and white picture of a boy one sees a normal flesh-coloured human being. So, how can one say that the picture's vehicle displays the picture's subject, if in many cases no such similarity holds?

To be sure, one might bite the bullet and say, with Husserl (2006) and Nanay (2016, 2018), that the intermediate item one sees in the picture is, respectively, an alien woman with a green stripe on her face and an alien black and white boy. Indeed, according to them, what possesses the standard colours for a woman and a boy respectively is not the intermediate item, but the picture's referent: Matisse's wife in the first case and the photographed boy in the second case. If this were the case, the similarity between the perceivable properties of the picture's vehicle and those that are seen in the picture's subject would be restored.

Yet firstly, this move seems merely to push the problem one step forward. Husserlians are ready to say that the further relation between the intermediate item and the picture's referent is again a presentation relation: the intermediate item displays or exhibits the picture's referent.[12] Yet in the above cases there is obviously no similarity between the intermediate item, as is postulated to be by Husserlians, and the picture's referent: for example, the greenish woman one allegedly sees in *The Green Stripe* is not similar in colour to Madame Matisse herself. Moreover, as to opaque pictures at least, there is no causal, but just an *intentional*, relation between the intermediate item and the picture's referent: Madame Matisse has obviously not caused the picture's subject of *The Green Stripe* to have the colours and shapes it is seen as having, whatever they are. Thus, how can one ground the claim that the former presents the latter? Secondly, the move itself seems to be hardly justified. Undoubtedly, green is perceptually captured in the apprehension of *The Green Stripe*'s vehicle, notably in the configurational fold of the relevant seeing-in experience. Yet if that vehicle suffered a physical alteration that changed the hue of green that is painted on it, we would still see in it the very same flesh-coloured woman. This is even more evident with respect to black-and-white pictures. If due to a physical process the vehicle of a black-and-white photo turned into a sepia one, we would still see in it the very same flesh-coloured human. One may also put it the other way round. If while watching a football match on TV our device suddenly became unable to transmit colours, we would

12 Cf. Eldridge (2018), Kurg (2018). This claim is often taken by Husserlians to justify their further claim that the picture's referent is also (quasi-)perceived in the overall pictorial experience. Let me however put this aside.

still see in the match normally flesh-coloured human beings, not exotic black-and-white individuals.[13]

Thus, in order to solve the problem one must look for elsewhere. As we have seen, when it is a matter of fortuitous images, as to presentational issues we rely on the *actual* similarity between the vehicle's design properties and the perceivable properties that are ascribed to the subject. But, one may well say, when it is a matter of *pictures*, as to presentational issues we rely on the artist's *intended* similarity between the vehicle's design properties and the perceivable properties that are ascribed to the subject. To stick again to my favourite example, clearly enough there is no actual similarity between the greenish look of *The Green Stripe*'s vehicle and the flesh-coloured face of the woman one sees in it. Yet one may well say that Matisse *intended* that such a greenish look were similar to the colour of that face. As Picasso famously said as to his *Portrait of Gertrude Stein*, "Everybody thinks she is not at all like her portrait. But never mind, in the end she will manage to look just like it."

Finally, if this solution as to the presentational character of pictures is viable, a further advantage arises. As we have seen in the previous section, *qua* seeing-in pictorial perception is just *sui generis* presentational. For in virtue of its recognitional fold it does not take the object of that fold, i.e., the picture's subject, as present in its mode, but just in its content. Yet in its configurational fold it is genuinely presentational as to the object of that fold, i.e., the picture's vehicle. For the sensory features of that fold definitely present, in a causally-based way, the corresponding perceivable properties the picture's vehicle instantiates. One's greenish experience of the green spot lying in *The Green's Stripe*'s vehicle presents – in a causally-based way – that vehicle in the perceivable properties it instantiates. Now, since as we have just seen a vehicle presents in in its own turn the corresponding picture's subject, one may well say that, albeit in a merely derivative sense, *qua* seeing-in pictorial perception properly presents the picture's subject as well. Thus in the end, there is an admittedly derivative way to bypass the fact seeing-is is just a *sui generis* presentational form of perception.[14]

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13 Incidentally, if we allow for *strong* cognitive penetration about pictures, as Wollheim (2003a) wished - a conceptual penetration affecting not only the phenomenal character, but also the content, of the relevant experience (Macpherson, 2012, 2015) - it is hard not to take the picture's subject as being ascribed the perceptual properties matching the way we conceptualize it.

14 This paper has been presented at the conferences *Perception and Aesthetic Experience, Starting from Noë's Strange Tools. San Raffaele Spring School of Philosophy*, May 22 – 24 2017, Milan; *Anglo-German Picture Theory Group, Annual Meeting 2017*, University of Milan, October 2-3 2017, Gargnano sul Garda. I thank the participants for their provoking and stimulating questions.

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CAN MOVEMENT BE DEPICTED?

abstract

It is natural to describe many pictures as of movement. We might for example say that a painting is of a horse rearing up, or a dog scurry along the pavement. The topic of this paper is how this "of" should be understood. Can a static picture depict movement, or is movement merely represented by, or suggested by, pictures, in some non-pictorial way? We argue that movement can be depicted and not merely represented. We examine three different views put forward by Le Poidevin, and use his third as a basis for our own view of movement depiction, which is a version of Hopkins's experienced resemblance theory of depiction.

keywords

movement depiction, resemblance theories, pictorial representation, movement perception, specious present

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1. Is Movement Depicted or (Merely) Represented?

It is natural to describe many pictures as *of* movement. We would, for example, say that Theodore Gericault's *The Charging Chasseur* (1812) is a picture of a horse rearing up, and that Balla's *Dinamismo di un Cane al Guinzaglio* (Dynamism of a Dog on a Leash) (1912) as a picture of a dog on a leash scurrying along the ground, rapidly wagging its tail. There are a very wide variety of other examples, in a range of pictorial styles. Indeed, we have a specific label, 'still life', for pictures which are not of objects moving, suggesting that perhaps the majority of pictures we look at are of moving things. The topic of this paper is how this "of" should be understood. That is, can a static picture depict movement, or is movement merely represented by, or suggested by, pictures, in some non-pictorial way?

We can think of pictures as representing in two types of way. *The Charging Chasseur* depicts certain objects and their properties: a horse, a rider, the horse's shape, the colours of the rider's uniform etc., but we might think that the picture represents more than it depicts, perhaps it represents gallantry or honour, bravery or victory, but we would not say that these abstractions are depicted, or *seen in*, the picture. Rather, we might think, they are inferred or associated with what the picture is seen to depict: from what we know about officers, their steeds, and how they behaved in the world, we understand the picture as having certain connotations. Do pictures represent movement in the way that they depict objects and their properties, or in the way that they depict gallantry and victory?

Here are two prima facie reasons for thinking that movement can be depicted. First, it is natural to think that the sorts of thing that paintings can depict are things that can be seen, and, as well as seeing colour and shape, it seems that we can also see movement: providing that an object is moving quickly enough, for example the seconds hand of a clock, or a raindrop slipping down a windowpane, we are able to see that it is moving.[1] Therefore, movement should at least be considered a *candidate* for what can be depicted. Second, denying that movement can be depicted leads to the peculiar consequence that pictures we would describe as of movement, in fact depict objects frozen in unstable positions, or as having strange features: Gericault's horse does not rear up, but is balanced precariously on two legs, Balla's dog stands still but has many tails and feet. If movement cannot be pictorially represented it seems we are forced to accept this strange consequence.

1 As we shall see later, various accounts have been put forward by psychologists and philosophers of perception as to how such experiences should be understood.

On the other hand, there are also prima facie reasons for doubting that movement really can be depicted. First, we might also think that although movement can be seen, this type of perceptual experience differs from those of seeing objects' colours, shapes, and locations. Whereas an object can be seen as either moving or staying still, no such dichotomy exists for colours or shapes. While it is possible to see a horse as unmoving, it is impossible, or at least very unusual, to see it as unshaped, or uncoloured as un-located. Moreover, we typically see objects moving or changing *by* seeing objects and their properties. Part of seeing a ball roll is to see it to be first here then there, and part of seeing a chameleon change colour is to see it as first red and then orange –we do not, at least in normal cases, see movement or change *simpliciter*. Given that the perception of movement is different from perception of colours, shapes, and textures, different enough for to warrant its own sub-discipline within philosophy of perception,[2] we might think that, unlike these intrinsic properties, it cannot, in fact be depicted. Second, and perhaps more obviously, pictures do not themselves *move*, at least not the pictures we are concerned with here.[3] Given this fact, there is a strong intuition that photos and paintings are 'snapshots', depictions of how things are *at an instant*, and thereby cannot be of the movements of objects which necessarily require more time than an instant; an object can have a certain colour or shape at an instant, and so these features can be captured on canvas, but it is far less obvious that movement can be presented in an instant of experience.[4]

We might think that this latter point is fatal, and that any investigation as to whether a static image can depict a moving object is a non-starter. However, we should not be so quick. Notice that a picture can depict an object as having certain properties without necessarily sharing those properties. That there is a speck of white paint in a depiction of an eye, does not mean that the eye is depicted as having a speck of white in it, but rather can be used by an artist to depict the eye as a shiny object which is catching the light. Similarly, and as we shall see later on, importantly, paintings and photographs are two-dimensional, and yet we are happy to say that they depict bodies which extend over three-dimensions.

We can see then that an account of movement depiction is not only desirable, but is not, at least not obviously, impossible. The remainder of this paper will be spent trying to develop just such an account. First, we shall examine and criticise some suggestions that Le Poidevin has made on this issue, before going on to show how his ideas on movement in Futurist paintings can be extended to provide an account of movement depiction more generally.

2. Three Proposals from Le Poidevin

One philosopher who has given significant attention to movement and pictures is Robin Le Poidevin.[5] He puts forward three quite different views on pictures and motion. In his 1997, he argues that movement is, in fact, *not* depicted. Rather, pictures can depict how moving objects are at an instant, and thereby non-depictorily represent a broader movement:

> In the experience of any change we may identify a particularly salient point, such as the moment a long-distance runner crosses the finishing line. We might represent this as a time-slice of the action, but in fact (since we perceived it) it has a non-zero duration.

2 See, for example, the recent volume edited by Phillips (2017)

3 Our interest here is not in cinema –*moving* pictures– nor in the type of op-art that gives the illusion of figures on the canvas actually changing or moving.

4 We shall return to this question later.

5 Another was Gombrich, whose arguments for the possibility of movement depiction stem from his idea that, metaphysically, there is no such thing as an instant (1960, 1964). We will not examine this idea here, but see Le Poidevin (1997, 2007, 2017) for criticism.

> This, then, is what static images are capable of depicting: specious instants which are parts of a larger movement represented by the image. Images can thus represent a movement by depicting perceptually minimum parts of it (1997, p. 186)

This is to adopt the austere account of depiction which we outlined above: we see marks on canvas as depicting an object at an instant at which it is in motion and from this *infer* the rest of its movement. For example, we see a depicted object as being in an unstable position and infer that it is moving, or we see some streaked lines behind a figure and as we are familiar with the convention that those lines represent fast motion, we infer that the object we see (in the picture) is running.[6]

In his 2007, however, Le Poividen presents a more ambitious account, one based on *recognition* accounts of depiction (Schier, 1986; Lopes, 1996; Currie, 1995). On a recognition account, a configuration of marks depicts a certain aspect if it activates the viewer's ability to recognise by visual means that aspect.[7] This ability on the viewer's side plays an essential role also in identifying what the picture is of. For some philosophers this recognitional ability is purely perceptual, for other philosophers it engages also conceptual capacities. Le Poividen draws on Currie's version of this approach:

> Currie suggests two quite different mechanisms for feature recognition: one involves reasoning and reflection, general beliefs about what is probable based on previous experience; the other is 'more automatic, less flexible, less rational'...The kind of recognition capacities that define depiction are, he holds, of the latter kind. (LePoidevin, 2007, p. 136)

On Currie's view a clear line can be drawn between what is depicted and what is merely represented: the contents of a picture which we recognise automatically and irresistibly are what it depicts, those that we recognise only through reflection or reasoning, it non-pictorially represents. Le Poidevin modifies this idea. Arguing that although there are more and less sophisticated types of recognition, we should get rid of the idea that there is a clear line between them: sophisticated vs automatic recognition is not either/or, but rather two ends of a continuum:

> to the extent that an image triggers a recognition capacity for x that is at the 'less sophisticated' end of the continuum, we will be more inclined to say that the image depicts an x. To the extent that the relevant capacity is nearer the 'more sophisticated' end of the continuum, we will be more inclined to say that the image non-depictively represents an x (2007, p. 137).

On this account, the line between what is depicted and what is non-depictively represented is hazy –if the capacities we deploy to recognise an image as being "of movement" are at the "less sophisticated" end of the spectrum, then movement is depicted, if they are at the 'more sophisticated' end, it is not. Arguably, our ability to recognise movement is on the less sophisticated end, this would explain why we are so quick to describe certain pictures as being "of" one movement or another.

6 For this view see Lopes (1996, p. 17)

7 Notice however that for some recognition theorists pictorial aspects are not identical to visual aspects.See on this Lopes, 1996, p. 119.

While we do not have a knock down argument against this view, questions can be raised as to how desirable it is as a general account of depiction. First, determining what a picture depicts based on how reflexively our recognition capacities are engaged seems to open up the possibility that just about anything can be depicted. It seems plausible to suppose that our recognition capacities can be improved through practice. The more often I am exposed to, say, *draught horses* the quicker and more reflexively I will be able to recognise them in both pictures and real life. If this is correct, it is easy to imagine a perceiver's "less sophisticated" recognitional capacities being trained up so that they automatically recognise just about anything, including quite abstract concepts such as gallantry or victory. Should we therefore say that, for some perceivers, pictures are able to depict such abstract concepts? An account of depiction that allows just about anything to be depicted does not seem an especially appealing one. Second, the idea of a recognitional continuum suggests that there might be *degrees of depiction*, if the recognitional capacities deployed are, say, at the midpoint of the continuum it seems that we have to say that motion is "somewhat" depicted, or partially depicted. It seems then that while this account of depiction allows that motion can be depicted it does so at the cost of endorsing an extremely liberal view of what counts as depiction.
Le Poidiven's most promising account of movement depiction can be found in his most recent work on the topic, in which he focuses on *Futurist* pictures, such as *Dinamismo di un Cane al Guinzaglio*:

> non-realist paintings depict, in part, by taking an aspect of our ordinary experience and making it the object of a visual experience...In the case of the Futurists, the aspect is the way in which the perception of a shifting scene is influenced by past perceptions, which are present in the picture. The picture thus confronts us with a temporally extended vision of the scene. This is not a depiction of motion in the recognition-capacity-triggering sense, since the picture does not, at least directly, trigger our visual recognition capacities for motion. But what makes it appropriate to talk of depiction here is that experience nevertheless has something in common with the visual experience of motion, namely awareness of the multiple of indeterminate locations of the depicted object. We need this second kind of depiction to accommodate the depiction of features of our own experience, as opposed to depiction of external objects. (Le Poidevin, 2017, p. 324)

We can see here that Le Poividen has moved away from recognition accounts of motion, and depict motion in virtue of capturing the blurry, indeterminately located, appearance that objects take on when they move rapidly. Such an approach can be understood as the endorsement of a *resemblance* approach to pictures. On this type of view pictures depict their objects in virtue of their resembling their objects. More specifically, in suggesting that pictures such as Balla's "have something in common with the *experience of motion*" Le Poidevin appears to endorse something like Hopkins' *experienced resemblance* account of depiction, whereby:

> What is crucial for pictorial representation is...that the marks be experienced as resembling the depicted object in this respect. To experience this resemblance is to see the object in the picture (Hopkins, 2003, p. 149)[8]

8 Other resemblance theories are available, which may also be compatible with the ideas we put forward here, but for simplicity's sake, we will focus on Hopkins.

Specifically, Hopkins argues that pictures depict what they depict in virtue of their resembling their subjects in outline shape, that is, "the shape things have if we ignore the dimension of depth" (ibid., p. 147). If you look at any object in the environment you will see it as just that: a thing extending through space, something with a certain three-dimensional shape. Looking at a cardboard box you will see it as a cuboid. However, on Hopkins' account, you will also see it as having a particular two-dimensional quadrilateral outline shape, the precise dimensions of which will depend upon which angle it is viewed from. Imagine you are viewing the box through a pane of glass, you would be able to cut a piece of paper so that when you glue it to the window it completely occludes the box. This, is the outline shape that from your current viewpoint, you see the box as having.

While Hopkins emphasises that outline shape is "a genuine property of things in our environment" (2003, p. 148), he also, importantly for our purposes, suggests that visual experience *presents* items as having outline shapes: "We do see outline shape, despite the apparently esoteric nature of that property" (1996, p. 60). It is also important to notice that seeing an object to have a particular outline shape (from a particular perspective) depends both on the properties of the object (its 3D shape) *and* features of our perceptual system. If our visual system were set up differently (if the way it structured our perception of the world were different) then the outline shape of an object might be presented to us differently (or it might not be presented at all). If for example we had less fine-grained visual systems (which some of us do) then we would see objects as having fuzzier, less determinate outline shapes.

With these ideas in hand we can now see how Le Poidevin account of futurist pictures can be thought of as resemblance theory. First, notice that when objects move rapidly, as when small dogs vigorously wag their tails and scurry along the ground, they are experienced as having a *particular type* of outline shape, what we might call a *motion blur* outline shape, in which the object does not seem to be located at one specific region, but indeterminately located at many. As with the outline shape of motionless objects, *motion blur* outline shape is dependent both on the properties of the object itself and structural features of the perceptual system.[9] A dog's wagging tail looks the way it does because of three dimensional shape of the tail, the locations which that object is moving through, the viewpoint from which it is being observed, and, crucially, the limited temporal grain of our visual system. We see the tail as a blur because there are limits as to how accurately we can see objects when they are moving rapidly. Objects which move at a slower rate, such as the languid flaps of an eagle's wings are seen clearly and distinctly as they move, very slow movements, such as a snail's slithering, are not detected at all. *Dinamismo di un Cane al Guinzaglio* can be thought of as depicting motion through resemblance. A dog with a rapidly wagging tail is depicted because the figure on the canvas is painted in such a way as to elicit the experience of resemblance in *motion blur outline shape*.

Considering motion depiction in this way certainly seems to have some merit. Unlike Le Poividen's first approach to these issues, it is an account of movement *depiction*, and, as it does not rely on a sliding scale of recognition, it is more appealing than his second. However, as it stands, we can criticise this approach for being somewhat limited scope: futurist paintings make up only a small proportion of pictures which we describe as *of* motion. Can only rapid movements, those in which objects take on a motion blur outline shape, be depicted? That is, should we say that Balla's painting is a depiction of motion, but Gericault's does not? In the

9 We intend motion blur to be understood as distinct from other types of blurriness or indeterminacy we might visually experience. Different for example, to the blurry way the world looks if one is short sighted, and to the indeterminate boundaries of clouds of smoke or steam.

remainder of this paper we will suggest how Le Poividen's approach to futurist pictures can be modified and extended so as to admit a wider variety of picture types.

3. Resemblance and the Depiction of Non-rapid Motion

We might think that despite its success in showing how *rapid* motion can be depicted, experienced resemblance cannot be used to provide an account of how *ordinary* motion can be depicted. Consider the following quote from Hopkins:

> the outline shape of a standing horse differs from that of one cantering, and the outline shape of a horse cantering towards us differs from that of one cantering away (1996, p. 82)

If we compare the outline shape of a horse cantering away from us to that of a horse cantering towards us then, clearly there is a difference, but there is *not* a difference in outline shape between that of a horse cantering away from us, and the outline shape that it would have if it were frozen mid-canter so that it balanced on three hooves. The reason why Le Poividen's account of futurist depictions of motion is convincing is that it conceives of futurists as drawing figures which can be experienced as resembling the *distinctive* outline shape which rapidly moving objects take on. Such an option does not seem available if we want to explain the depiction of non-rapid motion.

While intuitively compelling, we think the above argument is too quick. Objects moving at an ordinary speed *do* take on a unique visual appearance, and we see pictures such as *The Charging Chasseur* as depicting this type of motion in virtue of their resembling objects with this appearance. More specifically, we suggest that a horse seen in the middle of rearing up or cantering is seen as *a unified temporal part* of an object in motion, and that this, like the case of motion blur, and that it is seen as such due to certain structural features of vision. Pictures depict motion by resembling objects with this type of appearance. To see how this is possible we need to focus on a structural feature of vision which is often invoked to explain how we perceive motion in real life.

As has been mentioned, there are movements and changes that we can see, such as the seconds hand of a clock, but also movements that we cannot, such as those of the hour hand of a clock. The notion of a temporal field is often used to explain why this is the case. The basic idea is described by Soteriou as follows:

> ...the things we perceive are perceived as filling, occupying, or having some location within, an interval of time, just as the objects we see are generally seen as filling, occupying, or having a location within a region of space (2011, p. 195, see also, for example, Phillips, 2011, p. 363; Dainton, 2008, p. 634).

On this account, the world is not experienced instant by instant, but rather in "gulps" (Lockwood 2005, p. 365) of approximately one second in duration.[10] The contents of each gulp are *perceptually unified*, or, as Dainton puts it "diachronically co-conscious" (2010, p.135), in a way similar to how the visual *spatial* field makes our perceptions of different aspects of the world *synchronically* co-conscious: just as you are able to see the horse on your left and the tree on your right simultaneously, and as part of the same perceptual experience, you perceive what happens at the beginning of any particular gulp *together with* what happens at its end.

10 Dainton (2000, p. 171) estimates it to be about half a second or less, Lockwood "a second or a second and a half' (2005, p. 381), and Strawson about 300ms (2009, 5.9).

Diachronic unification accounts for the difference between perceptible and imperceptible movement in the following way. If an object moves from one location to a *discriminably different location* within a second, then the perceptions of the object in both locations are experienced together, and constituting a perceptual experience of the object *moving from* the first location to the second. If, however, an object is moving but so slowly that it is not in a discriminably different location within a second, then the viewer will not be diachronically co-conscious of the object in different locations and movement will not be experienced.

How can the temporal field provide an account of the *depiction* of non-rapid motion? We have seen that the pictures which are contenders for depicting ordinary motion are those that show objects in unstable positions, and objects in real life only adopt unstable positions when they are in the middle of a movement. We therefore only ever see objects in unstable positions *as parts of* temporally extended experiences of motion. As with perceptions of *motion blur* the unique appearance that objects in the midst of motion take on depends both on properties of the object itself –the unstable position that the horse has adopted– *and* structural features of the viewer's perceptual system –the temporal field entailing that the horse is seen as part of a temporally extended whole. Paintings that we would describe as being of non-rapid motion can therefore be thought to *depict* non-rapid motion by presenting the viewer with a figure which is experienced as resembling an object with this type of *unified temporal-part* appearance. *The Charging Chasseur* depicts a horse in motion because the outline shape on the canvas is experienced as resembling a unified temporal part of a 'horse rearing up' event.

This then is the central claim of our positive account. To get clearer on exactly what the commitments of such a position are, it will be instructive to look at what might seem an obvious challenge that could be made to it. One might be tempted to argue here that what we have presented is simply a disguised version of the claim that pictures can only represent movement but not depict it. Why not say that a viewer of the Gericault simply experiences the figure as resembling an object in the midst of motion, and then *infers* the movement?

Our response to this challenge draws on the uncontroversial idea that pictures are capable of depicting *three-dimensional shape*; a temporally extended movement is depicted by a figure resembling one of its unified temporal parts for the same reasons that a *three-dimensional object* is depicted by figure which is experienced as resembling one of its possible outline shapes.

It is natural to think that if material objects are depicted at all, they are very often depicted as three-dimensional. We do not think of the Gericault as depicting only a horse's front facing parts (a horse facade) from which we *infer* that it has three-dimensional girth. Rather, we see the picture (see *in* the picture) a *whole* spatially extended horse: in virtue of their eliciting experiences of resemblance in outline shape, pictures are capable of depicting three dimensional objects. This can be put in terms of the resemblance approaches to depiction that we have been concerned with in this section and the last: in experiencing a figure in a picture as resembling a three-dimensional object in outline shape, we are thereby experiencing the figure as resembling that three-dimensional object.

It may be objected here that any outline shape is compatible with an infinite number of three-dimensional shapes. The outline shape of the horse in *The Charging Chasseur* could be that of a fully three-dimensional horse, a flat cardboard cutout, or the front, but not the back, half of a horse mannequin. It might be thought that pressure could be put on resemblance accounts by asking for an explanation as to why an outline shape is experienced as resembling a single determinate three-dimensional object rather than any other possible configuration. Hopkins, however, thinks that proponents of experienced resemblance do not owe an account of the precise details as to why an outline figure is experienced as resembling one determinate three-dimensional shape. It is enough to recognise the fact that viewers *do* experience certain outline shapes as resembling certain three-dimensional objects. He also points out that, in real

life , as opposed to picture perception, "...visual experience includes the representation of 3–D arrangements" (p. 117), despite our only being in direct perceptual contact with those front facing parts of objects which reflect light onto our retinas. When looking at a real life horse, I do not see it *as* a flat facade, but rather as something with three-dimensional spatial extension. While there is a thriving debate as to how precisely we should understand our seeing objects as three-dimensional (see Briscoe, 2011; Nanay, 2010; Noe, 2004) that that our visual perceptual system presents objects as three-dimensional is not a matter of debate. Neither, suggests Hopkins, should our seeing three dimensional objects in pictures.

We suggest that our resemblance account of the depiction of non-rapid motion can be justified in a parallel way. Although there is room for disagreement about exactly how we can be diachronically co-consciousness of objects in time[11], that our experience presents temporally extended events involving objects is uncontroversial. When we experience a painted figure as resembling a unified temporal part of an object in motion, we thereby see that movement as being depicted. Put another way, we can say that as well as seeing depicted objects as extended in a third spatial dimension, we also see them and their movements as extending a short way through time. As with the depiction of three-dimensionality, a precise account of how this is achieved is unnecessary. It is enough to note that movement can be part of the content of perceptual experiences of the real world, that objects are seen to take on a unique appearance as they are moving, and that figures can be painted or captured in photographs which are experienced as resembling these unique appearances.

4. Conclusion

Here we have argued that an account of movement depiction is both desirable and possible. Moreover, it is attainable through extending a popular account of depiction –the experienced resemblance theory– in quite a modest way. Due to our ability to be diachronically co-conscious of an object at two different positions, we see things to take on a particular appearance when they move. Figures which elicit experiences of resembling objects with this particular appearance can therefore be thought of as depicting objects in motion: we see spatially extended objects in pictures, and so too do we see temporally extended events.

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11 For example, the debate between extensionalist (e.g Phillips 2014) and intentionalist (e.g. Lee 2014) accounts of the diachronic co-consciousness.

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THE SPATIAL EXPERIENCE OF MUSICAL SOURCES: TWO CASE STUDIES

abstract

When listening to specific musical compositions in which physical space is employed with an aesthetic role, we can hear sound sources` spatial properties in the same way as we do it in the case of environmental sound sources. In this essay, I will expand the application of a model for the spatial experience of sound sources to the experience of listening to the musical sound sources of two musical compositions by the Italian composer Luigi Nono. In order to do that, I will briefly summarize how we experience sound sources` spatial properties in the case of environmental sounds; I will then mention the different kinds of physical space which we might be able to hear in the case of musical listening, and I will finally analyze Luigi Nono's "Hay que caminar" soñando *(1989) for two violins and* La lontananza nostalgica utopica futura *(1988) for solo violin and 8-track tape to show how the model of the experience of environmental sound sources applies also to these musical cases.*

keywords

musical sound, environmental sound, spatial perception, music, aesthetic experience, sound

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In the contemporary debate in analytic philosophy on the location of sound we have three main groups of theories: the distal theory of sound claims that we hear sound as located where sound sources are so that sound and sound sources are heard as co-located (Casati & Dokic, 1994, 2005, 2009; Pasnau, 1999, 2000; O'Callaghan, 2007, 2009); the medial theory (Nudds, 2001, 2009; Smith, 2009; Sorensen, 2009) states that we do not locate sounds at their sources and so that sounds and their sources are not heard as co-located, but that sounds are heard as either spreading out from their sources or travelling like sound waves. Finally, proximal theories either locate sounds at the ears of the perceiver (Maclachlan, 1989) or consider sounds to be proximal stimuli (O'Shaughnessy, 2009). While these three different views differ in the matter of the location in which sound seems to be heard, they all agree on the fact that auditory experience is somehow spatial and that we are able to recover spatial information on sound sources through hearing. That is, claiming that auditory experience is somehow spatial and that there are spatial properties of sound sources which we might recover by audition is independent from specifying where sounds are heard as being located.

I (manuscript) suggested a specific model for the spatial experience of sound sources. While, as just stated, the three groups of theories on the location of sound disagree on the spatial location they attribute to sound, they might perfectly agree on the way in which we experience the spatial properties of sound sources. The model for the spatial experience of sound sources which was originally conceived by taking into account only sound sources producing environmental sounds has been extended to sound sources producing musical sounds (Di Bona, 2017). In this essay, I will further expand the application of the model for the spatial experience of sound sources to musical sounds by analyzing how we experience space when listening to two musical compositions by the Italian composer Luigi Nono.

In order to reach my objective, I will briefly summarize (§1) how we experience sound sources spatial properties in the case of environmental sounds (Di Bona, 2017); (§2) I will then mention the different kinds of physical space which we might be able to hear in the case of musical listening (ibid), and (§3) I will finally analyze two compositions by Luigi Nono, namely, *"Hay que caminar" soñando* (1989) for two violins and *La lontananza nostalgica utopica futura* (1988) for solo violin and 8-track tape to show how the model of the experience of environmental sound sources applies also to musical sound sources. When listening to these musical compositions, we can hear sound sources' spatial properties in the same way as we do it in the case of environmental sound sources.

1. The space of environmental sound sources

We can describe extensively the way in which we experience spatial properties of sound sources through audition by focusing on the sources producing environmental sounds, which are commonly considered to be the sounds which surround us in everyday listening, e.g., the sound of a door slamming, cars running in the street or people talking. Given that we seem to be able to tell where sound sources are located and to recover information on their distance and direction with respect to us (Blauert, 1997), the question is what spatial information about them we exactly get. We can auditorily experience the spatiality of sound sources analogously to the way in which we visually experience the spatiality of sound sources (Di Bona, manuscript). Nudds (2009), on the contrary, claims that the way in which we experience spatial properties through audition is more similar to the way in which we do it through touch, and his argument is based on Martin's account on the difference between the visual and the tactual experience of space (1992). According to Martin, when seeing an object we experience space in three modalities: 1) we see the spatial region where the object is located; 2) we see the space between the parts the objects is constituted of; and 3) we see space *itself*, namely the space where the object is seen to be, which is also the space where an object can potentially be seen. Following Martin's three modalities for the visual perception of space, Nudds claims that the auditory experience of spatial properties which relate to sound sources differs from the visual experience of objects in space since, even if we do experience the spatial region where sound sources are and also the space between different sources, we do not experience space itself in audition, namely space *heard* as potentially empty or occupied. Expanding on Nudds' view, we can claim that the way in which we experience spatial information of sound sources through audition is similar to the way in which we experience the space of objects in vision. Therefore, in audition we can not only 1) hear the space where sound sources are and 2) the space between different sources, but also 3) hear space itself, that is, space as something which can be perceived as potentially occupied or empty. In order to show that, we can describe the auditory experience we have when listening to the sound produced by a Russian matryoshka when someone shakes it (Di Bona, manuscript). Imagine to listen to the woody sound emitted by a matryoshka doll empty of all the small dolls inside it except from the medium-size doll. When listening to this woody sound, one might hear 1) the spatial region where the dolls are; 2) the space between the external matryoshka and the medium-size matryoshka, which is to say that one can hear the distance between two sources which are the bigger external matryoshka and the medium-size matryoshka inside it; and shaking the matryoshka several times and changing the size of the matryoshka which is inside, one can also experience 3) the space within the matryoshka, and also the spatial region where the matryoshka is located, as a space that might be potentially filled by or empty of other material objects. Actually, we can tell the "quantity" of space which might yet be filled (Di Bona, 2017, p. 96). The conclusion is that the ways in which we get spatial information about sound sources by audition are analogous to the ways in which we see an object as located in space. The analogy does not go as far so as allowing to justify that the acuity of audition is comparable to the acuity of vision: auditory acuity is still relatively poor when compared to visual acuity. The analogy is only a starting point to show that our auditory experience of the spatiality of objects is alike to the visual experience of the spatiality of objects.

2. Different roles of space in music

Before applying the "matryoshka model" to two musical compositions by Luigi Nono, we need to distinguish between two different ways of listening to musical space. When listening to music we can experience space *metaphorically* (Macedo, 2013-2014; 2015, p. 242) – when musical features of a composition, such as melody, harmony or rhythm, evoke a space (e.g., if one hears a 'rising' or 'falling' melodic line) or recall concepts related to an imaginary spatial scene (Scruton, 1983, 1997; Budd, 1985; Davies, 1994; Levinson, 2006; Peacocke, 2010; Kania, 2015);

or *literally* (Macedo, 2015, p. 243) – that is when one focuses on the interaction between the physical reality and sound. The four literal uses of space that Macedo identifies are location, acoustic space, sound spatialization, and reference. When focusing on the spatial information related to the specific venue where music is performed, composers usually employ space as *location*. The literal use of space as an *acoustic space*, underlining the specific acoustic effects of the environment on sound, is employed when composers pay attention to the resonances and the natural or artificial reverberation of the environment where sound propagates. Finally, when compositions take into account direction and motion, and give space more importance than the usual compositional means, such as harmony, melody and rhythm, they exemplify the literal meanings of space as *sound spatialization* and *reference* (Macedo, 2015, pp. 245-247). Space as sound spatialization or reference generates the dissemination of sources throughout the performance venue producing the experience of being in imaginary places that are comlpetely different from the one where the music has actually taken place.

Not only we can listen to space in music metaphorically and literally, but we can also focus on the physical space we can have an experience of when concentrating on the spatial properties of sound sources, namely, the spatial information concerning the spatial regions where sound sources are located and the relative distance between the various sound sources with respect to each other and with respect to us. There is a way of having an experience of musical space literally which is strictly related to the auditory experience of physical space. Actually, composers take into account spatial information about sound sources and spatial features which are related to the motion and reverberation of sound when writing their music. We can distinguish, indeed, between three different aesthetic roles of physical space in music (Di Bona, 2017, pp. 97-98).

When composers consider in their compositions musicians' position with respect to each other and the audience, they use space with a *minimal* aesthetic role. Composers through almost the entire history of Western classical music have been using space with a minimal aesthetic role. Space is employed with a *weighty* aesthetic role when composers pay attention not only to the positions of musicians with regard to their relative placement and the audience, but also to the acoustic effects of natural or artificial reverberation generated by sound reflection, diffraction, and resonance. From late Renaissance music in Venice up to the 20th century, we find composers that give space a weighty aesthetic role. When having a weighty employment, space starts to play the same crucial role as the traditional aesthetic characteristics which are melody, harmony and rhythm. From the beginning of the 21st century, in the fields of electronic music and sound art, space was considered as a *prominent* aesthetic element to the point that it overshadowed harmony, melody and rhythm. In these cases, space has been investigated for the possibility of generating imaginary landscapes due to the effects based on the motion of sound. Compositions in which space plays a prominent role have been written by Karlheinz Stockhausen, György Ligeti, Luigi Nono, Jean-Claude Risset, Bernard Parmegiani, and György Kurtag. Also the genres of *field recording* and *soundscape composition* employ space with a prominent role. These genres explore the concept of space in order to create imaginary soundscapes which are completely different from the soundscapes usually generated in the specific venue where music is performed; they also include music that gives the impression of dispersing sound sources throughout the performance venue.

The three aesthetic uses of the physical space in music match the literal meanings of space pinned down by Macedo (Di Bona, ibid). The minimal aesthetic role of space corresponds to the literal meaning of space as *location* since both take into account, in a broad sense, the venue where music is performed. The minimal aesthetic role of space includes the spatial information recovered by the locations of musical sources, their relative placement and the placement with respect to the audience.

The literal use of space as an *acoustic space* perfectly matches the aesthetically weighty role of sound, being that it underlies the specific acoustic effects of the environment on sound: when employing the literal use of space as an acoustic space, we attribute space a weighty aesthetic role which is conveyed by taking into account the resonances and the natural or artificial reverberation of the environment where sound propagates. Finally, the prominent aesthetic role is employed in the compositions exemplifying the literal meanings of space as *sound spatialization* and *reference* (ibid., pp. 245-247), where musical space generates imaginary landscapes.
I have described so far the roles of space when employed with an aesthetic intent and found correspondances between those roles and Macedos' literal senses of space. Now, we can verify how the modality in which we experience the space of environmental sound sources is similar to the modality in which we experience the space of musical sound sources. I will therefore focus on the compositions in which space plays a minimal and a weighty aesthetic role.

3. Two Luigi Nono's compositions

When listening to the environmental sounds produced by specific sources we experience space in three ways: 1) we hear the space where sound sources are; 2) we hear the space between different sources; and 3) by hearing the space which separates sound sources, we hear space itself, that is, space as something which can be potentially perceived as occupied or empty. I will show now how this model works also when listening to musical sound sources by applying it to the listening of specific music compositions in which physical space is employed with the minimal aesthetic role and the weighty aesthetic role. As an example of a musical composition in which space is employed with a minimal aesthetic role – that is, when a composer takes into account musical sources' locations with respect to each other and the architectural features of an intended performance venue – I analyzed a composition for string quartet, W.A. Mozart's *Divertimento* in D Major K 136 (1772) (2017, p. 100). The analysis of Mozart's composition shows that the matryoshka model works in that case. The weighty aesthetic role of space is employed when space is used with the literal sense as acoustic space and I showed that we can experience musical sound sources analogously to how we experience environmental sound sources through the analysis of Giovanni Gabrieli's motet "In Ecclesiis" from Book II of *Symphoniae sacrae* and Alvin Lucier's piece *I am sitting in a room* (ibid., pp. 101-102). I will extend my analysis to two compositions by Luigi Nono, *"Hay que caminar" soñando* (1989) and *La lontananza nostalgica utopica futura* (1988).
Both compositions were conceived by Nono in order to explore the concept of sound in space in relation to the different ways of making space "resonating" through music; in both cases, Nono created dynamic acoustic atmospheres, trying to develop the potentialities of musical space. I will show that when listing to both compositions we experience musical sources in the same way as when we experience environmental sound sources, namely, by: 1) hearing the space where sound sources are; 2) by hearing the space between different sources; and 3) by hearing the space which separates sound sources, we hear space itself, that is, space as something which can be potentially perceived as occupied or empty.
"Hay que caminar" soñando is a composition for two violins. Nono asks explicitly the performers to change their positions while playing. They usually do it by displacing music stands in different places of the concert venue. Moreover, Nono asks the violinists to constantly vary the intensity and the way in which they create sounds in order to produce many different nuances in terms of volume and timbre (Haas, 1991; Petazzi, 1993). In the first part of the piece, there are many different degrees of "pianissimo"; in the second, there are more contrasts at the level of volume. The third part starts, instead, with a strong and intense musical passage and ends with seconds of silence as the bow of both violins remains in position. Imagine listening to a live performance of *"Hay que caminar" soñando* performed in a medium-sized

concert hall or in a church. When listening to this piece in a live concert, you can tell where the sources of sounds (the two violinists) are with respect to you and with respect to each other. Namely, you can tell if they are, say, in front of you on your left or on your right. And you can also tell when they change position as when moving from a music stand to another. Very often in this piece, there are pauses between the end of a short music sentence played by the first violin and the following music sentence played by the second violin. Already at the beginning of the piece, for example, the first violin opens the section and, when he/she concludes it, there is a long pause ("corona") before the second sentence played by the second violin begins. The same happens in the connection between the third and the fourth bar: again, there is a long pause between the end of a sentence played by a violin and the beginning of a new sentence played by the other violin. The piece is disseminated by examples like this. Now, when experiencing these moments of silence, in which eventually the last note of one violin resonates before fading away, we experience the space between the instruments in a way that can help to tell whether they are very distant from each other: sound tells us about the space between sound sources. Moreover, we come to experience also aspects of the actual place where sound sources are heard to be, just because musicians are constantly changing their position. Therefore, we can tell if the space where sound sources are can potentially be still occupied by or empty of different objects. That is, we get the "potentiality of filling" (Di Bona, 2017, p. 100) of the space where musical sources are heard to be, which corresponds to experiencing space itself.

The weighty aesthetic role of space is employed when space is used in the literal sense of acoustic space. The perception of acoustic space (Macedo, 2015, p. 243) depends on the acoustic effects of the performing environment, effects which are generated by reflection, diffraction and resonance. *La lontananza nostalgica utopica futura* is a piece for solo violin and eight channels of pre-recorded violin and other sounds, such as strings being tuned, scrapings of furniture, random environmental sounds, people talking between takes and so on. All the sounds are modified through frequency shifting, reverberation, delaying and other technological modulations. The violin sounds Nono recorded and analyzed were produced by the violinist Gidon Kremer. Nono turned them into an auditory material played through the eight channels. The material was constituted by a mixture of violin sounds with different styles of playing and noises from the studio; violin sounds made of high-pitched melodies played in harmonics, *spiccato* and fast tremolos at the point of the bow, and other effects created by the modulation of environmental sounds. During the live performance, the electronically modulated sounds are distributed among loudspeakers that are activated live by a sound technician, who is usually free to start, fade up, or silence each channel at any time. The soloist then interacts with the tape sounds and has the freedom to decide where to begin playing the score, how long to pause, change the rhythm and performing positions on or off the stage. Nono described *La lontananza...* as a madrigal for several "wayfarers" who join in play. Each player's score is also distributed among three music stands in different location of the performing space. The soloist part is divided into six parts whose order is fixed. During the piece, the performer walks from one stand to another. Few additional stands are left empty to add more freedom to the soloist creativity. Natural reverberation generated by the interaction between the sound of the solo performer and the eight channels alter the spatial perception of the positions of all sound sources. Nevertheless, imagine to listen to a live performance of *La lontananza nostalgica utopica futura*. One can tell where the sources of sound are located and also when they change position, as when the violinist plays from a different place from where he played before, since he moved from one music stand to another. Of course, also the loudspeakers, which are other sound sources, are spatially identifiable. Being *La lontananza* a piece that leaves room to improvisation, it is unpredictable when there will be

silence. However, very often in the piece, we are supposed to hear when a channel ends and start another one, and to experience moments in which also the solo part is silent. Now, when listening to these moments of silence we might experience the space between the different sources, at least that between the sources which are eventually located in the opposite sites of the performing space. Finally, when a loudspeaker ceases to play or the soloist himself/herself ceases to play, we can experience the space where he/she or the loudspeakers are located as something which can still potentially be filled by other material objects, which is a way of experiencing space itself.

I did not talk about cases in which space has a prominent aesthetic role, which is the role of space in the cases of sound spatialization and reference. There is some skepticism, indeed, about the possibility of providing an analysis that shows the similarity between the perception of musical sound sources and their localization, and the perception of non-musical sound sources and their localization when musical sounds are put in a way to create imaginary environments having imaginary sound sources (Di Bona, 2017). The skepticism is justified by the fact that the experience of space we have in these cases, in virtue of evoking imaginary sound sources, seems to be quite counterintuitive. Auditory experience is supposed to let us track and identify "real" sound sources. I will leave the justification of this skepticism to further research. For the time being, having showed a similarity between the spatial experience of sound sources and the spatial experience of musical sound sources when listening to two specific compositions of contemporary music is already a way of enriching the list of analogies between the two kinds of experiences with the aim of providing a unified conception of the auditory experience of sound sources.

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MODES OF PRESENTATION AND WAYS OF APPEARING: A CRITICAL REVISION OF EVANS'S ACCOUNT*

abstract

There are many ways in which a subject can think about an object. One of these occurs when the subject can perceive the object: perceiving an object makes it possible to think about it in a very direct and straightforward way. This is so because perception of the object makes a subject aware of the object itself. But what is it to be (perceptually) aware of something? Moreover, how does such an awareness have to be accounted for? According to a very influential proposal leading back to Gareth Evans (1982), the kind of awareness that can home a subject's thought on an object has to be cashed out in terms of singular object-dependent modes of presentation understood as ways of having discriminating (albeit non-descriptive) knowledge of the object. Contra Evans I shall claim that modes of presentation thus characterized do not account for perceptual awareness, but rather presuppose it.

keywords

perceptual awareness, acquaintance, perceptual contact, ways of appearing

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1. Introduction

The bulk of my paper is about the role that perception plays in our thinking about ordinary, environmental objects. It does not concern the traditional epistemic question of whether and how perception can justify our knowledge claims about the world. Rather, it concerns an issue which I think is preliminary to it and that should be settled in advance of any theorization about the epistemic, justificatory role of perception. This preliminary question is the following: how does perceiving an object make it possible to think about it? Dealing with such a question is of pivotal importance in order to understand the complex interplay between perception and thought and, more generally, the role that perception plays in our cognitive lives.

The question raised presupposes of course that perception (alone, or in combination with some other features) makes it possible to think about objects in our environment. It does not presuppose instead that perception is necessary (directly or indirectly) in order for any kind of thought to home in on an object. As a matter of fact, there are many kinds of thoughts that fix their aboutness utterly independently from perception. This is the case for example of all those thoughts that are about entities (such as numbers for example) whose abstract nature puts them outside the perceptual domain. But, even as regards concrete and therefore perceivable entities, perception is not necessary either. One can think of a concrete object without perceiving it, or even without ever having perceived it. Our question therefore only concerns those cases in which an object is within the subject's perceptual reach and ken. As regards these cases our main aim is to understand what role perception plays and how its playing such a role makes for a substantive difference in the way of functioning of perception-based thoughts.

Most people, and I side with them, agree in claiming that the way of functioning of perception-based (or more generally information-based) thoughts is different and irreducible to the way of functioning of thoughts which are not so based. While the latter fix their aboutness by specifying a set of descriptive identifying conditions (i.e. the conditions that something has to satisfy in order to qualify as the object the thought is about), the former fix it in a more direct way, a way that crucially depends on the existence of an information-perceptual link with the object itself.[1] But how does being perceptually linked with an object, being in

1 A distinction often used in this connection is that between satisfactional *vs.* relational models of the determination of the aboutness of a given thought.

contact with an object through one's perception of it, make available a way of thinking of the object that does not require the kind of cognitive, conceptual sophistication that is needed when the object is not perceptually available? A crucial step in answering this question goes through an understanding of the presentational role that perception plays in this connection. Clarifying this point helps in fixing one of the main differences between perceiving something and thinking of something. Both states are intentional in the sense of having directedness or aboutness. In so far as they are intentional, they present something to the subject (McGinn, 1988, p. 300). But, and here comes one crucial difference between them, the way in which the object is present is different in the two cases. Let me clarify this difference: in perception, the object is present merely in virtue of being there and within the subject's perceptual ken and reach (to have the object in view on the part of the subject only requires that her eyes are open and that she pays sufficient attention to it). Not so as regards thinking. In this case, the object's *being present* is the result of its *being presented*, that is: there must be something that puts the object before "the mind's eyes", so to say. In other terms, there must be something playing a presentational role. Thoughts differ as regards what plays this role: differences in ways of functioning have to do with what plays the presentational role and how. For thoughts that function according to the satisfactional model, the presentational role is played by a descriptive component in the thought's content (a component that specifies the conditions that something has to satisfy for being eligible as the object the thought is about). As regards perception-based thoughts however, the presentational role is played (wholly or partly) by perception itself. The object is presented (is brought before the eyes's mind) in virtue of its being present in one's perception of it. Perception puts us in contact with the object in such a way as to enable our thoughts to home in directly on it. But what kind of perceptual contact is required to that end? In particular, is a mere informational contact sufficient to home a subject's thought on the object that is the source of the information, or what is needed is something over and above a mere information-link?

In the next section I shall present Evans's account of perception-based thoughts that is one of the most influential theoretical proposals that have been put forward in order to address the above mentioned issues. According to Evans, the existence of a mere information-causal link is not sufficient to account for the kind of perceptual contact with an object suited to ground a thought about it. What more is required, according to Evans, is something that accounts for the subject's awareness of the object. In trying to account for such an awareness, Evans introduced modes of presentation of the objects conceived as ways of identifications that strictly depend on the existence of an information-link with the object. These modes are singular, object-dependent and very fine-grained. According to Evans, they are modes of presentations so conceived that account for the object's being perceptually presented to the thinking subject. Even though I agree that perception-based thoughts involve modes of presentation of their objects different from those involved in thoughts that function according to the satisfactional model, I disagree on how modes of presentations have to be conceived in order to provide awareness of the object. In particular, I shall claim that (i) Evans's modes of presentation do not account for the subject's awareness of the object, but rather presuppose it; and (ii) to account for such awareness one needs modes of presentations playing the role of ways of appearing.

After having introduced Evans's account, I shall take into consideration a criticism recently raised by Michelle Montague (2016) against it. Even though Montague's criticism and my own one present strong similarities, the way in which I propose to correct the inadequacies of Evans's account is very different from Montague's. The main difference has to do with the account provided of the role of appearances. Whereas she characterizes them in purely subjective, phenomenological terms, I opt for a characterization that makes room for

appearances conceived as objective and mind-independent features of objects. In my view only such an account is consistent with Evans' s claim that perception makes available ways of thinking that are about their object in a direct, non-descriptive, non-inferential way. The emerging picture provides an account of acquaintance which turns out to be closer to Russell's way of conceiving it than Evans's was, while avoiding at the same time the pitfalls of the sense datum theory that led Evans to part company from Russell's characterization of that notion.

2. Evans's account of perception-based thoughts

I shall here confine my attention to perceptual demonstrative thoughts,[2] that is thoughts that are typically expressed by sentences in which present-tense demonstratives occur such as "That G is F" (i.e. "that tree over there is a Pohutukawa", "that bird is a Kiwi", "that cup is yellow"). These are thoughts about spatio-temporal objects which are made available to a thinking subject on the ground of his standing in a perceptual relation with the objects his thought is about.

Evans's account of this kind of thoughts qualifies as an acquaintance-based account. In order to get a grip on the peculiarity of Evans's proposal it has to be stressed that there are two main families of such accounts: the epistemic and the causal ones.[3] Both depart radically from Russell's characterization of the notion of acquaintance,[4] mainly on the ground that it promotes an unbearable restriction of its extent to only sensible particulars, universals and abstract logical facts (1914, p. 127).[5] What motivates both parties in taking this move away from Russell is the willingness to accommodate within the relational model of genuine reference our ordinary reference to mind-independent objects. This point of agreement notwithstanding, the two families differ radically as regards the requirements they put on the acquaintance relation. Whereas the latter claims that a causal connection with the object is sufficient to ground a thought about it, the former, while acknowledging the relevance of causal links (and more generally of external constraints), stresses the need of an internal constraint (which is characterized in epistemic terms). Evans in *The Varieties of Reference* provided one of the most comprehensive account of the epistemic variety of the acquaintance-based model by criticizing the rival, merely causal, account that he labelled the "Photograph model" of singular mental reference. In that work, in the attempt to extend the application domain of the relational (i.e. non-satisfactional) model beyond Russell's strictures, in full

2 Perceptual demonstratives thoughts are for Evans a proper sub-class of demonstrative thoughts. Demonstrative thoughts for him include also spatial thoughts – of which "Here-thoughts" represent the paradigmatic case – and "I-thoughts" which are typically expressed by sentences in which a token of the first-person pronoun occurs. What motivates Evans in working with a unified category of demonstrative thoughts is a couple of ideas. First, the idea that all these thoughts share the same kind of identification of their aboutness. Second, the idea that the three kinds in question are not autonomous but complementary. In his account he illustrates the interplay between the three kinds by showing that one cannot demonstratively identify an object without at the same time being able to identify the place it occupies, where this identification requires, in turn, the capacity on the part of the thinking subject to conceive of himself as an object among others.

3 For the difference between these two accounts and their respective pros and cons see Hawthorne & Manley (2012).

4 For Russell's characterization of the notion see Russell, 1911, pp. 209-210; 1912, p. 46 and 1914, p. 127. In these passages Russell characterizes acquaintance as a dual cognitive relation between subject and object, a relation that provides awareness of the object in the most possible direct way, that is without the intermediary of any process of inference or any knowledge of truth. For Russell, acquaintance is the most basic cognitive relation in the sense of being presupposed by all other cognitive relation (among which he mentions: attention, sensation, memory, imagination, believing, disbelieving).

5 For Russell (1912, p. 51) we have acquaintance in sensation with the data of what he calls the outer senses, in introspection with the data of what he calls the inner sense, in memory with things that have been data either of the outer senses or of the inner sense. He also admits that we have acquaintance with universals, logical forms and (perhaps) oneself.

adherence with "Russell's Principle" (RP) (also known as "the know-which requirement"),[6] Evans promoted a radical revision of Russell's picture whose upshot is his neo-Fregean theory of singular, object-dependent thoughts.

Before illustrating the main points of departure from Russell's theory, it is worth stressing the extent of Evans's agreement with Russell. First of all, Evans agrees with Russell on the idea that genuine referential expressions do not function in the way in which definite descriptions do. The main difference between the two kinds of expressions amounts to the fact that in the case of the former, but not of the latter, their contribution to the thought (proposition in Russell's terminology) expressed depends on their having a referent, in such a way that if there is no referent there is no thought/proposition expressed.[7] The second point of agreement is the idea that what has to be considered in order to account for the different way in which the various referential expressions perform their common function – i.e. that of identifying an object – is the way in which the thoughts expressed by utterances in which referential expressions occur are about the objects they are about (Evans, 1982, p. 64). Thirdly, Evans agrees with Russell on the idea that what has to be considered in order to account for the way in which the aboutness of a given thought is secured is the kind of knowledge of the object that a subject has to have in order to think the thought in question, or, which amounts to the same in his view, in order to understand an utterance which expresses it. Finally, he agrees with Russell on the idea that genuine singular thoughts have to be grounded (on pain of the whole system of identification failing to be tied down to a unique set of objects)[8] on a kind of knowledge of the object radically different from knowledge by description. The kind of knowledge in question depends on the subject's being *en rapport* with the objects of her thought in such a way that no such thought would be available if the objects in question did not exist and the subject did not stand in this particular kind of relation with them.

These points of agreement notwithstanding, Evans disagrees with Russell on the idea that the only objects about which one can have direct non-inferential knowledge are mind-dependent ones.

Let us now consider how Evans's project of extending the relational model beyond Russell's narrow limits in full adherence to the "know-which requirement" is achieved. There are at least four points that need to be acknowledged to appreciate Evans's project. The first two are: (1) the rejection of Russell's interpretation of genuine epistemic requirements upon direct reference as requirements of infallibility, and (2) the rejection of Russell's Cartesian conception of the mind.[9] The adoption of these two points – which corresponds to the first step of Evans's strategy – makes it possible to extend Russell's model of acquaintance to ordinary spatio-temporal, mind-independent objects. The other step of his strategy – which aims at making the obtained extension compatible with the dictates of (RP) – is achieved

6 The requirement according to which in order for a subject to have a thought – or to make a judgment – about an object she must have knowledge of which object is in question (Russell 1912: 58). For the connection between Russell's Principle and the Principle of acquaintance see Sacchi 2001, pp. 21-29.

7 Thoughts expressed by genuine referential expressions are thus claimed to be "object-dependent" or, as Evans labels them, "Russellian thoughts".

8 Evans is here considering the problem of "massive reduplication" raised by Strawson (1959, chp. 1).

9 The two points are strictly connected: it was Russell's adherence to a Cartesian conception of the mind (and in particular to the idea that we have infallible and authoritative knowledge of the items in the mental domain) that motivated his peculiar way of interpreting the nature of the epistemic requirements upon direct reference. The upshot of Evans's move is to acknowledge that we are directly knowledgeably open to the world in thought, even though our "openness" is intrinsically fallible. This is so because, according to Evans, which contents we happen to entertain depends (among other things) on which objects in the world we directly interact with, objects about whose existence and nature we cannot be infallible.

though (3) the rejection of the idea that Russell's intuitions about the functioning of genuine referential expressions are incompatible with the ascription to those expressions of a sense, and (4) the acknowledgment of the possibility of non-descriptive singular senses. These non-descriptive modes of identification are, according to Evans, singular object-dependent senses. They are ways of identification of particulars that depend for their existence on the identified particulars themselves. In Evans's Frege-inspired revision of Russell's relational model of singular reference the kind of direct, non-inferential knowledge of the object able to ground non-descriptive thoughts amounts to the subject's practical ability to discriminate the object of her thought from any other objects, on the ground of the subject's standing, or having been stood, in some kind of direct, experiential, contextual relation with the object itself, where the paradigm of this kind of relation is provided by (even though not restricted to) the perceptual case (Evans, 1982, chp. 5).

Crucial in Evans's proposal was a drastic revision of the notion of experience. Evans replaced Russell's somewhat technical use of the notion – which was motivated by Russell's idea that the term 'experience' must not be used uncritically in philosophy on account of the "vague, fluctuating and ambiguous" meaning of the term in its ordinary use (Russell, 1914, p. 129) – with a use according to which experiencing an object means consciously receiving information from it. But for Evans, unlike Russell, experiencing an object is not sufficient in order for a subject to have knowledge of the object. Having knowledge of the object is for Evans having a discriminating knowledge, acquired on the basis of the subject's receiving or having received information from the object. This kind of discriminating knowledge does not amount to possessing some piece of propositional knowledge. Rather, it is a kind of "practical" knowledge (knowledge of the "know-how" variety) which manifests itself in the subject's capacity to attend selectively to a single thing over a period of time or, as Evans puts it, a capacity to keep track of it. Having this discriminating ability is for Evans to possess an "idea" of an object. In turn, having an idea of an object amounts to having a general ability that "makes it possible for a subject to think of an object in a series of indefinitely many thoughts, in each of which he will be thinking of it in the same way" (1982, p. 104).[10]

I think that Evans was right in stressing, against what he called "the Photograph Model", that a correct account of perceptual demonstrative thoughts requires not only an external constraint but also an internal one. The role of the internal constraint was to account in his view for the way in which the object is presented. In stressing the role of a "presentational element" in an acquaintance-based account of mental reference Evans showed adhesion to an important aspect of Russell's picture, according to which the acquaintance relation between subject and object is the converse of the relation between object and subject which constitutes presentation (Russell, 1911, pp. 209-210). A subject is acquainted with an object only insofar as the object is experientially presented to him. But what kind of presentedness has to be in place in order for one to stand in an acquaintance relation with something suited to ground a thought about it? Moreover, does Evans's account provide an adequate characterization of it?

3. Revising Evans's account

Evans's account has been very influential in all the subsequent philosophical debate on the intersection between perception and thought. Some scholars have tried to develop more broadly some of Evans's insights by preserving his main tenets while others have taken a more radical critical attitude towards his proposal. Some people have criticized Evans's idea that perceptual demonstrative identification requires the capacity on the part of the thinking subject to locate the object in the objective space. Contra Evans, people like Campbell

10 This is called the "Generality Constraint" that Evans put on the possession conditions of concepts.

(2002, p. 112) for example, have contested the necessity of Evans's internal requirement by claiming that a subject can entertain a perceptual demonstrative thought about an object even though she is wrong about the object's actual location.[11] Here we will not consider those criticisms that contest the necessity of Evans's requirements; rather, we shall concentrate on criticisms that are targeted on their sufficiency. One such criticism has recently been raised by Montague (2016) in the context of developing an account of what she labels the "access problem" and that she presents as "the problem of giving a characterization of the mechanism that determines *which particular object* a subject is perceiving or thinking of on a particular occasion" (p. 142). As a matter of fact, this very issue was at the core of Evans's philosophical project as well (even though Evans would not have resorted to the notion of "mechanism" in framing the problem) and Montague's discussion of Evans's answer to that problem is aimed at paving the way for her alternative proposal. Montague agrees with Evans that no purely externalist answer to the access problem can be adequate and that an internal requirement accounting for the way in which the object is presented is an indispensable ingredient of any adequate explanation. Her point of disagreement with Evans concerns the nature of the internal requirement. In her view, Evans's way of accounting for the access problem in terms of Russell's Principle (the "know-which requirement") was wrong. She says that one of the main distinctive feature of her view as opposed to a view such as Evans's based on (RP) "is the emphasis it places on the phenomenological features of experience. It states that a certain number of phenomenological features of a perceptual experience need to be in place in order for the perceptual experience to qualify as perceiving some particular object [...]. The claim, then, is that one has to consider phenomenology, narrowly construed, when determining the object of a thought or perception" (pp. 145-146). We can rephrase this point by saying that the main point of disagreement concerns the nature of the internal requirement: Evans characterizes it in epistemic terms (in terms of a notion of knowing-which that he took to be more basic than the notion of thinking of an object) while Montague provides a phenomenological characterization of it. In order to show the inadequacy of Evans's account, Montague proceeds by presenting some cases in which, even though Evans's conditions are satisfied (according to her interpretation of those conditions),[12] there is a strong reluctance in allowing that in such cases the subject succeeds in homing her thought on the object. She provides an example in which a subject is in causal contact with something (a garden shed) but, due to some kind of garbling and distortion, the light-waves reflected by the shed reach the subject rearranged in such a way that the subject ends up having an experience as of a pink elephant (p. 153). According to Montague, since the subject is in causal contact with the shed and has discriminating knowledge about it (in so far as she can locate and track it), it ought to follow, if Evans were right, that the subject can think about the shed. But this is false; the subject of the example does not see the shed (because her apprehension or representation of it is too inaccurate) and *a fortiori* cannot think about it either (assuming, she adds, that the subject has no other access to it); therefore, Montague concludes, Evans's account is wrong (pp. 159-161). The strategy that Montague follows to show that Evans's internal condition

11 In Evans's picture, the necessity of the "location requirement" is grounded on the role played by "fundamental ideas". The part of his work having to do with such ideas and the role they are supposed to play in accounting for the "Generality Constraint" is, according to many people, one of the most problematic in his overall picture. I have dealt with this topic in Sacchi, 2001, pp. 97-107 where I revised Evans's requirement with a weaker one based on the notion of "apparent location" of the object.

12 I stress this point because, as I shall say, I do not think that her interpretation of Evans' s conditions does full justice to Evans's account in so far as it does not assign to a notion that occurs in Evans's picture (the notion of "having an adequate conception of the object") the importance I think it deserves.

on the access problem is wrong is therefore the following: first she tries to show that it is insufficient in the case of seeing an object; then she extends this point to the more general issue having to do with what it is for a subject to have an object in mind.[13] It is important to clarify that for the sake of Montague's argument it is fundamental that the case presented is not taken as one of hallucination. For if it were, the external requirement would not be satisfied: an object must exist in order for a subject to stand in an information-link with it. She also rules out that such a case can be taken as one of illusion, because illusion requires that the object be perceived (albeit misleadingly), whereas in the case considered this requirement is not satisfied due to too strong a deception on the subject's part. We can say that the degree of deception that this case presents is lower than that of hallucination but somewhat higher than that of an ordinary illusory experience.[14] Montague's suggestion is to treat it as a case in which while the subject is in visual contact with the object, she is not in perceptual contact with it.[15] Visual contact for her is something in between mere informational contact and true perceptual contact. It requires visual phenomenology and also that some counterfactual dependencies related to eyes and body movement hold (the subject's experience of the object must correlate with his eyes and body movements).[16] But mere visual contact is not enough for seeing, she claims. The subject of the example does not see the shed because there is too much mismatch between how things appear to her and how things are. It is precisely such a mismatch that prevents the subject from being in perceptual contact with the shed. But how wrong can one be before perceptual contact fails? Her answer to this question is the "matching content view" according to which "for a perceptual experience to be about an object, there must be a certain degree of match between the properties an object has and the properties the perceptual experience represents the object as having" (p. 145). The idea is therefore that one must correctly represent a sufficient number of the object's properties in order for it to be true that one sees the object. To sum up: in order for someone to be in perceptual contact with an object it is not enough either to stand in an informational contact with the object, or to stand with it in visual contact, or to possess a discriminating idea of the object. What more is required is that the subject's experience has the right kind of content, a content which she qualifies as phenomenological in so far as it concerns the properties that the represented object (phenomenally) appears to have. Which object a given subject is in perceptual contact with is the one that satisfies most or a 'weighted most' of the set of the properties that the subject's experience represents the object as having.

Is Montague right in claiming that Evans's account is inadequate because he would have said that the subject of the example can think about the garden shed? I have to express my disagreement with Montague on this point. In my view, what Evans would have said as regards her example, which is very similar to one he himself provides (Evans, 1982, pp. 196-197), is that the subject cannot be credited with such a thought because, even though his attempted

13 Actually, it has to be stressed that Russell's Principle was not meant by Evans as an internal requirement applicable to perceptual experiences, but only to thoughts. Not only the claim that in order to perceptually experience an object a subject has to have a discriminating idea of it does not figure in his work, but it also seems to collide with his adherence to non-conceptualism as regards the content of perceptual experience.

14 Ultimately it is not very clear how one should treat such a case. Is it a case of imagination somewhat prompted by visual stimulation?

15 I find this distinction somewhat unclear. Moreover, her characterization of the notion of perceptual contact in terms of phenomenal content seems to me to be tendentious.

16 This is how Montague characterizes this notion: "Visual contact is causal and sensory contact of a sort that involves the impact of light on a sensory organ, and gives rise to experiences of colour and shape of a kind that can be sufficiently indicated by saying that they are of the same sort phenomenologically speaking as experiences of the kind we call 'visual'" (2016, p. 154).

thought is based on information derived from the shed, the information-link at play does not provide the subject with an *effective route* to the shed (notwithstanding the subject's ability to locate and keep track of it). And this is so because the *conception* of the target which governs the subject's attempted thought of the shed is too defective in this case. The notion of conception that Evans mobilizes in this connection is very important to address the issue at stake; I think that Montague, while considering the passages in which Evans makes use of this notion, does not give it the importance it deserves. According to Evans, an information-based thought is governed by a conception of its object that is the result of a belief about how the world is which the subject has because he has received information (p. 121).[17] He adds that as far as perceptual demonstrative thoughts are concerned, their governing conception is determined only by the content of the perception. He admits that the information link may not be functioning well so long as it provides an effective route to the object (p. 179). This requirement is not satisfied when there is too much error in the perceptual-based beliefs that the subject forms on the basis of the information-link and which ground the guiding conception of his attempted thought. Seeing a garden shed as a pink elephant is to host an inadequate conception of the target which, in turn, prevents a subject from entertaining a sufficiently clear idea of the object. In such cases, Evans says, "there is some inclination to say that the attempted thought lacks a content" (p. 197). So, to resume my assessment of this case, I think that, given the role that Evans assigned to the notion of "having an adequate conception of the object" he would not have taken cases such as the garden shed one as counterexamples to his account of perceptual based demonstrative thoughts.[18] If I am right, it follows that Evans's account of the internal requirement is more complex than Montague's reconstruction of it in so far as it does not seem to be exhausted by Russell's Principle. By integrating within the picture the notion of "having a conception of the object" the result is a threefold requirement on a subject's ability to perceptually demonstratively refer to an object in one's thought:

i. the subject must stand in an information-link with something (the thought's target);
ii. the subject must be able, on the ground of that link, to form an adequate conception of the thought's target;
iii. the subject must be able, on the ground of that conception, to form a sufficiently clear idea of an object (an idea that singles that object out from any other object).

It is true that in the example that Montague provides the subject is in an information-link with the shed and moreover possesses discriminating knowledge of it. But, if my interpretation of Evans's requirement is correct, this would not be enough in order to credit the subject with a thought about the shed, because in such a case clause (ii) of the complex requirement is not satisfied. This said, it has to be emphasized that, besides some few scattered hints, Evans did not provide any detailed account of what it is for a guiding conception to be adequate. This is certainly a lacuna in his account. But what this lacuna shows is that Evans's account, as

17 What he meant in speaking of a subject's thinking being governed by a conception of its object is that "the way he entertains the thoughts (as probable, improbable, true, or false), and the significance he attaches to them (the consequences he is prepared to draw from them) are determined by the content of this conception" (p. 121).

18 It is true that Evans says that a subject can have a perfectly clear idea of an object even though she misperceives its properties and get altogether quite a wrong view of the thing (p. 179). But he also adds that what is required is that the information-link with the object provides the subject with an effective route to the object. In my way of reading Evans, the satisfaction of this requirement has to do with the kind of conception of the object that the subject is able to acquire on the basis of her perceptual experience.

it stands, is incomplete, not that it is wrong. What interests me here is to consider whether there is a way in which this lacuna could be filled in a way which is consistent with Evans's claim that we can make direct, non-inferential reference in our thinking to ordinary external objects.

4. Modes of presentations and ways of appearing

What is lacking in Evans's official doctrine is a detailed account of what it is for a subject to entertain an adequate conception of a thought's target. In my view, in order to provide such an account, Evans should have assigned to conscious experience a far more important role than he did. He stressed that the information received from the object must be consciously possessed by the subject (p. 158), but what he meant by this was that the information must be poised for use for the direct rational control of thought and action.[19] We can say, by resorting to Block's (1995) distinction between access consciousness and phenomenal consciousness, that Evans only considered the cognitive-access aspect of conscious experience, almost neglecting its experiential-phenomenal aspect. What was needed instead was an account of how an object has to appear in order for a subject to be in perceptual contact with it. He acknowledged that not any possible way of appearing is compatible with the subject's standing in perceptual contact with an object. But then he did not say anything about how ways of appearing of the object have to be conceived and moreover in which relation do they stand with (cognitive) modes of presentation.

Let me expand on this point in order to clarify the connection between cognitive modes of presentation, ways of appearing and awareness of the object. In several passages of his work, Evans explicitly links the notion of a mode of presentation with the notion of awareness of the object (1982, p. 83). Awareness of the object should provide the subject with an "effective route to the object". And yet, cognitive modes of presentation do not seem to be good candidates for playing that role. As a matter of fact, in the garden shed example provided by Montague the subject possesses discriminating knowledge of the object (she can locate the object and keep track of it) and therefore possesses a mode of presentation of the object and yet what she lacks is precisely awareness of the object.[20] This raises a perplexity that it is important to articulate in order to understand what I take to be an ambiguity hidden behind Evans's use of the notion of "having an effective route to the object". The perplexity is the following: how could a subject in a situation such as the one that Montague presents lack an effective route to the object, given that she can locate and keep track of it? Isn't this enough in order to have an effective route to the object? In general, Evans's use of this notion is taken to have cognitive-epistemic connotations and it is presented in connection with modes of presentation. A mode of presentation, so conceived, is something that provides a subject with an epistemic route to the object the mode of presentation is a mode of presentation of. In the garden shed example we can say that the subject has a cognitive-epistemic route to the object and yet such a route turns out to be incapable in homing the thought on the relevant object because of the lack of "another kind of route", experiential rather than cognitive, actually more basic than the previous one. How does the notion of having an effective experiential route to the object have

19 In one of the rare passages in which he talks about conscious experience he says "we arrive at conscious perceptual experience when sensory input is not only connected to behavioural dispositions [...] but also serves as the input to a *thinking, concept-applying, and reasoning system*; so that the subject's thoughts, plans, and deliberations are also systematically dependent on the informational properties of the input. When there is such a further link, we can say that the person, rather than just some part of his brain, receives and possesses the information" (Evans, 1982, p. 158).

20 People who claim that awareness of the object only requires possession of information about the object enabling the subject to point to it will disagree on this point. For a discussion on this issue see e.g. Dretske, 2006.

to be conceived then in its application to the content of perceptual experience? I think, and this is what I take to be the second reading of Evans's use of this notion, that such a notion in its non-cognitive/epistemic reading, concerns the appearance of the object. A perceptual experience provides a subject with an (experiential) route to the object (able to ground a cognitive-epistemic route to it) in so far as it makes the object appear to the subject. This is required in order to be perceptually aware of the object. A subject cannot be perceptually aware of an object if the object does not appear to her and the object's perceptually appearing to her is what provides the subject with an experiential route to the object.[21] This conclusion has important repercussions on Evans' picture. Cognitive modes of presentation do not account for awareness of the object after all. If such an awareness is not already provided, they are by themselves unable to provide it. It follows that Evans was wrong in thinking that they are cognitive modes of presentation that provide awareness of the object.

I think that behind Montague's criticism of Evans's account there is a similar diagnosis of what is lacking in it. She claims that Evans's internal requirement (clause (iii) in the threefold requirement) is not sufficient because that requirement can be instantiated even in cases in which the subject is not in perceptual contact with the object. As I said I think she is wrong in claiming that in the case presented Evans would have said that the subject can think about the shed (because in such a situation clause (ii) would not be satisfied). But she is right in claiming that an internal requirement only framed in terms of Russell's Principle is insufficient. As I said, I take it to be insufficient because, by itself, it does not provide awareness of the object. It is true that Evans stressed that the subject needs to possess an adequate conception of the object, but he actually did not articulate this point. My suspicion is that had he explicitly articulated this part of his proposal, he would have been compelled to downplaying the role of (cognitive) modes of presentation in his account and conceive of them as grounded on more basic modes of presentation having an experiential nature.

It seems that in his attempt to combine Russell's picture of direct reference as a kind of semantic relation grounded in a basic epistemic relation of acquaintance with Frege's idea that reference is always guided by modes of presentation of the object, Evans has ended up impoverishing Russell's notion of acquaintance to the point of making it unsuited to provide the kind of direct (experiential) contact with the object able to sustain awareness of it. But could Evans have filled this lacuna without abandoning the idea that perception-based thoughts are about ordinary external objects in a direct, non-inferential way?

To start answering this question let us consider whether Evans could have filled such a lacuna by adopting something along the lines of Montague's matching content view. Actually, there are passages in Evans's work that seem to encourage the idea that he had something similar in mind when he talks about the adequacy requirements upon a subject's conception of an object.[22] He explicitly says that there are cases in which it is not appropriate to credit the subject with an adequate conception of the object, because there is too much mismatch between how things appear and how things are. Does this show that he could have had in mind

21 To sum up: I think that Evans's use of the notion of "having an effective route to the object" is ambiguous between a cognitive-epistemic reading and an experiential one. Even though Evans did not explicitly articulate the relationship between these two readings of the notion, it seems coherent with what he says about the role of the notion of "having an adequate conception of the object" that the experiential reading is more basic than the cognitive-epistemic one. Ditto for the relationship between ways of appearing (or experiential modes of presentation) and cognitive modes of presentation. The former account for awareness of the object. The latter presuppose such an awareness and make it manifest at the cognitive level (in particular, in the subject's ability to take information from the object as immediately germane for the semantic evaluation of her thoughts about it).

22 On p. 134 note 21 for example he says "There is some degree of incorrectness in a subject's conception of an object that makes it pointless to ascribe thoughts about it to him".

something along the lines of the matching content view?
In my view, whatever he could have had in mind, such a picture would not have been compatible with his idea that singular thoughts secure their reference in a direct, non-descriptive way. In my view, the adoption of the matching view would not have allowed him to preserve this central feature of his account of singular mental reference. To see why this is so, let us consider the account that Montague provides of what she calls the mechanism of the determination of the aboutness of a perception-based thought. In her view, the thought's aboutness is determined partly by external features (causal-information connections with the environment) and partly by internal phenomenal features. What a given thought is about is the object that stands in the right kind of causal connections with the thought and that satisfies most or a 'weighted most' of the set of the properties that the thought's content represents the object as having.[23] Such a content involves modes of presentation of the object that are only contingently related with the objects a given thought is about.[24]
Could Evans have endorsed one such model? I think not, because he would have considered it inadequate to account for the peculiar way of functioning of singular information-based thoughts. For him, such thoughts do not function in a descriptive way and they do not settle their aboutness by way of a satisfactional (or causal-satisfactional) mechanism. Rather they fix it in a very direct way: the object a given information-based thought is about is the one that constitutes the modes of presentation that figure in its content. The object-dependency of modes of presentation was for Evans a non-dispensable feature in the account of the nature of what he, not accidentally, called singular thoughts.
It has to be stressed that this point is well taken by Montague, whose account of the access problem has actually an important section specifically devoted to the particularity issue. For her, a singular thought is a thought that purports to be about a particular individual (in this sense it differs from a purely descriptive thought that purports to be about whatever is the satisfier of a uniquely identifying definite description). This particularity however is not cashed out in terms of object-dependency, but rather in terms of a feature of the cognitive phenomenal character of the mental state that grounds the state's content. She calls this feature "the fundamental object-positing feature or taking as object".[25]
Whether the peculiar way of functioning of singular thoughts is actually reflected in their phenomenology,[26] the question still remains as to whether a phenomenological account of particularity is adequate to capture the kind of particularity that Evans wanted to capture in his account. One important distinction in this connection is that between two senses of particularity: the phenomenological and the relational sense.[27] It is the latter that Evans

23 In specifying the mechanism of reference determination, Montague makes use of the so-called "cluster" version of the description theory. Her proposal is similar to Searle's even though, as she clarifies, while Searle's view proposes both a sufficient and a necessary condition on reference, her proposal only requires that the weighted cluster of descriptions be a necessary condition (p. 161).
24 The idea that there are internal, phenomenological constraints on the determination of the aboutness of a given thought is present in other authors who defend the phenomenal intentionality thesis. A case in point is provided by Horgan and Tienson (2002) in particular as regards the role they assign to "grounding presuppositions" (the set of presuppositions, determined by phenomenal intentionality, concerning the existence of, the persistence of, and various features of, the sort of entities presented in experience (528)).
25 "The idea is that demonstrative thoughts involving bare demonstratives such as [that (thing)] manifest a fundamental category of our thinking and indeed our experience in general—the concept or category OBJECT [...]. Object-positing delivers the this-object of perceptual experience. Even more strongly put, object-positing is the experiencing of a this-object. Experiencing this kind of thisness is a matter of being presented experientially with an identifiable and usually persisting unity, and this is just what object-positing does" (Montague, 2016, p. 138).
26 This is a claim explicitly endorsed by Farkas (2008) for example.
27 For this distinction see e.g. Schellenberg (2010) where the contrast between the two senses is expressed in

thought was indispensable in an account of singular thoughts and such a sense is not explained by the former, nor can it be reduced to it (Sacchi, 2013). That's why I think that Montague's proposal could not have been coherently accepted by Evans.

Is there a way in which Evans could have developed his picture in order to integrate the role that the appearance of the object plays in an account of awareness in a way compatible with the idea, taken from Russell, that the object itself is a constituent of the thought? I think that a positive answer to that question can be provided and in the remaining part of my paper I shall try to sketch how such an account could be given. One such account ought to satisfy (at least) the two following requirements: (i) it ought to mobilize ways of appearing of the object suited to account for the subject's awareness of the object; and (ii) suited to provide a non-satisfactional explanation of the mechanism of reference determination. Regardless of whether Montague's proposal satisfies the first requirement, the second one is not satisfied in the picture she provides.

I think that one of the main difficulties in trying to satisfy both requirements is due to the tendency to read the notion of appearance only in its psychological sense (as something having only to do with the subjective modifications in the subject's experience). Actually, this is an important sense of the notion of appearance, but it does not exhaust its full sense. As a matter of fact, nothing (different from the subject and her inner world) would appear to a disembodied soul in an empty world. Something (different from the subject and her inner world) appears to us because there is a world out there that appears. And that world would still appear even if no experiencing subject existed. In such a case there would not be appearing in the subjective, psychological sense, but there would still be appearing in the objective sense of the notion (Johnston, 2009). It is precisely this objective sense that is in my view relevant to consider here and this sense becomes available once one stops fixing only on the subjective reading of the notion. So the relevant contrast here is one between a subjective and an objective reading of the notion of "way of appearing". Let us try to clarify this distinction by making an example. Right now in front of me on my desk I have my laptop open. My laptop is purple and it appears purple. Its appearing purple has both a subjective reading (my experience of the colour of the laptop has a purple-ish phenomenal character) and an objective reading (the laptop appearing purple is a feature of the laptop itself: its looking purple is as objective as its being purple).[28]

The notion of appearance here is connected with the notions of look, seem. Jackson famously articulated some strands of these cognate notions by distinguishing three different, albeit related senses of them, namely: the epistemological, the comparative and the phenomenological. What I am here saying is that such a tripartition does not capture the complexity of these notions. There is (at least) a further sense, relevant to the phenomenological one, that is objective rather than subjective (Martin, 2010; Maund, 2003, cap. 7). The notion of a phenomenological-objective sense of appearing, while not as widespread as its subjective counterpart, figures in different authors.[29] So, there does not seem to be anything weird with such a notion. But how could such a notion be used in an account of perceptual contact that does not appeal to something along the lines of the matching content view?

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the following way: "a mental state instantiates relational particularity if and only if the experiencing subject is perceptually related to the particular object perceived. A mental state instantiates phenomenological particularity [...] if and only if the particularity is in the scope of how things seem to the subject, such that it seems to the subject that there is a particular object or a particular instance of a property present" (Schellenberg, 2010, pp. 22-23).

28 The idea that there are objective ways of appearing is very well expressed in a passage by Austin in which he claims "I am not disclosing a fact about myself, but about petrol, when I say that petrol looks like water" (1962, 43).

29 See, for example, Shoemaker (1994, 2000) for the view that appearances are partly objective, and Noë (2005) for the idea that appearances are "perspectival properties" of objects. See also Schellenberg (2008) and Genone (2014).

This is the suggestion toward which I am inclined.[30] A subject is in perceptual contact with an object (and therefore has an adequate conception of it) if and only if she has an experience that is constituted by a phenomenological-objective way of appearing of the object (where a phenomenological-objective way of appearing is something that reveals properties that the object possesses relative to some environmental-contextual features such as the subject's point of view, the lighting conditions and so on and so forth). Let me make some example. The white way of appearing of a white wall under a neutral light is a phenomenological-objective way of appearing of the wall, because it reveals a property that the object possesses. But also the yellowish way of appearing of the white wall under a yellow light is a phenomenological-objective way of appearing of the white wall, because it reveals a property that the object possesses under those conditions: white objects have the property of appearing yellow under a yellow light. Ditto for a round coin appearing elliptical when seen from a certain position. A phenomenal-objective way of appearing is objective under several regards: it reveals properties of the object and it is something that any subject in the same environmental conditions would enjoy. Phenomenal-objective ways of appearing are modes of presentation of the object's properties, they are the way in which those properties are revealed to us; they play so to say a "revelational role". The requirement stated is not satisfied in the garden shed example provided by Montague. An elephantine way of appearing is not a phenomenological-objective way of appearing of the garden shed, i.e. it is not a possible way in which the garden shed can manifest some of its properties. That's why in such a case I think it is wrong to say that the subject can see the shed and consequently think about it. As it turns out, an account of perceptual contact framed in terms of phenomenal-objective ways of appearing does not make any appeal to the idea, central in the matching content view, that the properties represented in the content of the subject's experience has to match, to a sufficient degree, the properties that the object the experience is of possesses.

Phenomenological-objective ways of appearing constitute the contents of the subject's perceptual experiences that ground her perception-based thoughts. I ultimately think that something along the lines I have indicated could be implemented within Evans's picture in order to fill the lacuna that his account of perception-based thoughts presents in a way which preserves his idea concerning the peculiar way of functioning of this kind of thoughts. Evans acknowledged that not any possible way of appearing is compatible with the subject's standing in perceptual contact with an object. But then he did not say anything about how ways of appearing of the object have to be conceived. I ultimately think that this lacuna has its source in Evans's attempt to avoid the pitfalls of the sense-datum theory which, in his view, was responsible for Russell's inadequate conception of the notion of acquaintance. The fact that Evans stripped Russell's notion of acquaintance of any phenomenological import prevented him from providing an adequate account of the converse notion of presentation. He tried to account for it in terms of ways of thinking of the objects informationally grounded. But modes of presentation, so conceived, are not enough to capture the notion of presentation in its full sense. This is so because such modes of presentation (I have labelled them *cognitive modes of presentation*) do not ultimately account for the kind of awareness of the object that perceptual contact requires. What I have attempted to do in this paper is showing a possible way out that could have enabled Evans to provide a more adequate account of the notion of presentation without falling into Russell's error. This way out hinges on a phenomenological sense of the notion of ways of appearing that is objective rather than subjective.

30 I do not have enough space here to fully develop this proposal. Here I shall confine myself to provide a very sketchy presentation of it.

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