DEPICTING MOTION IN A STATIC IMAGE. PHILOSOPHY, PSYCHOLOGY
AND THE PERCEPTION OF PICTURES

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Abstract

This paper focuses on whether static images can depict motion. It is natural to say that pictures depicting objects caught in the middle of a dynamic action - such as Henri Cartier-Bresson's *Behind the Gare St. Lazare* - are pictures of movement, but, given that pictures themselves do not move, can we make sense of such an idea? Drawing on results from experimental psychology and cognitive sciences I show that we can. Psychological studies on implicit motion and representational momentum indicate that motion is really perceived in some static images: our visual system is built in order to detect motion even where it is only implied and to anticipate the probable outcomes of others' actions - even when the “others” are only pictures' subject matters. I argue that, consequently, a range of popular depiction theories - perceptualist theories of depiction - can accommodate depicted motion.
Painting extends over all the ten functions of the eye; that is,  

*darkness, light, body, colour, shape, location, remoteness, nearness, motion, and rest.*

Can static pictures depict motion and temporal properties? Famously, Lessing (1766) wrote a book intended to convince painters and sculptors to give up the temptation to narrate: painting and sculpture are arts born to make a scene visible, but are inapt where beauty and intuitive richness arise from the development of an action. Lessing’s position - labelled by Gombrich (1964) “the traditional view” - was common in 18th century discourse on art and aesthetics: there is no temporal dimension in static pictures; the scene depicted is frozen and merely represents a moment, an instant, a *punctum temporis*. Currie (1995) raises two contemporary versions of the traditional view: static pictures cannot depict motion or temporal patterns (i) because there is nothing that *resembles* motion in the content of a static picture (no resemblance) and (ii) because the spectators’ motion-*recognition* capacities are not activated while looking at a static picture (no recognition). Static images can at best non-pictorially represent motion, but they cannot depict it. In today’s analytic aesthetic, this is a widely held position: LePidevin (1997) argues that pictures can only depict how moving objects are at an instant, and thereby non-pictorially represent a broader movement;\(^2\) Friday, following Warburton (1988), suggests that ‘photographs are clearly not something that we can use to see temporally extended events’ (Friday, 1996, p. 33); Abell claims that a still image ‘might depict a moment in time. It may even be possible to infer from the moment depicted

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either what events have led up to it or what events will follow. However, such pictures are incapable of depicting events as occurring in a temporal sequence’ (2010, p. 278); for Benovsky ‘a photograph can represent temporal extension via its narrative function but it cannot depict it in this way since no change or movement is visually directly accessible to the observer of the image’ (2012, p. 202); finally, for Shardlow “we may be able to depict movement, stasis and intervals of time in film, but on a canvas there is no time to move”(2020, p. 20).

Against the traditional view, the opposite theoretical camp claims that movement can in fact be depicted in a static image. Gombrich (1964) was already against the limitation imposed by Lessing: for him, static images depict more than a punctum temporis, because such a thing as a punctum temporis does not exist, neither psychologically, nor metaphysically. More recently, two main “positive” approaches can be distinguished among the few papers on the topic: (i) trying to show how might this or that account of depiction accommodate the depiction of things in time by still images - LePoidevin (2007), Walton (2008) and Young & Calabi (2018) all fit this pattern; (ii) focusing on the analysis of a special kind of image that seems to be the most effective way to depict motion: long exposure photographs and futurists’ streaky images - this is the road followed by Benovsky (2012), Kulvicki (2016) and LePoidevin (2017).

In this paper I put forward a new argument to show that motion and temporal properties can be depicted in static images, but my analysis differs from that of the “positive” approaches just outlined. On the one hand, I do not focus on streaky images - as Benovsky, Kulvicki and LePoidevin did - but I concentrate on pictures that depict objects caught in the middle of a

3 Benovsky, then, is in both the “negative” and “positive” camps. In fact, Benovsky suggests that streaky photos can depict temporal patterns though, as Kulvicki noticed, ‘it is hard to square those remarks with the previous one’ (Kulvicki, 2016, p. 346).
is partly because streaky images are not what Lessing and contemporary “traditionalists” have in mind when they deny that static pictures can depict temporal properties, and partly because I think that streaky images are a peculiar kind of image that deserves a peculiar type of analysis. On the other hand, I do not focus on a single theory of depiction, but I take what is at the basis of our engagement with pictures more generally: pictorial experience aka picture perception. Moreover, in order to answer the original question, I examine what experimental psychology and cognitive sciences tell us about the nature of our responses to pictures such as Cartier-Bresson’s photograph. While psychologists have been interested in the depiction of motion in static images, potential connections between their results and the philosophical debate remain under-explored. In this paper, I show that we have empirical reasons for considering the pictorial content of images such as *Behind the Gare Saint-Lazare* as giving visual information about an interval and not a mere instant: the temporal/dynamic contents of experience are richer than the above mentioned theorists appear to acknowledge, insofar as such theorists focus on the mere presence (in films) and absence (in pictures) of motion-like phenomenology. But, I maintain, perceptual content outstrips phenomenology. I argue that, consequently, perceptualist theories of depiction should accept that motion and temporal extension can be depicted in static images.

Section I isolates the kind of picture upon which this paper focuses. Section II defines depiction, pictorial experience and pictorial content, and outlines perceptualist theories of

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4 Analysis that will be the subject of another paper. Here, it will suffice to say that I take streaky images to display a peculiar graphic solution that adds a further complexity in the process of interpreting their pictorial content. Even if I broadly agree with the authors previously cited, who claim that long exposure photographs (Benovsky 2012, Kulvicki 2016) - and their pictorial counterpart, some Futurists' paintings (LePoidevin 2017) - depict the temporal trajectory of the objects photographed and so depict a temporal pattern, not everyone does (see for example Shardlow (2020) pp. 15-16).
I. STATIC PICTURES OF THINGS IN MOTION

In this paper I focus on images that capture moments in which their subjects, in virtue of how they are posed, are dynamically unstable - as can be seen in Cartier-Bresson’s photograph *Behind the Gare St. Lazare*.

In this picture we see, among other things, a man jumping over – and probably into – a puddle. When trying to describe the picture, we naturally say that he “is jumping into a puddle”, even if we are seeing a static image. We describe the image with words we usually employ for describing actions and dynamic events. There is also a temptation to say that, phenomenologically, it seems as though what is depicted is a man jumping, not levitating - that the depicted scene we are seeing is something that it seems to be moving, even if it is not in motion.

And yet, these prima facie reasons are not sufficient for us to consider such pictures as depicting motion. Not least because our intuitions might pull us in the opposite direction: obviously, a picture such as Cartier-Bresson’s does not itself move – we can describe and it can seem to one that it is of a moving object, but a proper description of the picture and of
our experience of it is constrained by the inevitable fact that it is, indeed, a static picture – after all nothing literally moves.

In this paper I give an argument for thinking that movement can legitimately be said to be depicted in *Behind the Gare St. Lazare*. I claim that we can think of motion as being part of the content of a subject’s perceptual experience when she encounters images such as this one, even though we need not think that there is anything that amounts to proper motion phenomenology in such cases.\(^5\) I start with addressing the nature of pictorial experience, pictorial content and depicted properties.

II. DEPICTION, PICTORIAL EXPERIENCE AND PICTORIAL CONTENT

Though there are various accounts of the nature of depiction, one way that theorists have cashed out the intuition that depiction is specially pictorial is in terms of the viewers’ peculiar perceptual state. One of the most popular frameworks for understanding depiction is Wollheim’s seeing-in theory: when we face a picture, we see the picture’s subject in a marked surface (Wollheim, 1980). Seeing-in is distinguished by a feature Wollheim called ‘twofoldness’: a viewer looking at a picture undergoes a ‘twofold’ experience: on one hand, she is visually aware of the flat surface of the picture; on the other, she discerns the subject matter of the picture. Wollheim called the first of these aspects of seeing-in the ‘configurational’ aspect, and the second the ‘recognitional’ aspect.\(^6\)

\(^5\) Part of the task will then be to say what one means by saying that there is ‘motion’ in the perceptual content though there is not motion-like phenomenology. Sections II, III and IV will show why we should think the temporal contents of some pictorial experiences as richer than normally acknowledged; section VI will specifically deal with the phenomenology.

\(^6\) Between the myriad contemporary philosophers that have built on Wollheim’s proposal, two main theoretical camps can be distinguished: one occupied by experiential theorists, who maintain that a picture depicts its subject only if it elicits in the viewer the appropriate experience (Peacocke, 1987; Budd, 2004;
According to contemporary seeing-in theorists (see for example Matthen, 2005; Nanay, 2011a; Ferretti 2018), pictures somehow evoke perceptual states like those evoked by the depicted objects: part of what it is to be a picture is to be the kind of thing that is apt for bringing about such states. The depictive content - which consists in the properties a picture represents the world as having - is interpreted in perceptualist terms: what is properly \textit{depicted} in a picture has to do with what may be perceived by means of it.

Along these lines, I assume here that our experience of seeing something in a picture is a perceptual experience - seeing-in really is seeing the depicted object in a certain way, namely, in the picture – where a perceptual experience is a mental state that consists in perceptually attributing properties to the perceived scene.\footnote{But see Goodman (1968) for a contrasting view. Here, as an aside, I want to note that my perceptual account, even if it does not work in the framework of Goodman’s conventionalism, could work in that of the best developed contemporary semiotic theory – Kulvicki’s (2006). As Voltolini (2015) rightly notes, Kulvicki’s theory implies that, firstly, it is not the case that in order for a semiotic account of figurativity to really hold true, one can account for a picture’s figurativity without making reference to the perception of such a picture and, secondly, that perceivable properties are relevant for they enable a perceiver to discern not only the picture’s vehicle, but also what that vehicle presents.} In these terms, the depictive content of a picture - what is seen in it - is constituted by the properties our visual experience attributes to the pictorial scene. In particular, I take that a property x is depicted in a picture P if x is perceptually attributed by an observer’s perceptual mechanisms to a depicted subject S – that

\cite{Hopkins1998,Walton1990}; the other by recognitional theorists, who posit that a picture depicts its subject only if it engages the very same recognitional capacities people activate when faced with that subject (Schier, 1986; Lopes, 1996). There are also syncretistic paradigms that integrate both experiential and recognitional aspects, for example Newall (2011) and Voltolini (2015). See Hyman and Bantinaki (2017) for a review.
Since pictorial representation has this peculiar perceptual and visual character, the driving question of my paper – whether motion can be pictorially ascribed to the subject of a static picture - concerns pictorial seeing, and it can be seen as falling within the mesh of a bigger problem concerning depiction and picture perception: what kinds of properties does our visual system attribute to the depicted object? We can then reformulate the question in “perceptualist” terms: can we perceive ongoing movement as opposed to arrested poses in depicted scenes? Can we perceive motion and a temporal dimension as properties of the pictorial content of a static picture?

True, the claim that the depicted object and its properties are represented perceptually is not a particularly strong one (see also Nanay 2011a, p. 467), and it should be noted that there has been a lot of discussion about what properties are represented perceptually (see for example Siegel 2006; Nanay 2011b). We perceive objects (both real and depicted) as having various properties - as having a certain shape, a certain size, and a certain color for example.

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8 I want to emphasize that even if I talk in terms of ‘perceptual representations’ I am open to these claims being cashed out in anti-representationalist terms (perceptual states “presenting” or “being sensitive to” or “tracking” some properties).

9 I have described pictorial experience as seeing-in and as a twofold experience, but note that my claim about depicted properties also works in the theoretical framework of the other main paradigm of pictorial experience, seeing-as (Gombrich 1960), recently reinvigorated by Briscoe (2018) who defends a sort of ‘weak onefoldness’. In fact, for the purposes of this paper, I could very well be neutral on whether we simultaneously represents surface and scene properties (seeing-in) or if on the contrary we oscillates between an awareness of the two (seeing-as). Also, notes that Briscoe's account does not deny, as ‘strong onefoldness’, that our visual system attributes properties to the depicted object and to the surface at the same time. It simply wants to stress that pictorial experience is ‘onefold’ “in the sense that its content reflects a single, consistent 3D scene interpretation of the retinal image” (2018, Sect. 4).
Of course, not all properties that we represent objects as having are perceptually represented. I perceive my laptop as black, as in front of me and as fairly small. But I can also non-perceptually represent it as having the property of being the same laptop I use every day to read and write (Nanay 2011b). Without entering into this debate, it is sufficient for me to ask: can our visual system perceptually represents the motion of depicted objects even if there is no actual locomotion going on and in the absence of phenomenology characteristic of seeing real life motion? If perception is the key to depiction, and a property is depicted in a picture if it is perceptually attributed to the pictorial scene, I suggest we should look for an answer in the sciences of vision, inspired by the idea that only a combination of empirical and philosophical research can give us a satisfying theory of picture perception and depicted properties in particular (Matthen 2005; Nanay 2011b; Ferretti 2016, 2018; Briscoe 2018), as well as a well-founded theory of perception in general (Block 2014). In the next section, I turn to work from experimental psychology and cognitive sciences to show that we have good empirical reasons to think that motion is experienced in the pictorial content of certain figurative static pictures. If this is right, perceptual theories of depiction should make room for the possibility of the depiction of movement.

III. IMPLICIT MOTION AND REPRESENTATIONAL MOMENTUM

‘To survive in a dynamic world, the sensitivity of the human visual system for detecting motion cues is a critical evolutionary advantage. This motion sensitivity is so delicate that motion perception can occur even when no physical motion is presented but only implied’ (Lu, Li, and Meng, 2016, p. 668). We can begin to understand how this is possible by considering various psychological studies of motion perception by Freyd and collaborators - specifically, on what they called *implicit motion* and *representational momentum* - and their contemporary development. As I will show in this section, these two interrelated psychological mechanisms are responsible for the viewer’s experience of depicted motion in...
Behind the Gare Saint Lazare. While both have been – and still are - extensively studied, there is no agreement on the interpretation of the empirical data issued from experimental psychology and neuroscientific studies. In fact, two main interpretations of how implicit motion and representational momentum work are available: an “internalization” interpretation -on which implicit motion and representational momentum are the result of purely perceptual mechanisms, dependent on the fact that some of our mental representations are intrinsically dynamic - and a top-down perceptual interpretation – on which implicit motion and representational momentum are fundamentally top-down mechanisms, dependent on high-level cognitive processes and belief.¹⁰ In this section I unpack the two in order to analyze the psychological mechanisms underlying the experience of depicted motion; in the next one, I argue that both interpretations sustain the thesis of this paper: motion can be depicted in static images.

Let’s start from the “internalization” reading. This is Freyd’s theoretical interpretation of her seminal work on what she originally called implicit motion and its link with representational momentum. First of all, what is implicit motion? Freyd’s view is that we represent movement ‘independent of whether the stimuli are dynamic or static’ (1983, p. 575). But how can some static pictures and photographs lead to the mental representation of movement? Freyd’s experimental investigation of this question began with a test of the hypothesis that frozen-action photographs might involve the representation of dynamic information. Her 1983 experiment showed that we can mentally represent a still figure as being in motion: Freyd called this “implicit motion”, motion perception cued by a still or frozen-action shot. For her experiment, irreversible action sequences - such as a man jumping down from a wall - were filmed with a movie camera, and pairs of individual frames

¹⁰ These are the two main interpretations of the data. See Hubbard (2010) for a review of more nuanced positions on representational momentum.
were selected to use for stills [Fig. 2]. The frames in these pairs were separated by 55 to 500 msec in the real world. In the experiment, individual stills were presented to subjects. They were asked to look at one frame [Fig. 2, Top] for 250 msec and to hold it in memory for another 250 msec, and then to determine whether the second frame [Fig. 2, Bottom] was “same as” or “different from” the first. Subjects took longer to correctly complete the task when the pair was in real-world temporal sequence than when it was in reverse order, supporting the hypothesis that ‘when people perceive the first member of the pair they cannot help but anticipate the continuation of the implied motion’ (1987, p. 430). Freyd’s conclusion was that subjects “unfroze” the frozen motion implicit in the frame by creating a dynamic mental representation of the static photograph; in other words, they anticipated the motion in the scene.\footnote{One year later, Freyd and Finke (1984) also argued for a similar visual effect in connection with the direction or path of movement.}

These results supported her hypothesis that the visual system represents the motion implicit in a photograph.\footnote{I would like to stress that none of Freyd’s claims concern proper motion phenomenology. In fact, she is explicit in distinguishing her claims regarding ‘mental representations of movement’ from ‘perceptual illusions of movement’ (where motion is visually experienced even though there is no object moving, like in op-art paintings such as Bridget Riley’s \textit{Fall}). This distinction is consistent with what I argue for in this paper: while there is no motion phenomenology, the temporal contents of our experiences of certain static pictures are particularly rich.}

For Freyd (1993), implicit motion is closely related to another perceptual mechanism: \textit{representational momentum}. Representational momentum is a small, but reliable, error in our visual perception of moving objects. Instead of seeing the exact location of a moving object, we perceptually represent it as slightly farther along its trajectory. Freyd and Finke (1984) demonstrated that when a rotation of a visual pattern is implied, an observer’s memory for the pattern orientation tends to be displaced forward in the direction of the implied motion.
Freyd and Finke termed this phenomenon “representational momentum” because of its similarity to physical momentum, in which a physical object continues along its path of motion through inertia. Just as a moving physical object cannot be immediately halted because of its momentum, so too a mental representation of that motion cannot be immediately halted because of an analogous momentum within the representational system (Finke and Freyd, 1985; Finke et al., 1986). Freyd’s idea is that the perceptual system has internalized, or has evolved to include, basic principles of Newtonian physics – that’s why Hubbard (2010) labeled her position “internalization theory”. What Freyd’s internalization theory suggests is that the perception of a given motion or event includes its present state as well as its “implicit” future one – all within the perception of that motion or event: perception is not momentary, but temporal: ‘just as time is a dimension in the external world, inseparable from other physical dimensions, so might time be a dimension in the represented world’ (Freyd, 1993, p. 105).

In more recent years, Freyd’s implicit motion has been extensively studied from a neurophysiological point of view under the label of implied motion. Converging neurophysiological and neuroimaging evidence indicates common neuronal substrates
between real and implied motion in both monkeys (e.g., Jellema & Perrett, 2003; Krekelberg et al., 2003) and humans (e.g., Kourtzi & Kanwisher, 2000; Senior et al., 2000; Lorteije et al., 2006; Urgesi et al., 2006; Kim & Blake, 2007; Proverbio, Riva, and Zani, 2009; Osaka et al. 2010; Lu, Li, & Meng, 2016; Cattaneo et al., 2017; Mineo et al., 2018): the medial temporal (MT) and medial superior temporal (MTS) areas - that play a central role in the perception of motion - respond not only to physical motion, but also to dynamic information contained in still photographs when motion is not presented, i.e. implied motion. What these studies suggest is that the dynamic information in static images does not come from direct motion signals, but instead may be implied from object categorization and the knowledge about how animate and inanimate objects move: MT/MST (V5) area is more active when presented with real-life images that imply motion than when similar images are shown that do not imply motion.

These studies seems to reinforce Freyd’s original idea that motion is experienced in static pictures thanks to implicit (or implied) motion and representational momentum. And yet, a number of experimenters have queried Freyd’s “internalization” interpretation of these mechanisms, putting the case that representational momentum and implied motion are affected by knowledge of the situation – that is, implied motion and representational momentum are the effects of cognitive processes that penetrates our perceptual experiences.

15 Other interesting findings correlates real motion and implied motion: (i) common direction-selective circuits for both real and implied motion have been suggested by motion and positional after-effect experimentation in both adults and infants (e.g., Lorteije et al., 2007; Winawer, Huk, and Boroditsky, 2008; Pavan et al., 2011; Shirai and Imura, 2014, 2016); (ii) both real and implied motion led to increases in perceptual estimates of temporal duration (Kanai et al., 2006; Yamamoto and Miura, 2012); (iii) Acik, Bartel, and Konig (2014) using eye-tracking demonstrated similar fixation selectivity when comparing real versus implied motion stimuli, concluding that static cues can be sufficient in revealing movement in a scene.
the interpretation endorsed by two of the main studies that initiated the analysis of implied motion’s neural correlates: Senior et al.’s (2000) and Kourtzi and Kanwisher’s (2000). Senior et al. (2000) used functional magnetic resonance imaging (fMRI) to explore the neural substrate for representational momentum. Subjects participated in two experiments. In the first, they were presented with video excerpts of objects in motion (versus the same objects in a resting position). This identified brain areas responsible for motion perception. In the second experiment, they were presented with still photographs of the same target items, only some of which implied motion (representational momentum stimuli). When viewing still photographs of scenes implying motion, activity was revealed in secondary visual cortical regions that overlap with areas responsible for the perception of actual motion. Importantly, the experiment suggested that higher-order semantic information can act on secondary visual cortex to alter perception without explicit awareness: ‘higher-order information that interacts with representational momentum is processed within the ‘object identification’ ventral pathway without the need for ‘executive’ involvement’. Semantic and conceptual factors can

16 Already in the 80s Hubbard and Bharucha (1988), Ranney (1989), and Finke and Freyd (1989) debated the extent to which representational momentum is cognitively penetrable. Finke and Freyd (1989) argued that representational momentum is relatively impenetrable - that is, subjects cannot instantaneously halt the represented motion no matter what they think or attempt. But Hubbard and Bharucha (1988) thought this was not the case: in their experiment they found that representational momentum seems to involve knowledge of the future position of the moving target, implicating a high-level cognitive mechanism that predicts the future position of a moving target on the basis of knowledge of its previous pattern of behavior. For them, the context influences representational momentum. In 1996 Reed and Vinson tried to give a more a more convincing demonstration of Hubbard and Barucha results – i.e. of non-modularity of representational momentum – and argued that ‘conceptual information about objects and motion held in long-term memory could influence many aspects of representational momentum’ (Reed and Vinson, 1996, p. 849). See Hubbard (2010) for a review of different interpretations of representational momentum.
findings, imply that higher-order information can act on specialized motion-specific regions of the visual cortex to alter perceptual experience in the absence of awareness. Implied motion is cognitively penetrated’ (Senior et al. 2000, p. 20).

In the same year as Senior et al., Kourtzi and Kanwisher (2000) conducted a very similar study which activated the MT/MST (that is, V5) area, showing real and depicted motion registering in the same region. Since object recognition was involved, they postulated long-term memory assistance from outside the motion processing zone: the fact that showing pictures of houses evoked no response from observers while pictures of people moving did, strongly suggested cognitive inference. ‘Inferring motion from still images depends on object categorization and knowledge about the repertoire of behavior different objects can exhibit. It seems most likely that such high-level perceptual inferences occur elsewhere in the brain and modulate activity in the MT/MST in a top-down fashion’ (Kourtzi and Kanwisher 2000, p. 52).

Now, what are these experiments telling us about the perceptual content of pictures such as *Behind the Gare St. Lazare*? Is motion depicted in it?

**IV. DEPICTED MOTION AND PICTORIAL EXPERIENCE**

If we take psychologists’ interpretation of implied motion at face value, we should commit to the fact that our visual experience automatically represents various information about motion when seeing certain static images. The experiments show that perceiving a picture which depicts an object caught in the middle of a dynamic action automatically involves the representation of motion in the perceptual content of our visual experience: when seeing a picture of a dynamic object, our visual experience perceptually attributes motion to that very same depicted object.
As we have seen in section II, for a general perceptualist account like the one I endorsed here, a property \( x \) is depicted in a picture \( P \) if \( x \) is perceptually attributed by an observer’s perceptual mechanisms to a depicted subject \( S \) – that is, if the observer \( O \) has the visual experience (or form perceptual representations) as of \( x \) when looking at \( S \) in \( P \). Experiencing a picture’s content involves representing its subject matter as having the properties the picture represents it as having.

What the studies on implied motion and representational momentum suggest, is that among these properties motion can also figure. When the subject matter is depicted as being in the middle of a dynamic action, motion is represented in the perceptual content of our experience as a property of that very subject. Both interpretations analyzed in the previous section support this claim:

(i) From the point of view of Freyd’s internalization theory, some of our mental representations are dynamic, and this dynamicity is also present in pictorial seeing: we represent some static scenes as being in motion because this peculiar trait of our mental representations is reflected in the recognitional fold of our pictorial experience. In Freyd’s framework, understanding the dynamicity of some of our perceptual representations is fundamental to understanding depicted motion: if certain objects of perception are intrinsically temporal, we have no reason to believe that the pictorial content of a static image cannot also be temporally extended. *Behind the Gare St. Lazare* and Freyd’s stimulus are very similar images with a very similar subject: they both depict a man caught in the middle of a dynamic action. Both images’ depictive contents - men jumping – are perceived as including relevant information about their motion - direction, speed, implicit future position - and this is so because our mental representations intrinsically includes perceptual knowledge about expected motion of objects in the form of a dynamic mental representation.

(ii) From the perspective of the top-down perceptual reading, it is excluded the intrinsic dynamicity of our mental representations, but it is nonetheless maintained that perception
attributes motion to the depicted object thanks to high-level perceptual inferences. The perceptual content of our visual experience is enriched by expectations automatically provided by higher-order semantic information.

At this point, one may wonder if experiencing depicted motion truly means that we perceptually attribute motion to the depicted scene: I am not endorsing a too liberal view of perceptual content? There are two reasons why I do not think that I am. First, as we have just seen, psychologists speak of these phenomena in perceptual terms – even if it is a matter of cognitive influence on perception. Second, a number of philosophers have recently maintained that perceptual content is richer than it was traditionally acknowledged, and that the border between perception and cognition is not so clear-cut – cognition can influence perceptual content both in general (Siegel 2006; Raftopoulos 2019) and in the particular case of pictorial experience (Zeimbekis 2015). And if we maintain that the perceptual content of visual experiences is rich and vertically articulated (Kulvički, 2007), I suggest that we should also maintain that the recognitional fold of pictorial experience is richer and more articulated than usually thought. In these terms, we still maintain a temporally extended perception of the pictorial content of Cartier-Bresson’s photograph: motion constitutes a property of the recognitional fold of pictorial seeing because the recognitional fold is cognitively penetrated. Significantly, this view is in line with Wollheim’s original idea: as Wollheim (2003) claimed, seeing-in is cognitively penetrated as far as its recognitional fold is concerned - namely, the content of that fold is constituted by concepts of the items that the picture presents (see also Voltolini 2020).

In sum, both psychological perspectives tell us that motion is really perceptually attributed to the depicted object in Behind the Gare St. Lazare, that is why we speak of their contents in dynamic terms. Prima facie, we would be tempted to say that no temporal properties are depicted in this kind of image, because nothing really moves. While most agree that two-dimensional surfaces can pictorially represent three-dimensional objects and spatial relations

between them\(^{17}\), we might think that static pictures are not obviously temporal. And yet, as we have seen in the previous section, experimental psychology and cognitive sciences tell us that the perceptual content of this kind of picture is more complex than it appears: it represents objects caught in the middle of a dynamic action as being in motion, as having a temporal extension. The perception of dynamic figures in static pictures includes relevant visual information about their motion; an experience that offers a kind of perceived temporality to the pictorial content of some static images. This means that perceptual theories of depiction should make room not only for the depiction of space in a flat surface, but also for the depiction of time in a still picture. In fact, implicit motion and representational momentum suggest that the depictive content of Bresson’s picture is perceived as temporally extended. If we agree that depiction is to be explained in perceptual terms, we are bound to acknowledge that motion is depicted in Bresson’s *Behind the Gare Saint Lazare* and, more generally, in many pictures that depict objects caught in the middle of a dynamic action.

V. PICTURES OF MOVING THINGS THAT DO NOT DEPICT MOTION

There are photos of moving things that fail to give the experience of motion. In fact, there are images of bodies or objects in motion that we experience as if its subject was still: imagine, for example, a series of photographs of a singer who appears to make grotesque faces - and we are apt to misinterpret her as “making a funny face” - when she is actually in the middle of movement – e.g. singing.

As we have seen in section II, the properties depicted in a picture depend on the visual information encoded in its depictive content, not on the real life scene originally recorded; all the viewer has at her disposal for interpreting a picture are marks on a surface – or clusters

\(^{17}\) See for example Hecht, Schwartz, and Atherton 2003.
of pixels, since the vast majority of pictures nowadays are viewed on light-emitting displays like smart phone screens - and her perceptual abilities. As a consequence, the difference between *Behind the Gare St. Lazare* and the freeze frames of the singer lies in the different interpretations the spectator gives of the different visual cues available in their depictive contents. Knowing that the photograph was taken when she was moving does not change the depictive content of the picture. So, how do the interpretations differ? As before, I suggest we should look to vision science for an answer – or at least hypothesize one that would require further empirical studies.

While the photographs of men jumping are strong stimuli for activating implicit motion mechanisms, the singer’s picture is not: we see the singer standing still and grimacing rather than being in the middle of a dynamic action, e.g. singing. In fact, recent neuropsychological evidence have shown that implied motion activation depends on both object categorization and the depicted situation, and that both kinds of information can determine different levels of perceived implied motion speed (Lu, Li, and Meng 2016) - not every still picture depicts motion with the same degree of force. For humans, categorizing postures and facial expressions is essential for dynamic interpretations and we can hypothesize that we most readily categorize the singer’s facial expression as “still grimace” rather than “singing” and that in this case implied motion mechanisms are not activated. For example, in a study Proverbio et al. (2009) presented participants with static pictures of women and men engaged in simple dynamic and almost static actions while event related potentials (ERPs) were recorded. Observation of static photographs of human actions with implied motion produced an increase in cortical activation, much greater for dynamic than less dynamic actions. Not every photographic recording of movement depicts motion, because depiction primarily depends on the perceived features of the depictive content: different subject matters and different configurations differently modulates motion and speed responses in viewers. In short, it is because we have the visual experience as of motion when we look at
VI. PERCEIVING MOTION IN STATIC IMAGES AND PERCEIVING MOTION IN FILMS

How does the depiction of movement in *Behind the Gare St. Lazare* differ from the depiction of movement in film? In fact, there is a big difference in the phenomenology of motion in films and the phenomenology of depicted motion in static pictures. In seeing a movie shot of a man jumping over a puddle we really see a man jumping from point A to point B, when we see the man in Cartier-Bresson’s photograph we do not see anything moving - as the phrases “freeze frame” and “still” suggest.

When the stereoscopic technique was invented in the first half of the 19th century, it was possible for the first time to produce images - called “stereograms” - capable of eliciting a realistic illusion of depth and of three-dimensionality. But the fact that there is a difference in the way three-dimensionality is experienced in standard pictures and stereograms does not imply that depth is only properly depicted in stereograms while it is not depicted in standard pictures. In fact, every philosopher working on depiction agrees that two-dimensional surfaces are perfectly able to render three-dimensional configurations and depth relations in their depictive contents without the help of stereopsis. It is true that stereograms added an essential depth cue - stereopsis - to the ones already available to standard pictures - linear perspective, dwindling size perspective, aerial perspective, texture gradient, occlusion, elevation, familiar size, and highlights and shading - but this does not prevent standard images eliciting the experience of depth and three-dimensionality. The two kinds of image only differ in the type and quantity of depth cues available to the spectator, but both are perfectly able to render depth in a pictorial manner.
I argue that we should look at the question of depicted motion from a similar angle: film’s capacity to show actual motion depends on a different kind of motion cue that enables the image to strengthen its ability to show motion, by engaging peculiar characteristics of the human visual system – the multifaceted and complex perceptual mechanisms underlying “apparent motion”. Even if we grant that in the one case (films) there is, and in the other (pictures) there is not, proper motion phenomenology, this does not mean that motion can only be depicted by films. In fact, showing motion has always been a possibility of static images, because their depictive content is able to provide motion cues that engage the spectators’ motion-perception mechanisms; as I have argued throughout this paper, we perceive motion in *Behind the Gare St. Lazare* and this motion is *depicted* through static motion cues to which we so easily respond, owing to peculiar mechanisms of our perceptual system – implicit motion and representational momentum. It is not depiction through apparent motion, but is depiction nonetheless. Films and static images are different media and they depict temporal properties in different ways, using different motion cues to engage viewers’ perceptual systems. In a formula: *Behind the Gare St. Lazare* depicts motion, without actually instantiating motion. Static images can depict an extremely wide range of properties without actually instantiating them, and they can do so by exploiting in various ways the vast array of the viewers’ perceptual resources. Depicted motion is one of these properties.

If motion is not instantiated and there is no perception (or illusion) of actual locomotion should we conclude, then, that motion *per se* is not depicted? I do not think so. What is depicted in Cartier-Bresson’s picture is indeed motion, but motion perceived in the perceptual context of experiencing a static image. All we have to acknowledge - and remember - is that pictorial representation and depicted properties come in different varieties depending on the media the observer is viewing. In the case of Cartier-Bresson’s picture the

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18 Thanks to an anonymous referee for pressing me on this point.
spectator is seeing a static image and this ‘perceptual context’ influences the way in which the content of the picture is perceived, and the properties that are perceptually attributed to it: we see the man as jumping and not as levitating in midair. This is clearer if we take the case of freeze frames inserted in motion pictures. As Walton notes, ‘for a moment, until she realizes that it is a freeze frame, the viewer may read the frozen image as portraying a frozen scene—an athlete or dancer stuck in midair, for instance. Once it is evident that the image is a still picture, once she understands it as such, all-at-once features of the unmoving image may induce her to see the athlete or dancer as in motion’ (2008, 164). Once it becomes clear that what we are seeing is a static image, the dynamic disposition of the depictive content stimulates our visual system into perceptually attributing motion to that very scene. That is why, I maintain, we can legitimately talk of depiction of motion, even in the absence of a proper motion phenomenology. Of course, what static pictures display is only a part of the movement - partial information about the motion of the subject matter - but it is motion information nonetheless, and it is sufficient for the viewer to perceptually represent it as motion.

Obviously, in static images depicted motion is displayed through a static medium – that is why we define the picture as a “still” picture and their content as “frozen”. Frozen is a key word here: it is a word that implies movement; more precisely, it implies its negation. But for there to be the negation of motion it is necessary: (i) that there is something that suggests motion; (ii) that there is something that denies it. In static pictures, while the depicted subject appears to be moving, the picture surface itself does not – motion and immobility are properties ascribed to two different objects, the surface and the subject matter respectively. This contrasts neatly with film, where both the depicted subject and the light on the surface

19 If they were both attributed to the same object, we would have an experience with a contradictory content. But it does not seem right to describe as contradictory experiences of pictures such as Behind the Gare St. Lazare.
itself appear to move. We perceive a static image for a relatively long period of time and this is enough to react both to the impression of movement and to its denial: this is the reason why we say that the scene is frozen – where a frozen scene is a scene in which movement is both perceived and denied. And this tension between the depiction of motion and its negation, far from being an échec, is exactly why our experience of an image like Behind the Gare St. Lazare is so interesting, both perceptually and aesthetically.

VII. CONCLUSION

In his paper Moment and Movement in Art, Gombrich (1964) argued that the idea that static pictures depict a moment in time in showing a scene without temporal extension is in itself problematic. For him, static images depict more than a punctum temporis, because such a thing as a punctum temporis does not exist, neither metaphysically, nor psychologically. According to Gombrich’s psychological analysis, we never perceive moments understood as instants: the idea of a moment in time is totally at odds with the manner in which we perceive reality. The same is true for the perception of pictures: static images create in us the ‘memories and anticipations of movement’ (1964, 61); they are temporal because we perceive them as extending over a span of time.20

In this paper I have shown that Gombrich was right all along and, more importantly, why he was right. We really do experience motion in some static images, thanks to the fact that some configurations activate perceptual mechanisms such as implicit motion and representational momentum – two phenomena that have been (and still are) extensively studied in psychology. Furthermore, I showed that if we agree to explain depiction in

20 A similar idea developed in the framework of a recognitional account of depiction is present in Young and Calabi (2018).
perceptual terms - as most of today’s depiction theorists do - we have to acknowledge that there is not merely representation, but pictorial representation of motion.\textsuperscript{21}

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