Human Perception and The Animated World

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Animation carries a range of connotations in contemporary ocularcentric culture. The term is getting more difficult to define, as animation becomes more deeply interwoven into our ubiquitous computational information society. The accumulating number of moving images that pervade our screens impact on how we understand and experience the world, not just optically but multisensorily too. The question addressed here is how we perceive moving images in terms of 'somatosensation' (Perterson 2016:25).[1] This topic has long been discussed in the fields of science (biology, psychology, and neuroscience) as well as the humanities (art, philosophy, anthropology and sociology). One of the prime focuses is on the information processing of digital computational images, relating it to technical and organic cognitive systems used in neuropsychological approaches, something I have discussed in elsewhere (Tamari 2021, forthcoming). In this paper, I have one additional consideration to make in this context, the question of how 'our body' perceives the animated world from the phenomenological approach. The aim of this paper is to unpack the complex production process of 'visual fields' of human perception and to consider its relationship *with* 'the visual world' we live in from both neuropsychological and phenomenological approaches. To help address this issue, I particularly try to shed light on the role of the producers of visual representations, such as draughtsman, painter, and animator's production processes of the drawing objects.

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[1] There are different modes of human perception. Paterson introduces Sherrington's categorization of human perception. Sherrington (1906) categorized the senses of taste and smell as 'chemoreceptive', the sense of limb position as 'proprioceptive, and touch including pain and temperature as 'exteroceptive'. (cited in Paterson 2017 :9). Paterson goes on to explain that J.J. Gibson developed 'the perception of bodily sensations including touch and proprioception as part of a larger "haptic system"' (Paterson 2017: 9-10).

It is, therefore, helpful to begin by revisiting one of the fundamental mechanisms of human perception: the relationship between retinal vision and the process of drawing objects. Heinrich Wolfflin articulated the characteristics of the linear and the painterly in drawings. For him, a draughtsman produces a form which is 'essentially objective in outlook' in relation to the objects. Conversely, an artist creates a form which is 'more subjective in attitude, bases the representation on the *picture*, in which the visual appearance of things looks real to the eye, and which has often retained so little resemblance to our conception of the real form of things' (Wolffline 2003 :53, emphasis in original). He, therefore, clearly categorizes drawings in two ways: the draughtsman's linear form and artist's painterly form: the linearly form lies in the pictorial form (the representation and object are identical) and the painterly form (the drawing no longer coincides to the geometric lines of objects) and is largely based on subjective sensitivities.

Wolfflin further considers that 'line has an element of physical grasping', which implies that 'the eye performs the operation of the hand which feels along the body, and the modelling which repeats reality in the gradation of light also appeals to sense of touch' (2003:56). Eventually, Wolfflin conceives that, as art developed, the appearance and tactility become less important and the shift from linear form to the painterly form led to 'a triumph of seeming over being' (2003:54).[2] Wolfflin's distinction between the two types of drawing is admirable, but there might need to be further consideration. It is clear that creation of drawings can be influenced by the drawer's subjective knowledge and experience, but this does not mean that tactility through the hand (and so the body) will be diminished in painterly form. Rather, there might be a shift from the quality of tactility which evokes direct-physical touch ('grasping' in physiological state), to tactility which involves 'mental' touch. Furthermore, the mental touch in tactility can also be found in linear form.

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[2] Wolffline gives an example to explain this shift. 'just as the child ceases to take hold of things in order to "grasp" them, so mankind has ceased to test the picture for its tactile value. A more developed art has learned to surrender itself to mere appearance' (2003:54).

As Pallasmaa argues

> When sketching an imagined space, or an object being designed, the hand is in a direct and delicate collaboration and interplay with mental imagery. The image arises simultaneously with an internal mental image and the sketch mediated by the hand. It is impossible to know which appeared first, the line on the paper or the thought, or a consciousness of an intention. In a way the image seems to draw itself through the human hand (Pallasmaa 2009: 91-92).

Hence, the tactility (physical grasping and mental touch) plays in both linear and painterly forms and, as Pallasmma's remarks, the lines are not just representation of the object, but also representation of thought, imaginary and tactility, producing though the human hand. The lines can, therefore, be said to be abstracted form of our mind.

Tim Ingold brings this into another observation of the lines – the abstract line. Drawing on Kandinsky's claim on 'the spiritual in art', Ingold demonstrates that 'the abstraction does not mean draining a work of content' (Ingold 2013:135). Kandinsky considers the abstraction means taking away all the external elements of things (outer appearances) so as to unfold their "inner necessity" (Kandinsky 1982:160 cited in Ingold 2013:135). For Kandinsky, this process brings about a way in which 'the life force that animates them and that, since it animates us too, allows us to join with them and experience their affects and pulsations from within' (Ingold 2013:135).

This idea can be supported by an episode of Hayao Miyazaki's drawing. Miyazaki is an internationally well-known animator. The Gihbli's producer, Toshio Suzuki demonstrates Miyazaki's distinctive skill as an animator, which

we can find an evidence in the drawings of Totoro.[3] The most important
character of Totoro is its organic feeling. The feeling of Miyazaki wanted to
create was expressed by drawing 'Totoro's tum' which should be 'naturally' or
'organically' bent by pushing. The feeling of touch should be real in the full
sense of the experience. He uses only simple lines and contour to create
Totoro. Suzuki asserts that many complexed lines and detailed information do
not work, rather destroy Totoro's 'inner necessity' (Suzuki 2010).[4]

https://twitter.com/i/status/1223507353569333248   [a short video clip]

But how can 'the inner necessity' *animate* the drawing and us? How can our
affective feelings be evoked by the abstract lines? To address this question, it
could be useful to explore further the selectivity of information processing in
human perception. A Japanese neuroscientist, Kenji Tanaka discovers that
there is, what he calls an 'image simplification process' in our brain's neuron
activities. This is an activity which neurons produces an initial rough
categorization of the image of the objects and then single out its details later
(Dehaene 2009:133). A French cognitive neuroscientist, Stanislas Dehaene
(2009) also conceives that when we perceive objects, our neurons detect their
characteristic configurations first and then identity what the object is. What is
common to both scientists is that in our cognitive process, there is a selective
process, which is a process of *abstracting* core information from the whole
sensory data sources in order to produce a completed perception of the objects.
The core information in this context can be also relevant to Kandinsky's 'inner
necessity'. The abstract line can, therefore, contains 'inner necessity' which
animate the objects and evoke affective feelings.

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[3] *My Neighbor Totoro* (*Tonari no Totoro*) is Japanese animated fantasy
film written and directed by Hayao Miyazaki and animated by Studio Ghibli in
1988. Totoro is the main character and a seemingly forest spirit.
[4] 'The producer, Toshio Suzuki talks about Studio Ghibli's Production', *IT Media
Business Online*, 25 Nov 2010.
https://www.itmedia.co.jp/makoto/articles/1011/25/news024_5.html (accessed
20 August 2020)

It is, however, clear that we perceive not just with optics, but with multiple senses in the whole body. Our perception, the body and the environment continuously influence each other. We often imagine, as Ingold remarks, that it is often assumed that 'things are perceived from a stationary platform…[B]ut in real life, for the most part, we do not perceive things from a single vantage point, but rather by walking around them' (Ingold 2011:45). For him, 'locomotion, not cognition, must be the starting point for the study of perceptual activity (Ingold 2000a:166 cited in Ingold 2011:46). How we perceive an object, therefore, depends on from where we see it (e.g. perspective). The body is never static and fixed as a living organism as it is in continuous interaction with the environment. Hence it can be said that the living body is in constant animation.

The question here is, then, how can we as the 'living' body, apprehend our spatial perception?[5] To further this inquiry, I would like to address the relationship between the living body and the ocular process. There is a biological mechanism of human retinal perception which lies in the oculomotor system. When we see an object, it is hugely significant to 'maintain a steady gaze'. Suzan R. Barry explains that we tend to believe that we sense the world first, and then we react, it is not a true, since 'we cannot perceive the world in any detail without moving at the same time --- Perception and movement are intimately linked in a continuous two-way conversation' (Barry 2009:70).

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[5] A moving image has to be understood as a phenomenon of movement not only in space, but also in time. Considering time in relation to cognitive process is particularly important to understand the interdependent relationship between consciousness and non-consciousness (see Hayles 2017: 41 onward and 2021 forthcoming). The debate on time (timing) in affect has also been discussed in a great deal in the fields of psychology, neuroscience, film theory and media theory, such as Brian Massumi's 'the missing half second' (Massumi, 2002). A number of books, such as *Timing of Affect, Epistemologies, Aesthetics, Politics* (2014) edited by Marie-Luise Angerer et.al. and *A Tenth of A Second, A History* (2009) written by Jimena Canales, are also important. For the purpose of this paper, I only focus on space and will consider issues related to time in another paper in the future.

Hence, to see an object clearly, as Barry argues, we need to develop a stable gaze not just while we are still, but also while we are in motion. How can we keep a stable gaze? Imagine when you keep looking straight ahead, then move your head left and right. Your eyes move in an opposite direction from your head movement. In this situation, the oculomotor system plays a central role. This is a mechanism, a compensatory eye movement which is the vestibular organs (the otolith organs and semicircular canals) that sense the head movement and then send the information to neurons to stimulate the brain in order to move the eyes in a direction the opposite to that of the head. 'This is the vestibulo-ocular reflex' (Barry 2009:77). Thanks to this system, we can keep a stable gaze in motion, therefore we can keep body balance and spatial perception. Another vital function to see an object is 'saccades' which is a rapid movement of the both eyes in the same direction. Saccades are executed by the fastest movement of six extraocular muscles in the human body, occurring in as little as one-fiftieth of a second. Owing to saccades, we can perceive our spatial surroundings by 'rapidly and continually glimpse, recomposes, remakes visual data, piecing it together in order to constitute a continually experienced "visual field"' (see e.g. Burr and Morrone, 2004 on saccades cited in Paterson 2016:7). The visual fields here include both 'still image' as well as 'moving image'.   What is striking to know about our capacity to see is that 'if the image of an object on your retina does not move at all, it fades away' (Barry 2009: 71). Our eyes need to be continuously moving to retain a stable gaze in order to perceive the world. This suggests that we/our perception already always live in/with the animated/animating world. Furthermore, as Barry suggests, 'we perceive an object by combine information from the eyes and other senses into a perceptual whole and direct your movement according to what you sense' (2009:75). Hence, we can integrate a range of information though the multisensory capacities of the body in order to perceive an object in the environment.

Our perception is, however, not only constructed by the bodily sensory system, but also by our memory, experience and tacit knowledge as mentioned earlier. Although there is as yet no a scientific, neuropsychological or neurophysical

evidence of the precise mechanism of the interconnectivity (e.g. in a complex neuron network) between the biological sensory system and our memory, knowledge and experience, 'it is almost a truism that we perceive not with the eyes, the ears or the surface of the skin, but with the whole body' (Ingold 2011:45).[6] Nevertheless, the debates of how our perception can be constituted and be influenced by memory, experience and tacit knowledge have been developed by many thinkers and critics.   For example, Deleuze' theory of time-image cinema[7] which is largely influenced by Bergson's exploration of '*Matter and Memory*' (1896).[8] The memory is also particularly important for Bernard Stiegler, especially its constitutive relation to technics. He argues that with the development of computational technical memory aids, human memory today is more and more exteriorized and expanded. Technical devices and systems systematically order human memories. Stigler writes, 'This is particularly apparent in the transition from mnemotechniques to mnemotechnologies[9] – from individual exteriorizations of memory functions to large-scale technological systems or networks that organize memories' (Stiegler 2010 :67). Computationally organized memories consequently become 'the new technological forms of knowledge' (Stiegler 2010 :67), which provides a new way of seeing and perceiving the world. This process, conversely, 'engender a loss of knowledge' (Stiegler 2010 :67). This is what Stiegler calls, *pharmakon,* which refers to the paradoxical double meaning: cure and poison. Thanks to

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[6] According to the experimental psychologist, Makoto Ichikawa, we know that we have many types of illusions and their elements and characteristics, but we do not exactly know why human perception creates illusions and the mechanism in human perceptual system. Accessed 23 August 2020 https://yumenavi.info/lecture.aspx?GNKCD=g000191

[7] For Deleuze, an image is infused with time. The time is an important axis to articulate memories. See his book, *Cinema 2, The time-image* 1989 Translated by Hugh Tomlinson and Robert Galeta, Minneapolis: University of Minnesota Press.

[8] Bergson writes, 'there is no perception which is not full of memories' (Bergson 1886:11).

[9] Mark Hansen elaborates on Stiegler's terms: mnemotechniques refers 'the artificial storage of individual memories that characterizes hypomnesis from ideogrammatic writing to the print revolution'; mnemotechnologies means 'the embedding of memories within technological systems that systematically order memories according to their own logics' (Hansen 2010:65).

technology, we expand our memories and knowledge, but at the same time, the dependence on the externalization of memories reduces our immanent capacity to organize memories and knowledge, then we eventually become isolated from them. We forget techniques and tacit knowledge in an automated society. We lose our 'own' perception of the animated world.

A similar fear of the dangers of the computational technical systems can be found in Pallasmma's claims about 'the computerized hand' in architecture design process (2009:95). He emphasises that 'the computer imaging tends to flatten our magnificent multi-sensory and synchronic capacity of imagination by turning the design process into a passive visual manipulation, a retinal survey' (2009:97).   Both Stiegler and Pallasmma sounded the alarm on losing our immanent human capacity of perception. Pallasmma further stresses the importance of directness in hand-drawing to create a haptic connection between the object (its representation) and the designer's mind (her/his perception). For him, 'the computer drawing is a mediated construction' (Pallasmma 2009:97).[10]

This diminishing capacity of human perception is perfectly captured by his description of how the craftsmanship should be.

> The craftsman needs practices to develop specific relationships
> between thought and making, idea and execution and action and
> matter, learning and performance, self-identity and work, pride and
> humility. (Pallasmaa 2009:53).

Although he applied this suggestion to the craftsman, we could also include animators, draughtsman, even artists, in effect all of us who live in hypomnesic

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[10] It is, however, almost inevitable for us to take for granted 'being-with-the machines' in contemporary life of digital information society. Therefore, Pallasmaa insists 'The craftsman needs to embody the tool or instrument, internalize the nature of the material, and eventually turn him/herself into his/her own product, either material or immaterial' (Pallasmaa 2009:53).

computational society. What is important in this message is the importance of avoiding unintended integration of human conscious and perception with algorismic reasoning and thinking: it is, therefore, essential to improve our 'craftsman's techniques and their sprits – craftmanship. Hence it could be ventured if we could remain like a 'craftsman' who is not totally contaminated by the huge networked computational system (the 'attention economy'), it would enable us to live a dignified human life and to continue to 'perceive' the ever-changing animated world.

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