Francesco Parisi, Giovanni Pennisi
CITY AND ECOMEDIA: FROM A LINGUISTIC AND OCULARCENTRIC TO A SENSORIMOTOR AND MATERIAL ACCOUNT*

Abstract

This paper aims to frame a discussion on the philosophy of the city within the context of cognitive sciences. In the first part of the paper, we will outline the double shift from a linguistic and ocularcentric account towards a sensorimotor one; then we will defend the idea that the less you refer to language and ocularcentrism in handling the urban dimension, the better phenomena can be understood and described. More generally, we argue that the most intriguing conceptual contaminations between cognitive sciences and urban philosophies, as well as the best approach in designing and planning cities, have become attainable because of the marginalisation of language-inspired models of cognition and ocular imperialism in favour of other aspects of our phenomenal consciousness, like emotions, habits, and sensorimotor attitudes.

Introduction

This paper aims to frame a discussion on the philosophy of the city within the context of cognitive sciences. Over the last 20 years, cognitive sciences have become much more integrable with other disciplinary domains. Not anymore focused on the mind of the single agent, the cognitive agenda turned from computational, computer-inspired, mechanistic descriptions to more biological, inter-subjective, and material factors as key elements for understanding cognitive phenomena. In our opinion, this increased permeability is mainly due to the loss of centrality occupied by the "language faculty", as the linguist and father of cognitive sciences Noam Chomsky defined it (Hauser, Chomsky, Fitch 2002),

* Although the result of a joint effort, paragraphs 1, 4, and 5 are conceptualized and written by Francesco Parisi, while paragraphs 2 and 3 are by Giovanni Pennisi.

as the pivotal element of cognitive phenomena, as well as a reduced importance conferred to vision as the most important among our senses. Indeed, language and pure vision have progressively left room for other human faculties, like emotions and, more generally, the *sensorimotor and material dimensions*. In this paper, we argue that this is also true for cognitively-inspired urban philosophies.

In the first part of the paper, we will outline the double shift from a linguistic and ocularcentric account towards a sensorimotor one; then we will defend the idea that the less you refer to language and ocularcentrism in handling the urban dimension, the better phenomena can be understood and described. More generally, we argue that the most intriguing conceptual contaminations between cognitive sciences and urban philosophies, as well as the best approach in designing and planning cities, have become attainable because of the marginalisation of language-inspired models of cognition and ocular imperialism in favour of other aspects of our phenomenal consciousness, like emotions, habits, and sensorimotor attitudes.

1. The role of language in cognitive sciences and urban philosophy

Language has philosophically dominated the XX century. Not only specific disciplines – linguistics and semiotics – are born to selectively and rigorously study language, but several disciplinary domains have been affected, in one way or another, by its cumbersome presence. For what concerns our commitment, it is quite easy to show the profound linguistic and propositional birth of cognitive sciences, as briefly anticipated in the introduction. Noam Chomsky is the most eminent living linguist and one of the fathers of the cognitive turn in human mind studies. The alliance between language and cognitive sciences did not stop at the birth of the discipline but has continued over the decades. We are not committed to demonstrating this point in detail, which would go far beyond the purpose of this paper, but to indicate how the use of a given terminology reflects this epistemological aptitude.

Cognitive sciences and urban philosophy sometimes share terms and concepts: mental or cognitive map, representation, and image. Here, we want to pick up one of them – the term representation – to justify the general commitment according to which the loss of centrality of language has opened a new era, certainly for both cognitive sciences and, allegedly, for urban philosophy. The centrality of representations in cognitive sciences is, in fact, indisputable. Actually, it can be said that there is no cognitive science without representations (even if some scholars are trying to challenge this point, as we will see). The general idea, forged in decades of research and ultimately delineated in the "Representational Theory of Mind", is that representations are "information-bearing structures" that can be produced, transformed and stored by the mind/brain in order to realise mental phenomena (cf. Pitt 2022). In the context of cognitive sciences,

representations are key theoretical sources adopted by the standard vocabulary to explain mental phenomena. For the first wave of cognitive studies, the format of such representations was entirely and exclusively logical and propositional. The philosopher Jerry Fodor is probably the most well-known defender of this claim, and he proposed – by receiving Chomsky's legacy – the "Language of Thought Hypothesis". The Language of Thought Hypothesis is the idea that a language, called Mentalese, governs cognitive phenomena. It states very clearly what "mental representations are like: not pictures, or maps, but formulas in a language-like medium that functions both to express the intentional content of mental states and to provide the domain of mental processes" (Fodor 2008: 8). The quote is taken from a book that Jerry Fodor wrote in 2008, but the original idea of the Language of Thought went out for the first time in 1975 (Fodor 1975).

Four years later, in urban studies, a highly influential book – *The Timeless Way of Building*, by Christopher Alexander – was published, and we believe it constitutes meaningful proof of the massive influence exerted by the linguistic paradigm on studying human affairs. A quote from it enlightens this point. The author wants to introduce the term pattern, which is at the core of his proposal:

> To understand, in detail, how these patterns work we must extend our definition of 'a pattern.' [...] Each pattern is a rule which describes what you have to do to generate the entity which it defines. [...] It is in this sense that the system of patterns forms a language. [...] From a mathematical point of view, the simplest kind of language is a system which contains two sets: 1. A set of elements, or symbols. 2. A set of rules for combining these symbols. [...] A pattern language is a system which allows its users to create an infinite variety of those three-dimensional combinations of patterns which we call buildings, gardens, towns (Alexander 1979: 181-186).

Things started to change during the '70s. Some scholars proposed to conceive the possibility that some representations can have irreducible visuospatial properties (Shepard, Metzler 1971; Kosslyn 1980; Block 1981). Mental imagery, they claim, is the ability to re-present reality by preserving its visuospatial structure: no reduction to any linguistic or symbolic format, but a transposition from the matter to the mind that saves the structural dimension of space. The debate on the representational format fired up during the '90 (Sterelny 1986; Ferretti 1998; Tye 1991; Kosslyn, Thompson, Ganis 2006) and now can be considered solved (Pearson, Kosslyn, 2015; Parisi 2017). Through the passage from language-like to visual formats we can capture the first significant shift within cognitive sciences: the brain can elaborate reality without employing linguistic or symbolic reductions, computed representations carrying physical properties. Even if this step is towards a less linguistic and propositional conception of mental phenomena, nevertheless the presence of representations still inspires a cerebro-centric perspective. In fact, despite the absence of a Language

of Thought, the brain is still the computational machinery creating mind and consciousness from a representational repertoire. Besides, and we will focus on this in the next paragraph, moving from language to vision has produced different but still notable biases.

2. Ocularcentrism and the city

The gradual abandonment of propositional and representation-based models of cognition mirrors the critical approach that many authors have developed towards accounts that present vision as either a picture-like mechanism and/or the primary mode of access to sensorial information. The first account is best described by the "snapshot conception" exposed by Alva Noë (2004; 2012); the second by the notion of "ocularcentrism" or "visual imperialism" (Pallasmaa 2012; Gallese 2017; Gallese, Gattara 2015). The "snapshot conception" – that is, the idea that vision is a collection of "retinal images" that, once processed by the brain, give us an impression of the world with picture-like contents – is rooted in many classical studies on optics, such as Leonardo da Vinci's and Kepler's, whom both ascribed to the eye the properties of a picture-making machine, a *camera obscura* (Noë 2004: 39-40). According to Noë, the snapshot conception has several shortcomings, all of which stem from the fact that the supposed internal, faithful reproduction of our surroundings could never be achieved by a system – such as that of human sight – that is full of technical, well-known limitations: "there are two retinal images, not one, and they are distorted, tiny, and upside down. There is a so-called blind spot in each eye. The resolving power of the eye is limited and nonuniform; outside the high-resolution foveal region, the retina is nearly colourblind [...]. On top of this, the eye is in nearly constant motion" (Noë 2012: 92). Among all these anatomical and functional properties of our vision, we want to emphasise the latter. The issue of the relationship between movements – of the eyes and the body in general – and mental representations such as those contemplated by the snapshot conception is pivotal for enactivism and must be worked out before we get to the points we intend to make.

Describing how sight operates by appealing to the metaphor of the slideshow is a way to reiterate a Cartesian understanding of the action/perception cycle, a compartmentalisation of sensorial inputs and motor outputs that is well captured by Hurley's critical "sandwich model of cognition" (1998), and that is incompatible with those interpretations that take into account the dynamicity intrinsic to the experience of getting to see and navigate the world. What the snapshot conception is really deficient in, in fact, is the explanatory power of the fluid nature of vision, which is the result of micro-movements – saccades, unintentional inclinations of the head and body, etc. – and macro-movements – voluntary changes in the direction of torso and neck, goal-targeted actions, etc. – that are

carried out during our perpetual engagement with the environment. Moreover, the pictorial approach completely misses the point when it comes to addressing the ongoing character of visual perception: as Gallagher puts it, "an action is not a momentary or frozen snapshot supplemented by representations of past and future movements; it has a unity over time that is accounted for by (and integrated into) the intentional structure of the action itself" (2017: 99). In turn, this way of experiencing the perceptual contents as a whole that transcends the present moment, unfolding in a temporal continuum that also encompasses our future dispositions towards what is there, depends on the peculiar nature of our consciousness, which, for Husserl, has the fundamental function of structuring the flow of time in three seamlessly integrating aspects:

- the *primal impression*, which is a mode of appearance of the intentional object that cannot provide us with any temporal information about it, as it is constituted by every single 'now' in which a portion of the object is given to the senses;

- *retention*, namely a particular kind of non-representational, "primary memory that continuously attaches itself to the [primal] impression" (1966, Eng. trans. 1991: 32) and that, adding to the actual "now" of every perception, allows us to experience the intentional object as a phenomenon that extends across a time span;

- *protention*, which is the intuition that something is about to happen in the very next phase of the perceptual process; it is an anticipation based upon the combination of the retentional sense of the just-past moments and that manifests itself as the expectation we have towards the future modes of appearance of the intentional object.

Importantly, the sense of temporal continuity we are provided by our consciousness is embedded as well in the tireless activity of the *whole* body, which, even when it switches from a precise position to another, "is not posturing from moment to moment but is constantly *on the way*, in the flow of the movement such that the abstract [viz. picture-like] postural moment only has meaning as part of that process" (Gallagher 2016: 211).[1] The involvement of the entire body in the action/perception cycle – and, fatally, in the visual exploration of the environment – is a crucial point for understanding also the positions of those scholars who deem Western society as flawed by "ocularcentrism", or "visual imperialism".

"Ocularcentrism" is a term that denotes the tendency to consider sight as the most important or preferential sensory channel. It is a phenomenon with a long history, which Pallasmaa traces back to his *The Eyes of the Skin* (2012). In short, the Finnish architect places the beginning of the hegemony of visual culture

---

[1] For an extensive discussion on the *intrinsic temporality of action*, see Gallagher 2016, 2020.

in classical Greek thought when Heraclitus, Plato and Aristotle referred to the eyes as the noblest and most reliable source of information and to clear vision as a metaphor for the truth itself. The reinforcement of the sight-dominance principle came with the invention of perspectival representation and Renaissance, when the five senses were conceived according to a hierarchy in which vision was on top, and hearing, smell, taste, and touch followed in this order (Pallasmaa 2012: 18). In the remainder of the book, Pallasmaa provides many examples to show the effects that ocularcentrism continues to play in our society, especially when it hides behind the architectural design and city planning. In his mind, "the inhumanity of contemporary architecture and cities can be understood as the consequence of the neglect of the body and the senses, and an imbalance in our sensory system" (2012: 21).

We will address the issue of the relationship between urban landscapes and human senses, emotions, and habits in the next sections. For now, we want to highlight that the "imbalance in our sensory system" produced by ocularcentric design is a topic dear also to some contemporary neuroscientists, for it is a correlate of those representational approaches to vision – such as the snapshot conception – that cognitive science recently contributed to subvert. For instance, Gallese (2017; Freedberg, Gallese 2007; Gallese, Gattara 2015) used his notion of *embodied simulation* – that is, the functional mechanism through which the perception of others' actions, emotions, and sensations elicits our inner reproduction of the body states associated with such stimuli, via the activation of the Mirror Neurons System (Gallese 2003, 2005, 2007) – to account for the resonance that arises during the beholding of works of visual art, architectures included. Analogously to the mirroring process that occurs in our brain and body when we see someone extending his arm to reach for an object, when we are in front of a work of art we involuntarily reenact the creative gestures of the artist internally, whether they are dynamic brushstrokes (Sbriscia-Fioretti *et al.* 2013), cuts on canvas (Umiltà *et al.* 2012), or carvings on a block of marble (Tononi 2020). So, for example, "a twisted column might induce a state of tension within our bodies, as our mirror systems viscerally simulate the twisting of the column" (Mallgrave 2015: 25); broadly speaking, this is to say that seeing is never merely seeing, but rather an act that involves the body in its entirety, and that it is just a part of the "synesthetic multimodal relationship" (Gallese 2017: 48) that binds us to the material, architectural, and intersubjective surroundings. By neglecting the principle of body-centered and multisensory integrated navigation of the world, "modernist design at large has housed the intellect and the eye, but it has left the body and the other senses, as well as our memories, imagination and dreams, homeless" (Pallasmaa 2012: 22), making "a reading of collective signification impossible" (2012: 25). In the next sections, we will follow on this critical and close to nihilistic position, providing examples that support it, and then explore the contribution that cognitive science might make in order to favour a more immersive and bodily-attuned experience of the city.

3. Effects of ocularcentrism: skyscrapers, tours, and maps

One of the most distinctive symbols of ocularcentric design is the skyscraper. While tracing the history of the modifications that occurred to Singapore's urban landscape after WWII, Bullock refers to the skyline that now dominates the city as a presence that "reflects (in its form and content) the attention to vision as the primary sensory experience" (Bullock 2018: 29). In a similar fashion, El Moussaoui frames the spread of skyscrapers that characterised Western metropolis during the twentieth century as the manifestation of an actual ocularcentric obsession of contemporary societies, and as a "need to develop a visually appealing design [which] overrides consideration of how the design might influence the people" (El Moussaoui 2020: 1292). Such criticisms echo many philosophers', architects', and writers' accounts which explicitly opposed the diffusion of this kind of buildings and rejected everything they stand for: for instance, Darton (2002) admitted that even for a New Yorker who was devastated by the 9/11 terrorist attacks like him, it was impossible not to conceive the edification of the World Trade Center "itself as a destructive act – specifically, an attack planned by the city's oligarchs and carried out with the general consent of its populace" (2002: 91). The modern skyscraper is also stigmatised by feminist theorists, for it is seen as a "pinnacle of patriarchal symbology and the masculine mystique of the big, the erect, and the forceful" (Weisman 1994: 16), whose diffusion – reflected in the notorious "race for the skies" in which Chicago and New York were embroiled during the twentieth century – is in turn the expression of an exasperate and masculinised competition (Graham 2016).

The above accounts fit into a broader framework that considers the skyscraper as a structure that affects fundamental aspects of the livability of the city, which are sacrificed on the altar of a (questionable) ideal of aesthetic greatness. An example of this critical stance is represented by the 1916 Zoning Resolution, a set of regulations adopted to arrest the growth in numbers and sizes of buildings in downtown Manhattan. This measure was especially aimed at reducing the adverse effects of the edification of skyscrapers, such as public safety issues, inhuman scale, poor lightning, substandard air quality, and traffic congestion (see Kalayjian 1996: 44-45). Taken together, these parameters point in the direction indicated by Pallasmaa when he speaks of a neglect of the body and senses (vision excluded) in urban planning, which results in a total lack of comprehension of the role that habits, emotions, and sensations play in shaping our exploration of the environment.

The disembodied approach underlying traditional ocularcentric design is contrasted, for Pallasmaa, by the experience of home, which "is structured by distinct activities – cooking, eating, socialising, reading, storing, sleeping, intimate acts – not by visual elements" (Pallasma 2021: 68). This is to say that there are ways of living space that transcend geometry and measurability, and

that could never be captured by architectural approaches that do not aim to "create embodied and lived existential metaphors that concretise and structure our being in the world" (2012: 76). Importantly, the embodied aspects of the lived experience of space exemplified by our relationship with the home have been experimentally tested. For example, in a study on how people describe their apartments, Linde and Labov (1975) asked participants to mentally represent their houses and then give a verbal account, finding that there are two basic cognitive approaches usually followed: the "tour" and the "map" (see also De Certeau 1984; Ryan *et al.* 2016). In the tour approach, people "walked" the experimenter through their homes, offering a close to interactive experience – as if the listener was a museum visitor, and they were the guides. Those who relied on this method made extensive use of verbs of motion and provided what the authors defined as a "pseudo-narrative spatial representation" (Linde, Labov 1975: 927) of their apartment, imagining themselves and the interlocutors as if they were all *inside* of it. In the map approach, on the contrary, people seemed to occupy an observer-like, detached perspective: their accounts were plain overviews of the house's features, which were split into different sections, each of which was described separately and then reassembled with the others.

There are two important things to note here. The first is that the tour was by far the most employed approach in the experiment. This is probably because the map-like depiction "involves a greater cognitive effort than the tours" (Ryan *et al.* 2016: 28), since the former requires a good photographic memory and the use of a quasi-technical, architectural vocabulary, whereas the latter appeals to the sensations that walking through one's apartment arouse, with all that this entails in terms of retrieval of both spatial and emotional information. In a nutshell, "whereas the tour treats space as an expanse to be traversed, stopping at various points where significant events occur, the map regards it as a surface to be thoroughly covered by language" (Ryan *et al.* 2016: 32). This leads to the second point, that is, that the distinction between the two approaches corresponds, with good approximation, to the difference between two relations that bind us to space: the emotional and the strategic one (Ryan *et al.* 2016: 39). When we say that we are emotionally attached to a place, we mean that we feel like we belong to it as much as it belongs to us, that it is some sort of extension of our body – to say it again with Pallasmaa, "we are in constant dialogue and interaction with the environment, to the degree that it is impossible to detach the image of the Self from its spatial and situational experience" (Pallasmaa 1994: 47). In narrative terms, this translates into a tendency to recount space as the bearer of countless affordances, of vivid feelings and of meaningful memories, a special modality of navigating – both mentally and physically – the environment, as if we were on a journey. On the other hand, the strategic relation to a place prompts us to plan in advance every move we make and consider contingent information to achieve our goals or avoid unwanted outcomes. Such a kind of approach "is best symbolised by a chessboard. The squares on a chessboard

have no intrinsic emotional value for the player; they only matter because of the actions that they allow to perform" (Pallasmaa 1994: 39).

The differences between the tour and the map, as well as those between emotional and strategic space, are of great relevance for the purposes of this paper. When we talk of strategic urban development, we refer to a set of technical measures and architectural choices that are meant to solve certain problems and rationalise space – for instance, the diffusion of skyscrapers in North American cities during the early twentieth century was a response to the enormous growth in population caused by mass immigration. However, the point we want to stress is that mapping space and conceiving the people that inhabit it as pieces on a chessboard can lead city planning to overlook fundamental aspects of the quality of life, which can enter the equation only if one adopts an approach that takes into due consideration how everyday interactions with the surroundings transform emotions, habits, and sensorimotor schemes. In a nutshell, if one adopts an *enactive* approach to the city.

4. Unbiasing cognitive sciences: 4E cognition and the ecomedia

As we have glimpsed previously, a turn occurred in cognitive sciences at the end of the last century, especially thanks to Francisco Varela's work. What if – cognitive scientists started to wonder – we can explain cognition by entirely switching the metaphor underneath it? We are not beings that compute; we are beings that *act*. As seen in paragraph 3, the sandwich model (perception-elaboration-action) is problematic because it splits something that appears to be a unitary phenomenon. According to this new wave of cognitive scientists, perception and action *are one*: perception is action (an activity); action is perception (a way to apprehend the surroundings). It is a pragmatist revolution, fighting a cartesian legacy. Jerry Fodor clearly saw how one is the nemesis of the other:

"Cartesians think that thought is prior to perception (because perception is, inter alia, a kind of inference). Pragmatists think the opposite. Cartesians think that concepts are prior to percepts (because inference requires, inter alia, subsuming a percept under a concept). Pragmatists think the opposite. Cartesians think that thought is prior to action (because acting requires planning, and planning is a species of reasoning). Pragmatists think the opposite. Cartesians think that action is the externalisation of thought. Pragmatists think that thought is the internalisation of action. In effect, pragmatism is Cartesianism read from right to left" (Fodor 2008: 12).

"Action" is the new word in cognitive science that challenged "representation" in the epistemological agenda. If representations need a brain as a material vehicle, actions need a body; therefore, the representational formats available on the table are not language-like or visuospatial but include bodily or B-formatted

representations, that is, representations that preserve the structure of the body they refer to (Gallese, Sinigaglia 2018).

Once you move from the brain to the body, why stop at the edge? If action is the key to accessing human consciousness, it is implicitly assumed that there is an environment where actions take place. However, does this environment play a role, or is it just a passive background with no function? A growing number of scholars think that, to comprehend cognition properly, the brain-body system *and* the world out there must be considered. Scholars who believe this, along with pragmatists, are gathered under the label 4E cognition: cognition is Embodied, Extended, Embedded, and Enactive (Menary 2010; Newen, De Bruin, Gallagher 2018). Three of the four Es are particularly interesting for urban philosophy, for they explicitly characterise cognition as *constitutively made* of the interaction between the agent and his or her environment.

This is a crucial point that deserves to be clearly illustrated. What does it mean that cognition is constituted by the interaction between the agent and the environment? First, it means that an externalist perspective is required: cognition is not the result of the brain-body activity but the result of the brain-body-*world* interaction. Second, such an externalist perspective must include not only the natural environment but also human artifacts, since they are elements of that world that can structurally modify how you access it. Third, there is no centre anymore: there is no subject who is "in charge" and the world that follows, but only a relational encounter with no hierarchy (Malafouris 2013: 128). In the 4E perspective, but especially in the enactive perspective, the structural, centerless coupling between the agent and its techno-mediated surroundings produces cognitive phenomena.

The term ecomedia (Parisi 2019; 2021) identifies a principle of transformation with which we indicate the ontological or functional *continuity* between the things we use and the places we live in, between the tools we manipulate and the spaces we explore. The ecomedia is the material outcome, never completed and intrinsically endless, of the adaptation process of Homo sapiens. This continuity between the ecological and the media dimension is bidirectional: for thousands of years, we have been extracting, forging, recombining, refining – in short, treating – environmental resources to create artefacts allowing us to enhance our grasp of the world (mediation). In addition to their mediating power, the artefacts produced can take on purely spatial characteristics (such as a house or a city) or provide unprecedented ecological opportunities, either allowing access to otherwise unreachable spaces or generating alternative worlds to explore (ecology).

5. Representations got materiality: SIRN and MET

Interestingly, also in geography and architecture, things have changed since the influential book by Christopher came out, getting rid of language and embracing self-organising and emergent models. The best interpretation of how a city grows consists of imagining the process as led by distributed, centerless dynamics and not as an intentionally driven set of rules. We believe the work done so far traces the path from language to materiality we advocated for at the beginning of this paper. Following the work by Juval Portugali (2011; Haken, Portugali 2021), we can notice the shift from a language-like or ocularcentric modelisation of city understanding to a sensorimotor and externalist one. Juval Portugali's interpretation is, we claim, entirely in line with the assumptions of 4E. He still uses representations to explain the relationship between humans and urban space, but in a crucially different way. He developed a model called SIRN (Synergetic inter-representation networks). According to it:

– Humans have an innate capability for representation that comes in two forms: internal and external.
– This shows up in many cognitive tasks that evolve as a sequential interaction between internal and external representations.
– Representations enfold and convey quantitative (Shannonian) and qualitative (semantic) information.
– They coexist in implicate and explicate relations, in a way reminiscent of the relations between genotype and phenotype.
– The boundaries of the cognitive system should be perceived as distinct from the boundaries of the brain/skull and the body/skin.
– The above network of internal and external representations emerges as a self-organising system. Its dynamics is best captured by Haken's synergetic approach to self-organisation (Portugali 2011: 141).

Let us consider the points from 1 to 3. Here we can see how the concept of representation, when unburdened by its linguistic weight, can better capture the essence of many semiotic acts. The fact that representations are both internal and external is at the base of the theory of content developed by Dan Hutto and Erik Myin: there are not just images in the head (Hutto, Myin 2013), but images *for* the head in the world out there (Hutto, Myin 2017; Parisi 2017).

The functioning of this representational interaction has been described through the "Enactive Sign", a concept proposed by Lambros Malafouris in his *material engagement theory* (MET). Writes Malafouris:

By 'the fallacy of the linguistic sign' I mean, essentially, the commonly practised implicit or explicit reduction of the material sign under the general category of the linguistic sign. Technically speaking, to commit this fallacy is to *conflate semiotic ontologies*. That means, put very simply, that you assume that a real ceramic vase and the

word 'vase' possess the same semiotic properties and affordances. In other words, you presuppose that both the vase as a material entity and 'vase' as a word mean, or signify, in the same manner. When the issue is viewed from a methodological perspective, what this fallacy implies is that you have adopted *the analogy of material culture as language or text* (Malafouris 2013: 91).

Language again. The thing is not its sign. Or, put otherwise, the sign does not capture all the effects that things carry out on the human. Because the signifier is connected to the thing by conventional rules, its materiality is ignored by the logic of the linguistic sign. But the enactive sign is different. Charles Sanders Peirce is considered the father of a semiotic interpretation that does not reduce every aspect of the sign to its arbitrary and merely linguistic properties (for a detailed and contextual discussion between MET and Peirce, see Paolucci 2021).

So, what is the enactive sign and in what it differs from a linguistic one? The enactive sign possesses material properties: in the context of the city, the difference can be made between a STOP signal and a bump. The signal "tells you" to stop, while the bump "acts you" to stop. In the first case, you have to interpret a message; in the second case, "the medium is the message", McLuhan would say (1964). Quoting Malafouris:

(1) I define the material sign as a semiotic conflation and co-habitation through matter that enacts and brings forth the world. (2) I define enactive signification as a process of embodied 'conceptual integration' responsible for the co-substantial symbiosis and simultaneous emergence of the signifier and the signified that brings forth the material sign. (3) I propose enactive signification as the crux of material semiosis and thus of the meaningful engagement of cognition with matter (2013: 99).

Matter *matters*. The material sign brings forth, creates, realises, and concretises the world. This happens because, by combining inner and outer representations, we create the meaning for making sense of our action-perception loops.

Point 4 affirms that the different representational domains are interconnected within a network through implicate and explicate order. We prefer to quote the book because it is the easiest way to present this complicated passage:

The implicate-active information is a potential; the explicate-Shannonian information, is its realisation in a specific way. Thus, a building, a map, or a whole city, are external representations by virtue of the active information they enfold. This potential information is being actualised/realised in specific ways by different individuals depending on their memory content, energy and the task and context within which this specific actualisation takes place (Portugali 2011: 150).

He concludes:

In terms of cognitive maps this implies, first, that the environment/city is enfolded in the mind in the form of active information that when actualised gives rise to a

specific ad-hoc internal representation, that is, to a cognitive map. Second, that the minds of individuals are enfolded in the environment/city in the form of a multiplicity of external representations that create the environment's/city's active information that can be actualised in a specific way. Mind and environment/city are thus only relatively independent – they form a single interactive network with implicate and explicate properties (*ibid.*).[2].

Points 6 and 7 are the crux of SIRN. There are two ways to conceptualise an emergent property. One is expressed marvellously by a video,[3] where a slime mould creates a city network that replicates almost exactly the Tokyo rail system. In this case, there is not an individuated organism, yet the behaviour shown by the mould looks intelligent and follows a purpose. The other way, closer to human activity, considers emergent a property that cannot be entirely reduced to its parts. These two different ways characterise enactive cognition.

Surprisingly, though, Portugali does not cite this corpus of contemporary research but seems to know only their epistemological originator, Francisco Varela. Enaction is, in fact, a direct descendent of autopoiesis. So, what both SIRN and enaction strongly claim is their externalist perspective: cognition is not confined to the head; it spreads out in the world by involving it. We do not do things by computing symbols in our head: this metaphor is too poor for describing cognitive phenomena. Instead, we interact with our surroundings in a way that progressively structures what we will be more prone to do in the future and what is unlikely or even impossible to do. From the enactive perspective, cognition is the activity of sense-making performed by the agent. During this constant and biologically structured activity, the agent makes sense of the world, that is, he or she assigns values and priorities and develops habits and hierarchies. This process is based on sensorimotor loops involving the material surroundings.

Let us provide you with some examples. In a book considered a milestone for enactive philosophy, Ezequiel di Paolo and colleagues defined habits as the enactment of "self-sustaining precarious sensorimotor schemes" (Di Paolo, Buhrmann, Barandiarian 2017: 144). Habits become activities when the agent coordinates their occurrence according to a given purpose. Think of preparing coffee, for instance. At last, activities produce sensorimotor networks made of clusters and nodes coordinated by organisational principles responding to what the agent usually does over time. Waking up, preparing coffee, getting dressed, going out, etcetera. Despite similarities, everyone develops personal habits, which are heavily dependent on the context. One of the central tenets of the enactive

[2] We are not committed to point 5, the genotype/phenotype analogy, because we think it is unnecessary and adds nothing to our discussion.

[3] *Tokyo rail network designed by Physarum plasmodium*, available at the following link https://www.youtube.com/watch?v=BZUQQmcR5-g

proposal, at least the one proposed by Di Paolo and colleagues, is the idea that "sensorimotor life" is the result of our own *biocultural history of sensorimotor habits, constrained over time by the ecological opportunities we encounter.* According to Di Paolo and colleagues, changing a habit produces a wave along the entire cognitive system that affects the other nodes and clusters. In a nutshell: you cannot just change a habit without changing the network, or at least without perturbing it. Or, conversely, you cannot introduce a new habit without taking into due consideration the network of habits already existing.

Language and ocularcentrism have overshadowed other cognitive phenomena, making cognitive sciences quite impenetrable to conceptual contaminations and urban philosophy affected by a sort of ocularcentric bias. In this paper, we have tried to show that there is an already mature alternative for both disciplines, by sketching a preliminary, possible path of integration between cognitive sciences and urban philosophy grounded on sensorimotor and material aspects.

References

BLOCK, N. (ed.)
— 1980, *Imagery*, Cambridge (MA), The MIT Press.
BULLOCK, N.
— 2018, *Ocularcentrism in Singapore: a preliminary analysis of architecture*, "eTropic: electronic journal of studies in the Tropics", 17, 1: 25-40.
DARTON, E.
— 2002, *The Janus face of architectural terrorism: Minoru Yamasaki, Mohammed Atta, and our world trade center*, in M. Sorkin, S. Zukin (eds), *After the World Trade Center: Rethinking New York City*, New York, Routledge: 87-95.
DE CERTEAU, M.
— 1984, *The Practice of Everyday Life*, Berkeley, University of California Press.
DI PAOLO, E.A., BUHRMANN, T., BARANDIARAN, X.E.
— 2017, *Sensorimotor Life. An Enactive Proposal*, Oxford, Oxford University Press.
EL MOUSSAOUI, M.
— 2020, *The ocular-centric obsession of contemporary societies*, "Architecture", 8, 6: 1290-1295.
FERRETTI, F.
— 1998, *Pensare vedendo. Le immagini mentali nella scienza cognitiva*, Roma, Carocci.
FODOR, J.
— 2008, *LOT2. The Language of Thought Revisited*, Oxford, Oxford University Press.
— 1975, *The Language of Thought*, New York, Crowell.
FREEDBERG, D., GALLESE, V.
— 2007, *Motion, emotion and empathy in esthetic experience*, "Trends in cognitive sciences", 11, 5: 197-203.

Gallagher, S.

—2016, *Timing is not everything: The intrinsic temporality of action*, in R. Altshuler, M.J. Sigrist (eds), *Time and the Philosophy of Action*, London, Routledge: 205-221.

—2017, *Enactivist Interventions: Rethinking the Mind*, Oxford, Oxford University Press.

—2020, *Action and Interaction*, Oxford, Oxford University Press.

Gallese, V.

—2003, *The manifold nature of interpersonal relations: the quest for a common mechanism*, "Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences", 358, 1431: 517-528.

—2005, *Embodied simulation: From neurons to phenomenal experience*, "Phenomenology and the cognitive sciences", 4: 23-48.

—2007, *Before and below 'theory of mind': embodied simulation and the neural correlates of social cognition*, "Philosophical Transactions of the Royal Society B: Biological Sciences", 362, 1480: 659-669.

—2017, *Visions of the body. Embodied simulation and aesthetic experience*, "Aisthesis. Pratiche, linguaggi e saperi dell'estetico", 10, 1: 41-50.

Gallese, V., Gattara, A.

—2015, *Embodied simulation, aesthetics, and architecture: An experimental aesthetic approach*, in S. Robinson, J. Pallasmaa (eds), *Mind in Architecture: Neuroscience, Embodiment, and the Future of Design*, Cambridge (MA), The MIT Press: 161-180.

Gallese, V., Sinigaglia, C.

—2018, *Embodied resonance*, in A. Newen, L. De Bruin, S. Gallagher (eds), *The Oxford Handbook of 4E Cognition*, Oxford, Oxford University Press: 417-432.

Graham, S.

—2016, *Vanity and violence: On the politics of skyscrapers*, "City", 20(5): 755-771.

Haken, H., Portugali, J.

—2021, *Synergetic Cities: Information, Steady State and Phase Transition: Implications to Urban Scaling, Smart Cities and Planning*, Cham, Springer.

Hauser, M.D., Chomsky, N., Fitch, W.T.

—2002, *The faculty of language: what is it, who has it, and how did it evolve?*, "Science", 298, 5598: 1569-1579.

Hurley, S.

—1998, *Consciousness in Action*, Cambridge (MA), Harvard University Press.

Husserl, E.

—1966, *Zur Phänomenologie des inneren Zeitbewußtseins* (1893-1917); Eng. trans. by J. Brough, *On the Phenomenology of the Consciousness of Internal Time* (1893-1917), Dordrecht, Kluwer Academic Publishers, 1991.

Hutto, D.D., Myin, E.

—2017, *Evolving Enactivism. Basic Minds Meet Content*, Cambridge (MA), The MIT Press.

—2013, *Radicalizing Enactivism. Basic Minds Without Content*, Cambridge (MA), The MIT Press.

Kalayjian, W.H.

— 1996, *Owner, Architect, Builder, Banker: Comparing the Development and Construction of Two Manhattan Skyscrapers, 1930 and 1990* (Doctoral dissertation, Massachusetts Institute of Technology).

Kosslyn, S.M.

— 1980, *Image and Mind*, Cambridge (MA), Harvard University Press.

Kosslyn, S. M., Thompson, W.L., Ganis, G.

— 2006, *The Case for Mental Imagery*, Oxford, Oxford University Press.

Linde, C., Labov, W.

— 1975, *Spatial networks as a site for the study of language and thought*, "Language" 51, 4: 924-939.

Mallgrave, H.F.

— 2015, *"Know thyself": Or what designers can learn from the contemporary biological sciences*, in S. Robinson, J. Pallasmaa (eds), *Mind in Architecture: Neuroscience, Embodiment, and the Future of Design*, Cambridge (MA), The MIT Press: 9-31.

Menary R.

— 2010, *Introduction to the special issue on 4E cognition*, "Phenomenology and Cognitive Sciences", 9: 459-463.

McLuhan, M.

— 1964, *Understanding Media. The Extensions of Man*, New York, McGraw Hill.

Newen, A., De Bruin, L. Gallagher, S. (eds)

— 2018, *The Oxford Handbook of 4E Cognition*, Oxford, Oxford University Press.

Noë, A.

— 2012, *Varieties of Presence*, Cambridge (MA), Harvard University Press.

Pallasmaa, J.

— 1994, *An architecture of the seven senses*, in S. Holl, J. Pallasma, A. Perez-Gomez (eds), *Questions of Perception: Phenomenology of Architecture*, Tokyo, a+u Publishing Co.: 40-49.

— 2012, *The Eyes of the Skin: Architecture and the Senses* (3rd ed.), Chichester, Wiley.

Paolucci, C.

— 2021, *Cognitive Semiotics*, Cham, Springer.

Parisi, F.

— 2017, *Immagini nella testa o immagini per la testa*, "Fata Morgana", 31: 69-80.

— 2019, *La tecnologia che siamo*, Torino, Codice.

— 2021, *Enacting Virtual Reality*, in A. Scarinzi (ed), *Meaningful Relations. The Enactivist Making of Experiential Worlds*, Academia-Verlag, Baden-Baden: 245-262.

Pearson, J., Kosslyn, S.M.

— 2015, *The heterogeneity of mental representation: Ending the imagery debate*, "Proceedings of the National Academy of Sciences", 112, 33: 10089-10092.

Pitt, D.

— 2022, Mental Representation, in E. Zalta, U. Nodelman (eds), *The Stanford Encyclopedia of Philosophy*, https://plato.stanford.edu/archives/fall2022/entries/mental-representation/

Portugali, J.

— 2011, *Complexity, Cognition and the City*, Cham, Springer.

Ryan, M.-L., Foote, K. E., Azaryahu, M.
—2016, *Narrating Space/Spatialising Narratives: Where Narrative Theory and Geography Meet*, Columbus, Ohio State University Press.
Sbriscia-Fioretti, B., Berchio, C., Freedberg, D., Gallese, V., Umiltà, M.A.
—2013, *ERP modulation during observation of abstract paintings by Franz Kline*, "PloS One", 8, 10: e75241.
Shepard, R.N., Metzler, J.
—1971, *Mental rotation of three-dimensional objects*, "Science", 171, 3972: 701-703.
Sterelny, K.
—1986, *The imagery debate*, "Philosophy of Science", 53, 4: 560-583.
Tononi, F.
—2020, *Aesthetic response to the unfinished: empathy, imagination and imitation learning*, "Aisthesis. Pratiche, linguaggi e saperi dell'estetico", 13, 1: 135-153.
Tye, M.
—1991, *The Imagery Debate*, Cambridge (MA), The MIT Press.