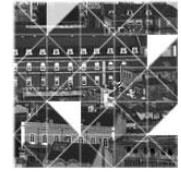


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# CIDADES, Comunidades e Territórios

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## Cities, Systems and Structures: an ontological approach to urban studies.

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### Abstract

Ontological issues lie at the heart of the epistemological, methodological and theoretical discussions over the workings and operations of cities – however, as Castells and Zukin point out, they often find themselves mired in the midst of the praxis of urban studies, for reasons not entirely clear. In this work we attempt to trace a path through the ontology of urban studies, attempting to show the reasons for this apparent omission, as well as showing a possible line of convergence through the lens of systems theory, for a common ontology. We propose a set of analytical classes drawn from the literature, drawn from the need to discuss social phenomena, tracing some of the ontological compromises made in light of such entities. In line with that, we argue there is a need for a transparent phenomenological epistemology, tracing some methodological implications of such processes. We conclude by drawing some scientific and practical implications of these debates for a more general discussion of ontology in urban studies and research.

**Keywords:** epistemology, ontology, urban studies, systems theory.

## 1. Introduction

There is a set of questions with which any analysis about space, urban life, as well as social and cultural phenomena taking place in these contexts, has to face even if implicitly: what do we define as a city, a culture, an urban space, an agent or a public space? These questions are what we can call ontological concerns, that is, questions regarding what can be said to exist in urban contexts, – including the concept of the urban *qua* urban, or “urban in itself” – what properties they can be said to possess, etc. Such suppositions can be found in urban research practice, although often implicitly (Zukin, 2011), despite their relevance in defining what entities are thought to belong to an urban analysis, what methods should be used, and what impacts can be expected from research.

In parallel, if not as a consequence of this, in urban studies the entities postulated between disciplines often lack cohesion, taking several meanings according to the specific discipline. Such consistency of use is something

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needed so that common sense and intuitive notions such as “agent” or “culture” can be made into operational concepts, easily understood within the field, and coherently mobilised. More so, the specific ways in which such entities as agents or culture are given ontological substance – recognising how agents can be embodied, emotional, rational and creative agents rather than fulfilling the axioms of Von Neumann-Morgenstern, for instance – pose important questions to the development of a reflexive science that recognises its own imposed limitations and seeks to capture how social reality truly is.

All such definitions – what the urban is, what entities we assume underlie that definition, how best to study it, what methods to use – constitute a necessary starting point in the practice of urban research: without them we cannot do research. However, explicit debates on these questions are lacking. The purpose of this paper is to try to open up a debate on these two topics:

- 1) What is “the urban”?
- 2) What kind of entities, and what kinds of behaviours, generate “urban contexts”?

We seek to address such questions by first looking at the ways in which these ontological questions have been addressed in the field of urban studies. We defend that three interconnected perspectives exist on the substance of “the urban”, and argue for the ontological primacy of emergent patterns of actions and relations by entities – analysed as systems – in defining it. We then turn to the underlying entities present in such a systemic ontology, outlining the metaphysical compromises made in that process and arguing for explicitly assuming the complexity of agents, groups and objects through a semiotic, phenomenological and interdisciplinary lens. Finally we turn to the epistemological and methodological consequences of such a systemic perspective, drawing some implications of systems theory, semiotics and phenomenology to the inquiries of urban research, before drawing some final remarks.

## **2. An Ontology of Urban Studies**

### **2.1. The Ontological Urban Question**

As Zukin (2011) points out, in reference to Castells (Castells, 1983), the concerns over the ontological status of urbanity in general are not felt upon reading most works in urban studies: whilst various ontological assumptions are mobilised, and certain aspects of ‘the social’ are considered crucial for defining the urban, these debates are often made without direct reference to the status of such questions. The critique is quite incisive, even if limited to the scope of urban sociology – although, whilst in other disciplines such a concern has been at times made more explicitly (Lynch, 1960; Scott, 2008), it is anything but the norm.

Looking at the history of urban studies, we find the question “What is the urban?” (implicitly) present in many longstanding academic debates, with sociology being a prime example: from the succession of ideas about urban space as a system of economic production, as in Marx, to its status being that of a threat to social community, as in Durkheim and especially Tönnies, to urbanism as a way of life as stated by Wirth (1938), to the urban as a habitat passible of ecological analysis (Park and Burgess, 1925), to the urban as opposed to the productive and cultural patterns of the “rural”, as in Sorokin (Nikulín and Trotsuk, 2018), the urban as another stage for the operation of the capitalist system (Castells, 1983), or the urban as the producer and product of cognitive-cultural economic shifts (Scott, 2008). In all of these works, the substance of the urban tends to be posed in cautious terms. Always the questions that surround it are: can such defining factors be known from any specific analysis of a phenomenon, or multiple such phenomena? Can such a question even be legitimately asked?

All the same, these works mobilise sets of concepts to distinguish and specify certain areas of study, defining them in light of specific disciplines, and opting to give greater emphasis to certain entities than others within the urban – which we could call, to use Heidegger’s terminology, “ontical questions”. However, since multiple disciplines find the same objects, attribute them with the same names, yet focus on different aspects, the way each ontic hierarchy is organised is often widely different: areas like architecture or geography will consider the role of the

environment, both built and natural, as a determinant factor, sociology, anthropology and economy will privilege the motives and intentions of agents (for instance, the demand side explanations of gentrification) or alternatively the role of social structures that command action from the agents, generating a certain level of complexity of family ties, a dynamics of housing, or another such pattern recognised as relevant. This is a gross simplification, but one that finds echoes in works such as those of Nigel Thrift (1996) in geography, John Urry (2002) in the studies of culture and heritage, David Clarke (1997, 2010) in economic sociology or Bill Hillier (1984) in architecture. We have thus two core problems in the study of urban life: the lack of a commonly held notion of what “the urban” is, and a lack of synthesis in the entities postulated to explain specific phenomena that occur in ‘urban contexts’. Should the latter surprise us given the former?

From our understanding of the field of urban studies, we propose that views on “the urban” can simplistically be characterised in three, interconnected, types of perspectives. The first, which we might call the reductionist perspective, characterises “the urban” as a mere family resemblance concept, without any more ontological substance than its use, rendering the analysis of urban studies no different from any other analysis in the social sciences, having merely a set of apparently different phenomena that can be reduced to other, better understood forms. In short – the urban is nothing if not the social dressed in specific structures of discourse. This is the position that Castells takes in his “The Urban Question” (Castells, 1977), albeit moderated and somewhat influenced by the other two.

By posing urbanity as a form of political, ideological and scientific construction, it simultaneously recognises that new forms of phenomena may appear in such contexts, but that such phenomena are ultimately reducible to questions of economic determination and class struggle. Such a position has its appeal in simplicity – it casts the entire ontological question out of the window – but bears with it the cost of having to systematically explain how the phenomena which have emerged in “urban contexts” can be intrinsically tied to relations of power, ideology, or another external basis for reduction. Moreover, by chasing the ontological question onto a new level, it forces us to follow it towards those domains of knowledge – such as Marxist theory – where the question would have to once again be posed with “the social” in its place.

The second perspective, which we might call the phenomenalist conception of the urban, is one that equates “the urban” with a phenomenal experience, hinged on materiality, sensation, and drawing heavily from the (post-) phenomenological tradition. This can in part be seen in Simmel’s (2002) classical text on the metropolis, where the author sees the metropolis as inducing a certain emotional state which in turn generates a set of social effects. Rather than reducing the urban to the social, this perspective sees the urban as inherently generating in human individuals (as presumably in other entities) a set of phenomenal experiences and engagements with ‘objects’ that are what urbanity means. A similar perspective is exposed by certain authors associated with some forms of object oriented ontology – Jane Bennett’s work on the Political Ecology of Things (Bennett, 2010) exposing in an accurate sense how the “assemblages” produced by our existence in the midst of things generates a specific form which is ontologically relevant, and which impacts our engagement, or William Connolly’s (2010) discussion of how we engage in certain “force fields” that shape our perception. The takeaway is simple: the urban is essentially borne out of the interrelations of certain actants, and is, like everything else, subject to becoming and transformation (Connolly, 2010).

Such a perspective, in the extreme, would radically reject the former: rather than a vaster entity determining the behaviour of the urban, it places the character of the urban in the “agents” and “objects” themselves, with relations which are eminently dependent on them. But such a perspective, in taking on such a focus, makes the study of the urban a volatile endeavour, with an added risk of a highly nominalistic and atomised epistemology that rejects patterned phenomena entirely.

The third and final perspective is a variation of what we have previously discussed: the characterisation of the urban through one specific set of ontical entities, which might be called an ontical-emergentist perspective. In the limit, it defines the urban as being reducible to the specific patterns which those entities otherwise specified generate through their relations – the urban is the set of emergent behaviours caused by these entities. In its strongest form such a perspective could take on a Humean stance (Lewis 1994), with similarities, although only in form, to the (ontic) structural realism of the physical sciences (French, 2014; Worrall, 1989): all there is for our

scientific purposes is an analytical structure generated by entities which may or may not really exist as we conceive them, and which guarantees the ontological consistency of our world. Such a perspective has the advantage of being closest to the intuitive practice of most urban scholars, but in turn is subject to criticism from the other two: there is no guarantee that the patterns out of which the analyst casts a system are not mere epiphenomena of a more foundational concept, being shaped by ideology; and in rejecting the phenomenal character of the urban in favour of a high-level description, it casts a series of metaphysical assumptions on objects, relations and agents that are rarely questioned, and which deny the capacity of agents to reflect and act upon the very patterns they generate.

These three perspectives coexist in the bulk of urban research practice: the first is mostly found in Marxist theory as well as other forms of “grand-theory” (Castells, 1983; Lynch, 1994); the second appears especially in areas such as heritage studies (Haldrup and Bærenholdt, 2015; Waterton and Watson, 2015), some forms of anthropology (Low and Lawrence-Zuniagais, 2003) and studies of geography and psychology that tackle the generation of place-identity (Goodman, Goodman, and Redcliff, 2010; Proshansky, Fabian, and Kaminoff, 1983; Urry, 1995); whilst the third is found in sociology (Sassen, 1991; Zukin, 1995), economics (Scott, 2012), geography (Portugali, 2011) in various ways that go far beyond the scope of this article.

What this entails is that the very reflection on ontological questions remains an open question, with numerous fields yet to explore. Nonetheless, we are particularly inclined to defend one particular version of the third ontological perspective, which seems to us to be better suited for the practice of an urban research that carries scientific and political ambitions.

## 2.2 Urban Reflexive Systems

We propose that a way forward can be thought out by mobilising some of the ideas of all three former ontological perspectives, and tying them to the calls for a “complexification” of social research in general (Urry, 2005) as well as urban research in particular (Portugali, 2011), and to the expansion of complex systems theory (Morris et al., 2014). Whilst systems “theory” is often referred to as a “theory”, it is first and foremost a framework through which to think the interrelations of entities, and to bring into emphasis the emergent patterns that ensue. Crucially, such an approach requires that we admit the existence of contexts which are conventionalised as “urban” – the “urban contexts” we have alluded to, and which are socially taken to be as such<sup>2</sup>; and it also implies that no single system can account for the urban, with systems being differentiated according to the types of entities and relations they contain – economic, cultural, aesthetic, emotional, legal, amongst others – a point which deserves elaboration, and to which we will return in the next section. From this perspective, the urban is an entity that emerges out of the interrelations of patterns of ‘lower-level’ entities.

Such a framework can be found in areas such as urban ecology (Fischer-Kowalski and Hüttler 1999) and some strands of architecture (Hillier and Juliette 1984), as well as urban movement and dynamics (Portugali, 2011). It seems however to be lacking in contexts of urban cultural studies, studies of meaning or of social ties – a case to which we will allude throughout the text, to showcase the potential for systems to unite urban research. The goal of such an ontological framework is to reduce the complexity of social phenomena to a set of entities which relate to which other, which, in analytical terms, can be said to compose a “system” out of habitual relations, with specific ‘dynamics’ which may be oriented towards one or another end and measured as such. It also bears an association to certain evolutionary perspectives (Mesoudi, 2016; Steward, 1972), as well as to the Parsonian tradition of cybernetics, which carry with them the Darwinian concepts of adaptation, selection, drift and transmission as well as notions of function, optimisation and feedback – concepts which although useful to represent some social phenomena have to be used with caution to avoid falling into forms of conservatism (Buchanan and Powell, 2015; Mills, 1976) or of grand explanation without empirical ground (Mills, 1976).

An immediate criticism which can be made is that such an approach seems to again throw the ontological burden of its own explanation into another concept. Indeed, such a criticism could continue by noting that in reducing the

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<sup>2</sup> A finer version of this semiotic assessment of what kinds of contexts, or things, qualify as “urban” could and should be given by inquiry into the ways in which they are socially categorised as such.

urban to a set of patterns we are forging the entire set of engagements which individuals have and which mark the very way in which urban contexts are experienced. Such a line of criticism would perhaps accuse us that this functionalises society, doing away with the experiential and phenomenal nature of engaging in urbanity. However, two arguments can be levied against it: on the one hand, we would note that the sensations generated, and engagements made by individuals, are not necessarily outside the scope of a systemic ontology, as we would say that those arrangements which are born of phenomenal experience will themselves be systems, whether on a purely psychological basis (how a given being experiences its surroundings) or as systems of shared experience.

Moreover the work of second-order cybernetics (Pask and Foerster, 1960), as well as complex systems theory (Mesoudi 2016; Morris et al. 2014), show us that more complexity is allowed into the systems than mere mechanistic representations, with the concept of a reflexive system taking on the capacity to engage with its own action, to model its own behaviour, and to trace its own path.

What this amounts to is first of all a conception of the urban as a set of patterns, analysed as systems – but can this be said to answer what the urban as urban is? This we would argue is not a question that should be answered *a priori*, but rather that towards which the study of urban research points to: a description of what kinds of patterns exist in the urban that do not exist elsewhere, and which clearly demarks it from other contexts.

Furthermore, such a perspective seems to rescue the other two, in different forms: rather than take the experience and phenomenal conception of the urban as having ontological priority, such a perspective can and should be mobilised in refining what entities we consider to have ontical substance; and the critical reductionist thesis, if properly situated in a context of emergentism, can imply that the urban generates impacts and is recipient to consequences of higher patterns, generated by the very systems which constitute the urban – generating in the process phenomena related to states, international politics and questions such as gender or race.

### 3. A Systemics of the Urban

With this framework in mind – which we hope to develop further in future work – we are still left with the task of defining what sort of entities exist and what their relations are. Such a task involves two key points: on the one hand it seeks to propose a shared language with which to model the patterns and to construct working systems; on the other hand, it invites us to pay close attention to the ontological and metaphysical compromises made in that course, and to note what analytical consequences can be drawn from such compromises. Having these entities and the restrictions or suppositions made of them clearly outlined seems to us the best path towards constructing an analytically solid and politically well-defined area of studies, following in line with the concerns of analytical sociology (Edling and Rydgren, 2014; Hedström and Bearman, 2009), amongst other similar calls in social theory and philosophy for middle-range theories borne out of common ontological frameworks (Byrne, 1998; Elster, 1989).

In discussions of social systems, we are intuitively brought to the notion of “agent” – an entity, often human in nature, that is able to execute a certain action, which is goal-oriented, intentional in both a psychological and action-theoretical sense, and justified in doing so (Wilson and Shpall 2016) – what is often summarily captured in the idea of “rational agent”, and captured in axioms such as Von Neumann Morgenstern (Neumann and Morgenstern, 1944).

However, as Jane Bennett (2010) notes, what defines the agent is, in metaphysics, far from settled – agent is often considered as opposite to “object”, in a duality where the first has a generative, causal and effective power, capable of directing intentional action, whilst the second lacks one or more of these characteristics. As the same author points out, the specific point of cleavage is never clearly defined in an unproblematic way. A similar problem can be seen in the distinction between agent and “structure” (Giddens, 1984): whether to define agents as capable of intentional social action by themselves, capable of exacting social transformation in a context of structural constraint that force them to reproduction of social processes, or whether this constrictive force is what is responsible for these transformations, has been a core discussion in sociology from its inception.

Both approaches have often been charged with reductionism (agents are instances of structures/objects; structures/objects are instances of agents), and both have faced attempts at synthesis, such as the work of Pierre Bourdieu (1984, 1986) about the *habitus*, Giddens “double structuration” (1984), and in philosophy, the work of Object-Oriented Ontologists (Harman, 2007), with varying degrees of success. To speak of agent, we can – not without its problems – assume a social action to be an effect that can be recognised as having an effect in the social world, in that sense putting it on a similar basis than the Luhmannian tradition of “information” (Luhmann, 1982). However, such recognition need not be universal: since those very social worlds are not transparent, and require a way of access that is often mediated by cognitive entities, we must be careful in speaking of patterns generated by those actions (as we will discuss below), since it requires that we admit that our analytical entities have a representation in the social world, and that we can access them unproblematically. When such a presupposition cannot be met, we can only hope to hint at vague patterns in social reality. Moreover, this implies that we are not compromised to any form of agency being exclusively human, admitting, with authors such as Latour (2005), that other entities can have forms of agency.

We would want, in order to better appeal to intuition and to our present analytical models, to take action as the basis of such agents. We can in that sense follow the line of Parsons (Parsons, 1937), and take the crucial element of a social system to be this action – we are nonetheless still in trouble. As noted by Habermas (Habermas, 1984), assuming agents produce these actions through the intentional and rationalistic model above can lead to a vicious circle if left at that: how should then agents engage in a context where their action depends on the actions of others, often called the problem of double contingency?

We can think of a way to still take the action of agents as the core of the system, and not fall into this problem, by simply complexifying what we take to be the agent. Drawing from the phenomenalist ontological position, we can assume the human agent (to distinguish him from other “actants” in the Latourian sense) to metaphysically be the entity that recognises its existence and engages with the world through a sensorial body, that distinguishes himself from objects in its capacity to manipulate them (Bourdieu, 1984; Merleau-Ponty, 2012). We likewise assume the human agent, in social terms, to be the imbricated entity which acts upon a certain structure with an illusion of certainty (Bourdieu, 1984), a certain cognitive framework, a sociological background which constrains his capacity for action whilst giving him margins of creativity. Such a discussion can lead us only so far if we maintain a distance from other specialised sciences: we can, without loss of generality, take concepts from cognitive and social psychology, economics and even biology to attempt to ground such a notion of agent, which we hope to be able to develop further in future work.

What this amounts to, is saying that agents have a certain intention in their action, and that they have specific causes for those actions. Such assumptions are what we can call **Principles of Action**, and they permeate social theory: ‘Individuals act upon situations based on towards maximizing their wellbeing’, which implies, in some of its forms, almost perfect information (Becker, 1976), or ‘Individuals act based on their social role’, as implied by Durkheimian structuralism, are some of those assumptions. We can speak of the “strength” of such an assumption as the measure to which it can prove certain results and entail certain analytical conclusions – stronger assumptions normally provide more information but carry strong ontological restrictions. Different ontological arrangements will impose such restrictions on the basis of what they attempt to prove, but drawing from a phenomenological perspective, they should be well-informed of their consequences: if we assume that agents cognitively and rationalistically engage with objects in all of their relations to them – denying that objects are imbued with meaning in a social world, and are always deformed in how agents engage with them (Harman, 2002; Heidegger, 1962) – we will be constructing a model with dubious applicability in epistemological and methodological terms.

With these implications in mind, and having in mind the need to provide a general frame of action which both accurately captures behaviour and can have further elaboration in contexts such as cultural systems, we can draw from American Pragmatism and symbolic interactionism, the following as a principle:

**First Principle:** Individuals act upon things based on the meaning that they attribute to them (Blumer, 1969)

A clear definition of meaning is then forthcoming: following the pragmatic line exposed by the symbolic interactionists (Blumer, 1969; Mead, 1934), and especially of semioticians such as Charles Sanders Peirce, we can

define meaning as a composite structure: it is a given referent which, in a social world, we take to be represented by a sign, which is the phenomenological projection of the entity, and is found through a chain of interpretation (Peirce, 1958), where a set of interpretants, themselves other signs, are mobilised. Those very referents can serve as the basis of urban analysis: taking individuals to be situated in a world with socially constructed meaning which, nonetheless, has to be recognised on an individual basis, we can take agents to be recognising such aspects as the (ordinal) value of an object or the belonging of an element to a category when they act within relevant systems.

From this definition we can sketch a justification for the intuitive notion of the difference of systems such as the economic, social or cultural: systems are distinct based on the kinds of actions we identify with them<sup>3</sup> – a purchase or exchange lying in an economic system and a communication of appreciation lying in a cultural one – but also based on the underlying interpretations, such that the same kind of action can be differentiated according to what grounds it.

Having laid the basis of systems, and having a general ontological framework of an agent, we need in a social world to talk of different kinds of agents. To do so we need to also bring in agent properties, that admit of various attributes (an attribute being the “value” that a certain property assumes in the individual). These can have physical or biological (age or sex), sociological (gender) or otherwise specified basis (such as liking to play football on Tuesdays when it rains in the town of Sines). These are not fundamental facts of agents, but rather contingencies which gain sense by relation to a given society: the “difference” that generates such properties only exists as the product of agents and structures in interaction (Luhmann, 1982), which lends to the common interpretation that a property is an instance of a relation (Peirce, 1958), as is often mentioned in social network analysis (Wasserman and Faust, 1994; White, 1963). In a way, we can see that those properties become then the result of the specific meaning that individuals attribute to other individuals, with the referents being categories, and the interpretants being those characteristics that are most strongly associated with them.

In urban contexts we ought also to define “objects” and “structures”. We can speak of a territory as the perceived and outlined space where entities not built or incorporated by humans exist, and which is subdivided into “territorial units” by geographical, physical and cognitive criteria; non-human built entities defined as objects, which in the urban context are mostly buildings; and the emergent structures which derive from the interaction between agents and other entities (including other agents), within a given set of actions and normally set on a given intention of action, where such intention can be constructed. These structures are in fact the basic building blocks of any analysis: a group, a territory, an institution, public space or commodities are in all cases structures necessary to talk of urban social worlds.

For us to be able to proceed we must also make use of a primitive notion: the idea of set. This can be taken as abstract ontological categories, like relations, and as such they exist as building blocks of analysis, denoting a specific relationship: sets denote belonging to themselves based on a predicate<sup>4</sup>, and when they possess a membership function they can have fuzzy degrees of belonging. These forms are crucial in many conceptual definitions and modelling efforts: they follow the arguments of Charles Ragin (2000), of how the fuzzy nature of social sciences should entail an acceptance of such diffuse forms, for instance in attributing indexes of certainty to constructs, as is the case of Cronbach’s Alpha and similar tests for quantitative analysis, but which seldom if ever are seen in qualitative analysis with a comparative framework (Smithson and Verkuilen, 2006). For instance, when we talk of the elements of a given culture, it becomes conceptually more accessible to imagine such a process as a diffuse set of belongings, driven by individuals who place them within a set of concepts according to their apparent satisfaction of a predicate to a certain extent, rather than defining in a clear-cut way what does belong to the given culture.

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<sup>3</sup> It seems natural to assume that the same kinds of action belong to different systems; however, the referents of such systems should, at least for analytical purposes, be taken as unique, to avoid over-generalising the concepts.

<sup>4</sup> This intuitive understanding of set is deeply problematic in set theory and is often called “comprehension without restriction” – that is, understanding that the set is defined by the members which satisfy the given predicate, which lead easily to Russel’s Paradox. Whilst it is by itself questionable that anything like that would happen analytically, it is likewise worthy of note that in multi-value logic – fuzzy logic and fuzzy sets – like we are discussing here, the axiom of comprehension is sufficient (Hájek and Haniková, 2003).

We can then define here a class of structures composed of the previous elements, which we can call a social group: an entity, abstractly represented by a set, composed of individuals who share a given set of attributes that define it. The intuitive reasoning on social groups would put them as “crisp” entities, that is, admitting belonging only in binary terms – one either is or is not part of the group. However, it is clear that certain predicates are inherently diffuse: “liking crocodiles” is not the same kind of relational property as “being 16 years old” – the second relates to a socially accepted and reproduced notion of age which is taken as unproblematic, whilst the first has a much wider margin of doubt, as “liking crocodiles” can be a very different thing for two individuals. Consequently, what happens in some social groups is the need to admit input functions with values that vary in an interval – they are diffuse social groups.

Such notes obviously leave out many elements which are crucial for the construction of any analytical framework: we can speak of a type of object defined as ‘commodity’ as that which can be acquired (which involves the relation of property and the subsequent exchange of it), of ‘common’ or ‘public’ goods when the property belongs to an organized structure to which the individual belongs (such as a state or a collective), and so forth. Public space can thus be defined as a common good which contains multiple objects which are supposed to be used by individuals, and which is recognised collectively (and often institutionally) as belonging to all agents. Heritage could be defined in such a hasty manner, but we reserve it for a specific kind of definition: following the notes of Merleau-Ponty (2012) or Gibson (1979), we assume that the engagement of individuals with objects entails a given relation of modality, that is, a certain way the object presents to the individual in the plausible interaction between the two, whether physical manipulation as such, taken as a cognitive primitive, or socially mediated action (Ramstead, Veissière, and Kirmayer, 2016). As such, cultural affordances can be seen as modalities, and modalities are in practice how the individual perceives his engagement with the object. “Heritage” could be seen as generating such form of modality, where the engagement is based on the attribution of high cultural, social or emotional capital to an object (or other entity), in such a way that it is, to a greater or lesser extent, desired to remain for future use by individuals – to be preserved. The heritage modality would thus also lead individuals to categorise elements in the appropriate category – the category of “Heritage”.

With all of this in place we can conceive that something like an urban economic system consists of a series of relations established by individuals, and where the agent engages objects through an economic modality, interpreting them according to their utility and executing actions such as exchanging, buying and transferring goods; and analogously, that a cultural system consists of a culturally restricted modality, interpreted according to the belonging to such a culture, and with actions such as communication and attendance of cultural events. Such a cultural system can then be restricted to deal only with certain social groups, and the way in which they demarcate their properties, as well as bounded to a certain territory to produce an urban cultural system fit for research. With some necessary developments, phenomena such as cultural gentrification (Zukin, 1995), urban subcultures (Brake, 1980; Muggleton and Weinzierl, 2003), creativity (Costa, Vasconcelos, and Sugahara, 2011) amongst other phenomena could be brought together under such a description. Namely, for phenomena such as heritage, such a systemic discussion can bring to light the similarities of topics discussed there with other cultural phenomena.

However, as we alluded in passing, all of these elements serve only as “building blocks”, having epistemological and methodological consequences which need to be brought to discussion – especially in what this concerns the practice of urban research and its political impacts.

#### **4. Epistemological and Methodological Issues**

Having these entities in place, and their inherent complexities in mind, it would be odd to produce an analysis which mobilised them through simple mechanisms of obtaining theoretical and empirical knowledge. We can here follow some implications of a phenomenalist perspective of urban studies, without following it entirely, with the goal of trying to construct explanations about urban patterns based on the way that we engage with the entities of our research: using, as far as possible, the representations of the social world presented by the agents, despite the limitations inherent in adequately accessing those representations, and checking as far as possible the scope of our assertions over external entities with other analysts, so that biases can be detected and incorporated.



However, there is the need to clarify what this means in practice: given that urban studies have a normative as well as a positive compromise, how can we hope for urban research to simultaneously engage the agents in their complexity, with their conceptions and understandings of reality, to produce a scientifically accurate representation, and also have normative value for public policy? If that is possible, what epistemological and methodological benefits can be reaped from such an ontology?

Following these lines of questioning, authors such as Alfred Schutz set out to describe social reality as being composed of multiple “lifeworlds” (Schutz, 1967), which depend on a temporal horizon as well as a local context. In similar fashion, albeit with a more cognitive focus, Maurice Merleau-Ponty (1964, 2012) founded the notion of modality and claimed that the body serves as a fundamental entity in constructing understandings about the realities we engage with, bridging the understanding of the social and the individual through the body, and giving social substance to many Heideggerian notions of engagement such as his tool analysis and his ontological categories of engagement (Harman, 2002; 2009), to which we alluded in the previous section.

Both research programs bring us the notion of agent we previously outlined: if we admit that the agent engages with a social world through his inhabiting of a body in an existential context, and a world already imbued with meaning, how can we seek to obtain knowledge of the interpretations of these agents, and what can we guarantee comes from it? Such a debate ties deeply with questions of the objectivity of research – whether analysts can truly detach from their own lifeworlds in accessing interpretations and even actions carried out by agents (Andersen, 2009; Beiser, 2011; Habermas, 1988) – as well as with the epistemic status of said research, and its ultimate ambitions.

The first question seems to us to have a solution by imposing a strong restriction on the urban analyst as the social analyst in general, and can be generally formulated as such:

**Second Principle:** Whenever the representation of a given analytical entity can be given through its own understanding of the world, such an understanding should be selected, and any analytical abstraction – such as the creation of typologies or aggregations – must as far as possible be recognised by the agents themselves.

However, such an epistemological principle can only be made universal at the cost of reducing all research into a mere descriptive effort (Santos, 1988). In so far as the analyst recognises in the agent a similar, and can empathise with his logics of action, even if never perfectly map into his social world, such a principle can perhaps be relaxed by allowing researchers to use alterity as a weak proxy for knowledge, taking care at length in understanding how and when comparisons, generalisations and classifications can be made, and working productively in such a context (Graeber, 2015). However, that naturally implies greater scrutiny into the epistemological choices made in analysis: when a cultural systems analyst decides to classify interpretants, his work should be possible to check and verify openly.

Having such a position naturally inclines us, in the debate between positive and interpretative science, to a Weberian-Diltheyan *verstehen* (Dilthey, 1991; Weber, 1991), which for instance in sociology played off Durkheim (Durkheim, 1998) and his “social facts” against the types of Weber. However, analysing Weber’s arguments – such as the fact that social reality always transcends the models we use to analyse them, requiring that we look at the complexity of the field at hand, and criticizing the over-expansion of scientific rules found – seems to allow the possibility of modelling phenomena that share a given structure. That amounts to first interpreting social phenomena through a set of ontological assumptions, and through them abstracting from the particulars into the principles considered at hand. The generalisation of properties, through a pattern emergent from the behaviour of the entities, gives us a trade-off in generality of explanation and analytical precision (Epstein and Atxell, 1996), due to the plausible case that social phenomena manifest nearly chaotic levels of emergence (Byrne, 1998; Urry, 2005), with minimal properties dramatically shifting the behaviour of the system over time. But in doing so, it allows us to speak of rules and to consider the dynamics of the system over time, whilst also reminding us of the inherent limitations of such a process. Many other implications – such as the role of history in social theorising – also appear to be reconcilable with the analysis of such patterns and should be aptly kept in mind (Habermas, 1988; Kashim, 2014; Mesoudi, 2016).

Such debates also bring us to the question of the admission of ethical orientation in research. The implication of works such as Habermas' (1988) tend to be that accepting critical theory does not destroy positive science, but rather exists in a permanent continuum with it – social science and applied fields such as urban studies more so, are always critical and always positive, but importantly, can never be adequately critical without being positive (that would be a merely moral projection onto the field) nor adequately positive without being critical (that would be ignoring a large part of the social phenomenon at hand). Crucially though, this hinges on recognising that the agents which we analytically construct and about which we make epistemological assumptions have themselves ethical charges which should be taken into account, and that they can reflect upon the very logics of impact and planning that relate to the patterns they generate – putting reflexivity to good use, as is the practice of some forms of planning (Fainstein, 2016).

Finally, such an ontological and epistemological admission of systems and levels of abstraction appears to us to open the way to the inclusion of new tools for modelling – such as Agent Based Modelling, where the full strength of a clear set of entities can be seen as the models take those same entities as part of their model, and intake principles of action to guide their behaviour. Despite having a long history (Epstein and Atxell, 1996), and numerous applications in urban studies (Boavida-Portugal, Ferreira, and Rocha, 2014; Bruch and Atwell, 2015; Morris et al., 2014; Portugali, 2011), the potential of using such tools for modelling all types of systems – rather than only those that involve assumptions of objective measurement – can open the way for more formal and accurate models that can, with time and effort, hopefully be turned into tools to inform policy-making by using ABM in conjunction with empirical data from the agents. In particular, by not requiring quantitative inputs, and outputting not only measures but also qualitatively observable outputs, such a tool seems particularly adequate for areas of urban analysis that have little in the way of formal methods of representation of their theories.

## 5. Concluding Notes

The transformation of urban and cultural contexts in recent years has renewed the need for intensive urban research dedicated to outlining social problems and providing empirical and theoretical insight for the development of policy and social action. Due to its dual role in producing analysis and normative assessment, the field is active and hastily engaged with socio-institutional contexts, which may in part explain some of the conceptual diffusion that tends to happen and which often leads to cross-disciplinary (and sometimes intra-disciplinary) confusion.

By discussing the question “what is the urban?” we identified three general perspectives which are present in urban studies – social reductionism, a form of phenomenism and a form of emergentism – which outline specific projects for the analysis of the urban and carry different kinds of entities with them. By proposing a specific approach to the latter, which takes multiple interconnected emergent patterns of action – analysed as systems – as the core entity, we sought to propose a way of framing current urban research as analysis of different systems, out of which the specific difference of the urban can be seen to emerge.

Consequently, we also tried to show how such a construction can be based on a phenomenological, social-theoretical, semiotic and interdisciplinary debate, and how such an approach can bear adequate epistemological ground to construct normative assertions that take on the complexity of the agents as morally charged agents with a capacity for social engagement, as well as their limitations, flaws and biases. We likewise attempted to show the methodological paths made clearer through a clear ontological perspective, namely the use of Agent Based Modelling as a tool for theory building and testing. It is our belief that sufficient development of these tools should allow the production of policy modelling up to and including domains of culture or place-identity – and it should be the practice of urban studies to attempt to make such experiments in order to best go in line with the political needs of relevant stakeholders.

It is our understanding that the systemic perspective exposed in this paper can serve as a promising avenue for bringing urban research under a common framework not only internally, but also in relation to fields such as engineering, biology, psychology, international relations or macroeconomics, with which it finds itself more often in dialog as a product of global-level changes. However, further discussion and research is needed in all of these

domains. Areas such as cultural and material heritage studies, given their circumstantial positioning in urban contexts can likewise benefit from their discussion as systems of shared meaning with given dynamics and specific patterns. Bridging these areas can in that sense provide the field with greater social recognition – necessary in its dealings with stakeholders – as well as hopefully, on a final basis, provide a decisive answer to what patterns effectively make “the urban”.

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