Ontology

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The word ontology comes from the ancient Greek *ontos* ("*being*" – present participle of "*eimi*", to be) and *logos* (knowledge, rational discourse). It is the branch of philosophy concerned with the nature of being. The classical questions addressed in ontology since the Pre-Socratics (especially Parmenides), Plato, and Aristotle are: "What is being?", "Which categories of objects exist?" or "Do social phenomena exist in the same way as physical objects?" Therefore, as a branch of metaphysics, ontology is mainly concerned with the modes of existence of different entities (tangible and intangible), such as material objects, social phenomena, concepts, mythological divinities or numbers*.*

"Ontology" also has a second meaning. It refers to a coherent representation of the world, its fundamental elements and the relations between them. "*An*" ontology is a simplified or abstract depiction of being, which provides a general framework for the analysis of the different elements that have been defined, how they interact and obey general laws. In the second definition, an ontology is partial and aims to explain a single dimension of being, whereas "ontology", as the science of being, addresses the general question of being.

The reflection on ontology is intrinsically linked to epistemological questions (EPISTEMOLOGY). A "world of reference" or an ontology is a set of ontological statements that specify what is and what is not. A given statement (knowledge) can be considered true or false depending on the ontology used as a reference. All scientific discourse relates to an object that is presumed to exist in this or that form according to a given ontology, which defines being and indicates whether a particular statement about an object is true or false according to the axioms of that ontology.

This is particularly clear in the case of social sciences. Every sub-discipline relies on an ontology that defines which elements really matter when it comes to explaining the phenomenon they set out to elucidate. Imagine, for instance, that John must go to the market and choose where to buy his vegetables. He has different options: one shop is the cheapest, another has the nicest seller, a third is closer to his current location, while the last shop offers the best guarantee of quality. Once his choice has been made, it can be explained in various ways, depending on what is thought to be the determining causal factor, i.e. the ontological understanding of what the situation *is* and the factors that the researcher considers are crucial for explaining John's choice. A psychoanalyst might explain the choice on the basis of the unconscious pressure to buy vegetables in the shop that reminded him of when he went shopping with his mother. An economist could argue that he was maximizing utility. A feminist researcher might claim that John went to the shop with the nicest seller because of sexist advertising and gender representations. The same phenomenon can be explained in various ways that each involve the existence of different ontological elements and of different relations between these elements that make sense in this ontology.

Each explanatory theory necessary relies on an "explicit" ontology, which explicitly defines the relevant units for this given theory (John's subconscious, his memories, the market, his utility, gender representations, etc.) and the laws governing their interactions at different levels (**LEVEL OF ANALYSIS**). In each ontology, some units are fundamental because they have a causal role (they cause John's behaviour), while others are secondary. Note however that the ontology on which a theory relies is also partially "implicit", insofar as it relies on an intuitive concept of being, in general, that is assumed to be uncontroversially shared by the members of a society. The underlying "implicit ontology" also "fills the gaps" of explicit ontologies by giving meaning to the elements and causal relations that aren't explicitly defined because it is assumed that every member of the society has the same uncontroversial opinion of what they are.
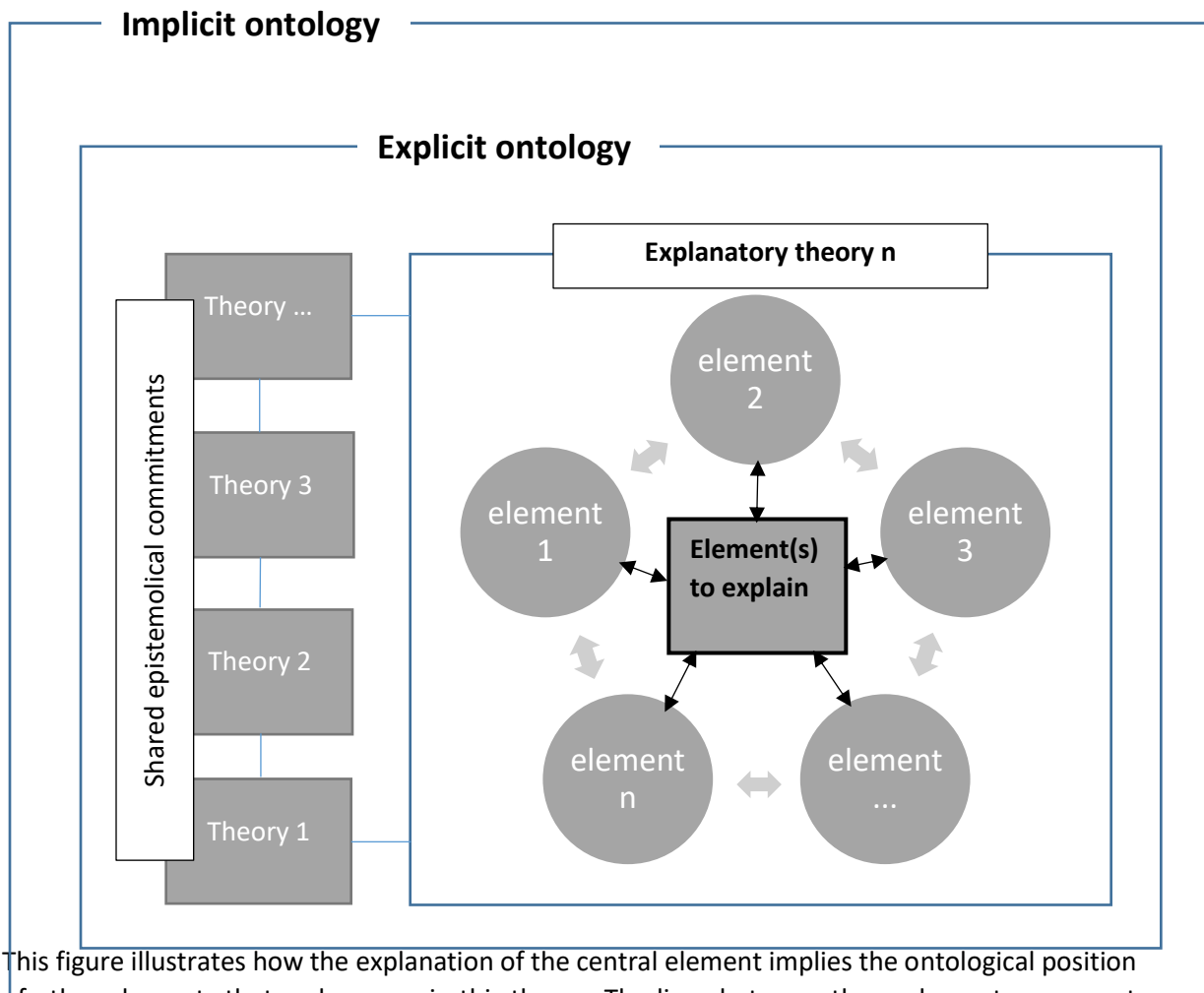
Different ontologies are not necessarily incompatible (some discipline embrace different ontologies, like sociology or political science for instance). In the previous example, each discipline explained John's behaviour from a different perspective, using concepts that have ontological priority in terms of how they conceive being. It is possible to combine various explanations drawn from economics, psychoanalysis and feminism, etc. Some explicit ontologies can be combined to form richer ontologies. However, the original complexity of John's behaviour calls for simpler explanatory models that have more general scope (but explain only one aspect of John's behaviour). To do so, the researcher has to build an ontology, which defines the fundamental entities (**UNIT OF ANALYSIS**) that are relevant in his or her view, and explain how they interact in specific circumstances. The ultimate goal of scientific research is of course to grasp a complete understanding of John's choice, but the incredible difficulty of combining all the different aspects of his choice (and their corresponding ontologies) explains that researchers try first to explain each of these aspects one by one.

As already suggested, this process is typical of scientific research. When seeking to explain a phenomenon (in social or natural sciences), the researcher's main aim is to develop an abstract representation of the phenomenon to help explain the causal mechanism involved (**CAUSATION**). A process of abstraction is used to achieve this, i.e. the characteristics of the phenomenon considered irrelevant are discarded. This can be likened to ontological pruning, whereby the researcher intuitively isolates the crucial parameters. For example, imagine a researcher wants to explain how and why an apple falls from an apple tree at a specific moment in order to develop a model that can explain the fall of "any" apple. In a first abstract model, the researcher ontologically defines what the apple is and determines which **VARIABLES** are important (weight, wood resistance or wind) and unimportant (the apple's colour or texture). While building the explanatory model, the researcher disregards many of the characteristics that define the unique apple he is studying. Thus, the abstract model will only include the characteristics considered relevant to explain its fall.

Therefore, when developing an explanatory model, general characteristics are abstracted from singular exemplars of the things observed (a definite conception of "an" apple is abstracted of the observation of many specific apples). Selection is guided by the researcher's intention and their pre-reflexive understanding of what being is, i.e. their intuition about how causality operates in the case to be explained. Science sets out to establish general laws, but it is confronted with

particular cases. Therefore, abstraction is required. Thus, science necessarily builds an ontologically simplified model of being. Consequently, every scientific theory (in natural or social sciences) is based on an explicit ontology, or a "world of reference". But this explicit ontology is inevitably deficient when being is considered in absolute terms. Therefore, it is crucial for the researcher to be aware of the fact that inquiry is driven by a pre-reflexive (and often unclear) representation of being, that is on what we called an "implicit ontology".

With these concepts at hand, we can illustrate as follows the relations between the researcher's implicit ontology, his explicit ontology, his epistemological commitments, and the explanatory theory he creates to explain a phenomenon:

Implicit ontology

Explicit ontology

Explanatory theory n

Theory …

Theory 3

Theory 2

Theory 1

Shared epistemolical commitments

element 2

element 1

Element(s) to explain

element 3

element n

element …

This figure illustrates how the explanation of the central element implies the ontological position of other elements that make sense in this theory. The lines between these elements represent the relations existing between them (and the central element to explain) that the researcher wants to clarify by using this specific explanatory theory. The other "theories" outside the "explanatory theory" (but inside the same "explicit ontology") express the fact that, to be accepted, the explanatory theory must be relatable to other existing theories of the discipline (except in the case of a paradigm changing theory – see *infra*). The fact that these theories share the same epistemological commitments explains that they are part of a same explicit ontology.

Note however that this illustration presents a highly simplified representation of much complex relations. For instance, a discipline can rely on different ontologies, and elements belonging to different ontologies can coexist in a same explanatory theory. Moreover, contrary to what this representation suggests, ontologies don't tend to be "closed". They rather evolve permanently, they are the objects of theoretical disputes, and their borders are often blur. Finally, recall that the "elements" appearing in the center of the explanatory theory are "pruned": they are abstract and "reduced" versions of what they "are" for the implicit ontology that encompasses the whole.

This illustration also underlines how important the implicit ontology is for it precedes and conditions the validity of alternative explicit ontologies. As Thomas Kuhn has shown in The Structure of Scientific Revolutions (Kuhn 1962), the implicit ontology of a society sets the limits within which the researcher's theory will (usually) develop, by conditioning the possible explanatory models. Thomas Kuhn's most famous example is the paradigm shift from geocentrism to heliocentrism in astronomy. Here, a conjunction of technical progress and social factors triggered a change in the ontological framework. Until then, the prevailing ontological framework placed the Earth at the centre of the universe. The new perception put the sun at the centre. Once researchers were able to conceive of "reality" in a different way, they endorsed the new paradigm and its ontology. But before that, a change in the implicit ontology was necessary, i.e. it must have been possible to think "the earth is not the center of the universe" and not immediately dismiss this idea as heretical or as pure non-sense.

In social sciences, the ontological status of objects like "nation", "patriarchy" or "crime" is less clear than in the case of natural sciences. As a result, a specific branch of ontology is devoted to the modes of existence of social phenomena: social ontology. Two main positions emerge: realism and constructivism. **SCIENTIFIC REALISM** assumes that social phenomena have an objective existence, independent of the subject. In the view of realist philosophers, like Bhaskar, social phenomena can be understood as the product of social structures that have an independent existence. The objective structures are "structures producing social phenomena analogous to the causal mechanisms of nature" (Bhaskar 1986, 108). Realism in social ontology is similar to ontological realism in natural sciences. It also shares some assumptions with pragmatism, as developed by philosophers like Charles Sander Pierce, William James and John Dewey. Pragmatism acknowledges the evanescent nature of social phenomena, but overcomes the difficulty by studying the real effects and actions they produce.

By contrast, constructivism claims that social phenomena have no objective existence and are a construction of the human mind. Its fundamental axiom is that, even if reality exists outside the subject's perception, the subject cannot reach it without perceiving it. This implies the mediation of imaginary structures, which are provided by social groups. There is no possible access to something like an objective and independent being. Social phenomena, in particular, have no objective existence, but they have meaning, interpretations and social representations that are built coherently by a subject, in its own language. For constructivist philosophers like Peter Berger and Thomas Luckmann (Berger and Luckmann 1966), every individual builds his own world with the categories and ontological entities he learned during his education. Social phenomena are the results of how the individuals in a given society construct their own world and how they act within

it according to socially acquired motivations. Therefore, the key epistemological question in constructivism is not "what is the reality?" but "how is it socially constructed?"

To conclude, it is important to note that many other positions exist apart from realism and constructivism. Empiricists adopt an empirical approach to human behaviour, while FALSIFICATIONISTS acknowledge the utility of abstract theories and request that their predictions can be empirically verified. Finally, it is worth mentioning Cornelius Castoriadis' theory of the imaginary institution of being (Castoriadis 1998). It proposes an ontology that is based on imaginary creation, which reconciles social imagination and the constraints generated by the materiality of being. This provides key concepts to help the researcher in social sciences to clarify how imaginary creation relates to his object and to the materiality of being.

References

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