# Controversies in the ontology and law debate

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**Abstract**

In this article we investigate the relations between philosophical ontology and ontologies in AI, applied to the legal domain. These concepts of ontology have different connotations in the fields mentioned. Their differences and similarities are subject of a critical review. This results in a philosophical evaluation of the concept of ontology in AI and law.

## 1. Introduction

In recent years the concept of *ontology* has been adopted in artificial intelligence (AI). In this discipline it has a meaning different from the original use in philosophy. This paper analyzes confusions that may arise from these differences, and tries to answer the question to what extent these diverging concepts of ontology can be usefully integrated in the legal domain. The general purpose of this paper is to discuss the use of ontology both in AI and in philosophy, and in the legal context. To provide the reader with a clear concept of ontology, in section 2 we discuss some preliminary definitions of ontology, epistemology, and semantics, and explain the differences between these philosophical disciplines. We relate them to three general philosophical frameworks: realism, constructivism, and relativism. In section 3 we discuss the relevance of the distinction between the philosophical disciplines discussed in section 2 for science in general and for the legal science in specific. In section 4 we discuss the views on ontology in AI. We explain why the differences between these views and the view of philosophy can cause serious confusion about our ontological and epistemic commitments, and in what way we can apply an ontology in AI to the legal domain with better philosophical foundations. In section 5 we make some concluding remarks about the concept of ontology in law and AI.

## 2. Ontology, Epistemology and Semantics

In this section we discuss three philosophical disciplines: ontology, epistemology, and semantics. By making a clear distinction between them, it becomes easier to systematically characterize three important philosophical schools: realism, constructivism, and relativism. We clarify the ontological, epistemic, and semantic claims for each of these schools. This clarification serves as a basis for understanding different schools in legal philosophy: *legal positivism* can be compared with constructivism or relativism, while the *natural law* doctrine can be related to realism (*cf.* section 3). These doctrines in legal philosophy will in their turn serve as an illustration for the importance of ontology in law (*cf.* section 4).

To explain the nature of ontology, epistemology, and semantics, we give an example. If we state that a tree has real existence (we make a strong ontological claim about that tree), we claim that this tree would exist, even if there were not a single person on earth to perceive it and to call it a tree. The inclination to make such a claim is not that strange if we realize that trees would just grow further if all human beings on the earth would vanish at some moment. Or is it a false claim after all? Does existence of individual things (particularia or *tokens*) depend on the existence of categories (universals or *types*) to which we reckon tokens of these categories (the Platonic view)? Or is there only some amorphous mass, a 'Ding an sich' that becomes structured through the perception of cognitive agents that perceive them (the Kantian view)?

We could define *ontology* as the discipline that investigates the nature of existence, and tries to determine what things have real existence, independent of the perception and cognitive abilities of man. As ontology is about real existence, it is hard to say anything sensible about it, for we are humans with limited cognitive abilities. Our knowledge depends on these abilities and on our intuition, so that we can only practise ontology through epistemic means. We can describe *epistemology* as the investigation of the ways in which we can know, and of what we can know. It describes the relation between knowing subjects (cognitive agents) and the object of knowledge (reality).

*Semantics* is the discipline that investigates symbol systems and their meaning, *i.e.* the relation between (combinations of) symbols and truth values. It is connected with epistemology and ontology in so far as it describes the relationship between symbol systems and reality by assigning truth values to (combinations of) symbols, depending on their mutual relations and the relation between symbols and reality. Psychological concepts of meaning do not position the meaning of symbol strings outside man, but in his cognitive abilities. Because symbol systems work through conventions, we cannot regard meaning completely separately from the mental. We elaborate on the distinction between ontology, epistemology, and semantics in the discussion of three main philosophical views: constructivism, realism, and relativism.

*Constructivism* is the view that there is something that really exists, but that this 'something' or 'Ding an sich' only gains structure when there is a cognitive agent that utters opinions about it, uses it to do something, or regards it as a token of some type. Constructivism says that all knowable structures in the world are projected into the world by ourselves. This is the epistemic part of constructivism. The world itself may be structured or not, but the ontological claim is limited to the existence of a 'Ding an sich', for we cannot know the structures *in* the world. The structures we project into the world may have nothing to do with the world's own structures. Constructivism is thus a mixture of ontological and epistemic claims: epistemic claims about the world are the only meaningful ones, and may therefore sometimes even be admitted to ontology (*cf.* Putnam's internal realism: Putnam 1990). If we do not want to admit epistemic structures to our ontology, it will remain bare and uninteresting, while our epistemology becomes rich but arbitrary. However, in that case our knowledge will depend less on reality and more on conventions.

Constructivism is quite a safe philosophical position, because it can take into account the limitations of the human cognitive system, the development (evolution) of that system in relation to the world, and to the (seeming) impossibility of practising ontology. Constructivism also makes it possible for semantics to make the reference of tokens depend on the things regarded as referents by human beings. The ontological commitment seemingly attached to semantics (signs denote *things*), is abolished in this position.

*Realism* as we define it is a purely ontological doctrine. It claims the existence of tokens of certain scientific or common-sense types (*e.g.* atoms), independent of the mental (*cf.* Devitt 1991: 303). Realism is nothing else but that claim; it says nothing about whether tokens or types are *knowable*. For this reason it also endangers itself: we cannot make any ontological claim without knowledge about that claim, so that we need epistemic means to make ontological claims. Thus, a realist position demands an epistemology that enables us to *know* the world (at least partly). If we can establish such an epistemology, the realist doctrine is to be preferred, as it enables us to say something about the world as it really is. In a realist position we can define reference of symbols as a relation between symbols and real entities; our semantics can thus be anchored in reality.

*Relativism* is a denial of the possibility to know anything at all about the real existence of things. Relativism does not make an ontological claim, but an epistemic one (we cannot know what really is). If we take a relativist stance, we will lose grip on reality as well as on our knowledge. In a relativist framework, semantics has no anchors in reality. Though we can define truth within a model of reality, the reference relation between the elements of the model and reality is utterly obscure.

Realism, constructivism, and relativism cannot easily be placed on one scale, because they make claims in different philosophical disciplines: realism is primarily an ontological doctrine, while constructivism and relativism make epistemic claims. Ontology, epistemology, and semantics are, however, related to a high degree. Semantic theories depend on both ontological commitments and epistemology for the relations they describe between symbols and entities in reality, ontology cannot be practised without making epistemic commitments and vice versa. Ontological claims should be argued for by epistemic means, for humans can only gain knowledge about anything at all through epistemic means. Epistemic claims should be grounded in ontological commitments, for otherwise knowledge is not based upon reality. This is why a strict distinction between ontology and epistemology is difficult to maintain; but it is important for explanatory purposes.

We need a clear distinction between ontology, epistemology, and semantics to clarify the status of knowledge, be it *legal* or scientific knowledge. In science we try to gather knowledge about reality and construct theories that are about reality and that seek to *explain* reality. What is the status of scientific knowledge: can we really gather knowledge, what is the relation between knowledge and reality, and how can we explain reality with our knowledge? Scientific theories are reconstructions, based upon a limited number of observations (the domain of epistemology). We do not know whether these observations are correct (the domain of semantics), and we do certainly not know whether the reconstruction has anything to do with reality (the domain of ontology). However, if we are able to establish a firm realism in combination with an epistemology that enables us to know reality, we can determine the truth of statements about reality. This would be a solid foundation for practising science.

In case science is about human institutions, like the legal science, the situation is a little different. Here scientific theories are about a reality we constructed ourselves, not about a reality independent of the mental. We should be aware of the fact that this makes ontological and epistemic claims hard to distinguish. We discuss this problem in the next section.

## 3. Ontology and Law

In this section we discuss the relevance of the distinction between ontology, epistemology, and semantics for an ontological analysis of law. We distinguish between two ontological controversies in law. By elaborating on these, we try to explain the applicability of philosophical principles on the legal domain. In the previous section we stated that in some sciences we can hardly distinguish between reality and construction. Law is such a science. It is largely a construction itself: though partly evolved, it is created mostly intentionally. Through this process a part of reality is made that is knowable to us: if we *construct* a part of reality, then it is highly probable that we can *know* it. The interaction between what is constructed (legal rules), and what is evolved (mankind and its culture), makes theorizing in legal science a discipline that has to take both artifacts and natural kinds into account.

The relevance of philosophical ontology to law is twofold. First, our view on the ontological status of law depends on our position in the natural law - legal positivism debate: does positive law have an ontological status, or are there more general principles that really exist? Second, does law have an ontological status at all? Is the essence of law that it tells us what *ought to be*, instead of what *is*?

We set out with the first controversy. We should realize that the ontological status of artifacts and natural kinds can differ to such an extent, that it may make no sense to make ontological claims in cases where postulated tokens or types are arbitrary human constructions. If we construct the parts of law ourselves, we can probably claim their existence in reality, and then we can refer to them in our theories. If we try to interpret our theory semantically, we can use the notion of correspondence truth: the meaning of a sentence depends on the structure of a sentence, the referential relation between its parts and reality, and the objective and mind-independent nature of reality (Devitt 1991: 29). Thus we have the possibility of providing better foundations for our scientific claims. However, we still should answer the question whether the parts of law we create ourselves are too arbitrary to make ontological claims about them; the kind of existence law has largely depends on human observation and theorizing. For that reason we had better adopt a constructivist position after all.

In the natural law - legal positivism debate, the natural law position is related to realism: law is a thing, it exists - and it does not necessarily coincide with the rules of law that are considered reconstruction attempts. What is incorporated by natural law is not clear. However, it does not include the complete body of positive law, which is subject to continuous change. Thus we could consider positive law as an imperfect *projection* of natural law. We could even imagine a situation in which positive law differs completely from natural law. In that case it is not a projection at all. The legal positivist considers the rules of law to be a construction. They have been invented and made by man as to achieve certain goals (*e.g.* order, safety). The extreme relativism has been tamed by the use of empirical epistemic methods (Hart 1961) and a rudimentary set of principles (Dworkin 1978, 1986).

Both from the natural law and the legal positivism perspective, positive law is the product of man. That is why we may make ontological claims about artifacts from both the legal-positivist and the natural law perspectives. The contingent character of positive law (it could have been constructed in a different way) does not threaten this possibility. However, if we adhere to the natural law view we probably do not attach much value to the possibility of making ontological claims about positive law. The existence of natural law is the important thing here, in addition to the question what it looks like. Positive law is a *reconstruction* of natural law; an attempt to make explicit the legal principles we carry with us, or that exist in nature.

We assume that we can claim the existence of positive law. When we abstract away from positive law, ontological claims about our classifications become increasingly controversial. An important problem is that we can claim the existence of multiple, mutually inconsistent, classifications. There are no criteria available to adjudicate rationally between them. We cannot claim the existence of all possible classifications (they may contradict each other). As long as we have no criteria available, we cannot claim the existence of a specific classification either. We can thus specify the essence of the problem of legal ontologies in AI: the philosophical concept of ontology suggests that we make absolute claims about existence. A legal ontology in AI generalizes about positive law, and it is therefore almost impossible to claim the existence of its main categories or types.

But if we only claim the existence of *tokens* (occurrences) of these types, not the existence of these types themselves, we may build a stronger case. Though this may seem attractive, it is not. If we could claim the existence of tokens of some type, we may establish a firm realism. However, if a token belongs to multiple types, and the typification is arbitrary to a high degree, our ontology consists of individual tokens that cannot be assigned a type. This would make the ontological claims quite worthless. It is the membership of types that makes ontological claims worthwhile and suitable for further epistemic and semantic theorizing. Without the ability of using types it becomes largely impossible to generalize about phenomena. Though types need not be directly grounded in reality, our theories will probably become inconsistent with each other if we can use different types to generalize about reality.

The second controversy is about the is - ought distinction. Law is often regarded as a means of specifying what reality *ought to* look like, not what it *does* look like. If this is the case, we are not practising ontology, but ethics. The assumption that we can derive what ought to be from what is, is often referred to as the naturalistic fallacy: if we take reality as a starting point to indicate what reality should look like, we do not say anything new about reality. Instead, we maintain the status quo. (Almeder 1990.) This argument against the naturalistic position is not correct. It *is* possible to derive prescriptive rules from descriptive data. The idea that this is not possible, originates from the assumption that in all cases there should be a one-to-one relation between description and prescription. However, there are numerous methods (among which scientific ones) and heuristics to derive rules or laws from data. These rules need not be purely descriptive; their prescriptions can deviate from reality. (Vollmer 1987.)

If we take the naturalistic fallacy to be refuted, and we accept that laws are - at least partly - derived from what we observe in the world, ontology will become a discipline relevant to legal science. The things, people, and institutions whose existence we claim in daily life, and the ways in which we usually interact, are found in the laws we construct. It therefore seems that we can not only claim the existence of laws, but also of some of the occurrences of types they mention. Our commitment to legal positivism or natural law then becomes largely irrelevant. We could describe natural law as basic predispositions of man to regulate situations and settle conflicts, that have arisen from biological evolution. And we may denote positive law as the result of cultural evolution. The distinction between these two kinds of evolution is not an absolute one, and therefore there is no absolute distinction between natural law and positive law either.

## 4. The Use of 'Ontology' in Artificial Intelligence

In this section we describe the use of the concept of ontology in AI. We explain why its use in this domain is confusing, and in what ways we can clarify claims in AI and law by using the philosophical principles explained in the previous sections.

Gruber defines an ontology as a specification of a conceptualization, or as a description of concepts and relations that exist for an individual or a community of individuals. A conceptualization is a representation of the world that is both simplified and abstract. (Gruber, 1993.) This is a definition that differs greatly from the one used in philosophy. Both Gruber and Valente (1995) notice these differences. An ontology in AI is not a set of ontological claims, but (possibly) a set of epistemic ones: it describes concepts and relations as they are perceived by certain persons or communities. The essence of ontology in philosophy is that the question about the existence of things is asked independent of the observations of cognitive agents. In so far as we try to make (philosophically) ontological claims in AI, we end up with a constructivist position: the conceptual schemata we use to structure the 'Welt an sich' that is in itself unstructured (or whose structures we cannot know), are assigned an ontological status (a constructivism is limited to epistemic claims and an ontological claim that there is a 'Welt' or 'Ding an sich').

Though Gruber recognizes that the concepts of ontology in philosophy and AI are used in a different manner, it seems that these different manners have that much in common, that confusion is inevitable. We should attach greater value to the existence claims of philosophical ontology than we should to those of AI. It is much easier to defend certain conceptual schemata than to claim independent *existence* for a certain schema. An existence claim for our conceptual schemata would mean that the structures we observe in the world do exist in the world. But if we can make different structurings for that world, do they all exist? Or does there exist only one, and if so, which one? Ontologies in AI do not make such radical existence claims. They probably do not even claim psychological reality for their conceptual schemata. The justification of the structurings they use is probably founded on criteria of portability and efficiency, and on limited knowledge about the domain. Ontologies in AI then make neither ontological nor epistemic or semantic claims. They are *constructions* (not reconstructions, because this would suggest that there is something that can be reconstructed, and this would only be possible if the structuring is based upon reality).

We can discern different kinds of legal ontologies in AI. Visser and Bench-Capon (1996: 15-16) list: McCarty's LLD, Stamper's NORMA, Valente's functional ontology of law, Van Kralingen and Visser's frame-based ontology. In LLD atomic formulas, rules, and modalities are distinguished. In NORMA we distinguish agents, behaviourial invariants, and realizations. Valente lists normative knowledge, world knowledge, responsibility knowledge, reactive knowledge, meta-legal knowledge, and creative knowledge. Finally, Van Kralingen en Visser discern norms, acts and concepts. In this brief enumeration it is easy to see that there are radical differences between ontologies. This illustrates the fact that it is hard to attach any (philosophically) ontological commitment to ontologies in AI.

Can we define the status of ontologies in AI somewhat more accurate with the help of the above observations? Let us take a legal ontology as an example. We distinguish between six types: facts, factors, valuations, considerations, sanctions, and norms. These six concept types are instrumental in an AI-system that has been developed as an adaptable tool to support Dutch judges in creating a more stable jurisprudence on criminal sentencing. We suppose these concept types (and their specification) would be an AI-ontology. But what are we talking about in a legal-theoretical sense? *Facts* are actually taxonomies, frame-like structures that model the relevant factual concepts related to certain crimes. *Factors* are concepts that may be attributed a value that will eventually weigh in some *valuation*, that instantiates a *norm* which may trigger *considerations* for selecting a *sanction*. All these concepts are processed by legal discussion and adaptation. From a philosophical viewpoint their ontological status is either extremely flimsy (purely as a temporary construction) or non-existent.

In a philosophical ontology we could try to claim the existence of tokens of these types. The question we have to answer is whether the existence of tokens independent of human conceptual schemata can be claimed. We can classify the elements of law in numerous types and corresponding tokens. Whether these are *correct* classifications, depends on many aspects, among which functionality, efficiency, and plausibility. When we make a classification, we can check its correctness to a certain extent, *e.g.* by consulting some authority. But we cannot guarantee that such a classification cannot be made in a different, better way. Therefore, we had better not adhere to existence or truth claims with respect to ontologies in AI, but consider the classification an instrument. The value of this instrument is determined by its applicability and portability.

In a philosophical framework we can give the following tentative definition of an AI-ontology (the definition is very much like the one given in AI, but the explanation of its components differs). An ontology in AI is a *conceptual schema* representing the main components or primitives of a specific domain, and the relations between them. We may be able to attach *ontological claims* to some of these components, *e.g.* to those components that are human constructions and directly stem from the domain, or to common-sense primitives. However, as can be seen from the legal ontology examples above, we cannot claim the existence of abstract categories (the ones that are necessary for developing a generally applicable legal ontology), nor can we sensibly claim the existence of tokens of these types. We can, however, call these abstract categories *epistemic types*, for they clearly are the result of our cognitive abilities to abstract away from reality. The second part of the definition is about *relations*. It is even harder to attach ontological claims to relations than to abstract categories. We define them as epistemic types too. An instantiation of a relation has an ontological status, but the reference relation between instantiations and the relation type is obscure. Thus, in legal ontologies we should restrict ourselves to epistemic commitments. Therefore this definition of legal ontologies fits best in a constructivist position (*cf.* section 2). A stronger (realist) position can also be defended, but this will not make much difference to the (absent) ontological commitments in our definition.

## 5. Conclusion and Further Research

Philosophical ontology is about (the nature of) real and independent existence. Ontology is relevant to two controversies in legal philosophy: the natural law - legal positivism debate and the is - ought distinction. The use of ontology in AI differs highly from that in philosophy. An ontology in AI may be defined as a specification of a conceptualization. This definition, however, has little or nothing to do with philosophical ontology. Ontologies in AI make epistemic claims at most. The same goes for legal ontologies in AI.

Because law is the product of human interaction and construction, independent existence is not the most interesting claim we can make about legal ontologies in AI. Thus, it is a rather confusing choice to call a conceptual schema of legal concepts an ontology. We had better leave ontology to (legal) philosophy, and for the moment limit ourselves to epistemically justifiable claims about the elements of law. If there should be any breakthrough in the ontology and law debate, it can always be used to support our epistemic claims. The legal ontologies in AI we mentioned show that different attempts to reconstruct the elements of law yield very different results. This is radically incompatible with the intentions of philosophical ontology. It therefore seems unwise to use the term ontology in the context of AI. Ontologies in AI had better be called conceptual schemata.

In as far as ontological commitments remain our main research goal, it would be best to investigate the possibility of distinguishing the universals of the legal domain, regardless of their applicability in AI. In AI and law we speak about *an* ontology, whereas we should find *the* ontology of law. Any research in this direction should be accompanied by the establishing of a firm epistemology, capable of justifying knowledge about legal types - be it natural kinds or artifacts.

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