



EUI Working Papers

LAW 2008/03

Legal Concepts: An Inferential Approach

Giovanni Sartor

EUROPEAN UNIVERSITY INSTITUTE
DEPARTMENT OF LAW

Legal Concepts: An Inferential Approach

GIOVANNI SARTOR

EUI working paper **LAW** No. 2008/03

This text may be downloaded for personal research purposes only. Any additional reproduction for such purposes, whether in hard copy or electronically, requires the consent of the author(s), editor(s). If cited or quoted, reference should be made to the full name of the author(s), editor(s), the title, the working paper or other series, the year, and the publisher.

The author(s)/editor(s) should inform the Law Department of the EUI if the paper is to be published elsewhere, and should also assume responsibility for any consequent obligation(s).

ISSN 1725-6739

©2008 Giovanni Sartor
Printed in Italy
European University Institute
Badia Fiesolana
I - 50016 San Domenico di Fiesole (FI)
Italy

<http://www.eui.eu/>
<http://cadmus.eui.eu/>

ABSTRACT:

The inferential and eliminative analysis of legal concepts proposed by Alf Ross will be connected to the views of theoretical concepts in science advanced by Frank Ramsey and Rudolf Carnap. Consequently, the mere comprehension of a legal concept will be distinguished from the application of the concept to a particular legal system, since application presupposes a doctrinal commitment, namely, the belief that the inferences constituting the concept hold in that system.¹

KEYWORDS:

law, legal reasoning, legal concepts

¹This contribution refines and develops ideas I presented in a previous contribution, where the inferential model was compared to the approach adopted in the so-called legal ontologies, where terminological information is provided through explicit definitions, distinguished from the substantive legal rules using the defined terms (Giovanni Sartor, “The Nature of Legal Concepts: Inferential Nodes or Ontological Categories”, in: *Proceeding of the Conference on “Approaching the Multilanguage Complexity of European Law: Methodologies in Comparison”*, ed. by Gianmaria Ajani, Giovanni Sartor, and Daniela Tiscornia, Florence: European Press Academic Publishing, 2007). Here I try to better specify the kind of (doctrinal) commitment that is involved in the application of an inferential framework to a particular legal system (see Section 4).

Contents

1	Concepts as nodes in inferential nets	1
2	Ross's theory of legal concepts	3
3	Implications of an inferential theory of legal concepts	7
4	Inferential meaning and substantive legal beliefs	8
5	Ramsey's elimination and Carnap's conditionalisation of theoretical concepts	10
6	Possession of legal concepts and belief in their applicability	12
7	Concepts in legal comparison and in legal doctrine	14
8	Conclusion	15

Legal Concepts: An Inferential Approach[†]

Giovanni Sartor

Marie-Curie Professor of Legal Informatics and Legal Theory
European University Institute, Florence
CIRSFID, University of Bologna

1 Concepts as nodes in inferential nets

A simple and popular way of representing knowledge—much used in science and in computer systems, but also in commonsense domains—is through *conditionals*, namely, informational structures linking a condition and a conclusion according to the following pattern:

IF *precondition* THEN *conclusion*

Such conditionals can be understood in different ways. For instance, we may view them as material implications, indicating that in case the precondition is true then the conclusions also is true, or as modal (strict) implications, indicating that whenever (in every possible situation) in which the precondition is true then the conclusion must also be true, or as condition-action connections, specifying that when the condition is satisfied that an action is to take place. A more abstract perspective—which subsumes the views above described, focusing on a common aspect of them, namely, the possibility of detaching the conclusion, given the precondition—consists in viewing such conditionals as *inferential links*, which are meant to govern reasoning: for an agent endorsing a conditional, believing a conditional’s antecedent justifies believing the conditional’s conclusion (at least when no information to the contrary is available).

The idea of conditionals as inferential links correspond perhaps to Frank Ramsey’s *variable hypotheticals*,¹ namely, informational structures that are “rules for judging”, as according to the pattern “If I meet a ϕ , I shall regard it as a ψ .” Such general conditionals are often called *rules* but I prefer to use the term *inferential link*, since in the legal domain the term *rule* has a variety of meanings that are not relevant to the present analysis.² I distinguish the notion of an inferential link also from the idea of a legal or moral norm, since not all norms are proper inferential links (nonconditional norms are not inferential links in the proper sense³) and not all inferential links are legal or moral norms (e.g., links concerned with symptom-cause or cause-effect connections are not norms).⁴ Note that precondition-action links (“if <precondition>, do

[†]Supported by the EU projects ONE-LEX (Marie Curie Chair), ESTRELLA (IST-2004-027665), and ALIS (IST-2004-027968). Many thanks to Anna Pintore, Giorgio Volpe, and to the participants in the *IVR-2007 Workshop on general legal concepts* for their for their comments, suggestions and observations.

¹Frank Plumpton Ramsey, *The Foundations of Mathematics and Other Essays*, ed. by Richard Bevan Braithwaite, London: Routledge, 1931, p. 241.

²For instance the concept of a rule is often associated with the idea of the command of a ruler, or with the idea of an obligation, or with the idea of an “exclusionary reason” (as in the terminology of Joseph Raz, *Practical Reason and Norms*, London: Hutchinson, 1975). In computing, on the contrary, the term *rule* is usually employed to denote any conditional structures. For instance we speak of *rule-based systems* to refer to computer systems containing and using information represented in conditional form.

³Though we may view unconditional statements as degenerate inferential links having no antecedent, so that their “conclusion” can immediately be endorsed.

⁴I am using the terms *normative proposition* and a *norm* as synonyms (I do not follow the terminology of Carlos Alchourrón and Eugenio Bulygin, for whom a normative proposition is a meta-level assertion concerning what can or cannot be deduced from a given set of norms (Carlos E. Alchourrón and Eugenio Bulygin, *Normative Systems*,

<action>”) can be translated into inferential links, since we can express the need to perform an action through an appropriate deontic qualification, as “it ought to be that” (“you ought to”, you shall, etc.) a qualification that can be the content of a normative belief. This translation is appropriate whenever the precondition-action link is not supposed to describe the functioning of an agent, but rather is a conditional instruction, meant to govern the agent’s behaviour, contributing to determine its future action.⁵

Thus, for instance, the condition-action link

- a. IF you receive an e-mail containing a virus, THEN delete it without opening it!

becomes the inferential conditional

- b. IF you receive an e-mail containing a virus , THEN you ought to delete it without opening it

whose conclusion (the obligation to delete the message) provides the content of a belief I should form whenever I know that I have received an infected message.⁶

The representation of information through inferential links is quite attractive and can be used in different domains.⁷ For instance, knowledge concerning diseases and their symptoms could be encoded in connections such as:

1. IF one has a persistent itch all over the body, especially at night, unexplained high temperature, weight loss or tiredness, and cough and breathlessness,
2. THEN one probably has Hodgkin disease.

Vienna: Springer, 1971). The idea that (conditional) norms can be primarily viewed as inferential links (rather than, for instance, as imperatives) is connected to the idea that norms are information structures having a specific role in practical cognition, i.e., in the process through which a (boundedly) rational agent evaluates and selects actions (see Giovanni Sartor, *Legal Reasoning: A Cognitive Approach to the Law*, ed. by Enrico Pattaro, vol. 5, *Treatise on Legal Philosophy and General Jurisprudence*, Berlin: Springer, 2005).

⁵Consider for instance a rule you may introduce in the knowledge base of your e-mail system, such as “if a message comes from Mr spammer@spam.com, put it in the trash folder.” This is not a forecast of the expected independent behaviour of your e-mail system, but a specification that is supposed to govern its future behaviour (you know that when receiving e-mails the system will access this rule and determine its behaviour accordingly). The normative aspect of such a specification can be made clear by putting it in a deontic form, though an e-mail system will generally be able to perform only a very limited form of deontic reasoning (just determining itself to execute a conditionally obligatory action whenever checking that the corresponding condition is satisfied).

⁶Beliefs in normative contents seem to presuppose that such contents can be true or false. This, however, is a presupposition I find unproblematic: following another idea by Ramsey—the so-called deflationary theory of truth (see Frank Plumpton Ramsey, *On Truth: Original Manuscript Materials, 1927-1929 from the Ramsey Collection at the University of Pittsburgh*, Dordrecht: Kluwer, 1991)—I will take the meta-proposition “it is true that p ” (for instance, “it is true that it is forbidden to smoke”) to be logically equivalent to proposition p itself (to “it is forbidden to smoke”), namely, to be another way of saying what p says. From this perspective, the idea that normative propositions can be true or false is ontologically neutral: it does not assume (nor deny) that an external reality exists matching such propositions. On deflationism, and on the cognate ideas of disquotationalism and minimalism, see Paul Horwich, *Truth*, Oxford: Clarendon, 1998 and, for a legal application, Giorgio Volpe, “A Minimalist Solution to Jörgensen’s Dilemma”, in: *Ratio Juris* 12 (1999), pp. 59–79.

⁷I shall not address here the issue of the cognitive function performed by conditionals (see Sartor, *Legal Reasoning: A Cognitive Approach to the Law*, Chapter 20). I just remark that we cannot say that a rational agent should always derive the conclusion of every inferential link that agent endorses: one’s mind would have to face an unbearable computational load, and one’s memory would be cluttered with mostly useless information. For instance, I believe the following: 1 is a natural number; for all X , IF X is a natural number, THEN $X + 1$ is a natural number. If my rationality obliged me to derive all consequences of such premises, I would spend my time and energies in counting natural numbers indefinitely. A bounded rational agent should rather perform the cognitive operation consisting in the derivation of an inferential link it endorses only when this link may contribute to solve an issue relevant to the agent’s interests. On the connection between interest and reasoning, see John L. Pollock, *Cognitive Carpentry: A Blueprint for How to Build a Person*, New York, N. Y.: MIT Press, 1995.

This is the connection that the Italian film director Nanni Moretti discovered by himself in a medical dictionary after a couple of years spent seeing a number of specialists, none of whom was able to provide the right diagnosis (see this in his movie *Caro Diario*).

Representing legal contents though inferential links comports with the widespread idea that legal norms typically have the conditional form:

IF *condition* (operative facts or *Tatbestand*) THEN *conclusion* (legal effect)

Indeed, inferential links provide the most widespread and successful representational model for legal knowledge.⁸ For instance, a trivially simplified representation of the discipline of Italian citizenship can be provided by two sets of inferential links, the links leading to the acquisition of the Italian citizenship

- IF x is born in Italy, THEN x is an Italian citizen
- IF x is born from Italian parents, THEN x is an Italian citizen
- ... (further ways of acquiring citizenship)

and the links establishing the consequences of Italian citizenship

- IF x is an Italian citizen, THEN x has the right to stay in Italy
- IF x is an Italian citizen and x is of full age, THEN x has the right to vote in Italian elections
- ... (further consequences of citizenship).

When information is only provided through inferential links, concepts—and in particular lexical concepts, namely, the concepts corresponding to the words or syntagms of a language—seem to play no autonomous semantic role.⁹ Inferences concern whole sentences (antecedent and consequent sentences connected though inferential links), and as a result lexical terms are not primary carriers of meaning.¹⁰ Rather, the meaning of a term results from the set of inferential links concerning the sentences in which the term occurs. For instance the concept of citizenship may be seen as emerging from the set of inferential links establishing what preconditions (birth in Italy, having Italian parents, and so on) determine citizenship and what further consequences are entailed this qualification (permission to stay in Italy, the right to vote, etc.).

2 Ross's theory of legal concepts

The idea that legal rules (viewed as inferential links of the type just described) determine, and even exhaust, the meaning of legal concepts was advanced by Alf Ross,¹¹ who imagines a population, the *Noît-cif*

⁸Also for the purpose of developing legal knowledge-based systems. See, for instance Marek J. Sergot et al., "The British Nationality Act as a Logic Program", in: *Communications of the ACM* 29 (1986), pp. 370–86, and Surend Dayal and Peter Johnson, "A Web-based Revolution in Australian Public Administration", in: *Proceedings Law via the Internet '99: 2nd AustLII Conference on Computerisation of Law via the Internet*, (Electronic publication. Also Published in the on line journal JILT, 2000, Issue 1.), Sydney: University of Technology, 1999.

⁹The term *concept* is here used in the most general sense, namely as referring to any content associated to a linguistic expression. On the contrary, in knowledge representation *concepts* are often understood as monadic predicates, denoting a class of individuals, to the exclusion of binary relationships, which are called properties or *roles*. This terminology is also used in description logics, see Daniele Nardi and Ronald J. Bratman, "An Introduction to Description Logics", in: *Description Logic Handbook*, ed. by Franz Baader et al., Cambridge, Mass.: Cambridge University Press, 2002, 5–44. .

¹⁰This view was advanced by Gottlob Frege, who affirmed that "it is only in the context of a proposition that words have any meaning" (Gottlob Frege, *The Basic Laws of Arithmetic*, (1st Ed. German 1893), Berkeley: University of California Press, 1964, p. 73), and has been endorsed among the others by William Quine, according to whom "sentences and not words" are "the wholes whose use is learned" (Willard Van Orman Quine, *World and Object*, Cambridge, Mass.: MIT Press, 1960, p. 13). On the extraction of sub-sentential meaning from sentential inferences, see Robert Brandom, *Making It Explicit: Reasoning, Representing, and Discursive Commitment*, Cambridge, Mass.: Harvard University Press, 1994. For criticism, see Jerry Fodor and Ernie Lepore, "Brandom's Burdens: a review of Robert B. Brandom's *Articulating Reasons*", in: *Philosophy and Phenomenological Research* 63 (2001), pp. 465–82.

¹¹Alf Ross, "Tü-Tü", in: *Scandinavian Studies in Law* 1 (1957), pp. 139–53

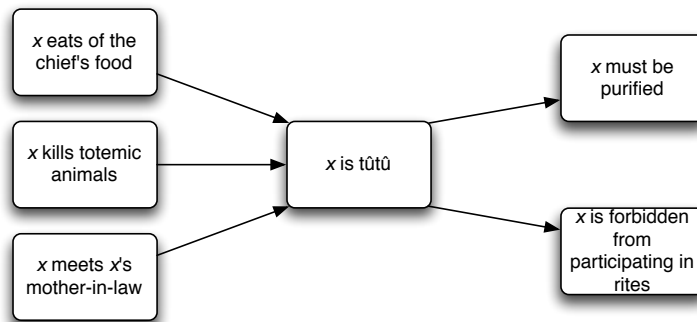


Figure 1: Tû-tû, an intermediate normative concept

tribe, endorsing two kinds of links:

1. links stating under what conditions something is (or starts to be) a tû-tû, and
2. links stating what normative qualifications or positions are determined by having or acquiring the tû-tû quality.

These two types of links are exemplified¹² by the following rules:

1. IF one has eaten of the chief's food, THEN one is tû-tû;
2. IF one is tû-tû, THEN one shall be subjected to a ceremony of purification.

According to Ross, to understand how the word *tû-tû* is used by the Noît-cifonians we need only to gather all links of the two kinds just mentioned, that is, all links establishing the following:

1. when someone or something qualifies as a tû-tû, or
2. what further normative qualifications or positions are determined by having the tû-tû quality.

Note that the Noît-cifonian population endorses both kinds of links: those concerning the determination of the tû-tû quality (for instance, rules stating that killing a totemic animal determines the killer's tû-tû-ness, or that meeting one's mother-in-law determines one's tû-tû-ness), and those concerning the effects determined by tû-tû-ness (for instance, rules stating that tû-tû-ness determines the prohibition from participating in certain ritual activities, or the obligation to undergo a purification ceremony). We thus get the normative information represented in Figure 1, where each arrow-connection represents a general rule.

For instance the arrow between “*x* eats of the chief's food” and “*x* is tû-tû” stands for the rule

FORANY (*x*) IF *x* eats of the chief's food THEN *x* is tû-tû

The members of the tribe perform two inferential steps for obtaining deontic conclusions (for inferring permissions or obligations) in tû-tû matters: the first step is concerned with establishing that someone or something is tû-tû (according to links concerning tû-tû's initiation), and the second step is concerned with establishing a deontic implication of tû-tû-ness (according to links establishing tû-tû's effects).

Ross argues that the tû-tû concept is superfluous, in the sense that the same deontic conclusions licensed by tû-tû-based inferences can equally be obtained through inferences directly connecting facts and deontic qualifications. If the members of the tribe were to disremember the tû-tû links and learn the links in Figure 2, they would not lose any real normative information: they would still be able to derive, given the same factual preconditions, the same deontic conclusions they could previously obtain (when they were still operating under the tû-tû links). According to the new links of Figure 2, these conclusions

¹²Ross, “Tû-Tû”

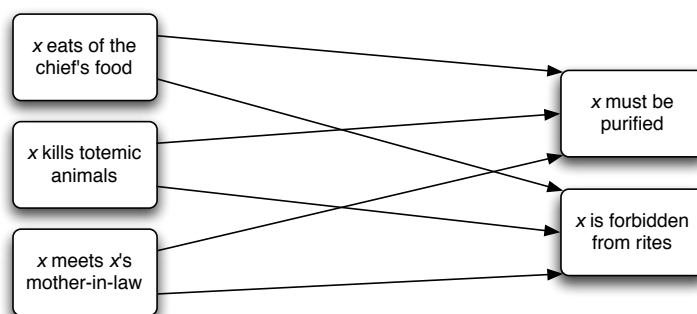


Figure 2: Elimination of tû-tû

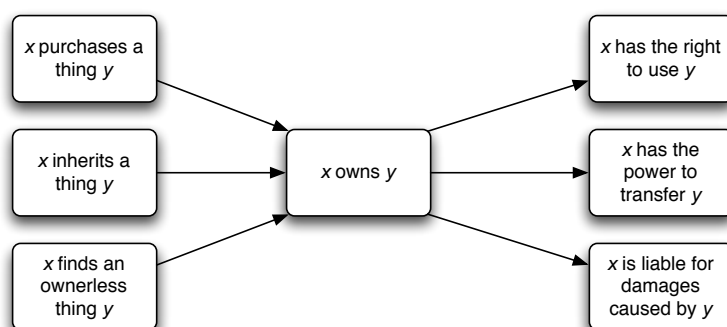


Figure 3: Ownership, an intermediate legal concept

would be derived in one step, for instance directly jumping from the fact that Tom ate the chief’s food to the conclusion that Tom must be purified, without passing through the intermediate conclusion that Tom is tû-tû.

Ross claims that non-deontic legal qualifications, such as the notion of ownership, are logically not different from tû-tû-ness: their function is limited to being relay nodes between factual preconditions and normative effects, as you can see in Figure 3. Like tû-tû-ness, so ownership can be eliminated without deontic loss, simply by substituting the set of links in Figure 3, with the set in Figure 4. The result we obtain by eliminating ownership is a more complex knowledge representation: in Figure 4 we have nine connections, that is, nine links rather than the six links of Figure 3.¹³ However, Ross correctly remarks that ownership can be eliminated—through a conceptual revision of all the original ownership-based links—in

¹³As Lars Lindahl observes, ideas similar to Ross’s were advanced about the same time by Anders Wedberg (Lars Lindahl, “Operative and Justificatory Grounds in Legal Argumentation”, in: *Associations* 7 2003, pp. 185–200, 186, 193ff.). According to Wedberg, the use of “meaningless expressions” has the function—not only in the law, but also in the natural science—of reducing the number of links that are needed to license certain conclusions (Anders Wedberg, “Some Problems in the Logical Analysis of Legal Science”, in: *Theoria* 17 1951, pp. 246–75). When we have m sentences $A_1 \dots A_m$ and n sentences B_1, \dots, B_n , in order to be able to infer from each A_i all of the B_1, \dots, B_n , we have two choices. The first choice consists in having, for each A_i , n links connecting A_i to each of the $B_1 \dots B_n$. This implies having $m * n$ links altogether (this is the situation we have represented in Figures 2 and 4). The second choice consists in introducing “a meaningless symbol Z ” having the following links: (a) for each A_i , one link connecting A_i to Z , and (b) for each B_j , one link connecting Z to B_j . This implies having only $m + n$ links overall, a number of links much smaller than $m * n$ (when m and n grow large enough), as you can see by comparing Figures 1 and 3 to Figures 2 and 4. For a recent discussion of Ross’s approach see also Jaap C. Hage and Bob Brouwer, “Fundamental Concepts of European Private Law”, in: *European Review of Private law* 1 (2007).

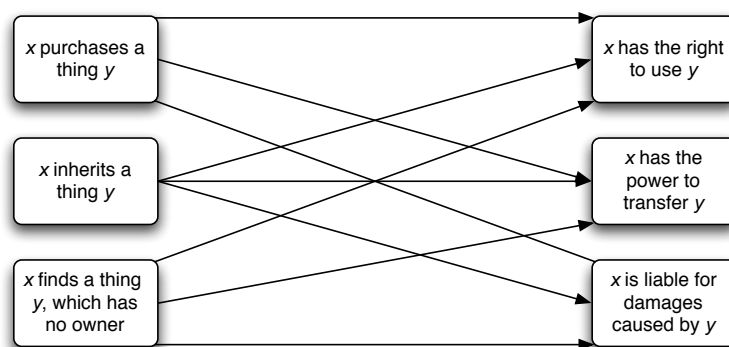


Figure 4: The elimination of ownership

such a way that the possibility is preserved of inferring the same deontic conclusions in the same factual situations.

Yet, from this fact, so clearly stated, Ross comes at questionable conclusions. In particular, he makes the following claim:

[T]he “ownership” inserted between the conditioning facts and the conditioned consequences is in reality a meaningless word without any semantic reference whatever, serving solely as a means of presentation.¹⁴

Therefore, Ross’s view of the function of intermediate legal concepts—they enable us to simplify the representation of normative information—leads Ross to a radical conclusion concerning the semantics of these concepts: they are just meaningless dummies.

This seems to me rather excessive. In fact, we need to reformulate our links, so as to eliminate the concept of ownership all the while preserving the same normative consequences. This shows that the term *ownership* did have a meaning after all, in the sense that it played a conceptual role: the reformulation is required exactly to express in a different way the legal contents we previously expressed by relying on the term’s conceptual role.¹⁵ With regard to terms expressing legal qualifications, we could thus say that such terms have an *inferential meaning*. The *meaning* of a legal qualification *Q*—intended as *Q*’s *conceptual function*—is given by two sets of inferential links:

- a. the links stating what conditions determine the qualification *Q* (*Q*-conditioning links), and
- b. the links connecting further properties to possession of the qualification *Q* (*Q*-conditioned links).

The connection between meaning and inferences enables us to derive two corollaries. First, *Q*-conditioning and *Q*-conditioned links *constitute* *Q*’s inferential meaning, since they determine what inferences lead to *Q* and what inferences depart from it. For instance, we can say that:

- a. ownership-conditioning links contribute to constituting the notion of ownership by establishing that ownership is acquired under certain conditions, while
- b. ownership-conditioned links contribute to constituting the notion of ownership by establishing the rights and duties of owners.

¹⁴Ross, “Tû-Tû”.

¹⁵In general, the fact that we can transform a theory T_1 using term t into a theory T_2 that does not use term t , but has the same implications of T_1 (with regard to statements not containing t) does not prove that t is meaningless, but rather that we can conceptualise a certain domain in different equivalent ways (the issue will then be what way is simpler, more elegant, more helpful for a certain inquiry). It is indeed very common especially in formal disciplines (like logic, game theory, etc.) that equivalent systems can be provided, which use different terms, defined in different ways.

Secondly, such links determine whether Q applies to particular individual entities and what further properties Q -qualified entities have. Therefore, these links *constitute* the fact that certain individuals are Q 's, as well as they constitute the normative consequences of this fact. For instance, we can say that:

- a. ownership-conditioning links contribute to constituting the fact that current owners own certain things, by having enabled the normative generation of their ownership of those things (as resulting from the conditions determining ownership according to such links), while
- b. ownership-conditioned links contribute to constituting current owners' rights and obligation, by providing for the normative generation of the normative entitlements owners have with regard to their possessions (as resulting, according to such links, from their ownership of these possessions).

Hence inferential links have a double legal significance: on the one hand they determine legal meanings and on the other hand they determine legal state of affairs and consequential effect. These two aspects are necessarily interdependent: any choice concerning the meaning of legal terms amounts to a choice concerning legal effects.

3 Implications of an inferential theory of legal concepts

The idea that legal concepts have an inferential semantics has some interesting implications. A first implication consists in eliminating (at least when all inferential links are treated equally) the distinction between terminological information (word knowledge) and substantive information (world knowledge), and consequently in eliminating the distinction between linguistic (analytic) and legal (synthetic) information.¹⁶ If the meaning of legal words were defined independently of inferential links (as provided by substantive legal norms), then we could separately consider what meaning a legal word has, and what norms are expressed using that word. If norms constitute meanings, such a distinction is no longer possible, or at least it cannot be presented as following from clear-cut theoretical principles.¹⁷

A second implication of the view that legal meanings are determined by inferential connections consists in the fact that legal concepts are determined by legal systems: since each legal norm using a concept contributes to characterising the meaning of that concept, and different legal norms exist in different legal systems, then different systems have different concepts¹⁸

A third implication is that legal semantics is determined (among other things) by legal doctrine, to the extent that doctrine determines, identifies or constructs legal norms on the basis of the sources of law. According to the inferential approach, the discussion concerning the meaning of a legal concept in a legal

¹⁶According to a long tradition (extending from Leibniz and Kant to logical empiricism), the truth-value of an analytical judgement is determined exclusively by the meaning of the terms occurring in it. A synthetic judgement, by contrast, says something that is not included in the meaning of such terms. "Bachelors are unmarried men" is a classical example of an analytic judgement, while "Bachelors take longer holidays" is an example of a synthetic judgement, whose truth-value depends not only on the concepts used but also on the states of affairs in the world. The distinction between analytic and synthetic judgements, famously criticised by Quine (see Willard Van Orman Quine, "Two Dogmas of Empiricism", in: *The Philosophical Review* 60 1951, (2nd revised edition 1961, In *The Logical Point of View*, Harvard University Press, Cambridge, Mass.), pp. 20–43), has been recently proposed again in new forms (see, for instance, Paul Boghossian, "Analyticity", in: *A Companion to the Philosophy of Language*, Oxford: Oxford University Press, 1997, pp. 331–68).

¹⁷We could try to distinguish, among the inferential links pertaining to a certain term, those links which are constitutive of the meaning of the term, and those which are not, but it seems very difficult to provide precise theoretical criteria for such a distinction. This does not exclude that for certain purposes, like the construction of a dictionary or an ontology, it may be appropriate to make such a distinction, according to criteria which have a sufficient pragmatic justification. On the idea that legal terms have a core meaning covering some, but not necessarily all of their inferential features, see Uberto Scarpelli, *Contributo alla semantica del linguaggio normativo*, Milan: Giuffrè, 1959 and Anna Pintore, *La teoria analitica dei concetti giuridici*, Naples: Jovene, 1990, 130ff.

¹⁸For a discussion of conceptual diversity, see, for instance, Gianmaria Ajani and Martin Ebers, "Uniform Terminology for European Contract Law: Introduction", in: *Uniform Terminology for European Contract Law*, ed. by Gianmaria Ajani and Martin Ebers, Baden-Baden: Nomos, 2005, pp. 11–20).

system concerns establishing what inferential links—leading to, or departing from, the term expressing the concept—hold in that system. Since the inferential links holding in a legal system represent, or are derivable from, norms of such a system, this discussion is inseparable from the doctrinal issues concerning what legal norms belong to a legal system (given the available legal material, such as legislation, precedent, custom, and so on) and consequently constitute correct premises of legal reasoning with regard to that system. On the one hand, when we argue that in a certain legal system certain preconditions determine the application of a concept and that certain consequences follow from it, we are arguing that such inferential links correspond to norms of such a system. On the other hand, when we consider whether a certain norm exists in a legal system we must take into account the conceptual network to which the norm participates: if the norm links a conceptual qualification to certain preconditions, we must consider what consequences other norms connect to that qualification; if the norm provides consequences of a certain conceptual qualification, we must consider what preconditions entail this qualification.

In fact, by constructing in a certain way (though doctrinal interpretation/construction) the inferential links characterising a certain concept in a legal system we contribute to determining the substantive legal conclusions derivable according to that system. Consequently, we will argue for one or the other interpretative construction of the relevant inferential links according to what conclusions, derivable according to such links, we believe better fit (the values and principles we associate with) the considered legal system.

Consider, for instance, the recent debate about torture, where the absolute prohibition of torture¹⁹ has been recently questioned with regard to the treatment of suspect terrorists.²⁰ A lawyer believing that the law permits infliction of pain on detainees for the purpose of extracting useful information has two ways to go about showing that this is the case: the lawyer can take either a restricted view of the conditions for applying the concept of torture (requiring, for instance, that permanent physical damage is caused, so as to exclude that there is torture when pain is inflicted without such an effect) or a restricted view of the consequences of qualifying an act as torture (assuming that only certain kinds of tortures are always forbidden, while other kinds of torture are in certain circumstances permissible). Correspondingly, a lawyer believing, on the contrary, that the law never permits any infliction of pain for the purpose of extracting information will claim that any pain inflicted for this purpose qualifies as torture, and will claim as well that the law always prohibits torture regardless of the form it may take. The two lawyers, in offering what they view as justified conditions for qualifying an act as torture or as justified consequences following from this qualification, will characterise in different ways the concept of torture, and this will have relevant deontic implications (the first characterisation of torture permits certain actions on detainees, actions which the second characterisation prohibits).

4 Inferential meaning and substantive legal beliefs

An inferential approach to the meaning of legal terms seems to entail that the understanding of legal concepts involves a doctrinal commitment with regard to the considered legal system (by a “doctrinal commitment”, I mean the belief that the considered legal system includes, or entails, certain particular normative contents). We can obviously make a doctrinally uncommitted use of the concept of torture by asserting that another person is using that concept in a certain way (which we may not share). However, when we frame in a certain way the very concept of torture we are using, we apparently take a stand on what counts as torture and on what normative consequences follow from this qualification in our legal system (or in any case, in the legal system we are considering). Every statement concerning what inferences can be derived from a certain legal concept, or what inferences lead to a legal concept, seems to become immediately a doctrinal commitment, namely, it seems to commit us to the view that the corresponding inferential links hold in the legal system we are considering.

¹⁹As stated in Art. 5 of the Universal Declaration of Human Rights: “No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.”

²⁰For a critical review of this debate, see Jeremy Waldron, “Torture and Positive Law: Jurisprudence for the White House”, in: *Columbia Law Review* 105 (2005), pp. 1681–746.

This approach to the inferential meaning of a legal concept can be connected with the general view that having a concept entails (or consists in) the disposition to make certain substantive inferences. This idea has been developed in particular by Michael Dummett, who has offered a well-known example concerning the French word *boche*, used disparagingly during World War I to refer to the Germans: you call someone a "boche" who is German—this forms the basis for calling that person a "boche"—and being boche entails having certain negative qualities, such as being cruel. According to Dummett,²¹ one has the concept of *boche* just in case one accepts the following inferential links (and is ready to reason accordingly):

- if x is German, then x is boche;
- if x is boche, then x is cruel.

One is wrong in having such a concept—as one is wrong in having similar disparaging concepts about other nationalities or ethnic or other groups—since this concept prompts us to make wrong inferences. In fact, combining the two inferential steps above ($German \Rightarrow boche \Rightarrow cruel$), the premise that one is German produces the conclusion that one is cruel. Such an inference is clearly wrong (it leads us in general to generally false conclusions), since most Germans are not particularly cruel (not more than people belonging to other ethnic groups).

Developing this viewpoint, Brandom says: "The use of any concept or expression involves commitment to an inference from its grounds to its consequences of application. Critical thinkers, or merely fastidious ones, must examine their idioms to be sure that they are prepared to endorse and so defend the appropriateness of the material inferential commitments implicit in the concepts they employ."²²

While I agree with Dummett and Brandom on the importance of an inferential understanding of (legal) concepts, I believe that an inferential theory of legal concepts cannot limit itself to this strong (doctrinally committing) way of having a concept; it must also provide a weaker way of possessing conceptual inferences, a way not involving the acceptance of such inferences, namely, not involving the belief that the corresponding inferential links hold in the domain we are considering. Such a weaker kind of inferential understanding should enable us to knowingly possess defective concepts (concepts whose constitutive inferential links we know to be wrong), or local concepts (concepts whose inferences we know to be applicable in certain contexts, but not in certain other).²³ For characterising this weaker kind of conceptual possession I shall first provide some examples, and then I shall attempt at constructing a general model.

Suppose that I am analysing different approaches to marriage and that I identify a view of marriage, let me call it *patriarchal marriage*, which is characterised by (i.e., whose meaning is given by) the following inferential links:

- IF a couple goes through a marriage ceremony, THEN the two spouses are in the relation of patriarchal marriage, and
- IF two spouses are in the relation of patriarchal marriage, THEN the husband has power over his wife.

Suppose that these links fully constitute the meaning of the term *patriarchal marriage*, as I understand it, and that I am fully aware of that (I know that the meaning of this term is constituted by such links). Consider now the following question. Does my knowledge of the meaning of term *patriarchal marriage*

²¹Michael Dummett, *Frege's Philosophy of Language*, New York, N.Y.: Harper and Row, 1973, p. 454.

²²Brandom continues as follows: "The proper question to ask in evaluating the introduction and evolution of a concept is not whether the inference embodied is one that is already endorsed, so that no new content is really involved, but rather whether the inference is one that ought to be endorsed. The problem with *boche* is not that once we explicitly confront the material inferential commitment that gives the term its content it turns out to be novel, but that it can then be seen to be indefensible and inappropriate, a commitment we cannot become entitled to" (Robert Brandom, *Articulating Reasons: An Introduction to Inferentialism*, Cambridge, Mass.: Harvard University Press, 2000).

²³See Paul Boghossian, "Epistemic Analyticity: A Defense", in: *Grazer Philosophische Studien, Fifty Years of Quine's Two Dogmas*, ed. by Hans-Johann Glock, Kathrin Glür, and Geert Keil, Amsterdam: Rodopi, 2003, pp. 15–35.

entail that whenever I know that a couple has gone through a marriage ceremony, I should conclude that the husband has power over his wife? The answer must be negative: while possessing the concept of patriarchal marriage and knowing that a marriage ceremony has taken place, I must be able to reject the conclusion that the husband has such power (since I reject the idea that, in my legal system, a marriage ceremony entails a legal situation having such consequences). This seems very reasonable, but it is incompatible with the view that knowing the meaning of a term (and thus “having”, in a sense, the concept corresponding to such a term) involves having among the premises our reasoning the corresponding inferential links. We can know a concept, but refuse to draw the concept’s conclusions (while believing that its antecedent preconditions hold).

The problem with regard to inferentially characterised concepts is that the preconditions for certain entities to be qualified as an instance of a concept do not logically entail the consequences following from such a qualification. The fact that a couple went through a marriage ceremony—this being the precondition for qualifying the couple as being linked by a patriarchal marriage—does not entail according to logic alone that the husband has power over the wife: for drawing this conclusion we need to make substantive assumptions, namely, we need to assume that the inferential links hold that characterise the concept of patriarchal marriage. But our possession of a concept should not force us to believe that the inferential links characterising that concept really obtain.

Let me introduce another example to clarify this point. Suppose that the concept of *debt-bondage* (a legal institution quite common in ancient legal systems, and unfortunately still in use in some parts of the world) is defined by the following links:

- IF x fails to repay x ’s debt toward y , THEN x is under debt-bondage toward y until x ’s debt is extinguished;
- IF x is under debt-bondage toward y , THEN x is bound to serve y .

Suppose that I grasp (and thus, in this sense, possess) this concept and that I know that Tom did not repay his debt toward Laura. Should I conclude that Tom is bound to serve Laura? This conclusion seems absurd: I can consistently possess the concept of debt-bondage and deny that its constitutive links hold and consequently reject the concept’s consequences, even when its preconditions are satisfied. In fact, I need to possess a concept even for rejecting it, in the sense of declaring that it does not apply.

5 Ramsey’s elimination and Carnap’s conditionalisation of theoretical concepts

A solution to this puzzle may come, I think, from some ideas originally developed by Frank Ramsey and Rudolf Carnap, as they have recently been applied by Paul Boghossian.²⁴ Ramsey developed the idea that theoretical concepts can be removed from scientific theories, but in a way different from the way in which Ross eliminated legal concepts: according to Ramsey theoretical terms can be replaced by variables.²⁵ Thus, given a theory (which for simplicity we can assume to consist of inferential links of the kind described above) containing a certain theoretical term, we can substitute that term with an existentially quantified variable. This substitution makes the assumption explicit that there exists some predicate that, substituted for the variable, yields true or valid propositions.²⁶

²⁴Boghossian, “Epistemic Analyticity: A Defense”.

²⁵This idea was put forward in the paper “Theories”, written in 1929 and published posthumously in 1931 (see Ramsey, *On Truth: Original Manuscript Materials, 1927-1929 from the Ramsey Collection at the University of Pittsburgh*). By a *theoretical term* Ramsey means a term occurring in scientific theories, which applies to non-observable entities, like mass, energy, or proton. Intermediate legal qualifications are likewise not observable (through our senses), so that we can assimilate them to Ramsey’s theoretical terms.

²⁶In general, given a theory T containing a term C , representing a theoretical concept, that is, denoting a non-observable category (a property or relation), we do the following: (a) we substitute C with a variable Z in all statements of T , obtaining a result that we denote as $T[C/Z]$, and (b) we specify that Z is existentially quantified.

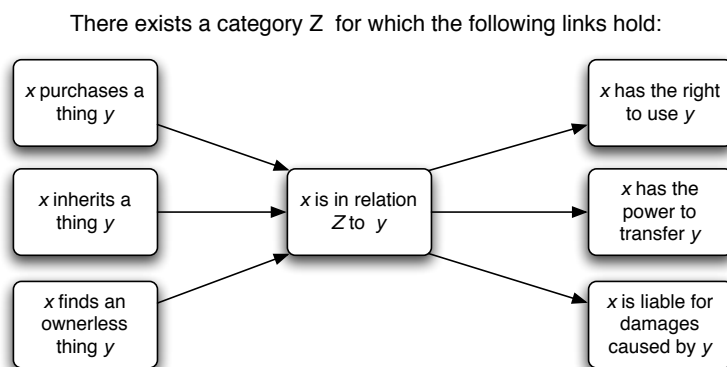


Figure 5: The Ramseyfication of ownership

For instance, a Ramseyfied version of the inferential theory of the concept of ownership consists in the claim that *there exists a category Z* , which is characterised by the following inferential links (see Figure 5):

- IF x buys a thing y , THEN x is in relation Z to y ,
- IF x inherits a thing y , THEN x is in relation Z to y ,
- ... , and
- IF x is in relation Z to y , THEN x can use y ,
- IF x is in relation Z to y , THEN x can transfer y ,
- ...

Ramsey observes by substituting theoretical terms with existentially quantified variables no observable (in our case, no deontic or potestative) consequences of the original theory are lost (assuming that the theory provides all the inferences concerning the theoretical terms at issue).

Note that if possessing a concept amounted to accepting the Ramseyfied version of the theory characterising that concept, then possessing a legal concept would amount to accept substantive legal claims. Having a concept would not only consist in understanding an idea, but would also amount to claiming that this idea has concrete reality, namely, that there exists a category for which the concept's constitutive inferences really obtain. For instance, possessing a concept of patriarchal marriage would entail assuming that there exists (in the context of the legal system we are considering) a relation Z having the following inferential features: (a) if a couple goes through a marriage ceremony, they are in this relation Z , and (b) if a couple is in the relation Z , then the husband has power over the wife. The existence of the category entails the holding of its inferential links. On the contrary, it seems to me that I can possess the concept of a patriarchal marriage—and use, at least in negative or meta-level assertions, like when asserting that x and y are not linked by patriarchal marriage, or that this kind of marriage involves the husband's supremacy—without assuming that the inferential links constitutive of such a concept hold in the legal domain. We need to distinguish the possession of a concept, from the belief that the concept's constitutive links obtain.

To clarify this distinction we can adopt an idea advanced by Rudolf Carnap.²⁷ This is the idea is that a concept's possession can be expressed through a conditional sentence having the following content: if

Thus, Ramsey's version of T is $\exists(Z)(T[C/Z])$, where $\exists(Z)$ is to be read as "there exists a Z such that." For expediency, I will assume here that there is just one theoretical concept.

²⁷See Stathis Psillos, "Rudolf Carnap's 'Theoretical Concepts in Science'", in: *Studies in History and Philosophy of Science* 31 (2000), pp. 151–72 This contribution contains the text on a hitherto unpublished lecture delivered by Carnap on 1959.

there exists some category that satisfies the concept's inferential links, then these links hold with regard to the concept at issue. In other words, the Carnap sentence says that if there exist a category (a property or relation) satisfying the concept's inferential links, then we may assume that this is the same category as is denoted by our concept's name, and we may apply to it the corresponding inferential links.²⁸ For instance, Carnap's statement about patriarchal marriage would be something like the following:

- *if there exists a category Z such that*
 - IF a couple goes through a marriage ceremony, THEN they are in this relation Z , and
 - IF a couple is in relation Z , THEN the husband has power over the wife
- *then*
 - IF a couple goes through a marriage ceremony, THEN they are in relation *patriarchal marriage*, and
 - IF a couple is in relation *patriarchal marriage*, THEN the husband has power over the wife

6 Possession of legal concepts and belief in their applicability

It seems to me that the possession of a concept is given by the acceptance of the corresponding Carnap sentence: I possess the concept of patriarchal marriage if I believe that, in case there exists (in the context I am considering) a category having the inferential features proper to patriarchal marriage (a marriage ceremony entails this relation, which entails husband's power), then these inferential features do indeed characterise the concept of patriarchal marriage. This way of possessing of concept of patriarchal marriage does not lead me to conclude that husbands have power over their wives with regard to legal systems where this is not the case: I can draw such a conclusion only with regard to a legal system where a relation exists having all the inferential properties of patriarchal marriage, namely, where it is the case that a (successful) marriage ceremony brings about a relation between husband and wife entailing the husband's power.

Unless I assume that all of these entailments do hold in the legal system I am considering, my understanding (possession) of the concept of patriarchal marriage does not commit me the sexist conclusion at issue. The possession of the concept is even compatible with the view that nowhere husbands have a legal power over their wives (this being in conflict with prevailing universal human rights²⁹): according to this view the possessed concept will nowhere be applicable, since its constitutive inferential links nowhere hold. However, such a defective concept may still be useful, for instance, in order to argue that it is indeed inapplicable, or to argue that somebody (wrongly) believes that it is applicable.

We can then distinguish the mere *possession* of an inferentially characterised concept from the *belief in its applicability* to a certain context, namely, the belief that the concept can be used, according to its constitutive inferences, in that context.

My possessing (in the sense of understanding or grasping) a concept requires only that I accept the corresponding Carnap sentence, namely, that I believe the following proposition: if there exists a category having the inferential links of the concept, then the concept's inferential links obtain. For instance, I possess the concept of patriarchal marriage in case I have the following belief: if there exists a relation having the inferential features of patriarchal marriage, then the term *patriarchal marriage* applies to this relation and the corresponding inferences hold with regard to this term.

My *belief in the applicability* of a concept requires an addition to its mere possession: besides accepting the Carnap sentence, I need to accept as well the corresponding Ramsey sentence, that is, I need to believe that a category exists such that the inferential features of the concept obtain with regard to that

²⁸Let us assume that TC is our original theory containing term C , and let us denote the corresponding Ramsey statement (the Ramseyfication of theory TC) as $\exists(X)(TC[C/X])$ abbreviated as TC_R . The corresponding Carnap statement (or rather, a simplified version of it) would then be $TC_R \rightarrow TC$.

²⁹In particular with Art. 16 of the Universal Declaration of Human Rights, stating that men and women "are entitled to equal rights as to marriage, during marriage and at its dissolution."

category: only if such a category exists the inferences constituting the concept will produce true (justified) conclusions. By combining the Ramsey sentence (an appropriate category exists) with the Carnap sentence (if an appropriate category exists, then the concept's inferences obtain), I can conclude that the concept's inferences actually obtain.³⁰ Thus, in order to believe that the concept of patriarchal marriage is applicable to a certain context, I need to believe that there exists in that context a relation generated by marriage that gives the husband power over his wife (the content of this belief is my Ramsey sentence), a relation that (according to the corresponding Carnap sentence) I will identify as patriarchal marriage. Only if such a category exists the concept will be applicable to the normative system I am considering.

The condition for a concept to identify an existing inferential category can be extracted from the characterisation of the concept itself: if a concept is meant to bridge its preconditions and its conclusion, the category will exist whenever there is the possibility of building such a bridge, namely when each precondition of the concept determines all of the concept's consequences. Thus the category identified by the intermediate concept Z (for example, x owns y) will exist with regard to a certain context Γ only if each precondition of Z (for example, x purchases y) determines, with regard to Γ , all consequences derivable from Z (x has the right to use y , ...).³¹

The mere applicability of a concept (namely, the existence of the corresponding category, in the sense just specified) does not imply that the concept has cognitive value and thus deserves to be explicitly recognised and explicitly (denoted) by a particular term. A concept deserves such a recognition only to the extent that it collects a set of inferential links whose collection is cognitively useful, since it reflects the nature of the domain to be examined. Within the epistemology of natural sciences, it has been said that concepts should approximate *generals* or *real types*, meant as “clusters of properties co-occurring because they are lawfully connected”³² (consider for instance the properties that are associated with the concept of gold, which can be explained by the physical laws which depend upon gold's atomic structure). In the same way, a legal concept should unify a bundle of normative links sharing not only the same legal effects, but also the same normative justification.³³ This should ensure the persistency and the cognitive relevance of the bundle so identified. For instance, the concept of ownership unifies a set of operative facts—the different ways of acquiring ownership—having common legal effects (the rights and obligation of an owner), but such a unification makes sense on the basis on assumption that such legal effects share the same justification (enabling exclusive individual utilisation of goods and their voluntary transferral, without imposing negative externalities on third parties, etc.). Consequently, those who believe that no such common justification can be provided for all cases covered by the traditional concept of ownership tend to split the concept of ownership into different notions (distinguishing for example entitlements over productive goods and entitlements over goods destined to private consumption). Similarly, it would make little sense to unify under a special concept all different offences punished with a particular sentence (for instance, all offences punished with a fine of 50 Euros).

³⁰Given the Carnap sentence $TC_R \rightarrow TC$ and Ramsey sentence TC_R I can infer TC .

³¹More precisely, let concept Z be inferentially characterised as being entailed by each precondition A_i in A_1, \dots, A_n and entailing all consequences B_1, \dots, B_n . We can say that a category Z corresponding to concept Z exists with regard to the normative systems Γ only if each precondition A_i of Z entails with regard to Γ the conjunction $B_1 \wedge \dots \wedge B_n$ (namely, if Γ does not entail $B_1 \wedge \dots \wedge B_n$, but $\Gamma \cup \{A_i\}$ does). When this condition is satisfied we can also say that concept Z is applicable to Γ . In other words a concept is applicable to Γ , if according to Γ each case satisfying one of Z 's preconditions also satisfies (or normally satisfies, in case of defeasible entailment) all of Z 's consequences.

³²Susan Haack, *Defending Science within Reason*, Amherst, N. Y.: Prometheus, 2003, p. 132. On “generals”, see Charles S. Peirce, “The Categories”, in: *Pragmatism, old and new*, ed. by Susan Haack, Amherst, N. Y.: Prometheus, 2006, pp. 177–208.

³³Lars Lindahl, “Deduction and Justification in the Law. The Role of Legal Terms and Concepts”, in: *Ratio Juris* 17 (2004), pp. 182–201

7 Concepts in legal comparison and in legal doctrine

The distinction between possessing legal concepts and believing in their applicability is particularly significant for comparatist lawyers. As a comparatist lawyer, I may want to characterise a legal concept in inferential terms, but this characterisation should not automatically commit me to the belief that the corresponding inferential links hold in all legal systems: such links will hold only in those contexts where the concept is applicable, namely, where such inferences actually hold. My understanding of a concept does not commit me to any existential thesis, but is rather a heuristic tool that leads me to look for certain inferential links: my grasping the concept of patriarchal marriage leads me to search for certain inferential links (those constituting this concept), and to label the combination of such links accordingly, namely, as an implementation of the concept of patriarchal marriage (if I ever happen to find such a combination, either in the legal reality or in wrong legal beliefs).

Note, however, that the doctrinal commitment characterising the application of a concept (as opposed to the mere possession of that concept) can be undertaken implicitly, as when one provides an inferential characterisation of a term already used in one's linguistic community, in describing a certain domain. In this case, unless I indicate that I am proposing an abstract characterisation of a concept (a characterisation looking for an application, rather than committed to particular applications), my specification of the inferential connections proper to that term will be understood as pre-supposing the existence of the category corresponding to my concept, namely, as stating inferential connections that (I believe) really obtain in the domain at issue.³⁴ This is the case, for instance, when a lawyer is attributing certain inferential connections to a category of his or her legal system, using a term that is already in use within that system.

For instance, if I said without qualifications, in a discussion with Italian lawyers, that marriage entails the husband's power over the wife, I would not be understood as characterising a particular concept of marriage (like the notion of patriarchal marriage), which may not apply to the Italian context, but rather as stating what consequences are entailed by marriage according to Italian law (taking for granted that the marriage I am considering is indeed that situation that results from a marriage ceremony according to Italian law). Thus I would not only possess, in the sense of grasping or understanding, a particular concept of marriage (together with other concepts of marriage, each applicable to different real or hypothetical contexts), but I would assume that the category denoted by the concept of patriarchal marriage (that kind of relationship between husband and wife) exists in Italian law so that the ensuing normative qualifications (the husband's power and the wife's subjection) hold according to that law.

An existential assumption is usually presupposed when the doctrinal characterisations of a legal concept is tied to a certain legal system, so that the concept is assumed to apply to that legal system (the concept's inferential links are assumed to obtain in that system). In fact, a doctrinal characterisation of the concept expressed by a certain term is usually assumed to provide the correct meaning of the occurrences of the corresponding term in the legal sources. For instance, by characterising in a certain way the concept of self-defence or of property, I will be indicating how the occurrences of the term *self-defence* or *property* in authoritative texts are to be understood. Thus such a characterisation is supposed to provide inferential links (conditional norms) established by valid legal sources, inferential links that consequently hold in the considered legal systems determining the existence of a corresponding legal category. On the contrary comparative legal research and legal theory are not tied to a particular legal system: thus in these domains we need to distinguish the characterisation of a concept and the assumption that the concept applies to a certain domain (an assumption entailing that the concept's constitutive inferences obtain in that domain).

³⁴By saying "inferential connections that really obtain" I am not committing to a particular theory of legal reality. In fact, the distinction I am proposing (the distinction between possessing a concept and endorsing it), is compatible with all of the following views: that the existence of a legal inferential link is an empirically ascertainable fact, that it is a socio-institutional fact, or that it is a normative fact, consisting in normative justifiability.

8 Conclusion

I hope to have convinced the reader that it is possible to understand the meaning of inferential legal concepts without undertaking any doctrinal commitment: we can consistently affirm that a legal concept is constituted by certain inferences while denying that such inferences obtain in the legal system we are considering, and consequently rejecting the conclusions derivable from the application of such inferences to known facts.

However, if we want to provide a doctrinally uncommitted inferential analysis of a legal concept we must make it clear that we are just identifying an inferential pattern, possibly in order to model (wrong) opinions on the existing law, without implying that this pattern is part of the law. Usually the opposite will be presumed in doctrinal discourse, namely, we will be taken as stating inferences (norms) we believe to hold in the considered legal system. In other words, we will appear to make the assumption (of the existence of a category satisfying our inferences) made explicit by Ramsey and Carnap's analyses.

References

- Ajani, Gianmaria and Martin Ebers, "Uniform Terminology for European Contract Law: Introduction", in: *Uniform Terminology for European Contract Law*, ed. by Gianmaria Ajani and Martin Ebers, Baden-Baden: Nomos, 2005, pp. 11–20.
- Alchourrón, Carlos E. and Eugenio Bulygin, *Normative Systems*, Vienna: Springer, 1971.
- Boghossian, Paul, "Analyticity", in: *A Companion to the Philosophy of Language*, Oxford: Oxford University Press, 1997, pp. 331–68.
- "Epistemic Analyticity: A Defense", in: *Grazer Philosophische Studien, Fifty Years of Quine's Two Dogmas*, ed. by Hans-Johann Glock, Kathrin Glür, and Geert Keil, Amsterdam: Rodopi, 2003, pp. 15–35.
- Brandom, Robert, *Articulating Reasons: An Introduction to Inferentialism*, Cambridge, Mass.: Harvard University Press, 2000.
- *Making It Explicit: Reasoning, Representing, and Discursive Commitment*, Cambridge, Mass.: Harvard University Press, 1994.
- Dayal, Surend and Peter Johnson, "A Web-based Revolution in Australian Public Administration", in: *Proceedings Law via the Internet '99: 2nd AustLII Conference on Computerisation of Law via the Internet*, (Electronic publication. Also Published in the on line journal JILT, 2000, Issue 1.), Sydney: University of Technology, 1999.
- Dummett, Michael, *Frege's Philosophy of Language*, New York, N.Y.: Harper and Row, 1973.
- Fodor, Jerry and Ernie Lepore, "Brandom's Burdens: a review of Robert B. Brandom's *Articulating Reasons*", in: *Philosophy and Phenomenological Research* 63 (2001), pp. 465–82.
- Frege, Gottlob, *The Basic Laws of Arithmetic*, (1st Ed. German 1893), Berkley: University of California Press, 1964.
- Haack, Susan, *Defending Science within Reason*, Amherst, N. Y.: Prometheus, 2003.
- Hage, Jaap C. and Bob Brouwer, "Fundamental Concepts of European Private Law", in: *European Review of Private Law* 1 (2007).
- Horwich, Paul, *Truth*, Oxford: Clarendon, 1998.
- Lindahl, Lars, "Deduction and Justification in the Law. The Role of Legal Terms and Concepts", in: *Ratio Juris* 17 (2004), pp. 182–201.
- "Operative and Justificatory Grounds in Legal Argumentation", in: *Associations* 7 (2003), pp. 185–200.
- Nardi, Daniele and Ronald J. Bratman, "An Introduction to Description Logics", in: *Description Logic Handbook*, ed. by Franz Baader et al., Cambridge, Mass.: Cambridge University Press, 2002, 5–44.
- Peirce, Charles S., "The Categories", in: *Pragmatism, old and new*, ed. by Susan Haack, Amherst, N. Y.: Prometheus, 2006, pp. 177–208.
- Pintore, Anna, *La teoria analitica dei concetti giuridici*, Naples: Jovene, 1990.

- Pollock, John L., *Cognitive Carpentry: A Blueprint for How to Build a Person*, New York, N. Y.: MIT Press, 1995.
- Psillos, Stathis, “Rudolf Carnap’s ‘Theoretical Concepts in Science’”, in: *Studies in History and Philosophy of Science* 31 (2000), pp. 151–72.
- Quine, Willard Van Orman, “Two Dogmas of Empiricism”, in: *The Philosophical Review* 60 (1951), (2nd revised edition 1961, In *The Logical Point of View*, Harvard University Press, Cambridge, Mass.), pp. 20–43.
- *World and Object*, Cambridge, Mass.: MIT Press, 1960.
- Ramsey, Frank Plumpton, *On Truth: Original Manuscript Materials, 1927-1929 from the Ramsey Collection at the University of Pittsburgh*, Dordrecht: Kluwer, 1991.
- *The Foundations of Mathematics and Other Essays*, ed. by Richard Bevan Braithwaite, London: Routledge, 1931.
- Raz, Joseph, *Practical Reason and Norms*, London: Hutchinson, 1975.
- Ross, Alf, “Tû-Tû”, in: *Scandinavian Studies in Law* 1 (1957), pp. 139–53.
- Sartor, Giovanni, *Legal Reasoning: A Cognitive Approach to the Law*, ed. by Enrico Pattaro, vol. 5, *Treatise on Legal Philosophy and General Jurisprudence*, Berlin: Springer, 2005.
- “The Nature of Legal Concepts: Inferential Nodes or Ontological Categories”, in: *Proceeding of the Conference on “Approaching the Multilanguage Complexity of European Law: Methodologies in Comparison”*, ed. by Gianmaria Ajani, Giovanni Sartor, and Daniela Tiscornia, Florence: European Press Academic Publishing, 2007.
- Scarpelli, Uberto, *Contributo alla semantica del linguaggio normativo*, Milan: Giuffrè, 1959.
- Sergot, Marek J. et al., “The British Nationality Act as a Logic Program”, in: *Communications of the ACM* 29 (1986), pp. 370–86.
- Volpe, Giorgio, “A Minimalist Solution to Jörgensen’s Dilemma”, in: *Ratio Juris* 12 (1999), pp. 59–79.
- Waldron, Jeremy, “Torture and Positive Law: Jurisprudence for the White House”, in: *Columbia Law Review* 105 (2005), pp. 1681–746.
- Wedberg, Anders, “Some Problems in the Logical Analysis of Legal Science”, in: *Theoria* 17 (1951), pp. 246–75.