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Deontic Closure and Conflict in Legal Reasoning

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Abstract. We identify some legal reasoning patterns concerning deontic closure and conflicts in defeasible deontic logics. First, whether the logic allows the derivation of permissions from conflicting norms. Second, whether the logic treats norms as closed under logical implication. We suggest appropriate approaches for legal settings.

1. Introduction

Normative systems can be understood as sets of norms, with each norm represented as an"**IF** conditions **THEN** conclusion" structure [10, 4]. Rule-based systems of this sort provide an adequate framework for the representation of norms, normative systems and legal knowledge (see, for example, [5, 9] for some rule-based frameworks for legal reasoning). It has been argued that for the successful representation of norms and legal reasoning rule-based systems should account for both defeasible reasoning [8], and reasoning with deontic concepts [7]. We refer to a system combing both aspects as a defeasible deontic logic. The use of defeasible deontic logics is a well-established aspect of research on legal reasoning and argumentation. Here we introduce and discuss a number of complex reasoning patterns that arise when using defeasible deontic logics to represent legal reasoning. The patterns concern the logics' approach to deontic closure and conflicts. In each case we provide examples and suggest the most appropriate approach for legal settings.

2. Defeasible Deontic Logic

We do not make use of any specific defeasible deontic logic. Rather, we outline general abstract characteristic of these logics before considering a variety of reasoning patterns any such logic will need to accommodate. We assume formulas from a logical language that includes the deontic operators O and P for obligation and permission, and the implication operator $\rightarrow$. As usual in deontic logic we assume that a prohibition is a negative obligation, i.e., $\mathsf{F}a \equiv \mathsf{O}\neg a$. Two additional operators P_w and P_s denote *weak* and *strong* permission, respectively. Eventually, a 'generic' permission will be understood as the disjunction of the corresponding strong and weak permissions, namely: $\mathsf{P}a \equiv (\mathsf{P}_w a \vee \mathsf{P}_s a)$. We also assume that a normative system is consistent. Namely, we assume: $\mathsf{O}a \wedge \mathsf{O}\neg a \rightarrow \bot$ and $\mathsf{O}\neg a \wedge \mathsf{P}a \rightarrow \bot$. Norms are represented by rules, where a rule is an expression with the following form:

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$$r\colon A_1,\dots A_n \Rightarrow C \qquad (1)$$

where r is the name/id of the rules, $A_1,\dots A_n$, the antecedents of the rule, are formulas in the language (including deontic formulas), and C the conclusion of the rule is a formula in the language (including a deontic formula). Notice that $\Rightarrow$ is not an operator of the object language.

We stipulate that all facts are given as formulas not containing deontic operators. Obligations, prohibitions, and permissions are are derived from rules (corresponding to norms) using an all-things-considered argumentation structure as follows:

To derive conclusion C

- there should be a rule (argument) for C such that the rule is applicable and
- all possible rules conflicting with the conclusion C (counterargument for C) are either
  - ∗ rebutted (meaning that the rule is not applicable)
  - ∗ defeated (meaning the rule is weaker than an applicable rule for the conclusion we want to prove)

The exception to the structure above is the derivation of weak permissions. As we state below, for our purposes we derive that something is weakly permitted just in case we fail to derive that the opposite is obligatory.

In the rest of the paper, we use the notation $r\colon \cdots \Rightarrow C$ to represent a rule r when the antecedent of the rule is assumed to hold and the content of the antecedent is not relevant for the discussion.

Note that the abstract formulation we provide in this section is compatible with several existing defeasible deontic logics, for example [5, 9, 11].

3. Permission from conflicting norms

Permission is sometimes defined as the absence of a prohibition or the absence of an obligation to the opposite. *Weak permission* arises where there are no norms against the permitted behaviour and no norms expressly permitting the behaviour. In other words, p is weakly permitted if $\not\models \mathsf{O}p$. *Strong permission* arises where norms explicitly permit an action in derogation from inconsistent norms [12, 1].

We first consider the case where there are two norms that are directly in conflict, the first of which makes a obligatory and the second forbidding a, where there is no mechanism for resolving the conflict. Accordingly, suppose we have the following norms/rules:

$$n_1\colon \dots \Rightarrow \mathsf{O}a \qquad\qquad n_2\colon \dots \Rightarrow \mathsf{O}\neg a \qquad (2)$$

Under the sceptical reading we have that $\not\models \mathsf{O}a$ and $\not\models \mathsf{O}\neg a$. For a sceptical reasoner, however, it may still be necessary to determine whether a is permissible. This is not because the reasoner needs to determine whether a is legal, but because whether a is permitted may trigger other normative requirements. So, for example, if we have a third norm n_3 with the following form:

$$n_3\colon \mathsf{P}a \Rightarrow X. \qquad (3)$$

a sceptical reasoner needs to determine whether a is permitted in order to determine whether X holds.

There are three options for this case. Option 1 is to argue that both a and $\neg a$ are permitted. There are rules that mandate, respectively, a and $\neg a$. On the assumption that the normative system is consistent, if we derive the obligation that a, we should also derive that a is permissible; otherwise we would have an obligation that a that was impermissible to discharge. Thus, n_2 is a norm that "strongly" derogates the obligation that a (strongly, in the sense that it would make a forbidden), and n_1 is a norm explicitly derogating the prohibition that a. Option 2 is to assert that neither a nor $\neg a$ is permitted: whatever one does the resultant state of affairs will be illegal. We believe however that this is not an acceptable option, assuming the consistency of the set of obligations. Option 3 is to assume that there is a gap (for defeasible deontic logics admitting such an option). We believe that only the first option is appropriate for legal reasoning. If it is possible to have conflicting norms (as n_1, n_2), then it is reasonable to assume, as we hinted in Section 2, that the normative system remains consistent, since real-life legal systems provide principles to resolve conflicts (against option 2). In adjudication of a case, moreover, a judge has to decide whether X holds, and in general cannot refrain from taking a decision (against option 3). A decision has to be taken systematically (taking into account that n_3 could itself derogate from another another norm with $\neg X$ as its consequence).

Moreover, there are situations where sceptical reasoners will be required to determine whether the permission in the antecedent of the norm is strong or weak. Thus, suppose instead of n_3 we have

$$n_3' \colon \mathsf{P}_w a \Rightarrow Y \tag{4}$$

where a is weakly permitted, does Y hold? Or

$$n_3'' \colon \mathsf{P}_s a \Rightarrow Z \tag{5}$$

where a is strongly permitted, does Z hold?

Norms with a strong permission in the antecedent are not uncommon. They can be used to formulate norms expressing rights where the right confers a permission on one party that impliedly confers an obligation on another party. Strong permissions also appear in the antecedent of a norm when a party exercises an entitlement (or permissions). Another case of a norm corresponding to n_3 (or more precisely, n_3') would be when the norm recites:

> If in derogation to Section X y does Z, then it is obligatory that ...

For an example with an explicit weak permission consider the following three norms.

Section 1 If a person lives in Italy for more than 183 consecutive days over a 12-month period, then the person is obliged to pay taxes in Italy on the person's worldwide income.

Section 2 A citizen of a country that signed a mutual tax treaty with Italy is exempt from paying her taxes in Italy, provided the citizen maintains fiscal residence in the country that signed the tax treaty with Italy.

Section 3 If a person is exempt from paying taxes on her worldwide income in Italy for reasons not listed in Section 2 and elects not to pay such taxes in Italy, then the person has to declare the countries where the person pays such taxes.

The first norm (Section 1) sets an obligation based on some factual condition for the obligation to be in force. Section 2 provides an explicit derogation to the obligation set in Section 1. Thus, when Section 2 applies, the obligation in Section 1 is not in force and we have a strong permission. If the applicability condition for Section 1 does not hold, then the corresponding obligation is not in force, and the opposite activity (i.e., not paying income taxes in Italy) is permitted. This permission is weak: assuming there are no other norms, there is no norm that explicitly exempts the payment of taxes in Italy. Finally, the clause in Section 3 takes exemption from Section 1 as part of the condition of applicability of another legal requirement (the obligation to declare where the income taxes are going to be paid). In this case, the permission invoked is weak; the provision explicitly excludes the explicit derogations provided in Section 2.

4. Closure under logical implication

In this section we address the closure of obligations under logical implication in cases of normative conflict. We introduce several cases distinguished by the nature of the conflict in question. Consider, again, the norm: $n_1\colon \ \ldots \Rightarrow \mathsf{O}a$. Suppose that the norm is applicable, and therefore the obligation $\mathsf{O}a$ is in force. Is the permission $\mathsf{P}a$ in force as well? What about the strong and weak versions of the permissions (i.e., $\mathsf{P}_s a$ and $\mathsf{P}_w a$)? Suppose that, in addition to n_1, we have the implication $a \rightarrow b$. The issues are now:

1. Are we allowed to conclude $\mathsf{O}b$? If so, under what conditions (e.g., the norms that either make b forbidden or $\neg b$ permitted are not applicable or defeated)?
2. Are we allowed to conclude $\mathsf{P}b$? If so, under what conditions (e.g., that the norms forbidding b are either not applicable or defeated)?

The appropriateness of logical closure in the context of legal requirements has been debated by Lou Goble [3] and John Broome [2]. Broome argues that closure is not a feature of positive requirements (such as law). In response, Goble offers the example of law that says 'there shall be no camping at any time on public streets', 'it does not seem much of a defense for a camper to plead that the law never said that there should be no camping on the streets on Thursday night'. Broome's reply is that the law you have breached does not forbid camping on Thursday, it forbids camping *at any time*. Here we introduce some observations in support of Broome's position.

Continuing with Goble's example, suppose we had two norms, one creating an obligation not to camp at any time and another permitting camping on a Tuesday:

$$n_6\colon \ \ldots \Rightarrow \mathsf{O}\neg \mathit{camping} \qquad\qquad n_7\colon \ \ldots \Rightarrow \mathsf{P}\mathit{camping\ tuesday}$$

where the implication $\neg \mathit{camping} \rightarrow \neg \mathit{camping\ tuesday}$ holds, and there are are no further rules. Here the safest conclusion seems to be $\neg\mathsf{O}\neg \mathit{camping\ tuesday}$, which supports the conclusion that we cannot derive $\mathsf{O}b$ from $\mathsf{O}a$ through closure unless there are no applicable or undefeated norms that make b forbidden or $\neg b$ permitted.

However, even where legal obligation is not closed under logical implication, legal systems probably feature defeasible closure rules as part of their interpretive canon, with something like the following form: $OX \wedge (X \rightarrow Y) \Rightarrow OY$

In the camping example, this defeasible closure rule would be defeated by the more specific permissive norm n_7.

Issue (2) seems to be related to the question of whether we can derive permission from conflicting norms, though the conflict in this case is indirect. Supposing we have two norms, one of which imposes an obligation on all campers in the forest not to light a fire of any sort, and a second which imposes an obligation on all park rangers to light their fire with a gas burner:

$$n_8 \ldots \Rightarrow \mathsf{O}\neg \mathit{fire} \qquad\qquad n_9 \ldots \Rightarrow \mathsf{O}\mathit{gas\ burner}$$

Where the implication $\neg \mathit{fire} \rightarrow \neg \mathit{gas\ burner}$ holds. It does not seem like the appropriate conclusion, in this case, is $\mathsf{P}\neg \mathit{gas\ burner}$. This seems to suggest that in these sorts of cases the condition for concluding $\mathsf{P}b$ through closure is that there are no applicable or undefeated norms forbidding b.

Conflicts and Closure: partially direct conflict Here, we discuss cases where logical closure created conflicts between norms. Consider norm n_1 and the norm

$$n_4\colon\ \ldots \Rightarrow \mathsf{O}\neg b \tag{6}$$

and either the implication $a \rightarrow b$ or the weaker $a \Rightarrow b$. What can we conclude: namely, $\mathsf{O}a$, $\mathsf{O}b$, or $\mathsf{O}\neg b$? And, more importantly, under what conditions are these conclusions correct?

To begin with, there is an intuitive conflict between n_1 and n_4. If we accept that obligation is not closed under logical consequence, then we need some sort of defeasible closure rule in order to explain the apparent conflict between the two norms. Suppose that we have our two norms n_8 and n_9, mentioned above, where, of course, $\mathit{gas\ burner} \rightarrow \mathit{fire}$. If there is no closure under logical consequence, then there is no conflict (obviously), and we have $\mathsf{O}\mathit{gas\ burner}$ and $\mathsf{O}\neg\mathit{fire}$. This seems right to us *prima facie*. If we were looking to *describe* the law, we would say that there is both an obligation not to light a fire and an obligation to light any fire using a gas burner. However, we also want to be able to describe why there is an intuitive conflict between the two laws. Thus we need some sort of defeasible meta-norm, like

$$n_{10}\colon \mathsf{O}\neg \mathit{fire} \wedge (\neg \mathit{fire} \rightarrow \neg \mathit{gas\ burner}) \Rightarrow \mathsf{O}\neg \mathit{gas\ burner}.$$

This meta-norm, when combined with n_8, would then be in conflict with n_9. Our legal intuition is that the resolution of this conflict would then depend on the relative priorities of n_8 and n_9. So if n_8 is higher in priority than n_9, then the argument chain involving n_8 and n_{10} will prevail, and there will be an obligation not to light a fire.

Conflict and Closure: fully indirect conflict The previous case involved a direct conflict. In other cases conflict is not direct, but induced by logical implications or other (constitutive) norms. For example, the norms

$$n_1\colon\ \ldots \Rightarrow \mathsf{O}a \qquad\qquad n_5\colon\ \ldots \Rightarrow \mathsf{O}b$$

paired with the implications $a \rightarrow c$ and $b \rightarrow \neg c$ are in indirect conflict. As before, we must address the correct sceptical response. What can we conclude: $\mathsf{O}a$, $\mathsf{O}b$, $\mathsf{O}c$, $\mathsf{O}\neg c$? More importantly, under what conditions are these conclusions correct?

The need to accommodate indirect conflicts is clearest if the prescriptions in n_1 and n_5 are "compensable", namely, instead of n_1 and n_5 we have[2]

$$n_1'''\colon\ \ldots \Rightarrow \mathsf{O}a \otimes \mathsf{O}d \qquad\qquad n_5'\colon\ \ldots \Rightarrow \mathsf{O}b \otimes \mathsf{O}e$$

Our view is that indirect conflicts between obligations should not block their derivation. Occasionally, these sorts of indirect conflict arise in private law without affecting the validity of the obligations in question. For example, in *J Lauritzen A.S v Wijsmuller B.V*[3] the defendants operated two ships, the Super Servant 1 and the Super Servant 2,

[2]Here we use the notation proposed by [6] to model compensatory obligations, $\mathsf{O}a \otimes \mathsf{O}b$ means that the a is the primary obligation, and the obligation of b is in force when the obligation of a is violated (namely, $\neg a$ holds, and the fulfilment of b compensates for the violations of the obligation of a).

[3][1990] 1 Lloyd's Rep 1.

which they planned to use to complete two different contracts. After Super Servant 2 sunk off the coast of Zaire, the defendants could not fulfil both contracts using only Super Servant 1. The defendants decided it was impossible to fulfil the plaintiff's contract. The court nonetheless held that the defendants were in breach of contract, and ordered the defendant to pay damages to the plaintiff.

Suppose we have two basic contractual rules:

$$n_1 \colon \ \ldots \Rightarrow \mathsf{O}Contract1 \qquad\qquad n_5 \colon \ \ldots \Rightarrow \mathsf{O}Contract2$$

Along with the implications:

$$\mathit{Contract1} \rightarrow \mathit{Super\ Servant1} \qquad\qquad \mathit{Contract2} \rightarrow \neg \mathit{Super\ Servant1}$$

Descriptively, in cases like this where there is indirect conflict, it is best to say that the defendant has both obligations (i.e. $\mathsf{O}Contract1$ and $\mathsf{O}Contract2$).

If we introduce the idea that both obligations are compensable into the logic, then the sense in which the two obligations conflict is particularly clear. If the defendant uses the Super Servant 1 to perform $Contract1$, then they owe the party to $Contract2$ compensation, or *vice versa*. So we now have:

$$n_1''' \colon \ \ldots \Rightarrow \mathsf{O}Contract1 \otimes \mathsf{O}Damages1 \tag{7}$$

$$n_5' \colon \ \ldots \Rightarrow \mathsf{O}Contract2 \otimes \mathsf{O}Damages2 \tag{8}$$

We have both obligations, and whichever one is not fulfilled will be compensable. Indirect conflict between the two obligations does not block their derivation.

5. Conclusions

In this contribution we discussed some reasoning patterns that may arise in the use of defeasible deontic logics for the representation of legal knowledge. In each case, we argued that certain reasoning patterns must be preserved in order to ensure that defeasible deontic logics are appropriate for representation of legal reasoning. The approach we favour generally tolerates forms of direct and indirect conflict between norms while rejecting the strict closure of deontic operators under logical consequence.

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