Legal decision making as dialectical theory construction with argumentation schemes

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1. Introduction

Notwithstanding substantial progress in the logic of law, it is hard to get a coherent view on the different opinions and approaches that have been proposed. A reason can be that there still is no common set of primitive notions that has turned out sufficiently flexible and expressive to accommodate the different approaches. Here a model of dialectical argumentation with argumentation schemes is presented in an attempt to fill this gap.

The presented approach combines three ideas. First, in legal decision making any statement can be just as well supported (by a reason for it) as attacked (by a reason against it). It turns out that this seemingly trivial point becomes a powerful tool when it is noted that it applies also to the warrants of arguments, i.e., the statements that express which statement supports or attacks which other statement (in analogy with, and extending Toulmin's 1958 notion of warrant).

Second, legal decision making uses dedicated argumentation schemes (like rule application, precedent distinction and analogy) and these schemes tend to be defeasible or even contingent. The modeling of argumentation schemes results in a blurred border between the logical object and meta-level, which provides philosophical insight into the relation between concrete, special-purpose legal logics and abstract, general-purpose logics (cf. also Verheij 1999b).

Third, legal decision making is a kind of dialectical theory construction. Initial assumptions and conclusions are critically addressed by adducing reasons for and against them. The result is a gradually changing dialectical theory in which statements can at one time be justified and at others defeated or unsettled. This process is heuristically guided by the data and argumentation schemes available.

In the full paper, the approach to the formal modeling of legal decision making is presented in reply to a critique of two existing approaches, viz. Prakken's (1997) and Hage's (1997). Five themes are discussed that are relevant for the formal modeling of legal decision making, and it is discussed to what extent and with how much success these are covered by Prakken's and Hage's approach. The themes are the logic of argument defeat, the logic of rules, the logic of law, the empirical adequacy of the approaches, and their heuristic value.

2. DEFLOG - a logic of dialectical interpretation

The approach proposed here is based on a recently developed theory of dialectical argumentation, and a corresponding logic of dialectical interpretation, called DEFLOG. It is related to work on automated argument assistance (e.g., Verheij 1999a). Below the theory is summarized. For a more extensive account, the reader may want to consult Verheij (2000a, 2000b).

2.1 Dialectical argumentation

In dialectical argumentation, statements can not only support other statements, but also attack them. For instance, as a reason to support that Peter shot George, the statement can be made that some witness, say A, states that Peter shot George:

The exclamation mark indicates an assumed statement, the question mark a statement that is at issue. Here the issue that Peter shot George is settled (the statement is justified, as is indicated by the dark, bold font) since there is a justifying reason for it, namely A's testimony.

As a reason against the issue that Peter shot George, the statement can be made that some other witness, say B, states that the shooting did not take place:


Assuming only B's testimony (not A's), the issue that Peter shot George is again settled, but this time the statement is defeated, as is indicated by the struck-through font.

That some statement supports or attacks another statement can itself be at issue. For instance, it can be argued that A's testimony supports that Peter shot George since witness testimonies are often truthful:

Likewise, a reason can be given to support that some statement *attacks* another statement.

A's unreliability can be adduced in order to attack that A's testimony supports that Peter shot George:
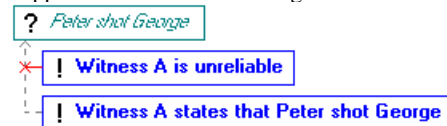
Here the issue that Peter shot George is unsettled, as is indicated by the light italic font, since it is not justified (e.g., by a justifying reason for it) nor defeated (e.g., by a defeating reason against it).

Similarly, a reason can be given to attack that some statement attacks another statement.

2.2 The dialectical interpretation of theories

Dialectical argumentation can be made formally precise in terms of the logical system DEFLOG (Verheij 2000a, b). DEFLOG's starting point is a logical language with two connectives × and ~>. The first is a unary connective that is used to express the defeat of a statement, the latter is a binary connective that is used to express that one statement supports another. When φ and ψ are sentences, then ×φ (φ's so-called *dialectical negation*, not to be confused with standard negation) expresses that the statement that φ is defeated, and φ ~> ψ that the statement that φ supports the statement that ψ. Attack is defined in terms of these two connectives: φ ~> ×ψ expresses that the statement that φ supports that the statement that ψ is defeated, or that φ attacks ψ, for short.

The central definition of DEFLOG is its notion of the *dialectical interpretation* (or *extension*) of a theory. A theory is any set of sentences, and when it is dialectically interpreted, all sentences in the theory are evaluated, either as justified or as defeated. This is in contrast with the interpretation of theories in standard logic, where all sentences in an interpreted theory are assigned the same positive value, namely true, e.g., by giving a model of the theory.

An assignment of the values justified or defeated to the sentences in a theory gives rise to a dialectical interpretation of the theory, when two properties obtain. First, the justified part of the theory must be conflict-free. A set of sentences is conflict-free when there is no sentence φ such that both φ and ×φ are in the set or follow by the repeated application of ~>-Modus ponens (i.e., from φ ~> ψ and φ, conclude ψ). Second, the justified part of the theory must attack all sentences in the defeated part, i.e., for all φ in the defeated part of the theory, ×φ must be in the justified part or follow from it by the repeated application of ~>-Modus ponens. (The formal details of the definition are in the full paper. Cf. also Verheij 2000a, b.)

The examples discussed in section 2.1 can be used to illustrate the definition of dialectical interpretation. Let s express Peter's shooting of George, a A's testimony, t the truthfulness of testimonies, and u A's unreliability. Then the third example corresponds to the theory {a, t, t ~> (a ~> s)}. In its unique extension, all statements of the theory are justified, and in addition a ~> s and s. The fourth example corresponds to the theory {a, u, u ~> ×(a ~> s), a ~> s}. Note that the theory is not conflict-free. In its unique extension, a ~> s is defeated and s is not interpreted (i.e., neither justified nor defeated).

There is a lot to say about the dialectical interpretation of theories. For instance, there exist theories without dialectical interpretation and theories with several dialectical interpretations. The new notion of *dialectical justification*, that can be seen as a generalization of valid consequence in a dialectical setting, gives rise to characterizations of the existence and multiplicity of extensions.

Verheij (2000a) gives additional information on DEFLOG, such as its relations with other formalisms, and explains that the dialectical logic DEFLOG can be regarded as an expansion of deductive logic by adding dialectical negation.

2.3 Expressiveness of the logical language

Notwithstanding the simple structure of DEFLOG's language, several central notions of dialectical argumentation can be analyzed in terms of it. For instance, an innovation of DEFLOG is the simple parallel between support and attack, and more specifically between Toulmin's (1958) warrants and Pollock's (1987) undercutters. Both support and attack are expressed using DEFLOG's conditional ~>, viz. as φ ~> ψ and as φ ~> ×ψ, respectively, and have their effect by the simple application of ~>-Modus ponens. Toulmin's warrants correspond to a nested conditional φ ~> (ψ ~> χ), where φ expresses a warrant, while Pollock's undercutters correspond to φ ~> ×(ψ ~> χ), where φ expresses an undercutter.

3. Argumentation schemes

Legal reasoning does not only involve reasons for and against conclusions, as analyzed in the previous section, but also makes use of dedicated, typically legal argumentation schemes. Such schemes tend to be defeasible, and can even be contingent. In the full paper, it is shown how argumentation schemes can be incorporated in the abstract model of dialectical argumentation of section 2. This gives rise to a notion of validity of concrete argumentation schemes in terms of DEFLOG's notion of dialectical justification. Moreover, it allows arguing about argumentation schemes.

4. Conclusion

The approach to the formal modeling of legal decision making summarized here involves two central elements. First, the abstract logic DEFLOG has been proposed as a 'bottom line dialectical logic', i.e., one that just allows the modeling of dialectical argument by means of dialectical theory construction. Second, it has been shown how contingent, defeasible argumentation schemes can be embedded in the bottom line logic for the flexible and empirically adequate modeling of concrete kinds of reasoning, such as statute-based and precedent-based reasoning in the law.

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