From Logic to Dialectics in Legal Argument

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Abstract

This paper investigates the relation between declarative and procedural accounts of adversarial legal argument. A three- leveled model is proposed, where a formal argumentation framework is built around a logical system and itself embedded in a dialectical protocol for dispute, in such a way that, each time a party adds or retracts information, the argumentation framework reassesses the resulting state of the dispute. The proposed link between the first, logical level and an argumentation framework obviates the need for nonmonotonic logics at the first level, while the proposed link between declarative and procedural models of argumentation enables us to regard induction and analogy not as forms of inference but as heuristics for introducing premises.

1 Introduction

With respect to normative models of legal argument, early criticism in AI and Law of e.g. [16] that logical methods neglect the adversarial aspects of legal reasoning has been addressed by work on logical argumentation frameworks (e.g. [18, 13, 17, 11]. Such systems (below AF's) take as input a set of premises plus a set of criteria for comparing conflicting arguments, and they produce as output an assessment of all arguments that are possible given the premises. Typically, this assessment tells us with which a dispute can be won or lost and which arguments leave the dispute undecided.

Another recent development in AI and Law is the construction of procedural, in particular dialectical models of legal argument ([9, 10]). These models are inspired by Toulmin's [19, pp. 7-8] advice that logicians who want to learn about reasoning in practice, should turn away from mathematics and instead study jurisprudence, since outside mathematics the validity of arguments would not depend on their syntactic form but on the disputational process in which they have been defended. According to Toulmin an argument is valid if it can stand against criticism in a properly conducted dispute, and the task of logicians is to find criteria for when a dispute has been conducted properly; moreover, he thinks that the law, with its emphasis on procedures, is an excellent place to find such criteria. In agreement with this, the procedural models of adversarial argumentation state criteria for the fair and effective regulation of dispute.

Are the declarative and procedural models rivals of each other or do these theories address different, although related issues? This question will be the topic of the present paper, which thus is not about descriptive but about normative the-

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ories of legal argument. The discussion will be informal, focusing on the underlying ideas rather than on technical issues. For details on formalisation and implementation the reader should consult the publications referred to in this paper. After outlining the main ideas behind declarative (section 2) and procedural (section 3.1) models of argumentation, I will, in section 3.2, argue that standard logic, argumentation frameworks and dialectical protocols are not rivals of each other but that they should be combined in a three-leveled model of legal argument. In the remaining sections I investigate this model in more detail, in particular, how nonmonotonic logics and theories of induction and analogy fit into it.

2 Declarative argumentation frameworks

In this section I will give an informal sketch of the main conceptual ideas behind existing AF's. Recall that such systems give an assessment of arguments on the basis of given premises and ordering criteria. AF's have also been developed outside AI and law (although the term 'AF' is mine). In philosophy Pollock (e.g. [12]) should be mentioned, who has analyzed epistemological issues in terms of constructing and comparing arguments, while in Artificial-Intelligence research AF's have been developed as a reformulation of ([3, 7]) or an alternative for ([18, 20]) earlier formalisations of nonmonotonic reasoning.

Roughly, AF's contain the following five elements, although sometimes implicitly. First they have an underlying logic, after which they define a corresponding notion of an argument. Next, AF's define when an argument is in conflict with, or attacked by other arguments. AF's also offer ways of comparing an argument with its attackers and, finally, on the basis of these elements they define the ultimate status of an argument, typically in terms of three classes: arguments with which you can 'win', respectively, 'lose' a dispute, and arguments which leave the dispute undecided. These five elements will now be discussed in separate subsections.

2.1 The underlying logic

AF's are built around an underlying logic, i.e. around a formal system defining a relation of necessary consequence between sets of premises and conclusions. Some AF's assume a particular logic: for example, [13] is based on default logic, with its threeplace domain specific inference rules, while [18, 10, 11, 17] assume a similar language with twoplace metalinguistic connectives. Other systems, e.g. [20, 7], leave the underlying logic partly or wholly unspecified; thus these systems can be instantiated with various alternative logics.

2.2 Arguments

In natural language the term 'argument' is ambiguous. It can, for instance, be used in the sense of 'reason', as in 'An argument for dismissing you is that you are always late'. However, in this paper such reason statements, which state contingent relations between propositions, will be regarded as premises, while the term argument will be used if relations between propositions are stated that are in some sense necessary.

In particular, in AF's an argument corresponds to a proof in the underlying logic. This is a rather technical use of the term 'argument', which should not be confused with the broader meaning it often has in AI and law, when it denotes a move or a sequence of moves in a dispute. To see the difference, if the underlying logic is standard deductive logic, then "According to Section 1612 of the Dutch Civil Code (BW) selling a house does not terminate an existing lease contract, the house which I lease has been sold, so my lease contract has not been terminated" is an AF argument, while the same information with "the house has been donated" instead of "sold" is not an AF argument; however, it can very well be an argument in the broader sense: for instance, it can be a move drawing an analogy between selling and donating. For more on this difference see section 4.2.

2.3 Conflicts between arguments

The previous two notions still fit with the standard picture of what a logical system is. In fact, their inclusion in an AF is the link between the first two levels of the three-leveled model of legal argument we are aiming at. The remaining three elements are what makes an AF a framework for adversarial argumentation. The first is the notion of a conflict between arguments. Its most common form is what I will, following Pollock [12], call *rebutting* arguments. This is when their respective conclusions are deductively inconsistent, as the conclusions of the above argument that selling the house has not terminated the existing lease contract and the argument "161* BW says that selling terminates an existing lease contract if in this contract the tenant has given his assent,[1] the tenants have given their assent in the lease contract, so it has been terminated". Clearly the rebut relation is symmetric. However, also a form of conflict exists which is not symmetric. The first argument can also be attacked by the argument "According to section 6:2-(2) BW a rule binding upon a creditor-debtor relation does not apply if application is unreasonable, a tenancy is a creditor-debtor relation, applying 1612 BW to cases where the new owner is homeless is unreasonable, the new owner is homeless, so 1612 BW does not apply to this case". Clearly this form of attack, for which I will use Pollock's term *undercutting attack*, is not symmetric, since the other argument does not challenge the attacking argument in any way. Some argumentation frameworks that allow for undercutting arguments are [12, 7, 14].

2.4 Standards for comparing arguments

When in a dispute arguments conflict, this is not the end of the debate. Instead, people try to convince each other that their argument is better than its counterarguments. The second characteristic element of an AF, then, is an ordering on arguments. Often this ordering is based on an ordering of the premises used by the arguments. In logic and AI much attention is paid to the so-called 'specificity principle', which gives preference to the argument that uses the most specific information. However, in legal reasoning specificity, or 'Lex Specialis', is only one of the possible ordering criteria and not even the most important one. In fact, all sorts of criteria are used. Legal systems try to anticipate such debates, by stating criteria in advance, ranging from completely general principles like Lex Specialis or Lex Posterior, i.e. 'the later rule has priority over the earlier rule', to more special rules like 'Statutory rules about labour contracts precede statutory rules about other types of contracts' (section 1637 of the Dutch Civil Code). However, as so often also in this respect legislators cannot foresee everything: often metaprinciples are themselves in conflict: for instance, if the general rule 1612 BW, respecting the existing lease contract, is later than the exception 161* BW in case of earlier consent by the tenants, then Lex Specialis, giving priority to the argument with 161*, is in conflict with Lex Posterior. When such conflicts happen, an ordering of the metaprinciples needs to be invoked but in most legal systems this ordering is far from clearly defined, which leaves room for debate. Such debates are particularly frequent if the 'object level' conflict concerns the interpretation of open-textured concepts: if for solving such conflicts any legal guidelines are available at all, they are of such a diverse and tentative nature that there is ample room for debate.

These observations imply that an argumentation framework can require only some very minimal formal properties of a binary ordering on arguments, for example, transitivity (although even this criterion is debatable) and noncircularity; for the rest it should leave room for any way of defining the ordering. In other words, the criteria for conflict resolution are not a matter of logic: they cannot be built into the semantics or proof theory of a logic, as, for instance, [2] do with specificity. Conflict resolution should be modelled outside the underlying logic. Moreover, an AF should be able to formalise de-

[1] For the sake of illustration I here assume that rule and exception are expressed separately; in fact they are combined in 1612 BW.

bates about the argument ordering, a topic which is beginning to receive attention; for instance, Brewka [4], inspired by [9], has formalised reasoning about priorities in his prioritised version of default logic, while [14] study this issue in the context of an argumentation framework.

2.5 The assessment of arguments

Since attacking arguments can themselves be attacked by other arguments, comparing just pairs of arguments is not sufficient; what is also needed is a definition that determines the status of arguments on the basis of all ways in which they interact. It is this definition that can be used by a procedural model of dispute for determining the outcome of a dispute. In the informal analysis I will use the terms 'justified', 'defeated' and 'defensible' arguments for, respectively, those arguments with which a dispute can be won or lost and which leave the dispute undecided.

A definition of a justified argument has to cope with several situations. It must first reflect the step-by-step nature of argumentation: an argument cannot be justified if one of its subarguments is not justified. For instance, the argument with 6:2- (2), stating that applying 1612 BW is unreasonable if the new owner is homeless has a subargument claiming that the new owner is homeless; now a successful attack on this subargument should prevent the entire argument from being justified. The definition should also allow for reinstatement, i.e. for arguments helping arguments that cannot defend themselves. The argument applying 1612 BW cannot defend itself against the undercutting argument with 6:2- (2) BW, but if the latter is defeated by the attack on its subargument for the new owner being homeless, that attack reinstates the argument applying 1612 BW.

3 Procedural models and their relation to logics and AF's

3.1 Procedural models

Toulmin himself has not carried out his suggestion of studying the procedural aspects of reasoning but his challenge has been taken up by others. Rescher [15] has sketched a dialectical model of scientific reasoning. Among other things he claims that such a model can explain the feasibility of inductive arguments: they must be accepted if they cannot be successfully challenged in a properly conducted scientific dispute. A formal reconstruction of Rescher's model has been given by [5]. Also Loui [10] defends that the rationality of the outcome of a dispute depends on the procedural aspects of the dispute. According to him this explains why nondeterministic reasoning can still be rational. Loui also studies computational aspects of dialectical protocols, in particular how they can be used to constrain search (see for that also [21]). Gordon [9], too, adheres to the procedural view of rationality. He has formally defined and implemented a procedural model called the 'Pleadings Game', that is based on Alexy's [1] discourse theory of legal argumentation, in particular on Alexy's thesis that a judicial decision is presumably correct if the procedure by which it was reached was fair. The Pleadings Game mediates the pleadings phase of civil cases: it regulates the moves of the parties (e.g. 'A party may defeat the rebuttal of a supporting argument for one of his own claims, if the claim is an issue', 'a party may not attack the same argument twice with the same counterargument'); it determines the relative force of the arguments put forward; and it checks which issues have been solved and which remain.

In sum, procedural models define the proper way in which a disputational process should be conducted: they identify the possible moves of the parties and sometimes also their rights and obligations, they keep track of the issues and they determine when a dispute has been won or lost. The leading idea is that rationality has a procedural side: the more fair and effective a protocol for dispute is, the more likely it is that the outcome is correct.

3.2 Three levels in argumentation

Are these procedural models of argumentation rivals of standard logic, as Toulmin intended them to be? If we look more closely, we see that they

are not; instead, they presuppose, or are built around a logic. For example, one of the procedural rules above says that a party may not contradict himself; clearly, whether this happens is determined by logic. Also the question whether an argument supports its conclusion at all, i.e. without even looking at possible counterarguments, is determined by an underlying view on the relation between premises and conclusions of an argument, i.e. by an underlying logic.

Is standard logic the only useful formal tool for a procedural model? Again closer inspection reveals that it is not: a standard logical system does no more than relating premises with conclusions: the question it is supposed to answer is whether of any given premises-conclusion pair that can be expressed in its language the conclusion indeed follows from the premises. Yet a procedural model of argumentation presupposes more. For example, the abovementioned rules of Gordon's Pleadings Game use the terms 'defeat', 'rebuttal', 'attack' and 'counterargument'; these notions are not analyzed in traditional logics. Instead, they are the subject of logical argumentation frameworks. Also the comparison of arguments, i.e. the assessment of their relative force, which in turn determines the outcome of a dispute, falls outside the scope of standard logic, while, as we have seen above, yet this comparison is not only based on procedural but also on substantive grounds. This, too, is studied by logical argumentation frameworks. In fact, Gordon's treatment of these notions is based on such an argumentation framework, viz. the proof theory of Geffner and Pearl's [8] logic for conditional entailment. And Loui's procedural studies are built around work on logical argumentation systems of [12] and [18]. In sum, a logical argumentation framework is an indispensable link between a standard logical system and a procedural model of disputation.

In fact, the precise way in which AF's and dialectical protocols are linked is that an AF receives a temporal index, relative to the state of the debate. To see this, observe first that the output of an AF is relative to its input: AF's determine the space of possible arguments on the basis of the premises, and they determine the status of these arguments on the basis of the input ordering. By contrast, a dialectical protocol is not defined over static information but over a sequence of changing input states. In a dispute the parties rarely show all their cards at once; rather they introduce new statements and claims during the dispute, depending on the opponent's moves. Now the task of a dialectical protocol is to regulate such information changing moves, while the task of an AF is, every time the information has changed, to determine the status of the arguments that are possible in the new state, given the ordering information available in the new state.

This, then, leads to our three-leveled model of normative theories of legal argument: an AF is built around an underlying logic, and is used iteratively in a dialectical protocol.[2]

Loui, e.g. with others in [11, p. 207] has a different way of accounting for the iterated use of AF's in dialectical protocols. His view is that at each state of a dispute we should not look at all the arguments that are possible given the information in that state but only at the arguments that have actually been stated; he does not close this set under logical consequence. This is related to the 'known' consequence relation of [9] and it is based on his, and also Gordon's view that it is the task of Artificial Intelligence to propose models of rational argumentation that acknowledge that actual reasoners do not have perfect and unlimited reasoning abilities.

Although this view has its merits, I think that it has no dramatic effect on the usefulness of AF's for procedural models of dispute. Firstly, the space of possible arguments can be determined, instead of by logic only, by logic plus the given resource bounds of the reasoner, and even in computing which arguments are in conflict incidental errors might be accepted; in both cases the conceptual view is still that of a temporally indexed AF. Moreover, if errors are accepted, the

[2] Also [6] have proposed a three-leveled model of argumentation. In fact, they combine my first two levels into one, the 'logical' level, and they split my third level into two: a speech act level, defining which speech acts are possible, and a protocol level, defining how the speech acts can, may or should be used.

role of a logical AF is still that of a measure of ideality for the actual system.

4 The underlying logic

In the rest of this paper I will look in more detail at possible underlying logics of an AF. Once the idea is accepted that arguments can be defeated by stronger counterarguments, it becomes natural to ask whether the strength of arguments only depends on the strength of their premises or also on the nature of the underlying logic. If all rules for constructing arguments are deductive the answer is clearly no; however, if arguments can also be based on weak forms of inference such as nonmonotonic reasoning, induction and analogy, the answer is yes: clearly a nonmonotonic, inductive or analogical argument is defeated by a deductive counterargument that uses the same premises. So should the underlying logic of an AF consist of a nonmonotonic logic or even a theory of inductive or analogical reasoning?[3]

In the rest of this paper I will argue that the answer is negative. I will first argue that the structure of AF's obviates the need for nonmonotonic logics at the first level. For this conclusion it suffices to look at the relation between the first two levels of our model. Then I will argue that the underlying logic should neither be a formal account of inductive and/or analogical reasoning. To defend this, also the relation between the second and third level must be considered, since some have argued that it is precisely the procedural aspects of argumentation that allow us to assume a theory of nondeductive reasoning at the first level.

4.1 Nonmonotonic reasoning

Until the late seventies 'logic' was equivalent to 'deductive logic'. Since then, however, research in Artificial Intelligence has resulted in so-called nonmonotonic logics. Standard, deductive logic is monotonic, i.e. valid inferences stay valid if more premises are added. In other words, standard logical inferences are, given the premises, absolutely reliable; they just restate what was already implicit in the premises. For mathematics, which was long the prime domain of application for logic, this is, of course, a desirable feature. However, in life's daily affairs the inferences that people make are often less strict: since the available information is rarely complete or certain, people often draw tentative, or defeasible conclusions, subject to evidence to the contrary. The canonical example is that normally birds can fly, Tweety is a bird, so we assume that Tweety can fly, as long as we do not learn that Tweety is a penguin, or an ostrich, or has its feet set in concrete, is dead, is lame, and so on. Elsewhere (e.g.[9, 13, 16, 17]), I and others have argued that also legal rules are defeasible, i.e. subject to exceptions and to defeat by conflicting rules.

How does the defeasible nature of ordinary reasoning fit with the concept of an argumentation framework? Can its underlying logic be a nonmonotonic one? The answer is no. Above we have seen that conflict resolution is not a logical matter but a matter of debate and should therefore be dealt with by an AF rather than by the underlying logic. And since conflict resolution is an essential feature of nonmonotonic reasoning, this means that a nonmonotonic logic should in fact be a combination of my first two levels. Indeed, many existing nonmonotonic logics can be (re)interpreted in this way, as, for instance, shown in [7]. However, problems arise if the conflict resolution principles are fixed. For instance, logics for defeasible conditionals, like e.g. [2] build specificity into their semantics, as a way of specifying under which conditions modus ponens applies. This might be regarded as an attempt to stay at the first of my three levels, while the view proposed in the present paper is that the question whether modus ponens is acceptable is answered at the second level, by considering all possible counterarguments: inside an argument, i.e. at the first level, modus ponens is unrestrictedly valid; nonmonotonicity arises from the possibility to attack an argument.

The reader might be surprised by this observation, since my earlier work on AF's in [13]

[3] Because of space limitations I will not discuss whether there is a clear dividing line between nonmonotonic logics and other forms of nondeductive reasoning, like induction and analogy.

used default logic as the underlying logic, which is nonmonotonic. However, this was done because of the one-directional, metalinguistic nature of defaults: this blocks contrapositive inferences, which as shown in [13] often give rise to intuitively unacceptable arguments. What is crucial is that inside arguments modus ponens applied unrestrictedly to defaults: also in my AF nonmonotonicity arose from the possibility of counterarguments. In fact, I did not use the nonmonotonic aspects of default logic, captured by the justification part of defaults, which has to be consistent with what is known. Because of this, my use of Reiter defaults was equivalent to the use of twoplace metalinguistic connectives by e.g. Rescher and (Simari and) Loui (cf. [15, 18, 10, 11]). Philosophically, the metalinguistic reading of defeasible conditionals can be defended by regarding such conditionals as preferences, or policies of what to believe if certain other things are believed: a defeasible rule 'Birds can fly' thus reads as 'Believing that something is a bird is a *reason* for believing that it can fly'.

It should be noted, however, that the metalinguistic reading of defeasible rules also has some drawbacks. Firstly, it seems that in natural language defeasible rules can freely be negated, nested, and conjoined or disjoined with other statements. Moreover, several defeasible inferences require reasoning *about* defaults, which is impossible in the metalinguistic reading. If, for instance, by default birds fly and, also by default, bats fly, and Tweety is a bird or a bat, then it seems natural to defeasibly infer that Tweety flies. This inference, however, requires that from the two rules a new rule 'by default things that are a bird or a bat can fly' can be derived. Therefore it is worthwhile exploring the alternative of formalising defaults as material implications (or other conditionals implying them), and let the comparison of arguments do the nonmonotonic job. The crucial problem to be solved here is finding a general criterion why the unacceptable contrapositive arguments are, although logically valid, defeated by other arguments.

To summarise, either we should formalise defeasible conditionals as metalinguistic connectives, thus invalidating all forms of contrapositive inference, or we should formalise them as conditionals implying a material implication and let unwanted contrapositive inferences be valid but defeated by other arguments. In both cases the underlying logic is monotonic, since in both cases modus ponens is inside an argument unrestrictedly valid; defeasibility arises since such arguments can be attacked by other arguments. The rest of this paper presupposes that one of these extremes has been chosen, but does not rely on a particular choice.

Why have I paid so much attention to this issue? The reason is that if the logic underlying an AF can be nonmonotonic, we are almost forced to accept also other nondeductive forms of reasoning as possible underlying logics, such as inductive or analogical reasoning. Now, however, that needs an independent investigation.

4.2 Induction and analogy

Next I discuss whether the first level of our model can be a theory of inductive or analogical reasoning. Must we accept patterns of these nondeductive forms of reasoning as arguments in the sense of an AF, or must we regard them as useful heuristics for finding new premises?

In [13, pp. 21-24] I argued for the latter option, since there is nothing in the *form* of such nondeductive arguments that justifies accepting their conclusion over not accepting it. An induction[4] can always be attacked with an undercutting argument saying that the claimed relation between premises and conclusion does not hold; and even the most specific, or most on point analogy will always have a counterargument that stresses the differences and that therefore is at least as specific. Let us again use the above example, where 1612 BW says that selling a house does not terminate an existing lease contract and assume that the house has not been sold but donated. Then a 'logic' for analogical reasoning would not only give rise to the analogy that both selling and donating are a transfer of property, but also to the distinction that selling is not the same as

[4] What I have in mind here is *generic*, i.e. nonstatistical induction, like e.g. induction to the future.

donating. This means that stating only the analogy and not the distinction is in fact a decision to regard the similarities as outweighing the differences. And a decision is fundamentally different from an inference relation.

However, Rescher and Loui claim that the procedural view on argumentation gives a new perspective. They argue that the strength of an induction or analogy cannot be determined in isolation, as with the strength of a deductive argument. Instead, such arguments should be evaluated in the dialectical context. Individual inductions or analogies may be weak but the idea is that they are tested, criticised and improved in a process of counterargument and rebuttal. Now a crucial observation is that if the protocol gives a party a fair opportunity to produce a counterargument to an induction or analogy, but s/he fails to do so, then it is fair to demand that party's acceptance of the argument; recall that the basic idea of the procedural view is that fairness and effectiveness of a protocol for dispute makes it just and rational to demand acceptance of the outcome of the dispute.

In order to assess this, we must keep the nature of AF's in mind. Recall that what these systems look at (given certain input information) is the space of *possible* arguments: they tell us which arguments of all those that are possible are winning, losing and equalizing. Now if this is the job of AF's, does it make sense to regard induction and analogy as argument forms? In my view it does not, since then it becomes pointless for a protocol to state the principle that arguments have to be accepted if there is no counterargument, which in itself clearly is a sensible protocol rule. The reason is that such arguments always *have* acceptable counterarguments since, as noted above, there is nothing in the *form* of nondeductive arguments that justifies accepting its conclusion over not accepting it.

At first sight this would seem to imply that declarative AF's are at odds with the principle that unattacked nondeductive arguments stand. And since this principle is very reasonable, it would seem that AF's have no use in protocols for dispute. However, I think AF's still have a role in such protocols, if only we employ a different view on the place of nondeductive argument in AF's, viz. as useful heuristics for finding premises. If induction and analogy were argument forms, they would with their counterarguments be contained in the set of possible arguments from the start. However, what is crucial is that if they are regarded as heuristics for introducing new premises, then each time a party uses such a heuristic, the input state of the AF and therefore also the set of possible arguments changes, which means that the output of the AF must be redetermined. It is this iterated use of an AF, as accounted for in our three-leveled picture of legal argument, that allows a protocol to state that unchallenged inductions or analogies have to be accepted.

In sum, I propose to regard analogy and induction as modes of reasoning outside but connected to an AF: from the point of view of an AF they can be seen as 'black boxes', connected to the AF in such a way that only their output matters: each time a black box produces a new premise, the input state of the AF changes and the status of arguments has to be redetermined.

To extend our example (with standard logic underlying the AF), assume that proponent P and opponent O agree on 1612 BW and on the fact that the house has been donated. Now a sensible way of using the analogy between selling and donating is to let it broaden 1612 BW into the rule that no way of transferring a property terminates an existing lease contract. By adding this new premise and the fact that donating is transferring a property, P has created a situation where the new premises give rise to an argument in favour of P's own claim. And since the new premises do not give rise to a counterargument, at the present stage P is winning, which forces O to attack the argument. If, by contrast, the analogy had been implied by the initial premises, also the counterattacking distinction would have been implied from the start and P would not at any stage have had a winning argument.

I end by once more extending this example, as a final illustration of the three-leveled view proposed in this paper. Consider the last state of the dispute between O and P, where given the analogy P is winning. Now O can counter in two

ways. Firstly, O can deny that the new principle underlies 1612 BW, for instance by saying that the principle of certainty of the law, which states that legal relations should be predictable, does not allow broadening statutory rules. This is an undercutting attack. Most existing AF's then assess the resulting state as won for O, since they let undercutting attacks succeed whatever the priorities are of the rules involved. Then P might try to reinstate its argument, by saying that, although in general legal security is indeed important, 1612 BW is meant to protect the interests of the tenants and that these interests here outweigh that of the certainty of the law. Thus P rebuts O's undercutting argument that the principle is not acceptable. Most existing AF's then invoke priorities; a call to specificity would again give P the winning argument.

A second strategy for O is to rebut P's original argument. For instance, O can use the same analogy as P and say that, although in general the new principle is OK, in this case there is an exception, since the tenants earlier agreed by contract that selling the house would terminate the lease contract; then clearly the same holds when the house has been donated. Since this is a rebutting argument, again the priorities should be invoked; this time an appeal to Lex Specialis would give O the justified argument. Now P could contest the use of specificity by invoking a different ordering principle, for instance, if the general rule was enacted at a later time, s/he could use Lex Posterior and the claim that this principle has priority over Lex Specialis.

Note that the last part of the debate was about priorities. Although here only domain specific meta criteria were used, it can also be otherwise; they can, for instance, be standards for good or bad legal argumentation, which fits with Toulmin's view in [19] that standards for good and bad arguments are field related; moreover, if from philosophy or AI certain systematic patterns of good nondeductive reasoning emerge, also these can be incorporated in the standards for comparing arguments.

5 Conclusion

To summarise the main results of this paper, a three-leveled picture has emerged of normative theories of adversarial legal argument: a monotonic underlying logic (possibly with a metalinguistic reason conditional), a declarative theory for assessing the status of conflicting arguments, and a procedural model of how to fairly and rationally conduct a dispute. The picture shows that declarative and procedural models of argumentation are not rivals of each other; instead they work together: a protocol for dispute regulates how the input of an AF can be changed, after which the AF is used to determine the effects of the change. The iterated use of AF's in dialectical protocols needs not be explained by looking only at the actually advanced arguments; it can be exclusively explained by the dynamic introduction of new premises, since induction and analogy are not modes of inference but heuristics for introducing new premises.

Let us finally recapture what features of AF's have been particularly important in developing our picture. Firstly, my argument against the use of nonmonotonic logics at the first level paved the way for regarding nondeductive forms of reasoning as heuristics for changing the information state rather than as modes of inference. The reason is that otherwise it would have been difficult to explain why some nondeductive forms of reasoning can and some other forms cannot serve as an underlying logic. Here it was crucial to regard the construction of arguments with twoplace one-direction rules as monotonic reasoning. Furthermore, the possibility of undercutting arguments is indispensable in explaining why induction and analogy, when viewed as arguments, formally always have nondefeated counterarguments. Finally, the possibility to have any standard for comparing arguments and to model reasoning about these standards is essential for including legal or even general standards for good and bad argumentation in the model.

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