Using values and theories to resolve disagreement in law[1]

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Abstract. In this paper we describe a novel approach to reasoning with cases and precedents. Its important features are that it integrates notions of purpose and value to inform the choice between competing arguments, and that it contextualises the reasoning by considering theories as a whole rather than isolated elements.

1. Introduction

In this paper we describe a novel approach to reasoning with cases and precedents. The approach is intended to address two main problems.

First we find that current case based reasoning systems tend to offer relatively little support in determining the outcome of a case. They either present a list of cases which may inform, but cannot determine, the outcome, or else, as in HYPO and its successors ([1], [2], [3]), present arguments for both sides of a question leaving it the user to decide which is the more persuasive. What is lacking from these accounts is a notion of what it is that makes an argument persuasive. This is addressed in the context of AI and Law by Berman and Hafner in [4], and in law generally by Perelman (e.g. [5]). For Berman and Hafner an argument is made persuasive by supporting the purposes that the law is designed for, and for Perelman it is by advancing or protecting values that its audience subscribes to (on teleological argument, see also [6]). We believe these things to be effectively the same: the purpose of a law is typically to advance or promote some desired value, and the audience is the community subject to the law. Thus our first goal is to provide a model of case based reasoning in which we can use purposes and values to explain disagreements and their resolution.

The second problem is the lack of the notion of context in many of the existing case based reasoning systems. A given case is decided in the context both of relevant past cases, which can supply precedents which will inform the decision, and in the context of future cases to which it will be relevant and possibly act as a precedent. A case is thus supposed to cohere with both past decisions and future decisions. This context is largely lost if we state the question as being whether one bundle of factors is more similar to the factors of a current case than another bundle, as in HYPO, or whether one rule is preferred to another, as in logical reconstructions of such systems, for example that of [7]). Recognition of context is vital if we are to understand accounts of legal reasoning (e.g. [8]) in which it is

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[1] This paper represents current on-going work investigating argument in case law. The ideas represent a development from those expressed in [9]) and [10] A paper describing this work was also presented in a workshop on Computational Dialectics at ECAI 2000 in Berlin [11].

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clear that the "meaning" of a case is often not apparent at the time the decision is made, and is often not fixed: the interpretation depends on how it is used in subsequent cases. Our second goal is to take this notion of context seriously: to this end in our approach we do not see the parties to a dispute as arguing that a precedent should be followed, or that a case yields a rule applicable to the current case, or even that one rule is to be preferred to another. Rather we see a case based argument as being a complete theory, intended to explain a set of past cases in a way which is helpful in the current case, and intended to be applicable to future cases also.

The two goals are closely linked. Values form an important part of our theories and they play a crucial rule in the explanations provided by our theories.

2. Levels of Justification

To better explain the role of our theories we can consider the ways in which people can disagree in a given case. Suppose we have a case: we may immediately say that it should be found for the plaintiff (or the defendant – we regard the two positions as symmetric, and will ignore this complication in what follows). If our position is accepted, well and good. But if our intuition is not shared, we will have to give reasons for our view. Typically this will involve citing features of the case which we believe are reasons for deciding for the plaintiff. In a HYPO like system, such reasons are termed *factors*. Thus we describe the case using terms which tend to support a decision for our view. The person disagreeing with us may now describe the case using factors of his own, which will this time be reasons to decide for the defendant. Such descriptions do not come "written on" the cases: they involve a degree of interpretation. At this point it is possible to argue over the factors that should be used, but let us suppose that we have resolved this. We now have a case with a number of reasons to decide it one way and a number of reasons to decide it in the other way. How do we justify our position in the face of this?

At this point we must ascend a level and introduce *precedent cases*. Precedent cases represent past situations where these competing factors were weighed against one another, and a view of their relative weights taken. On the assumption that new cases should be decided in the same way as past cases, if we can find a past case with the same factors as we have in the current case, then we can justify our choice using this precedent. If no past cases exactly match or subsume the current case, we argue about the importance of the differences. It is at this level that HYPO-like systems operate: but while they identify the differences, they do not justify acceptance or rejection of the significance of these differences[2].

To justify this we must ascend a further level. At this level we ask why a factor is a reason for deciding for a given party. We argue that this is because deciding for that party where that factor is present tends to promote or defend some value that we wish to be promoted or defended. The conflict is thus stated in terms of competing values rather than competing cases or competing factors. At this point the solution may be apparent: our set of factors may relate to values which subsume our opponent's values, or be accepted by our opponent as having priority. Beyond this we can only argue about which values should be promoted or defended, and so move beyond positive law, into the realms of politics and general morality. Disagreement is still possible, but no longer a purely legal matter. Laws apply to a community, and this community is held to have common priorities amongst

[2] In CATO [3] an effort is made to supply some assessment of the significance of distinctions by introducing the notions of emphasising and downplaying distinctions. Even here, however, the arguments are indicated but the user is left to be persuaded or otherwise.

values, and one role of the judge is to articulate these values. Communities can change their values, but to disagree with the decision is to commit to effecting such a change, which is beyond the scope of precedent-based legal argument.

The picture we see is roughly as follows: factors provide a way of describing cases. A factor can be seen as grounding a defeasible rule. Preferences between factors are expressed in past decisions, which thus indicate priorities between these rules. From these priorities we can abduce certain preferences between values. Thus the body of case law as a whole can be seen as revealing an ordering on values.

3. Theories

Our approach assumes that some prior analysis has been carried out in which past cases are examined to identify the factors that can occur in the domain, and to decide which factors apply to each of the past cases. This is the same analysis that underpins HYPO.

Each factor is associated with an *outcome* and a *value*. The outcome may be pro-plaintiff or pro-defendant, depending on which side is favoured by the factor. The value is that promoted by a decision for the side in the presence of the factor. Thus given a factor, F, we have a rule, R, expressing that the factor is reason for finding for outcome O:

R: If F then O

Following this rule in a given case will promote the value, V. This can be seen as a "teleological link", T:

T: Deciding O when F is present promotes V.

We represent these relationships in a *factor description*, $f(F^O,V)$, where f is a predicate for factor descriptions, F is the factor, O is the outcome and V is the value.

We also have the past cases. A past case is represented as a set of factors that applied in that case, and a decision, which indicates the outcome of the case. We represent a case as c(N,Fs,D), where c is a case predicate, N is the name of the case, Fs the set of factors present in N, and D the outcome of N.

On the basis of this we can begin to see how theories are constructed. The full analysis of factor descriptions and cases forms the *background* against which the particular theories are constructed. Theories are constructed by including elements of the background, namely factor descriptions and cases, in the theory. The factor descriptions will bring with them rules and teleological links. We provide a set of theory constructors which enable these basic elements to be manipulated to form more complicated rules, derive priorities between rules and derive an ordering on values.

A theory will include the following:

- a set of factor-descriptions
- a set of cases,
- a set of rules,
- a set of teleological-links,
- a set of value-preferences,
- a set of rules-preferences.

In the next section we will describe the theory constructors.

4. Theory Constructors

The object of a party to the dispute is to construct a theory, which (a) explains why the current situation should have the outcome wished by him, (b) is better (or at least not worse) than any theory of the opponent. The two aspects are obviously connected. However, we will consider the two aspects separately, focusing first on theory construction, and then on theory comparison. We have identified a set of twelve constructors which can be used in building theories. Here, because of space, we give only an informal description of them.

4.1 Include

The constructor *include* takes from the background an element such as a factor description or a case and adds it to the theory. This corresponds to the idea that the background comprises shared knowledge, acceptable by, and accessible to, both parties, which can be used to build a theory. It also makes explicit what the theory does and does not address.

4.2 Extract-rule-from-factors

The constructor *extract-rule-from-factors* extracts from a set of factor descriptions (in the theory) having the same outcome one new rule and adds it to the theory. The antecedent of the rule will be the conjunction of all the factors in those factor descriptions, and its consequent will be their common outcome. This constructor corresponds to the idea that rules result from factors although not being reducible to them: when some factors favouring the same outcome are considered jointly sufficient to produce that outcome, then they originate a rule to that effect.

4.3 Extract-teleological-link

The constructor *extract-teleological link* assigns values to a rule according to the values of the factors it contains. The idea is that when the antecedent of a rule contains a set of factors (and the rule's conclusion expresses their common outcome), then by adopting the rule one achieves all the values characterising at least one factor in the antecedent (in relation to that outcome).

4.4 Specialise-rule

The constructor *specialise-rule* expands the antecedent of a rule by adding one or more new factors to it. This can be viewed as a rudimentary formalisation of the so-called *a fortiori* argument (if the factors in the antecedent of a rule are sufficient to produce outcome O, adding one additional O-factor should make the case for O even stronger).

The specialisation of a rule involves the specialisation of the corresponding teleological link. The new rule thus promotes any values promoted by the new factor introduced as well as the values promoted by the rule being specialised.

4.5 Broaden-rule

The constructor *broaden-rule* consists in introducing a more general rule on the basis of a more specific one, already contained in the theory. The more general rule is obtained by deleting one or more factors in the antecedent of the more general rule. Note that the broadened rule will *not* promote any values promoted only by the factor removed.

4.6 Extract-rule-preference-from-rule-ordering

The constructor *Extract-rule-preference-from-rule-ordering* allows us to expand an ordering over rules taking into account the factors they contain. The idea is simply that rules which make a conclusion depend upon a given set of factors (favouring the same outcome) are stronger than rules which make that same conclusion depend upon a proper subset of those factors.

4.7 Extract-values-preference-from-values-ordering

The constructor *extract-values-preference-from-values-ordering* allows us to expand an ordering over sets of values, by taking any set of values to be superior to any of its proper subsets.

4.8 Extract-rule-preferences-from-value-preferences

The constructor *rule-preferences-from-value-preferences* introduces preferences between rules on the basis of preferences between values. The idea is that rules promoting more important values are stronger than those promoting less important values.

4.9 Extract-value-preferences-from-rule-preferences

The constructor is *value-preferences-from-rule-preferences* introduces preferences between values on the basis of preferences between rules. If we know that a rule is preferred to some other rule, we can infer that the values it promotes are preferred to the values promoted by that other rule.

4.10 Add-explanatory-preference

The constructor *add-explanatory-preference* introduces (abduces) rule-preferences when such preferences contribute to an explanation for a case the party has included in his or her theory. This corresponds to the idea that theoretical hypotheses are acceptable to the extent that they succeeds in playing an explanatory role, so that we can see decisions as revealing preferences between the rules that arose in a given case.

4.11 Add-arbitrary-rule-preference

The constructor *include-arbitrary-preference* allows a party to introduce a new rule-preference which does not help in explaining any precedents, but only allows that party to explain (for the target case), the result he wants. This corresponds to the idea that a party is allowed to argue for his result even when there are no other grounds for preferring that result. The other party is, of course not bound by such an argument: essentially this adds to the theory the very point that is at issue.

4.12 Eliminate-redundant-preference

If a rule-preference is such that all precedents it contributes to explaining can still be explained after removing it, then it can be removed from the theory. In particular, any preference which was introduced by the adversary according to *Add-arbitrary-preference* can always be removed.

5. Using Theories

The point of constructing a theory is to argue for a particular decision in a new case. To produce arguments from a theory we must use a logic. In this work we adopt a very simplified variant or the argumentation-based system proposed in [12], but other logics would be equally appropriate, if they can deal appropriately with prioritised conflicting rules. Let us introduce a few simple notions (these notions could be extended, but they are sufficient for our purposes).

An *argument* for C is a minimal, finite, sequence of rules and facts (unconditioned statements), such that

a. the last rule in the argument has consequent C;
b. each element (conjunct) in the antecedent of any rule in the argument occurs previously in the argument, either as fact or as the consequent of a rule.

For example, [A, A $\Rightarrow$ P] is an argument for P. We say that all consequents of rules in an argument A (plus all facts in A) are conclusions of A. We also say that argument A_1 attacks argument A_2 (A_1 is a counter-argument to A_2) iff A_1 and A_2 have contradictory conclusions: for example, [A, A $\Rightarrow$ P] and [B, B $\Rightarrow \neg$P] attack each other (are counter-arguments). When A_1 attacks A_2, we say that A_1 defeats A_2, in regard to a set of rule-preference PS, if the two conflicting conclusions are respectively the consequents of rules $r_1 \in A_1$ and $r_2 \in A_2$ such that, according to PS, r_1 is not inferior to r_2. For example, given the set of preferences [A $\Rightarrow$ P > B $\Rightarrow \neg$P], argument [A, A $\Rightarrow$ P] defeats argument [B, B $\Rightarrow \neg$P], while the latter argument does not defeat the first one. When, as in the example, A_1 defeats A_2 while A_2 does not defeat $A_{1,}$ we say that A_1 strictly defeats A_2.

The defeat relation is not yet a final assessment of the status of an argument within the given premises set (rules and facts) and preferences set. It is just a comparison between two individual arguments: it does not capture the phenomenon of 'reinstatement' (A_1 may defeat A_2, which in turn, is strictly defeated by A_3, so that A_1 is reinstated), and is therefore insufficient to establish whether an argument is justified. The basic idea is that, for an argument to be justified, all its defeaters must be strictly defeated by further argument, which must also be justified (so, all of their defeaters must be strictly defeated by further arguments, which must be justified, etc.). As in [12], in the context of a premise set S and a preferences set PS, the proof that an argument A_1 is justified takes the form of a tree of arguments belonging to S and preferences belonging to PS. Since we do not allow arguments about preferences here, preferences have no children. In this tree, nodes located at an even level (the level of a node being the distance from the root) attack, directly or indirectly, the root argument, while nodes located at an odd level defend the root argument (by attacking its direct or indirect attackers). The tree is a proof of argument A_1 if:

- A_1 is the 0-level (root) argument,
- Each argument A located at an even node is followed by all A's counter-arguments.
- Each argument A located at an odd level is followed by one counter-argument or by a preferences set PA $\subseteq$ PS, according to which A's predecessor strictly defeats A.
- Odd level arguments cannot be repeated in the same branch of a tree.
- Each branch of the tree terminates with an even-level node,
- Is not possible to add any further odd level nodes.

All these conditions being satisfied means that no attack against the root argument was successful (since every attacker was strictly defeated by a justified argument), and that no further attacks are possible.

Finally, we introduce the idea of an explanation, as a minimal such proof which is sufficient to establish that a certain conclusion is justified (i.e. established by a justified argument). Minimality concerns both the set of arguments involved in the proof and the content of those arguments. So, if the tree Tr_1 is a proof that argument $A_{1,}$ having conclusion P, is justified, but there is a subtree Tr_2 of Tr_1 which also is a proof that A_1 is justified, then Tr_1 is not an explanation of P. Even when no such subtree exists, Tr_1 is not an explanation if there is a proof tree Tr_2 for an argument having conclusion P, obtained by substituting an argument A_i in Tr_1 with an argument A_j such $A_j \subset A_i$.

In the following we will consider arguments A_i which contain rules from a theory T and facts (factors) from a case C, i.e. such that $A_i \subseteq (\text{Rules}(T) \cup \text{Factors}(C))$. By an *explanation* for case C, in a theory T, we mean an explanation of conclusion(C) in the context of premise set Rules(T) $\cup$ Factors(C) and preference set Preferences(T).

For example, assume the following

Rules(T) = [A $\Rightarrow$ P, B $\Rightarrow$ ¬P] ,
RulePreferences(T) = [“A $\Rightarrow$ P” > “B $\Rightarrow$ ¬P”],
Factors(c_1) = [A, B],
Decision(c_1) = P.
Then
<0, [A, A $\Rightarrow$ P],
{1, [B, B $\Rightarrow$ ¬P],
{2, “A $\Rightarrow$ P > B $\Rightarrow$ ¬P”}}>

is an explanation for c_1 in T (numbers indicate the level of the following nodes in the tree, and successor are indented and bracketed after the node they refer to).

The logic of a theory is completed by the assumption of transitivity in preference relations. Given preferences $p_1 < p_2$, and $p_2 < p_3$, we assume that the theory implicitly contains also the preference $p_1 < p_3$.

Given such a logic, the idea is to construct a theory which explains the case under consideration so as to give the outcome desired by the party constructing the theory.

6. Assessing Theories

With the theory-constructors presented above, each of the two parties, using materials from the same background, will produce theories which support opposed outcomes for the target case (Π’s theories will imply P for target case, while Δ’s theories will imply ¬P for the same case). Our basic idea is that this does not impede the possibility that the parties converge on a reasonable result. If the parties can agree that one of their competing theories is the best one, then both of them should accept the outcome implied by that theory.

We therefore need to provide some criteria for assessing theories. The abstract paradigm to measure the comparative strength of the competing theories will be the idea of *coherence*. We will not try to provide a precise notion of coherence, nor an exhaustive one (for coherence in the law, cf. among others, [13], for a general discussion of coherence and theory change, cf. [14]). We will just put forward some grounds on which one theory should be preferred to a rival one, in the domain here considered.

The first two criteria concern how well a theory succeeds in explaining the cases. In regard to legal theories cases play a role which is similar to the role of observations in scientific theories: they have a positive acceptability value, which they transfer to the theories which succeed in explaining them, or which can include them in their explanatory arguments (cf. [14], 65 ff).

- Cases-coverage: The theory explains more cases.
- Factors-coverage: The theory's explanations of the cases consider a larger number of factors in the cases. In general an explanation A containing a larger set of Factors(C) will provide a better (more thorough) explanation of case C. The set of factors considered by an explanation comprises all factors which are contained in the arguments in the explanation tree. For example, <0, [A, A $\Rightarrow$ P], {1, [B, B $\Rightarrow \neg$P], {2, ["B $\Rightarrow \neg$P" < "A $\Rightarrow$ P"]}}> is an explanation of C (with Factors(C) = [A, B, D]) which only considers A and B.

The following criteria consider the extent to which the preferences in the theory contribute to explaining the precedents:

- Non-arbitrariness: The theory that contains fewer preferences which do not contribute to explaining any precedent in the theory (are only used to explain the target case) is preferred. Such preferences are introduced through the *Add-arbitrary-preference* constructor.
- Explanatory-safety: The theory that contains weaker (safer) explanatory assumptions is preferred. The idea is that a weaker assumption (sufficient to provide a full explanation of the cases) is more strongly supported by the cases than a stronger one. In particular, preferences for more specific rules express weaker assumptions than preferences for more general ones. For example, "$F_1 \wedge F_2 \Rightarrow O$" > "$A_1 \Rightarrow O$" is implied by (and is therefore weaker then) "$F_1 \Rightarrow O$" > "$A_1 \Rightarrow \neg O$" (by "$F_1 \wedge F_2 \Rightarrow O$" > "$F_1 \Rightarrow O$", obtainable through rule ordering).

Obviously these criteria might conflict. We will assume that cases-coverage has the priority over all other criteria, but will not provide principles for resolving other conflicting evaluations of coherence. So, when both theories T_1 and T_2 explain the cases, but T_1 scores better under certain criteria, while a theory T_2 scores better under other criteria, their conflicts will remain undecided, as far as our model is concerned. In such a context, we say that T_1 is strictly non-inferior to T_2 (a connectionist method computing coherence, as developed in [14], may provide a viable approach here). However, when T_1 scores better than T_2 under certain criteria, and the two theories are equivalent in regard to the other criteria, we may conclusively establish that T_1 is strictly superior to T_2.

7. An Example

In this section we will discuss a small example to illustrate our ideas, taken from [4]. It consists of three cases involving the pursuit of wild animals. In all of those cases, the plaintiff (Π) was chasing wild animals, and the defendant (Δ) interrupted the chase, preventing Π from capturing those animals. The issue to be decided is whether Π has a legal remedy (a right to be compensated for the loss of the game) against Δ or not.

In the first case, *Pierson v Post*, Π was hunting a fox in the traditional manner using horse and hounds when Δ killed and carried off the fox. Π was held to have no right to the fox because he had gained no possession of it. In the second case, *Keeble v Hickeringill*, Π owned a pond and made his living by luring wild ducks there with decoys and shooting them. Out of malice Δ used guns to scare the ducks away from the pond. Here Π won. In a third case, *Young v Hitchens*, both parties were commercial fishermen. While Π was closing his nets, Δ sped into the gap, spread his own net and caught the fish. In this case Δ won.

In our discussion, we will have the *Young* case play the role of the target situation. In other words, we are assuming that Young was not decided, and that the two parties of *Young* are developing their theories on the basis of *Pierson* and *Keeble*. In doing this, we intend to show that our approach has a certain predictive value: it will lead to the same decision which was adopted by the *Young's* judges, i.e. that the theory which we identify as the best implies *Young's* decision. However, since we assume that the judges in *Young* were indeed right (as experienced judges should usually be), this also shows that our approach is capable of leading to the right result (at least in this domain). Moreover, by providing a whole theory supporting this result, we will also provide a hopefully convincing "rational reconstruction" of Young, i.e., we will explain why, in the context provided by *Pierson* and *Keeble*, the choice of the judges in *Young* was indeed a reasonable one.

We take our factors from the analysis of [4]

Pliv = Π was pursuing his livelihood
Own = Π was on his own land
Nposs = Π was not in possession of the animal
Dliv = Δ was pursuing his livelihood

Here we consider are only two possible (final) outcomes: a decision P, in favour of Π (i.e. the decision that Π has a legal remedy against Δ), or an outcome ¬P, in favour of Δ (i.e. the decision that Π has no legal remedy again Δ). We associate those outcomes to the above factors as follows:

- Pliv and Own favour Π, i.e. are pro-P factors (they are reasons for finding that Π has a legal remedy against Δ)
- NPoss and Dliv favour ¬P, i.e., are pro-¬P factors (they are reasons for finding that Π has no such remedy)

We express these connections by indexing each factor with its outcome, so as to obtain the following factor-characterisations: Pliv^{P}, Own^{P}, $\text{NPoss}^{\neg P}$, $\text{Dliv}^{\neg P}$.

Again following the analysis of [4] three values (public goals) are here considered:

- LessLitigation = diminishing litigation
- Productivity = increasing productivity
- Security= increasing security of possession

Those values explain why each factor should favour the corresponding outcome:

- Pliv favours P (Π pursuing his livelihood is a reason for giving him a remedy) in order to promote the value of Productivity. Deciding for Π when Pliv obtains (when Π's hunting is a productive activity), is indeed a way of protecting and encouraging his economical initiative, and thereby of promoting productivity.
- Own favours P (Π hunting on his own land is a reason for giving a remedy to Π) in order to promote the value of security. Giving a remedy to Π when Owns is the case is indeed a way of ensuring that Π can safely and freely enjoy his property.
- NPoss favours ¬P (Πnot being in possession of the animal is a reason for not giving him a legal remedy) in order to promote the value of LessLitigation. Denying a remedy to Π when he is not in possession prevents litigation in those cases where a party who did not catch the animal still may claim that he started chasing it first.
- Dliv favours ¬P (Δ being pursuing his livelihood is a reason for denying a remedy to Π) in order to promote the value of Productivity. Denying a priority right to Π when his competitor Δ is engaging in hunting as a productive activity, is a way of promoting general productivity (also by allowing free competition).

Let us now consider how *Pierson*, *Keeble* and *Young*. will be described The description of each case will include of a set of factors plus a decision:

Pierson:	Factors: NPoss	Decision: ¬P
Keeble:	Factors: Pliv, Own, NPoss	Decision: P
Young:	Factors: Pliv, Nposs, Dliv	Decision: P or ¬P

Accordingly, each case will be presented as a ternary predicate c(Name, Factors, Decision). This gives the following background:

Precedents: c(Pearson, [NPoss], ¬P),
c(Keeble, [Pliv, Own, NPoss], P).
Target: c(Young, [Pliv, NPoss, Dliv], _).
Factors: f($Pliv^{P}$, Productivity),
f(Own^{P}, Security),
f($NPoss^{\neg P}$, Security, LessLitigation),
f($Dliv^{\neg P}$, Productivity)

Elsewhere, in [11], we have given a step by step account of how theories could be developed and refined. Here, for reasons of space, we will jump straight to the final theory. Where appropriate, elements have a bracketed reference to the theory constructor which produced them.

THEORY: T_3 by Δ
Target: c(Young, [Pliv, NPoss, Dliv], ¬P)
Precedents: c(Pearson, [NPoss], ¬P),
c(Keeble, [Pliv, Own, NPoss], P),
Factors: f($NPoss^{\neg P}$, LessLitigation),
f($Pliv^{P}$, Productivity),
f($Dliv^{\neg P}$, Productivity),
Values: Productivity, LessLitigation
Rules: NPoss ⇒ ¬P, Pliv ⇒ P, NPoss ∧ Dliv ⇒ ¬P (spec-rule)
Teleological links:
promotes("NPoss ⇒ ¬P", [LessLitigation])
promotes("Pliv ⇒ P", [Productivity])
promotes("NPoss ∧ Dliv ⇒ ¬P", [LessLitigation, Productivity])
Rule Priorities: "Pliv ⇒ P" > "NPoss ⇒ ¬P" (explanatory preference)
"NPoss ∧ Dliv ⇒ ¬P" > "Pliv ⇒ P" (rule-preferences-from-value-preferences)
Value Priorities: [LessLitigation, Productivity]> [Productivity] (values-preference-from-values-ordering)

T_3 offers a good explanation of why Young should have decision ¬P: < 0. [NPoss, Dliv, NPoss ∧ Dliv ⇒ ¬P], {1. [Pliv, Pliv⇒ P], {2. ["NPoss ∧ Dliv ⇒ ¬P" > "Pliv ⇒ P"]}}. The preference in the explanation is not arbitrary, but is based on the fact that the value of Productivity is overridden by the combination of Productivity and LessLitigation. The teleological link is essential to ground this preference.

No better theory can be produced which supports Π. Only Own can be added, and although this will improve the theory by allowing the explanatory safer "Pliv∧Own ⇒ P" >

"NPoss $\Rightarrow \neg$P", this weakens Π's case, since Own is not present in *Young*. The preference "Pliv $\Rightarrow$ P" > "NPoss $\Rightarrow \neg$P", on which Π relies for his argument that *Young* should be decided for P, would then become redundant (not being needed to explain *Keeble*). Note that at this stage Π cannot introduce the priority he needs (Pliv $\Rightarrow$ P > NPoss $\wedge$ Dliv $\Rightarrow \neg$P) through *Add-arbitrary-priority*, since this contradicts the priority established in T_3 by *Extract-rule-preferences-from-values-preferences.* Thus the best, most refined, theory supports the defendant's request that *Young's* decision be $\neg$P (which was indeed the result which the judges achieved in that case).

8. Conclusions

In this paper we have put forward an account of arguing from legal cases which makes use of values, and which depends on the opponents putting forward theories, rather than single propositions. The argument proceeds as a process of incremental refinement of an opponent's theory, so as to yield a different outcome. We believe the advantages of this approach are as follows.

- The inclusion of values allows for more refined argument moves, and resolves disputes that could not be adjudicated without them. Values are recognised e.g. [5] as necessary to produce *convincing* arguments.
- Presenting the argument as a theory provides a context within which the cases are interpreted. Thus Own, present in *Keeble*, was not considered in *Young*. Perhaps in the light of future cases it will be brought into play.

We believe that our approach provides an interesting way of tackling reasoning with precedents in case law, and which enables the resolution of disputes which cannot be resolved without recourse to values. As such it provides evidence of the important role that values play in dialectics.

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