

Reasons and Precedent

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Abstract

This paper describes one way in which a precise reason model of precedent could be developed, based on Grant Lamond's general idea that a later court is constrained to reach a decision that is consistent an earlier court's assessment of the balance of reasons. The account provided here has the additional advantage of showing how this reason model can be reconciled with the traditional idea that precedential constraint involves rules, as long as these rules are taken to be defeasible.

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1 Introduction

The doctrine of precedent, as it has evolved within the common law, is constituted by a system of conventions through which the decisions of earlier courts in particular cases somehow generalize to constrain the decisions of later courts facing different cases, while still allowing these later courts a degree of freedom in responding to fresh circumstances. Although the techniques for reasoning with precedents are taught early on in law schools, mastered with relative ease, and applied on a daily basis by legal practitioners, it has proved to be considerably more difficult to arrive at a theoretical understanding of the doctrine itself, a clear articulation of the underlying system of conventions.

My purpose in this paper is to describe a new framework within which we can address this problem. The view I present will be contrasted with two other views, or models, of precedential constraint appearing in the literature. The first is the *rule model*. A precedent case normally contains, not only a description of the facts of the case along with a decision on the basis of those facts, but also some particular rule through which that decision was reached. According to the rule model, it is this rule that carries the precedential constraint. Constraint by precedent just is constraint by rules; a precedent case constrains the decision of a later court when the rule contained in that precedent applies to the fact situation confronting the later court.

A particularly strict version of the rule model has been advanced by Larry Alexander, and developed by Alexander and Emily Sherwin.¹ According to this strict rule model,

¹See Alexander (1989), many of the arguments from which are summarized in Alexander (1996); see also Alexander and Sherwin (2001). The term “rule model” is itself due to Alexander, who applies it only to what I describe here as the strict rule model, which reflects his own preferred view; I use the term more

the constraints carried by precedent rules are very nearly absolute, with the result that the freedoms given to later courts for developing the law are extremely limited. When a precedent rule applies to a later fact situation, then a court confronting that fact situation has, at most, two choices: the court must either follow the precedent rule, or, if that court has the authority to do so, it can overrule the precedent. There is, however, nothing in the general idea that precedential constraint is carried through rules that forces this very strict interpretation. A number of writers, while still adhering to this general idea, have argued for a more flexible version of the rule model according to which later courts have the power to develop the law by modifying, without overruling, the rules contained in precedent cases. The process through which these earlier rules might be modified, or *distinguished*, as well as the constraints on this process of distinguishing a precedent rule, are described with particular care by A.W.B. Simpson and Joseph Raz.²

The second view of precedential constraint to be considered here, recently introduced by Grant Lamond, may be termed the *reason model*.³ According to Lamond, what is most important about an earlier court's decision in a precedent case is, not the particular rule it sets out, but instead the court's assessment of the balance of reasons presented by the facts of that case. The requirement of precedential constraint can then be defined as follows: a later court is constrained to reach a decision that is consistent with the earlier court's assessment of the balance of reasons. A principle goal of this paper is to provide one way of making this idea precise.

broadly to apply to any model in which precedential constraint is thought to be carried by rules.

²See Simpson (1961) and Chapter 10 of Raz (1979).

³See Lamond (2005).

The account presented here has the advantage of showing how these two theoretical models of precedent—the rule model and the reason model—can be unified; it helps us see what is correct in each of these views, and how they are related. The unification is achieved by interpreting the rules contained in precedent cases, not as strict rules, but as default, or defeasible, rules, while reasons then serve as the premises of these default rules. This analysis of reasons as the premises of default rules, which we will return to shortly, is not at all unnatural, nor is it ad hoc, introduced here only to establish a connection between two theoretical models of legal precedent; it is something that I have defended on independent grounds elsewhere.

The key innovation of the present account is that it makes explicit what is generally only implicit in case law: a priority ordering representing the strength of the reasons underlying judicial decisions. Like the set of rules contained in precedent cases, this priority ordering is itself taken to be a part of the law, although, like the precedent rules themselves, the priority ordering is derived from the decisions reached in precedent cases, not defined independently. Once this priority ordering on reasons has been made explicit, the notion of consistency with past decisions, and so precedential constraint, can then be defined.

2 Factors, rules, and cases

Throughout this paper, I follow the work of Kevin Ashley and his colleagues in supposing that the situation presented to the court in a legal case can usefully be represented as a set of *factors*, where a factor stands for a legally significant fact or pattern of facts.⁴ Cases in

⁴See Ashley (1989) and (1990) for an introduction to the model; see also, Rissland (1990) for an overview of research in artificial intelligence and law that places this work in a broader context.

different areas of the law will be characterized by different sets of factors, of course. In the domain of trade secrets law, for example, where the factor-based analysis has been developed most extensively, a case will typically concern the issue of whether the defendant has gained an unfair competitive advantage over the plaintiff through the misappropriation of a trade secret; and here the factors involved might turn on, say, questions concerning whether the plaintiff took measures to protect the trade secret, whether a confidential relationship existed between the plaintiff and the defendant, whether the information acquired was reverse-engineerable or in some other way publicly available, and the extent to which this information did, in fact, lead to a real competitive advantage for the defendant.⁵

Many factors can naturally be taken to have polarities, favoring one side or another. In the domain of trade secrets law, again, the presence of security measures favors the plaintiff, since it strengthens the claim that the information secured was a valuable trade secret; reverse-engineerability favors the defendant, since it suggests that the product information might have been acquired through proper means. The present paper is based on the simplifying assumption, not just that many, or even most, factors have polarities, but that all factors are like this, favoring one particular side. And we suppose, as an additional simplification, that the reasoning under consideration involves only a single step, proceeding directly from the factors present in a case to a decision—in favor of the plaintiff or the defendant—rather than

⁵Aleven (1997) has analyzed 147 cases from trade secrets law in terms of a factor hierarchy that includes 5 high-level issues, 11 intermediate-level concerns, and 26 base-level factors. The resulting knowledge base is used in an intelligent tutoring system for teaching elementary skills in legal argumentation, which has achieved results comparable to traditional methods of instruction in controlled studies; see Aleven and Ashley (1997).

moving through a series of intermediate legal concepts. Both of these assumptions would have to be relaxed in a more complete theory.

Formally, then, let us begin by postulating a set F of legal factors. A *fact situation* X , of the sort presented in a legal case, can then be defined as some particular subset of these factors: $X \subseteq F$. We will let $F^\pi = \{f_1^\pi, \dots, f_n^\pi\}$ represent the set of factors favoring the plaintiff and $F^\delta = \{f_1^\delta, \dots, f_m^\delta\}$ the set of factors favoring the defendant. Given our assumption that each factor favors one side of the other, we can suppose that the entire set of legal factors is exhausted by those favoring the plaintiff together with those favoring the defendant: $F = F^\pi \cup F^\delta$.

A *precedent case* will be represented as a fact situation together with an outcome as well as a rule through which that outcome is reached. Such a case, then, can be defined as a triple of the form $c = \langle X, r, s \rangle$, where X is a fact situation containing the legal factors present in the case, r is the rule of the case, and s is its outcome. We define three functions—*Facts*, *Rule*, and *Outcome*—to map cases into their component parts, so that, in the case c above, for example, we would have $Facts(c) = X$, $Rule(c) = r$, and $Outcome(c) = s$.

Given our assumption that reasoning proceeds in a single step, we can suppose that the *outcome* s of a case is always either a decision in favor of the plaintiff or a decision in favor of the defendant, with these two outcomes represented as π or δ respectively; and where s is a particular outcome, a decision for some side, we suppose that \bar{s} represents a decision for the opposite side, so that $\bar{\pi} = \delta$ and $\bar{\delta} = \pi$. Where X is a fact situation, we let X^s represent the factors from X that support the side s ; that is, $X^\pi = X \cap F^\pi$ and $X^\delta = X \cap F^\delta$.

The *rule* r contained in a precedent case has the form $Y \rightarrow s$, where Y is some set of factors supporting s as an outcome. We define two functions—*Premise* and *Conclusion*—

picking out the premise and the conclusion of a rule, so that, in the case of this particular rule r , for example, we would have $Premise(r) = Y$ and $Conclusion(r) = s$. A precedent rule of this sort, once again, is to be interpreted as a defeasible rule, telling us that its premise entails its conclusion, not as a matter of necessity, but only by default. What the rule $Y \rightarrow s$ means, then, is that, if some fact situation contains all the factors from Y , then as a default, the court ought to reach a decision in this situation in favor of the side s —or perhaps more intuitively, that the factors from Y , taken together, provide the court with a reason for deciding in favor of the side s .

This connection between precedent rules and reasons—a guiding theme of the paper—can be illustrated by examining a different sort of normative rule, an ethical generalization, such as “If you make a promise, you ought to keep it.” Consider an instance of this generalization, such as “If I promise to have lunch with Alex, I ought to do so,” and suppose I have, in fact, promised to have lunch with Alex, so that the rule is applicable. What, then, is the force of this rule? It cannot mean that I ought to have lunch with Alex no matter what. Surely other, more important obligations might legitimately interfere; I might be called upon to save a life, for example. Instead, it is natural to interpret the rule as telling us that my promise, the premise of the rule, provides me with a *reason* for having lunch with Alex—presumably a very strong reason, since it is based on a promise, but still a reason that might be defeated by stronger reasons, or perhaps excluded from consideration entirely.⁶

⁶This general picture is described in much more detail in Horty (2007), where I appeal to techniques from nonmonotonic logic to develop a detailed theory as reasons as the antecedents of default rules; the theory allows us to understand both how reasons can be defeated by stronger reasons and how they can be excluded from consideration, in the way suggested by Raz (1975).

The idea behind the current account is that precedent rules work in exactly the same way, identifying legal reasons that support particular decisions. What the rule $Y \rightarrow s$ tells us, then, is that the factor set Y provides the court with a legal reason for deciding in favor of the side s . Just as in the case of ethical generalizations, however, the reason provided by this precedent rule may be defeated—or trumped, as we will say—by a stronger reason favoring the opposite side, in a way that will be explained shortly.

Let us return, now, to the concept of a precedent case $c = \langle X, r, s \rangle$, containing a fact situation along with a rule r leading to the outcome s . In order for this concept to make sense, we impose three coherence constraints. First, the rule contained in the case must be applicable to the facts of the case, in the sense that the fact situation contains the factors required by the premise of the rule: $Premise(r) \subseteq X$. Second, each of the factors contained in the premise of the precedent rule must actually support its conclusion, not the opposite side: where $Conclusion(r) = s$, then, we require $Premise(r) \subseteq F^s$. And third, the conclusion of the precedent rule must match the outcome of the case: $Conclusion(r) = Outcome(c)$.

These various concepts and constraints can be illustrated through the concrete case $c_1 = \langle X_1, r_1, s_1 \rangle$, containing the fact situation $X_1 = \{f_1^\pi, f_2^\pi, f_3^\pi, f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\}$, with three factors favoring the plaintiff and four favoring the defendant, where r_1 is the rule $\{f_1^\pi, f_2^\pi\} \rightarrow \pi$, and where the outcome s_1 is π , a decision for the plaintiff. Evidently, the case satisfies our three coherence constraints. The precedent rule is applicable to the fact situation, in the sense that $Premise(r_1) \subseteq X_1$. The various factors contained in the premise of this rule all support its conclusion, a decision for the plaintiff, in the sense that $Premise(r_1) \subseteq F^\pi$. And the conclusion of the precedent rule matches the outcome of the case, both favoring the plaintiff: $Conclusion(r_1) = Outcome(c_1)$. This particular precedent, then, represents a case in which

the court decided for the plaintiff through the application or introduction of a rule according to which the presence of the factors f_1^π and f_2^π lead, by default, to a decision for the plaintiff.

3 Ordered reasons and binding rules

With this notion of a precedent case in hand, we can now define a *case base* as a set Γ of precedent cases. It is a case base of this sort that is supposed to represent the common law in some area, and to constrain the decisions of future courts. But according to the present theory, these constraints depend more immediately on two additional concepts, both of which can be defined in terms of the case base.

The first is simply the set of rules derived from a case base, which is definable as the set containing any rule belonging to any case from that case base. The concept can be introduced formally by extending the function *Rule*, which extracts the rule from a single case, so that it applies also to an entire set of cases, yielding as a result the set of rules contained in those cases.

Definition 1 (Rules derived from a case base) Let Γ be a case base. Then the set $Rule(\Gamma)$ of rules derived from Γ is defined by taking $Rule(\Gamma) = \{Rule(c) : c \in \Gamma\}$.

To illustrate, suppose the case base Γ contains the case c_1 , considered above. Then the set $Rule(\Gamma)$ of rules derived from this case base will contain the particular rule r_1 , since this rule is the value of $Rule(c_1)$ and c_1 belongs to Γ .

It is customary, of course, to suppose that the rules derived from a case base play an important role in precedential constraint; some writers argue that these precedent rules play the entire role. The next concept we introduce—a preference relation on reasons—is much

less common as a focus of attention.

In order to motivate this concept, it will be useful to consider our previous example, the case c_1 , in more detail. The key idea underlying precedential constraint is that later courts must respect the decisions of earlier courts. So what information is actually carried by the earlier court's decision in the case of c_1 ; what is the earlier court telling us with this decision? Well, two things, at least. First of all, by appealing to the rule r_1 , the court is telling us that the premise of this rule—that is, $Premise(r_1)$, or $\{f_1^\pi, f_2^\pi\}$ —is a sufficient reason for reaching a decision in favor of the plaintiff. But second, with its decision for the plaintiff, the court is also telling us that this reason is preferred to whatever other reasons the case might present that favor the defendant.

To make this point precisely, let us now define a *legal reason* as a set of factors uniformly favoring one side or the other. For example, $\{f_1^\pi, f_2^\pi\}$ is a reason favoring the side π , a decision for the plaintiff, while $\{f_1^\delta, f_2^\delta\}$ is a reason favoring the side δ , a decision for the defendant; but according to this definition $\{f_1^\pi, f_1^\delta\}$ is not a reason at all, since the factors contained in this set do not uniformly favor either side. We can say that a fact situation *presents* a reason if all the factors from that reason are contained in that fact situation, and that a case presents a reason if its fact situation does so. Finally, if X and Y are reasons favoring the same side, we can say that Y is *at least as strong as* X whenever Y contains all the factors contained by X —whenever, that is, $X \subseteq Y$.

Returning to our example, the case c_1 , as we have seen, contains the set $X_1 = \{f_1^\pi, f_2^\pi, f_3^\pi, f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\}$ as its fact situation, and so the strongest reason presented by this case for the defendant is the subset $X_1^\delta = \{f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\}$, containing all those factors from the original fact situation that favor the defendant. Since the earlier court has decided for

the plaintiff on the grounds of the reason provided by $Premise(r_1)$, even in the face of the reason provided by X_1^δ for the defendant, it seems to follow as a consequence of the court's decision that the reason $Premise(r_1)$ for the plaintiff is preferred to the reason X_1^δ for the defendant—that is, that the reason $\{f_1^\pi, f_2^\pi\}$ is preferred to the reason $\{f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\}$. If we introduce the symbol $<_{c_1}$ to represent the preference relation on reasons that is derived from the particular case c_1 , then this consequence of the court's decision can be put more formally as the claim that $\{f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\} <_{c_1} \{f_1^\pi, f_2^\pi\}$, or equivalently, that $X_1^\delta <_{c_1} Premise(r_1)$.

As far as the preference ordering goes, then, the earlier court is telling us at least that $X_1^\delta <_{c_1} Premise(r_1)$, but is it telling us anything else? Perhaps not explicitly, but implicitly, yes. For if the reason $Premise(r_1)$ for the plaintiff is preferred to the reason X_1^δ for the defendant, then surely any reason for the plaintiff that is at least as strong as $Premise(r_1)$ must likewise be preferred to X_1^δ , and just as surely, $Premise(r_1)$ must be preferred to any reason for the defendant that is at least as weak as X_1^δ . As we have seen, a reason Z for the plaintiff is at least as strong as $Premise(r_1)$ if it contains all the factors contained by $Premise(r_1)$ —that is, if $Premise(r_1) \subseteq Z$. And it is natural to conclude, likewise, that a reason W for the defendant is at least as weak as X_1^δ if it contains no more factors than X_1^δ itself—that is, if $W \subseteq X_1^\delta$. It therefore follows from the earlier court's decision in c_1 , not only that $X_1^\delta <_{c_1} Premise(r_1)$, but that $W <_{c_1} Z$ whenever W is at least as weak a reason for the defendant as X_1^δ and Z is at least as strong a reason for the plaintiff as $Premise(r_1)$ —whenever, that is, $W \subseteq X_1^\delta$ and $Premise(r_1) \subseteq Z$. To illustrate: from the court's explicit decision that $\{f_1^\delta, f_2^\delta, f_3^\delta, f_4^\delta\} <_{c_1} \{f_1^\pi, f_2^\pi\}$, we can conclude also that $\{f_3^\delta, f_4^\delta\} <_{c_1} \{f_1^\pi, f_2^\pi, f_5^\pi\}$, for example.

This line of argument leads to the following definition of the preference relation among

reasons that can be derived from a single case.

Definition 2 (Preference relation derived from a case) Let $c = \langle X, r, s \rangle$ be a case, and suppose W and Z are reasons. Then the relation $<_c$ representing the preferences on reasons derived from the case c is defined by stipulating that $W <_c Z$ if and only if $W \subseteq X^{\bar{s}}$ and $Premise(r) \subseteq Z$.

And once we have defined the preference relation derived from a single case, we can then introduce the preference relation $<_{\Gamma}$ derived from an entire case base Γ in the natural way, by stipulating that one reason is stronger than another according to the entire case base if that strength relation is supported by some particular case in the case base.

Definition 3 (Preference relation derived from a case base) Let Γ be a case base, and suppose W and Z are reasons. Then the relation $<_{\Gamma}$ representing the preferences on reasons derived from the case base Γ is defined by stipulating that $W <_{\Gamma} Z$ if and only if $W <_c Z$ for some case c from Γ .

It is worth noting that the derived preference relation $<_{\Gamma}$ is very weak, both formally and conceptually. From a formal standpoint, it is not a connected relation: we do not invariably have either $X <_{\Gamma} Y$ or $Y <_{\Gamma} X$ —reasons need not be comparable. Nor is the relation transitive: $X <_{\Gamma} Y$ and $Y <_{\Gamma} Z$ does not entail $X <_{\Gamma} Z$.⁷

And the preference relation is conceptually weak as well, because it might reflect very few of our ordinary judgments about strength relations among reasons. Consider, for example,

⁷Indeed, quite the opposite. For it is easy to see from our various definitions that, whenever $X <_{\Gamma} Y$, the two reasons X and Y must lie on opposite sides of some dispute, one favoring the plaintiff while the other favors the defendant. Hence, given $X <_{\Gamma} Y$ and $Y <_{\Gamma} Z$, we can conclude that X and Z , both lying opposed to Y , must themselves favor the same side, from which it follows that $X <_{\Gamma} Z$ fails.

a situation in which the issue at hand is the question whether an individual's residence in a foreign country qualifies as a change of fiscal domicile with respect to income tax.⁸ The plaintiff is the individual's home country, which would like to collect tax on his income; the defendant is the individual, who would prefer to pay his income taxes to the foreign country, where we can assume the rates are lower. Imagine that the fact situation contains the following factors, all favoring the defendant: the individual resigned from his old job and is now employed by a company in the foreign country; he has sold his old home and purchased a new home in the foreign country; he has sold his old car and both purchased and registered a new car in the foreign country. Suppose these three factors are represented as f_1^δ , f_2^δ , and f_3^δ . In favor of the plaintiff is the single factor that the individual has maintained a registered bicycle in his home country, which he uses while visiting his parents; this factor is f_1^π .

Can we now assume that the reason $\{f_1^\delta, f_2^\delta, f_3^\delta\}$ favoring the defendant should be preferred to the reason $\{f_1^\pi\}$ favoring the plaintiff? Intuitively, it would seem so—surely information about employment, residence, and automobile registration should outweigh bicycle registration. But as a matter of law, not necessarily. Unless the case base Γ contains a previous case in which bicycle registration was actually weighed against at least one of the factors supporting the defendant, we will not have $\{f_1^\pi\} <_\Gamma \{f_1^\delta, f_2^\delta, f_3^\delta\}$. The present approach thus reflects a positivist view according to which the legally sanctioned preference relations among reasons, like precedent rules themselves, must have a basis in the acts of some appropriate legal authority—here, a court's decision in some precedent case. Of course,

⁸This example is derived from some hypothetical cases considered by Prakken and Sartor (1998).

it is likely in the present situation that the court confronting this case would be guided by our intuitive assessment concerning weight of the conflicting reasons and therefore decide for the defendant. As a result of this decision, the intuitive assessment would be given legal standing, and it would then hold, once the case is decided and the case base is updated accordingly, that $\{f_1^\pi\} <_\Gamma \{f_1^\delta, f_2^\delta, f_3^\delta\}$. This is the genius of the common law—that it provides a mechanism through which our ordinary intuitions about the relative importance of various reasons are gradually filtered into the legal doctrine, on an incremental basis, in reaction to particular circumstances.

We now turn to the task of defining the class of precedent rules that should be considered as *binding* in a particular fact situation, those with the greatest bearing on that fact situation, which any court confronting that fact situation must take into account. The definition is simple, and proceeds in three steps.

First of all, a rule is said to be *applicable* in a fact situation whenever that situation contains all the factors required by the premise of the rule.

Definition 4 (Applicable rules) Let Γ be a case base, with $Rule(\Gamma)$ the derived set of rules, and suppose X is a fact situation. Then a rule r from $Rule(\Gamma)$ is applicable in the fact situation X if and only if $Premise(r) \subseteq X$.

Since our precedent rules are taken as defeasible, however, not every applicable rule can be classified as binding. Some will be overridden—or *trumped*—by stronger, or preferable, rules supporting the opposite side.

When is one one of two conflicting precedent rules preferable to the other? The force of a precedent rule, we recall, is that the premise of that rule provides the court with a

reason for deciding in favor of the side specified in its conclusion. Precedent rules themselves can therefore be placed in a preference ranking exactly in accord with the reasons they provide, so that a rule r' is ranked as preferable to the rule r in the context of a case base Γ whenever the reason $Premise(r')$ is ranked as preferable to the reason $Premise(r)$, according to the preference relation $<_{\Gamma}$ derived from that case base—whenever, that is, $Premise(r) <_{\Gamma} Premise(r')$.

Given this preference ranking among rules, we can now characterize an applicable rule as trumped whenever there is another rule, also applicable, that is preferred to than the original and supports the opposite side.

Definition 5 (Trumped rules) Let Γ be a case base, with $Rule(\Gamma)$ the derived set of rules and $<_{\Gamma}$ the derived preference relation, and suppose X is a fact situation. Then a rule r from $Rule(\Gamma)$ that is applicable in X is trumped in the context of the case base Γ just in case there is another rule r' from $Rule(\Gamma)$ that is also applicable in X , but which is such that (1) $Premise(r) <_{\Gamma} Premise(r')$ and (2) $Conclusion(r') = \overline{Conclusion(r)}$.

And once we have defined both the applicable and the trumped rules, we can introduce the idea of a binding rule quite simply, as one that is applicable but not trumped.

Definition 6 (Binding rules) Let Γ be a case base, with $Rule(\Gamma)$ the derived set of rules and $<_{\Gamma}$ the derived preference relation, and suppose X is a fact situation. A rule r from $Rule(\Gamma)$ is binding in X just in case it is triggered in the fact situation X and not trumped in the context of Γ .

These concepts can be illustrated by considering the simple case base $\Gamma_1 = \{c_1, c_2\}$ containing only these two precedent cases, with c_1 as before and with $c_2 = \langle X_2, r_2, s_2 \rangle$,

where the fact situation $X_2 = \{f_1^\pi, f_2^\pi, f_4^\pi, f_5^\delta, f_6^\delta\}$, where the rule r_2 is $\{f_5^\delta\} \rightarrow \delta$, and where the outcome s_2 is δ , a decision for the defendant. Now suppose that, against the background of this case base, a new fact situation $X_3 = \{f_1^\pi, f_2^\pi, f_5^\pi, f_5^\delta, f_7^\delta\}$ comes before the court. The set $Rule(\Gamma_1)$ of derived precedent rules contains two rules, r_1 and r_2 ; and evidently, both of these two rules are applicable in the current situation, since we have both $Premise(r_1) \subseteq X_3$ and $Premise(r_2) \subseteq X_3$. The first of these rules, however, is trumped by the second. The two rules favor different sides, of course, with r_1 favoring the plaintiff and r_2 the defendant. And it is easy to see also that, in the context of Γ_1 as a background case base, the reason provided by the second rule is preferable to that provided by the first: it follows from our definitions that $\{f_1^\pi, f_2^\pi\} <_{c_2} \{f_5^\delta\}$, from which we have $\{f_1^\pi, f_2^\pi\} <_{\Gamma_1} \{f_5^\delta\}$ as well—that is $Premise(r_1) <_{\Gamma_1} Premise(r_2)$. Because both r_1 and r_2 are applicable, but r_1 is trumped, only the rule r_2 is binding in this fact situation.

4 Constraint by precedent

The account of precedential constraint set out here is a version of the reason model, advocated by Lamond, according to which a later court is constrained to reach a decision that is consistent, not necessarily with the rules set out in earlier cases, but with the assessments reached in those cases concerning the proper balance of reasons. In order to develop this idea, I first introduce a reason-centered notion of consistency for case bases. A later decision can then be defined as consistent with the precedents contained in a case base if it does not introduce an inconsistency into that case base.

As we have seen, a case base Γ leads to a derived preference relation $<_{\Gamma}$, where the

statement $X <_{\Gamma} Y$ means that the reason Y is preferred to the reason X according to Γ . Such a statement is supported, of course, by some particular precedent case from Γ in which it was decided either explicitly that the reason Y itself is preferred to X , or else that some reason at least as weak as Y is preferred to some reason at least as strong as X , from which it follows implicitly that $X <_{\Gamma} Y$. We therefore define the case base Γ as *inconsistent* whenever there are two reasons X and Y for which both $X <_{\Gamma} Y$ and $Y <_{\Gamma} X$ —whenever, that is, Γ tells us both that Y is preferred to X and that X is preferred to Y —and *consistent* otherwise.

Definition 7 (Consistent and inconsistent case bases) Let Γ be a case base with $<_{\Gamma}$ the derived preference relation. Then Γ is inconsistent just in case there are reasons X and Y such that $X <_{\Gamma} Y$ and $Y <_{\Gamma} X$. Γ is consistent just in case it is not inconsistent.

Is this a good definition of case base inconsistency, and so consistency, from an intuitive point of view? I think so. The condition isolated by the definition is almost certainly sufficient with respect to our intuitive notion of inconsistency—surely any case base from which it can be derived that, of two reasons, each is preferred to the other would have to be classified as inconsistent from an intuitive standpoint. But is the suggested condition also necessary? Perhaps a case base might exhibit some other anomaly that would lead us to classify it, from an intuitive standpoint, as inconsistent. Suppose, for example, that the case base contains two precedent cases of the form $\langle X, r, s \rangle$ and $\langle X, r', \bar{s} \rangle$ in which the very same fact situation leads to decisions for opposing sides; surely there is some kind of intuitive inconsistency in a case base like this. True enough, but as it turns out, this particular anomaly entails the formal condition set out in our definition to capture the intuitive notion

of inconsistency, so that it cannot be used to challenge the claim that the formal condition is necessary.

Observation 1 Let Γ be a case base containing two precedent cases of the form $\langle X, r, s \rangle$ and $\langle X, r', \bar{s} \rangle$. Then Γ is inconsistent.

Other anomalies can likewise be shown to entail our formal condition as well. Indeed, I have not been able to find any that do not, and will therefore take this formal definition of consistency and inconsistency for a case base as intuitively acceptable.

Given this notion of consistency, then, we can now turn to the concept of precedential constraint itself. The guiding intuition is that, in deciding a case, a constrained court is required to preserve the consistency of the background case base. More exactly, where Γ is a consistent case base, suppose a court that is constrained by Γ is confronted with a new fact situation X . Then the court is required to reach a decision on X that is itself consistent with Γ —that is, a decision that does not introduce inconsistency into the case base.

Definition 8 (Precedential constraint) Let Γ be a consistent case base and X a new fact situation confronting the court. Then precedential constraint requires the court to base its decision on some rule r leading to an outcome s such that the new case base $\Gamma \cup \{\langle X, r, s \rangle\}$ is itself consistent.

This notion of precedential constraint can be illustrated by returning to our previous example, in which $\Gamma_1 = \{c_1, c_2\}$ is the background case base, with c_1 and c_2 as before, and the court is confronted with the new fact situation $X_3 = \{f_1^\pi, f_2^\pi, f_5^\pi, f_5^\delta, f_7^\delta\}$. As we have seen, the rule r_2 , or $\{f_5^\delta\} \rightarrow \delta$, is the unique binding rule in this fact situation, so that, as far as precedent rules are concerned, the background case base unambiguously favors a decision

for the defendant. And in many situations, there may indeed be a presumption that favors following a binding rule.⁹ Still, on the view developed here, precedential constraint does not depend on binding rules, but instead, on consistency with the background case base.

The court, in this situation, would of course be free to follow the binding rule r_2 , leading to a decision for the defendant, and so augmenting the background case base with the new case $c_3 = \langle X_3, r_3, s_3 \rangle$, where the rule r_3 is simply r_2 and the outcome s_3 is δ , which would, in fact, preserve consistency. But the court is also free to decide, for example, that the new reason $\{f_5^\pi\}$, which favors the plaintiff, is preferable to the various reasons presented by this fact situation for the defendant. The court might then formulate a new rule $\{f_5^\pi\} \rightarrow \pi$, and on the basis of this rule, decide for the plaintiff. As a result, the background case base would be augmented with the new case $c_4 = \langle X_4, r_4, s_4 \rangle$, where X_4 is identical with X_3 , where r_4 represents this new rule, and s_4 is π . And again, the augmented case base resulting from this decision would remain consistent. The new case c_4 would allow us to derive, for example, the preference relation $\{f_5^\delta, f_7^\delta\} <_{c_4} \{f_5^\pi\}$. But this new preference relation is consistent with the others already derivable from the background case base.

What the court cannot do, however—what precedential constraint rules out—is find for the plaintiff on the basis of some reason that does not include the new factor f_5^π , since it is a consequence of the c_2 court’s decision that any such reason is less preferable than the reason $\{f_5^\delta\}$ for the defendant. Suppose, for example, that the court formulates the rule $\{f_1^\pi\} \rightarrow \pi$, and wishes to be decided for the plaintiff on the basis of this rule. Such a decision would result in an augmentation of the background case base with the new case $c_5 = \langle X_5, r_5, s_5 \rangle$, where X_5

⁹See, for example, the discussion of “presumptive positivism” in Schauer (1989) and (1991).

is again identical with X_3 , where r_5 represents the new rule, and s_5 is π . But this augmented case base would now be inconsistent. The new case c_5 would support the preference relation $\{f_5^\delta\} <_{c_5} \{f_1^\pi\}$, telling us that the reason $\{f_1^\pi\}$ for the plaintiff outweighs the reason $\{f_5^\delta\}$ for the defendant. But the background case base already contains the case c_2 , from which we can derive the preference relation $\{f_1^\pi\} <_{c_2} \{f_5^\delta\}$, telling us exactly the opposite. Since a decision for the plaintiff on these grounds would therefore lead to an inconsistent case base, it is ruled out by the present account of precedential constraint.¹⁰

It is worth noting that the present theory relies on the assumption that the background case base is itself consistent to begin with. This is, of course, an unrealistic assumption. Given the vagaries of judicial decision, with a body of case law developed by a number of different courts, at different places and different times, it would be surprising if any nontrivial case base were actually consistent. But in fact, this assumption is not essential. The notion of case base inconsistency at work here is not like logical inconsistency—it is local, not pervasive.

¹⁰Although this account of precedential constraint is a version of the reason model, originally proposed by Lamond (2005), there are at least two significant differences between Lamond’s proposal and the present account. First at all, at a conceptual level, Lamond sets out his reason model as an alternative to the conventional view of precedential constraint, with its emphasis on rules, while, on the present account, the roles of reasons and rules are integrated: it is reasons that function as the premises of precedent rules, and the preference ordering on rules is derived from the preference ordering on reasons. Second, although Lamond himself does not develop a precise implementation of his reason model, the account set out here does seem to differ from what he has in mind. In particular, Lamond suggests (pp. 18–19) that the meaning of precedents should be understood in terms of “protected reasons” and other forms of exclusionary reasons. Although initially sympathetic to this idea, I did not, in the end, find it necessary to appeal to exclusionary reasons in developing the present account.

A case base might be inconsistent in certain areas, providing conflicting information about the relative weight of particular reasons, while remaining consistent elsewhere. It would therefore be possible to extend the present theory of precedential constraint to apply also to inconsistent case bases, by requiring of a court, not necessarily that it should preserve the consistency of a consistent case base, but only that it should refrain from introducing any new inconsistencies, which were not present before, into a case base that may already be inconsistent.

5 Case base dynamics

I now want to consider how two of the most important concepts from the traditional theory of precedent can be accommodated within the present framework. These are the concepts of following a rule and distinguishing a rule. The goal is to understand the options available to the court under various circumstances, and also the way in which the case base and its associated constraints evolve when one of these options is selected—that is, the dynamics of case base update.

Imagine, then, that a court constrained by the precedents from a consistent case base Γ is confronted with a new problem situation X , and suppose to begin with that none of the rules belonging to $Rule(\Gamma)$ is even applicable to X . A situation like this is our theoretical analogue to the legal notion of a case of first impressions, presenting issues that have not previously been addressed within the law, so that the established rules of precedent have no bearing.¹¹ The court is therefore free to assess the issues in whatever way it thinks best, to

¹¹See, for example, the discussion in Cross (1968, pp. 190–195).

formulate a rule r supporting an outcome s , and to reach a decision of the form $\langle X, r, s \rangle$. This decision, of course, leads to $\Gamma \cup \{\langle X, r, s \rangle\}$ as the updated case base, and fortunately any such decision is guaranteed to preserve consistency. In a case of first impressions, there is no precedential constraint at all.

Observation 2 Let Γ be a consistent case base, and suppose X is a fact situation in which none of the rules from $Rule(\Gamma)$ are applicable. Then $\Gamma \cup \{\langle X, r, s \rangle\}$ is also consistent, where r is any newly formulated rule applicable in X and supporting s as an outcome.

Next, still imagining that a court constrained by Γ is confronted with a new situation X , let us suppose that some precedent rule from $Rule(\Gamma)$ is, in fact, binding in this situation. Then, according to the standard theory, any court has the option of either following or distinguishing the binding precedent rule.¹²

Where r is such a binding rule from $Rule(\Gamma)$, supporting the outcome s , we can say that the court *follows* this rule whenever it reaches a decision of the form $\langle X, r, s \rangle$, generating $\Gamma \cup \{\langle X, r, s \rangle\}$ as the updated case base. As we have seen, precedential constraint is not, on the present theory, carried through precedent rules, so one might wonder what role these rules do play. Here is one answer. Although satisfying precedential constraint does not require following a binding rule, it turns out that following a binding rule is sufficient to guarantee the satisfaction of precedential constraint; any decision that follows a binding rule preserves consistency.

Observation 3 Let Γ be a consistent case base with $Rule(\Gamma)$ the derived set of rules, and

¹²Of course, depending on their standing in the judicial hierarchy, have the further option of overruling the precedent. I will not consider this further option in this paper.

suppose X is a fact situation in which some rule r from $Rule(\Gamma)$, supporting the outcome s , is binding. Then the case base $\Gamma \cup \{\langle X, r, s \rangle\}$ is also consistent.

We can say that the court *distinguishes* the binding rule r , by contrast, whenever it either follows or formulates another rule r' supporting the opposite outcome \bar{s} , leading to a decision of the form $\langle X, r', \bar{s} \rangle$, and so generating $\Gamma \cup \{\langle X, r', \bar{s} \rangle\}$ as the updated case base. And of course, while, as we have seen, a court is guaranteed to preserve consistency whenever it follows a binding rule, there is no such guaranteed with distinguishing; the operation must be performed with some care, guided by the constraints of precedent.

Both the ideas of following and distinguishing a binding rule were illustrated by our previous example, in which a court constrained by the case base $\Gamma_1 = \{c_1, c_2\}$ confronts the new fact situation $X_3 = \{f_1^\pi, f_2^\pi, f_5^\pi, f_5^\delta, f_7^\delta\}$. Here, as we noted, the rule r_2 , or $\{f_5^\delta\} \rightarrow \delta$, is the unique binding rule, so that the court follows this rule if it reaches the decision $c_3 = \langle X_3, r_3, s_3 \rangle$, where r_3 is r_2 and s_3 is δ , leading to $\Gamma_1 \cup \{\langle X_3, r_3, s_3 \rangle\}$ as the updated case base. But as we also noted, the court is likewise free to formulate and apply the new rule r_4 , or $\{f_5^\pi\} \rightarrow \pi$, leading to the decision $c_4 = \langle X_4, r_4, s_4 \rangle$, where X_4 is X_3 and s_4 is π , and so to $\Gamma_1 \cup \{\langle X_4, r_4, s_4 \rangle\}$ as the updated case base. In that circumstance, we would now say that the court distinguishes the binding rule r_2 .

With these notions of following and distinguishing a rule in hand, I close with three points.

First of all, it follows at once from Observations 2 and 3 that a court, presented with a new fact situation, will always be in a position to comply with the constraints of precedent—the court will never be forced to introduce an inconsistency into the case base. For either no

rule from the background case base is applicable in the current situation, or some binding rule is applicable.¹³ If no rule is applicable, then it follows from Observation 2 that any decision reached by the court will preserve consistency. If some binding rule is applicable, then it follows from Observation 3 that the court can preserve consistency by following that rule.

Second, although the traditional concepts of following and distinguishing a precedent rule can be accommodated within the framework set out here, the present framework is more general, allowing us to understand options available to a court that do not seem to fall naturally within the traditional classification. To illustrate, we return to the example of a court confronting the situation $X_3 = \{f_1^\pi, f_2^\pi, f_5^\pi, f_5^\delta, f_7^\delta\}$ against the background of the case base $\Gamma_1 = \{c_1, c_2\}$, with r_2 , or $\{f_5^\delta\} \rightarrow \delta$, as a binding rule. The rule r_2 , of course, was formulated in the context of the precedent case c_2 , with $X_2 = \{f_1^\pi, f_2^\pi, f_4^\pi, f_5^\delta, f_6^\delta\}$ as its fact situation. What the c_2 court is telling us with its decision, then, is that the reason provided by $\{f_5^\delta\}$ for the defendant outweighs the reason $\{f_1^\pi, f_2^\pi, f_4^\pi\}$ present in X_2 for the plaintiff.

Now, we have previously imagined that the current court, confronted with X_3 , might conclude that the new reason $\{f_5^\pi\}$, which was not present in X_2 , is preferred to the previous reason $\{f_5^\delta\}$ for the defendant, and so decide X_3 for the plaintiff. But we could likewise suppose that the current court, while still recognizing that the reason $\{f_5^\pi\}$ for the plaintiff is preferred to $\{f_5^\delta\}$ for the defendant, also feels that the new reason $\{f_7^\delta\}$ for the defendant, also present here for the first time, itself outweighs $\{f_5^\pi\}$. The current court might then

¹³We can assume that the set of precedent rules is finite, so that not every applicable rule can be trumped by another rule; as a result, if any rule is applicable to a fact situation, some rule must be binding—applicable and untrumped.

reach the decision $c_6 = \langle X_6, r_6, s_6 \rangle$, where X_6 is X_3 , where s_6 is δ , and where r_6 represents the new rule $\{f_7^\delta\} \rightarrow \delta$. In this case, although both the decision and the train of thought leading to it seem to make perfect sense, it would be hard to describe the court's decision in terms of the traditional vocabulary of following or distinguishing a rule. The court is not following the binding rule r_2 , or $\{f_5^\delta\} \rightarrow \delta$, since its decision is not based on this rule, and indeed, it recognizes that the situation presents a the reason $\{f_5^\pi\}$ for the plaintiff that outweighs the reason $\{f_5^\delta\}$ for the defendant, on which the rule r_2 is based. But the court is not distinguishing the rule r_2 either, since it reaches a decision for the for the side that is favored by that rule.

Third, and finally, the present framework allows us to understand a feature of the common law that can seem very puzzling from a more traditional perspective—the idea that simply following a precedent rule can lead to a change in the law. This idea is often alluded to in the legal literature. Edward Levi, for example, writes that “the rules change from case to case and are remade with each case,” and later, that “the rules change as the rules are applied.”¹⁴ And, Simpson likewise, after discussing the operations of distinguishing and following a precedent rule, writes that “the development of the law is normally brought about by just these two activities,” which leads him to a sort of paradox: “The legal process is conceived of as conditioned by rules, yet in a sense the rules change from case to case; the very point in having a system of rules to ensure consistency in decision seems to be frustrated if the rules themselves lack fixity.”¹⁵

These remarks can be hard to understand. It is easy enough to see how distinguishing

¹⁴See Levi (1949, pp. 2–4).

¹⁵See Simpson (1961, p. 172), who himself cites Levi.

a precedent rule might introduce a change into the law. As we have seen, distinguishing a rule often involves introducing a new rule into the case base. But if a court simply follows a precedent rule—if it does no more than draw a rule from some precedent case and apply that same rule to a new fact situation—how can we say that the rules are changed, or that the law is affected at all?

The current account gives us the resources to answer this question, as long as we take phrases such as “the rules change as the rules are applied” to refer, not necessarily to the set of precedent rules themselves, but, in a more metaphorical way, to the precedential constraints generated by the underlying case base. In that case, although simply following a familiar precedent rule, applying it in a new situation, does not lead to any modifications in the set of rules derived from a case base, it does indeed affect the precedential constraints generated by that case base. For these constraints depend, not on the set of precedent rules, but on consistency with the background case base. Consistency, in turn, is defined in terms of the preference ordering on reasons that is generated by the case base. And as it turns out, even following a precedent rule—simply applying a familiar rule in a new situation—can change the preference ordering on reasons in a way that affects precedential constraint. Each time a familiar rule is followed in a new case, the court makes the decision that certain reasons, which might have been judged as strong enough to override that rule, are in fact not strong enough. These decisions, encoded in new cases, then modify the preference relations derived from the case base, which affects the options open to the court when it encounters those same reasons again in the future.

The point can be illustrated by returning once again to our familiar example, in which a court constrained by the case base $\Gamma_1 = \{c_1, c_2\}$ confronts the new fact situation $X_3 =$

$\{f_1^\pi, f_2^\pi, f_5^\pi, f_5^\delta, f_7^\delta\}$. Now, as we have seen, even though r_2 , or $\{f_5^\delta\} \rightarrow \delta$, is the unique binding rule in this new situation, precedential constraints allow the court to distinguish this rule, arriving instead at the decision $c_4 = \langle X_4, r_4, s_4 \rangle$, where r_4 is $\{f_5^\pi\} \rightarrow \pi$.

Suppose, however, that, prior to confronting the fact situation X_3 , the court is first faced with the fact situation $X_7 = \{f_5^\pi, f_6^\pi, f_5^\delta, f_7^\delta\}$, again with r_2 as the unique binding rule; but here, it decides simply to apply this rule, resulting in the decision $c_7 = \langle X_7, r_7, s_7 \rangle$, where r_7 is r_2 and s_7 is δ . In that case, the court would then be confronting the new situation X_3 against the background of the case base $\Gamma_2 = \{c_1, c_2, c_7\}$, rather than Γ_1 . And even though Γ_2 results from Γ_1 simply through the application to a new situation of a rule that is already present in Γ_1 , the mere application of this rule changes the precedential constraints derivable from the background case base to such an extent that the court is no longer free, when faced with the situation X_3 , to reach the decision $c_4 = \langle X_4, r_4, s_4 \rangle$. Why? Well, it follows from the court's decision in c_7 that the reason $\{f_5^\delta\}$ for the defendant is preferred to the reason $\{f_5^\pi\}$ for the plaintiff—that is, $\{f_5^\pi\} <_{c_7} \{f_5^\delta\}$. But the decision c_4 would tell us exactly the opposite, that the reason $\{f_5^\pi\}$ for the plaintiff is preferred to the reason $\{f_5^\delta\}$ for the defendant—that is, $\{f_5^\delta\} <_{c_4} \{f_5^\pi\}$. The decision c_4 , therefore, is inconsistent with Γ_2 or any other case base containing c_7 , and so ruled out by precedential constraint.¹⁶

¹⁶Lamond (2005) makes exactly this point—that following, as well as distinguishing, a previous precedent rule can change the law. However, the way in which he develops this idea indicates, I believe, a problem with his picture of case base dynamics and the evolution of legal doctrine. On Lamond's view, the doctrine provided by a precedent rule, or *ratio*, consists, not only in the particular reason carried by that rule, but in the set of facts that have been judged as insufficient in strength to defeat that reason. Following a rule thus leads to a change in legal doctrine because: “every time a precedent is followed, further facts are added to the list of those regarded as insufficient to defeat the reason provided by the *ratio* (p. 17; see also p. 20).”

6 Conclusion

The goal of this paper has been to describe one way in which a precise reason model of precedent could be developed, based on Lamond’s general idea that later courts are constrained to respect the weights assigned to various reasons by earlier courts. The account provided here is set out within a representational framework, due to Ashley and his colleagues, that has shown itself to be useful in both analytic and empirical studies of legal precedent. It has the additional advantage of allowing us to see how this reason model can be reconciled with the traditional idea that precedential constraint involves rules, as long as these rules are taken to be defeasible.

I would like to think that the present account could be developed into a more general

To illustrate with our example, the doctrine provided by the case c_2 would, on this view, consist in the rule r_2 , or $\{f_5^\delta\} \rightarrow \delta$, along with the list $\{f_1^\pi, f_2^\pi, f_4^\pi\}$ of factors judged by the c_2 court as insufficient in strength to defeat this rule; the application of the same rule in the case of c_7 would change the doctrine by expanding this list to $\{f_1^\pi, f_2^\pi, f_4^\pi, f_5^\pi, f_6^\pi\}$, which includes also the new factors judged by the c_7 court as insufficient to defeat r_2 . I feel, however, that the use of a simple list of individual factors that are viewed as insufficient to override a rule is not adequate. For this reason, I rely here on a more general preference relation to represent strength comparisons among conflicting reasons—sets of factors, rather than individual factors—and it is this relation that is then updated as rules are applied. On my view, then, the doctrine of c_2 consists in the rule r_2 together with the information that $\{f_5^\delta\}$ is preferred to the reason $\{f_1^\pi, f_2^\pi, f_4^\pi\}$ or any of its subsets, so that none of these reasons can defeat that rule; the case c_7 then adds the further information that $\{f_5^\delta\}$ is likewise preferred to $\{f_5^\pi, f_6^\pi\}$ or its subsets. But all of this is consistent with the idea that a court might eventually decide that $\{f_5^\delta\}$ is not preferred to, say, the reason $\{f_4^\pi, f_5^\pi\}$ —which contains a pair of potential defeaters, one from each of the two cases, which had not yet been considered in combination. It is hard to see how this latter possibility could be captured in Lamond’s list notation, which refers only to individual factors, rather than reasons, or sets of factors.

theory of precedential reasoning, but that would require a good deal of work along both defensive and constructive lines, none of which is attempted here. Defensively, the present treatment of precedent rules—balanced, as it is, in the center—is vulnerable to attack from both the left and the right. On the left, there are those who feel that rules play no real role in precedential constraint, including writers in the tradition of legal realism, of course, but also Ashley himself, whose very successful empirical and educational work on precedent involves no appeal to rules whatsoever. And on the right, there are those, such as Alexander and Sherwin, who recognize the importance of precedent rules, but argue that coherence requires these rules to be even stronger than those at work here—strict, rather than defeasible. From a constructive standpoint, the present account relies on a number of simplifying assumptions, which would have to be relaxed in a more general theory. These include, most notably, the assumptions, first, that every possible legal factor has a constant polarity, favoring the same side in every case in which it occurs, and second, that legal reasoning involves only a single step, connecting base-level factors directly to an outcome, rather than moving through a series of intermediate concepts.

A Observations and proofs

Observation 1 Let Γ be a case base containing two precedent cases of the form $\langle X, r, s \rangle$ and $\langle X, r', \bar{s} \rangle$. Then Γ is inconsistent.

Proof Suppose the case base Γ contains the cases $c = \langle X, r, s \rangle$ and $c' = \langle X, r', \bar{s} \rangle$. By our coherence constraints on rules and cases—particularly the requirements that the premise of a rule can contain only factors supporting its conclusion along with the requirement that

the rule of a case must be applicable to its fact situation—we have (1) $Premise(r) \subseteq X^s$ and (2) $Premise(r') \subseteq X^{\bar{s}}$, and obviously (3) $Premise(r) \subseteq Premise(r)$ and (4) $Premise(r') \subseteq Premise(r')$. From (2) and (3), we have $Premise(r') <_c Premise(r)$ by Definition 2, and likewise $Premise(r) <_{c'} Premise(r')$ by (1) and (4). We therefore have both $Premise(r') <_{\Gamma} Premise(r)$ and $Premise(r) <_{\Gamma} Premise(r')$ by Definition 3, and so Definition 7 tells us that Γ is inconsistent. ■

Observation 2 Let Γ be a consistent case base, and suppose X is a fact situation in which none of the rules from $Rule(\Gamma)$ are applicable. Then $\Gamma \cup \{\langle X, r, s \rangle\}$ is also consistent, where r is any newly formulated rule applicable in X and supporting s as an outcome.

Proof Assume that Γ is consistent and that X is a fact situation in which none of the rules from $Rule(\Gamma)$ are applicable. Now suppose for contradiction that $\Gamma \cup \{c\}$ is not consistent, where $c = \langle X, r, s \rangle$ with r a newly formulated rule supporting s . Since Γ is consistent but $\Gamma \cup \{c\}$ is not, the preference relation derived from c must conflict with the preference relation derived from some other case already belonging to Γ —that is, there must be considerations A and B such that (1) $A <_c B$ and (2) $B <_{c'} A$, where $c' = \langle Y, r', \bar{s} \rangle$ is a case from Γ . From (1), we have (3) $A \subseteq X^{\bar{s}}$ and (4) $Premise(r) \subseteq B$ by Definition 2, and likewise, from (2), we have (5) $B \subseteq Y^s$ and (6) $Premise(r') \subseteq A$. From (3) and (6), together with the fact that $X^{\bar{s}} \subseteq X$ we have $Premise(r') \subseteq X$, and of course r' belongs to $Rule(\Gamma)$, so that some rule from $Rule(\Gamma)$ is applicable to X , contrary to assumption. ■

Observation 3 Let Γ be a consistent case base with $Rule(\Gamma)$ the derived set of rules, and suppose X is a fact situation in which some rule r from $Rule(\Gamma)$, supporting the outcome s , is binding. Then the case base $\Gamma \cup \{\langle X, r, s \rangle\}$ is also consistent.

Proof Assume that Γ is consistent with X is a fact situation in which the rule r from $Rule(\Gamma)$, supporting the outcome s , is binding. Now suppose for contradiction that $\Gamma \cup \{c\}$ is not consistent, where $c = \langle X, r, s \rangle$. Since Γ is consistent but $\Gamma \cup \{c\}$ is not, the preference relation derived from c must conflict with the preference relation derived from some other case already belonging to Γ —that is, there must be considerations A and B such that (1) $A <_c B$ and (2) $B <_{c'} A$, where $c' = \langle Y, r', \bar{s} \rangle$ is a case from Γ . From (1), we have (3) $A \subseteq X^{\bar{s}}$ and (4) $Premise(r) \subseteq B$ by Definition 2, and likewise, from (2), we have (5) $B \subseteq Y^s$ and (6) $Premise(r') \subseteq A$. From (3) and (6), together with the fact that $X^{\bar{s}} \subseteq X$, we have $Premise(r') \subseteq X$, so that the rule r' is applicable in the situation X . From (4) and (5), we have (6) $Premise(r) \subseteq Y^s$, and obviously (7) $Premise(r') \subseteq Premise(r')$. By Definition 2, then, (6) and (7) tell us that $Premise(r) <_{c'} Premise(r')$, from which it follows that $Premise(r) <_{\Gamma} Premise(r')$. Since the rule r' from $Rule(\Gamma)$, which supports a different conclusion, is both applicable in X and stronger than r , it follows from Definition 5 that r is trumped. By Definition 6, therefore, the rule r is not binding, contrary to assumption. ■

References

- [Aleven and Ashley, 1997] Vincent Aleven and Kevin Ashley. Evaluating a learning environment for case-based argumentation skills. In *Proceedings of the Sixth International Conference on Artificial Intelligence and Law (ICAIL-97)*, pages 170–179. The Association for Computing Machinery Press, 1997.
- [Aleven, 1997] Vincent Aleven. *Teaching Case-Based Argumentation Through a Model and Examples*. PhD thesis, Intelligent Systems Program, University of Pittsburgh, 1997.

- [Alexander and Sherwin, 2001] Larry Alexander and Emily Sherwin. *The Rule of Rules: Morality, Rules, and the Dilemmas of Law*. Duke University Press, 2001.
- [Alexander, 1989] Larry Alexander. Constrained by precedent. *Southern California Law Review*, 63:1–64, 1989.
- [Alexander, 1996] Larry Alexander. Precedent. In Dennis Patterson, editor, *A Companion to Philosophy of Law and Legal Theory*, pages 503–513. Blackwell Publishers, 1996.
- [Ashley, 1989] Kevin Ashley. Toward a computational theory of arguing with precedents: accomodating multiple interpretations of cases. In *Proceedings of the Second International Conference on Artificial Intelligence and Law (ICAIL-89)*, pages 93–110. The Association for Computing Machinery Press, 1989.
- [Ashley, 1990] Kevin Ashley. *Modeling Legal Argument: Reasoning with Cases and Hypotheticals*. The MIT Press, 1990.
- [Cross, 1968] Rupert Cross. *Precedent in English Law*. Oxford University Press, 1968. Second edition.
- [Horty, 2007] John Horty. Reasons as defaults. *Philosopher's Imprint*, 7(3), 2007.
- [Lamond, 2005] Grant Lamond. Do precedents create rules? *Legal Theory*, 11:1–26, 2005.
- [Levi, 1949] Edward Levi. *An Introduction to Legal Reasoning*. The University of Chicago Press, 1949.
- [Prakken and Sartor, 1998] Henry Prakken and Giovanni Sartor. Modelling reasoning with precedents in a formal dialogue game. *Artificial Intelligence and Law*, 6:231–287, 1998.

[Raz, 1975] Joseph Raz. *Practical Reasoning and Norms*. Hutchinson and Company, 1975.

Reprinted by Oxford University Press, 2002.

[Raz, 1979] Joseph Raz. *The Authority of Law*. Oxford University Press, 1979.

[Rissland, 1990] Edwina Rissland. Artificial intelligence and law: stepping stones to a model of legal reasoning. *Yale Law Review*, 99:1957–1981, 1990.

[Schauer, 1989] Frederick Schauer. Is the common law law? *California Law Review*, 77:455–471, 1989.

[Schauer, 1991] Frederick Schauer. *Playing by the Rules: A Philosophical Examination of Rule-Based Decision-Making in Law and Life*. Oxford University Press, 1991.

[Simpson, 1961] A. W. B. Simpson. The *ratio decidendi* of a case and the doctrine of binding precedent. In A. G. Guest, editor, *Oxford Essays in Jurisprudence*, pages 148–175. Oxford University Press, 1961.