

# A Hybrid Model of Argument Concerning Preferences Between Statutory Interpretation Canons

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**Abstract.** This paper extends the existing account of statutory interpretation based on argument schemes theory. It points out that the preference relations among statutory canons are not always determined by some predefined rules, but in certain systems of law or legal domains, it is necessary to argue these preference relations on the basis of case law. A set of factors favouring linguistic arguments and teleological arguments is presented, and a case-based argument scheme for the assignment of preference relations is reconstructed.

**Keywords.** Argumentation schemes, case-based reasoning, factors, hybrid systems, statutory interpretation

## 1. Introduction

Statutory interpretation is one of the most theoretically engaging and practically significant topics in law [1]. In order for statutory norms to be applied to specific cases or to be elaborated in legal scholarship, their meaning needs to be grasped by relevant actors. On a day-to-day basis, lawyers exchange arguments on how statutory law should be understood. The interpretive statements, i.e. the statements on what meaning should be assigned to statutory expressions, are supported or attacked through arguments based on the so-called interpretive canons or rules of statutory interpretation/construction [2,3,4].

The topic of statutory interpretation caught the attention of the AI and Law community during the times of elaboration of the first hybrid systems, joining the elements of rule-based and case-based reasoning [5] and has become one of the mainstream research topics therein in the 2010s [6,7,8,9]. The currently dominant approach to this subject is to represent reasoning with the interpretation of statutes using argumentation schemes theory [10], which enables its formalization in computational models of argument for defeasible reasoning [11,12,13]. These formalisms allow the representation of interpretive canons as defeasible rules and reasoning with preference relations defined on the set of arguments (hereafter, the Basic Setting) [9].

This paper, using the same general formal framework, extends the Basic Setting by introducing a layer of reasoning not broadly researched so far, namely case-based

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reasoning with and about default preference relations between (classes of) interpretive canons. The model we develop is therefore a hybrid one as it joins rule-based reasoning (encompassed by the Basic Setting) and case-based reasoning to show how arguments based on past cases may be used to justify conclusions about the relative preference for canons. In the classical work on hybrid systems [5], the cases were used first and foremost as sources of information on the meaning of statutory terms; we extend this approach to show what other information, important for interpretive discourse, may be derived from past cases.

## 2. Interpretive Arguments: An Informal Exposition and Standard Formalization

### 2.1. Informal Exposition

Reasoning based on interpretive canons may be conveniently modelled using argumentation schemes theory [10]. The general scheme for arguments based on interpretive canons was formulated by Walton et al. [9]. In the generalized form, the capital letters E, D, M and C represent certain expression, document, meaning and canon, respectively, while the same small letters indicate a specific expression, document, meaning and canon. The relation “interpreted as” joining elements of E and M is a conceptual, extensional relation [6], for instance, an equivalence, difference, inclusion or exclusion relation.

**Major premise:** If the interpretation of E in D as M satisfies C’s condition, then E should (not) be interpreted as M in D.

**Minor premise:** The interpretation of e in d as m satisfies c’s condition.

**Conclusion (interpretive statement):** e should (not) be interpreted as m in d.

This interpretive argument scheme encompasses both positive and negative conclusions, that is, conclusions that favour either acceptance or rejection of a particular interpretation of the expression in question.

### 2.2. Example

Let us assume that in the village of Wooferton exists a rule in a local regulation, prohibiting anyone from entering the public library with dogs. In natural language, the rule reads as follows: *It is prohibited to enter public buildings with dogs.*

It may be subject to doubt whether actually all dogs are encompassed by the said prohibition. Let us present an argument based on a plain meaning canon (the major premise is left implicit; we also do not investigate whether this argument is actually convincing).

**Minor premise:** The interpretation of *dogs* in *Wooferton regulations* as *all dogs* satisfies the *plain meaning* condition.

**Conclusion:** *Dogs* should be interpreted as *all dogs* in *Wooferton regulations*.

However, this interpretation may be contested because, on its account, an assistance dog would not be allowed to the public building in Wooferton. This leads to doubts because then the rights of incapacitated persons would be unduly limited. We may therefore formulate the following teleological argument:

**Minor premise:** The interpretation of *dogs* in *Wooferton regulations* as *dogs kept for company or entertainment only* satisfies the *teleological interpretation* condition.

**Conclusion:** *Dogs* should be interpreted as *dogs kept for company and entertainment only* in *Wooferton regulations*.

Because assistance dogs are not kept for company and entertainment only, they are excluded from the prohibition.

Walton et al. [9] also formulated three general critical questions to arguments based on interpretive canons. It is also possible to determine specific sets of critical questions assigned to argument schemes based on particular canons [14]. Such specific critical questions may provide more definitive answers as to why a particular interpretive statement could be rejected.

If, in connection with a given problem, at least two interpretive statements concerning the same statutory expression are generated, it is necessary to determine which one should prevail. The Basic Setting enables all types of attacks on the arguments supporting or demoting particular interpretive statements. In particular, it is possible to express a preference relation between arguments supporting incompatible conclusions. The conclusion supported by the preferred argument should be accepted rather than another one.

### 2.3. A Formalization of the Basic Setting

Interpretive canons may be represented as defeasible rules in the general form [10]:

$$r: \varphi_1, \varphi_2, \dots, \varphi_n \Rightarrow \psi_1, \psi_2, \dots, \psi_n,$$

where  $\varphi$  and  $\psi$  are formulas in a logical language. The representation of interpretive canons as defeasible rules enables the application of the Defeasible Modus Ponendo Ponens Rule as the leading inference mechanism [15].

The authors [9] also introduce the function operator  $\text{BestInt}(E, D)$ , which reads as the “best interpretation of  $E$  in  $D$ ” and assumes the assignment of meaning to the expression as a result. The assignment of meaning is expressed by set-theoretical relations such as equivalence ( $\equiv$ ), difference ( $\neq$ ) and inclusion ( $\sqsubseteq$ ).

Oftentimes, it will be possible to generate at least two different interpretations of the same expression of the same document, and it will not be possible to accept both of them. In such a situation, it may be necessary to compare the strength of arguments pleading for incompatible conclusions. The Basic Setting [9] introduces a priority relation between both classes of and instances of canons, expressed in the following general pattern:

$$C_1(E, D, M_i) > C_2(E, D, M_j),$$

which reads that canon  $C_1$  assigning meaning  $M_i$  to expression  $E$  in document  $D$  has priority over canon  $C_2$  assigning meaning  $M_j$  to expression  $E$  in document  $D$ . Such a statement provides a defeasible basis for accepting the conclusion of arguments based on  $C_1$  rather than on  $C_2$ .

These basic considerations enable the formalization of reasoning with arguments based on interpretive canons, including all types of attacks between arguments (undermining, undercutting, and rebuttal) and with preferences between arguments, with the use of computational models of arguments enabling the generation of extension on the basis of Dung-style semantics [12,13,16].

### 3. Case-Based Reasoning about Preferences for Interpretive Canons

#### 3.1. Informal Exposition

How does one justify a preference relation between (instances of) interpretive canons? Of course, there exist different possibilities, and the actual persuasive force of particular arguments may vary across jurisdictions. One of the most important insights following from the comparative research is that it is possible to reconstruct general preference relations between classes of interpretive canons: canons based on language have some default priority over other types of arguments. However, canons based on systemic considerations and, eventually, teleology may rebut the former if there exists some additional reason to depart from the result following from the argument that has default priority [2]. It is also possible to reconstruct more specific rules: Walton et al. [9] refer to the work of Alexy and Dreier [17] who have reconstructed a set of such rules; for instance, in the field of criminal law, the ordinary meaning canon has a priority over arguments based on technical meaning.

However, the reconstruction of such rules is not always possible, and even if they are reconstructed, such rules are subject to doctrinal criticism and to multidirectional evolution in case law. For instance, the general default rule model [2] is contemporarily viewed as obsolete in many jurisdictions and in the context of some domains of law, especially where the regulation serves as the implementation of EU law, which is one of the factors leading to a relatively stronger position of canons based on the purpose of regulation. In actual legal practice, except for some specific contexts, establishing a preference relation among canons of interpretation is a matter of balance of reasons rather than the application of generic rules assigning default priorities. These findings suggest that the assignment of preference relations between the canons for a given class of cases may be modelled by means of case-based reasoning (CBR) patterns.

The standard paradigm for modelling CBR in AI and Law is a factor-based approach initiated by HYPO [18] and developed in multiple directions [19]. A factor is typically defined as a “stereotypical fact pattern”, i.e. a generalization from the description of facts of the case, which serves as a reason for a certain outcome of the case (e.g. to decide for the plaintiff or the defendant). Recently, it has been rightly pointed out that factors should be assigned to particular issues rather than to final outcomes directly [20]. This approach helps, in particular, to represent the multi-layered structure of legal reasoning. Accordingly, interpretive dispute also involves deciding certain issues, including whether a specific canon or a class of canons should be preferred to another one.

Classical factors are generalizations from the facts of cases in particular domains. Such factors may also play a role in the solving of interpretive problems, but as far as the disputes about the relative preference for canons are concerned, typically different categories of factors are considered: factors that represent features of the types of statutory regulation, the types of legal norms etc. Below, we present an example list of factors that tend to support either preferring linguistic canons over teleological ones or vice versa. We represent these factors as binary, following the approach initiated in the CATO system [21] and adopted, for instance, in [11]. It should be noted that some of these factors may be interpreted as gradual, enabling representation with magnitudes and dimensions [18,22]; we leave this possibility, however, for future work. Factors that support preference for linguistic arguments use the symbol PrefLing, while those supporting preference for teleological arguments use the symbol PrefTel.

### **Factors supporting preference for linguistic canons over teleological ones**

F1(PrefLing). The interpreted expression is a part of a prohibition directed to an individual.

F2(PrefLing). The interpreted expression imposes sanctions.

F3(PrefLing). The interpreted expression restricts individual liberty or rights.

F4(PrefLing). The interpreted expression is a part of the norm, which is an exception to a more general rule.

F5(PrefLing). The interpreted expression is defined legally.

F6(PrefLing). The interpreted expression imposes a duty on an individual towards a public authority.

F7(PrefLing). The interpreted expression represents the power of a public authority.

F8(PrefLing). The values realized by the regulation are recognized to the greatest extent by literal interpretation.

### **Factors supporting preference for teleological canons over linguistic ones**

F1(PrefTel). The interpreted expression grants rights or liberty to an individual.

F2(PrefTel). The interpreted expression is a part of a general principle.

F3(PrefTel). The interpreted expression is a general clause.

F4(PrefTel). The interpreted regulation implements a European Union law.

F5(PrefTel). The interpreted regulation concerns a constitutional value.

F6(PrefTel). The interpreted regulation concerns human rights.

F7(PrefTel). The interpreted expression concerns the mutual rights and duties of equal persons.

F8(PrefTel). The values realized by the regulation are recognized to the greatest extent by restrictive interpretation.

F9(PrefTel). The values realized by the regulation are recognized to the greatest extent by extensive interpretation.

The above list of factors enables the construction and evaluation of arguments based on CATO-style reasoning, including citing on-point cases (i.e. cases sharing at least one factor with the problem) and distinguishing arguments as well as different types of counterexamples [18,21]. The presented list also enables the development of a factor hierarchy in the style of CATO.

### 3.2. Example Continued

For the sake of application of this framework, let a case from the case base be characterized by two finite, possibly empty, sets of factors relevant to the issue of relative preference among interpretive canons ( $F(\text{PrefLing})$  and  $F(\text{PrefTel})$ ), the adopted preference relation among canons ( $\text{SetOfCanons}_a > \text{SetOfCanons}_b$ ) and the specific preference relation between specific canons and the scope of their application in a given problem:  $C_1(E, D, M_i) > C_2(E, D, M_j)$ . Let us note that the “case” in this sense does not have to concern any set of events (real or hypothetical); it may only concern an interpretive problem concerning an existing or hypothetical regulation.<sup>2</sup>

Case =  $\{F_1, \dots, F_n(\text{PrefLing}); F_1, \dots, F_n(\text{PrefTel}); \text{SetOfCanons}_a > \text{SetOfCanons}_b; C_1(E, D, M_i) > C_2(E, D, M_j)\}$

For instance, let us assume that the Wooferton regulations, discussed in the previous section, have been the subject of a litigation process and that the court found that the teleological canons should have priority over the linguistic ones and thus ruled that “dogs” should be interpreted as “dogs kept for company and entertainment only”. Let us further assume that the court found that the interpreted expression is a part of prohibition directed to an individual ( $F_1(\text{PrefLing})$ ) and the interpreted expression restricts individual liberty or rights ( $F_3(\text{PrefLing})$ ), but at the same time the interpreted regulation concerns constitutional values and human rights (protection of health, equal access to culture):  $F_5(\text{PrefTel})$  and  $F_6(\text{PrefTel})$ . These values are best realized through restrictive interpretation:  $F_8(\text{PrefTel})$ . Therefore, the representation of the Wooferton case could be as follows, where “purposive” and “plain language” are names of specific canons (instantiations of “ $C_1$ ” and “ $C_2$ ”):

Case 1: Wooferton =  $\{F_1(\text{PrefLing}), F_3(\text{PrefLing}); F_5(\text{PrefTel}), F_6(\text{PrefTel}), F_9(\text{PrefTel}); \text{Tel} > \text{Ling}; \text{purposive}(\text{dogs}, \text{Wooferton regulations}, [\text{kept\_for\_company\_or\_entertainment\_only}])\text{dogs} > \text{plain language}(\text{dogs}, \text{Wooferton regulations}, \text{dogs})\}$

Let us now consider a problem case: in the neighbouring town of Cat Hill, there exists a regulation that states the following: *It is prohibited to enter the public playground with any animals dangerous to children, including dogs and cats.*

An interpretive doubt emerges: should the prohibition encompass all dogs and cats *a limine*, or does it concern only such dogs and cats that are dangerous as individual animals? Let us assume that two alternative interpretations exist, one suggested by the plain meaning canon:

*Any animals dangerous to children, including dogs and cats = any animals dangerous to children, including dangerous dogs and dangerous cats.*

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<sup>2</sup> For the sake of simplicity, we assume that only one preference relation between sets of canons was expressed, and that only the preference between the set of linguistic canons and the teleological canons was considered. A generalization is possible.

The other one, extensive with regard to the former one, enhancing the protection of the safety of the children:

*Any animals dangerous to children, including dogs and cats = animals at least potentially dangerous to children, including all dogs and all cats*

Taking into account the factor overlap between Wooferton and the problem, the former case may be persuasively cited to bring the following solution to the Cat Hill case:

Case 2: Cat Hill =  $\{F_1(\text{PrefLing}), F_3(\text{PrefLing}); F_5(\text{PrefTel}), F_6(\text{PrefTel}), F_9(\text{PrefTel}); \text{Tel} > \text{Ling}; \text{purposive}(\text{any animals dangerous to children, including dogs and cats, CatHill regulations, } [\text{at\_least\_potentially\_dangerous\_to\_children}]\text{animals} \sqsupseteq [\text{dogs} \wedge \text{cats}]) > \text{plain language}(\text{any animals dangerous to children, including dogs and cats, CatHill regulations, } [\text{dangerous}]\text{animals} \sqsupseteq [\text{dangerous}]\text{dogs} \wedge [\text{dangerous}]\text{cats})\}$ .

The proposed approach enables representation of not only preference relations between (the instances of) interpretive canons based on predefined, e.g. doctrinal, rules but also the preference relations extracted from the (evolving) case law. The approach proposed by Prakken and Sartor [11] enables the extraction of factor-based rules and preferences between them from case bases. On the layer considered here, such rules will assume collections of factors relevant for the establishment of preference relations among canons as their antecedents and the default assignment of such a preference relation as their consequents.

### 3.3. Argument Scheme

It is possible to reconstruct an argument scheme based on the overlap of relevant factors between the problems and lead to a conclusion concerning the default preference relation between the classes of factors.

#### Argument Scheme for Case-Based Default Preference for Interpretive Canons

**Major Premise:** There exists case  $c$  in a case base such that

$c = \{F_1, \dots, F_n(\text{PrefLing}); F_2, \dots, F_n(\text{PrefTel}); \text{SetOfCanons}_a > \text{SetOfCanons}_b; C_1(E, D, M_i) > C_2(E, D, M_j)\}$

**Minor Premise:** The problem situation is characterized by the set of factors  $\{F_1, \dots, F_n(\text{PrefLing}); F_2, \dots, F_n(\text{PrefTel})\}$  and  $F(c) \cap F(p) \neq \emptyset$  (on-pointness).

**Conclusion:** In case  $p$ ,  $\text{SetOfCanons}_a > \text{SetOfCanons}_b$  and eventually  $C_1(E, D, M_i) > C_2(E, D, M_j)$  should be accepted.

As this argument scheme is a subtype of factor-based argument based on an earlier case, it is subject to characteristic attacks based on distinguishing (pointing out the differences between the cited case and the problem) or on counterexamples (indicating that on-point cases other than the cited one suggest a different conclusion). In the theory of argumentation schemes, such types of attacks may be codified in the list of critical questions; a list of critical questions assigned to an interpretive argument based on

precedent was presented in [14], and they may be used accordingly with regard to a case-based argument concerning the preference relation between interpretive arguments.

#### 4. Discussion and Related Work

Case-based reasoning patterns used for statutory interpretation have been discussed extensively since the early work on hybrid systems [5]. An argument based on precedent is one of the widely recognized canons of statutory interpretation [2]. The argumentation scheme approach, as advocated by [9], is able to express interpretive arguments based on earlier cases. However, these cases may serve as the source of information not only about how statutory expressions should be interpreted but also about the (default) preference relations between the interpretive canons. In certain contexts, these preference relations may be expressed in the form of relatively definitive rules, formulated a priori, for instance, by legal doctrine [17], but there exist jurisdictions and domains of law where such preference relations must be reconstructed from the case law. This paper presents a list of factors that are relevant for the purpose of establishing such preference relations, which may be understood as one of the issues [20] important for solving an interpretive problem.

For simplicity, we assumed that these factors are binary, as in CATO [21] or Prakken and Sartor's model [11]. However, it should be noted that at least some are, in principle, fit for representation through factors with magnitudes; for instance, one might consider the *degree* of restriction of an individual's liberty or rights (F3(PrefLing)). This opens a possibility for integrating the existing proposal with some recent approaches concerning reasoning with precedent [20,22,23,24,25].

There also emerges the question of whether judicial reasoning about the preference relations between interpretive canons should be modelled with the *result model* or the *reason model* [22]. If descriptive adequacy is adopted as the methodological goal, the result model seems fit for the modelling of rationales where the court uses a more magisterial style, leaving the reasons for adopting a particular preference relation implicit, while the latter seems more appropriate for the modelling of argumentative rationales.

A system of statements that play a role in case-based reasoning, focused on the context of common law tradition, has been developed in the AI and Law community [26]. Such a system of statements also needs to be developed in the context of statutory interpretation for both Anglo-American and continental law traditions.

#### 5. Conclusions and Future Work

This paper extends the currently dominating approach to the modelling of statutory interpretation using argumentation scheme theory by introducing case-based reasoning patterns for arguments concerning the preference relations between the interpretive canons. The resulting model is a hybrid one, as it encompasses the rule-based approach following the formalization of argumentation scheme theory and the model of reasoning with precedent introduced by Prakken and Sartor [11] with the classical case-based reasoning patterns discussed in the CATO system. Importantly, the reconstructed set of factors is related to the specific type of issue, namely, to the assignment of priority between the (categories of) canons; hence, it influences the final outcome of any particular case only indirectly. The methodological aim of this work is to bridge the gap

between logical, normative models of legal argument and a more descriptive stance, which aims to represent the diversity of reasoning patterns as they are expressed in the rationales of judicial decisions and analysed in legal doctrine and theory. For the domains where courts apply more argumentative style of rationale drafting and this expresses the rules on which it bases the issue resolution, the reason model [22, 23, 24] may be found more adequate.

Further extensions of the developed framework encompass the inclusion of different layers of interpretive reasoning, such as the interpretation of conditions of interpretive canons themselves (the concepts such as “literal meaning”, or “legislative intent” are subject to numerous controversies) and the representation of controversial distinction between interpretive reasoning and reasoning concerning legal classification or subsumption [27]. The extended model should also support teleological considerations, as discussed in the field of computational models of legal argument [28,29,30].

The presented model offers a version of a case-based argument scheme for ascription of preference between interpretive canons. Arguments schemes for case-based reasoning were discussed in [31] and in [32] which calls for a comparative evaluation.

Another important aspect of the extension of the model is the inclusion of the evolution of interpretive considerations over time, which may be documented in the case law. Such a model would represent not only how the understanding of statutory concepts changes over time [33,34,35] but also how the opinions concerning the relative strength of the interpretive canons and the understanding of the canons themselves change. Referring to past cases may not only stabilize the meaning of statutory terms [36] but also the preference relations among the canons in given domains of law.

Finally, the conceptual framework provided by the multi-layered model of legal reasoning should serve as the basis of an extensive annotation system enabling legal prediction with the use of Natural Language Processing tools based on machine learning (ML)[37]. The problems of legal interpretation have become the subject of interest for ML researchers interested in information retrieval and predictive analytics [38,39].

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