Teaching Creative Legal Reasoning with Examples from Supreme Court Oral Arguments

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ABSTRACT

Transcripts of oral arguments before the US Supreme Court provide interesting examples of creative legal reasoning. They illustrate, often in dramatic fashion, a sophisticated process of concept formation and testing driven by skillful posing of hypothetical examples. From the viewpoint of legal education, however, taking advantage of this resource presents challenges. The underlying processes of hypothesis formation and testing is complex. It is not easy for beginning law students to understand the arguments or for even expert human tutors to provide feedback on students' attempts at performing the process. We introduce a novel project with the dual aims of developing an intelligent tutoring environment for beginning law students to learn from these examples and an AI model of concept formation and testing for providing feedback. Our focus here is to provide an example of the phenomenon to be modeled, describe the model's overall requirements, and relate it to creative legal reasoning.

1. Introduction

The theme of the Artificial Intelligence and Legal Reasoning workshop, the Creative Legal Mind, refers to the importance in legal practice and law school education, of the ability to find creative and appropriate solutions to legal problems, recognizing relevant laws and constructing persuasive arguments. In developing methods of legal education to promote creative legal thinking, the workshop program recognizes the need to clarify the principles and methods of creative legal problem solving, and the potential utility of applying the methods of Artificial Intelligence and Law for this purpose.

In the past year the above researchers have been developing techniques for teaching law students legal reasoning skills using excerpts of oral arguments before the US Supreme Court. These arguments provide examples of accomplished judges and advocates discussing the most appropriate ways to decide important issues given the current state of the relevant laws and the inevitable role of Supreme Court decisions as guides for future legal decision-making.

For a number of reasons, the oral arguments are prime examples of creative legal minds at work.

First, the participating attorneys are thinking "on their feet" in the very dynamic environment of a timed hour-long, high-pressure oral discussion. The participants need to be flexible and creative in taking advantage of openings in an advocate's position and responding to such advances.

Second, in attacking or defending positions, the participants need to satisfy many diverse constraints. The Justices and advocates are aware of the relevant legal statutes and of the past precedents that constrain how the current problem can be decided. Typically, the Justices take an active role in probing the advocates' positions. In responding to the Justices' questions and comments, the advocates must be careful not to compromise their client's interests more than absolutely necessary while maintaining a credible position given the state of the relevant laws and the facts of the case. The advocates and the nine Justice's meanwhile are ever mindful of the need for achieving a position that a majority of the Court will support. The Justices must also consider the ramifications of a proposed decision for future cases. This multifaceted design problem calls for creativity in characterizing and reformulating legal positions.

Third, beside a decision of the case, the ultimate product of the discussion will be a written rationale including a standard or test for deciding the case. Formulating the standard or test may involve creative reasoning. Sometimes the written standard or test is merely an incremental adaptation of a past standard. Often, however, the new test must reconcile principles, policies, or conceptualizations that compete in the particular circumstances of the case to be decided. The advocates and the Court may need to invent new terms or novel formulations in order to reconcile the competing conceptualizations.

Fourth, the Justices routinely employ an inherently creative reasoning tool; they pose hypothetical cases to probe the advocates' proposed standards or tests. In proposing a test, an advocate proposes a *hypothesis* for how the case should be decided, a tentative assumption made in order to draw out and test its normative, logical or empirical consequences. A hypothetical is defined as a made-up situation that involves such a hypothesis, often implicitly.

As described in (Rissland, 1989 and Ashley, 1990) the oral arguments employ hypotheticals in the process of forming and testing legal concepts in the hypotheses. The Justices and advocates engage in a sometimes extended cycle of proposing a legal hypothesis, justifying it, and responding to challenges. In the process of responding to these challenges the hypothesis may be modified, new justifications may be added, and new challenges may ensue.

While the Supreme Court oral arguments provide many concentrated examples of creative legal problem-solving, using them as educational materials presents some significant challenges. For one thing, the hour-long oral argument takes place

against the background of extensive court filings, including the parties' briefs, the proceedings below (including lower courts' opinions) and the relevant statutes and precedents. In focusing law students on particular elements of the arguments, it is often necessary to summarize enough of the background material to ensure that students understand the relevant state of the law and the facts of the case.

Secondly, the arguments are complex. The underlying structure of the argument, the various argument moves and their relationship to the legal issues, the proposed tests or standards that serve as legal hypotheses, and the facts of the case, precedents, and hypothetical examples are complicated. In addition, the argument's structure may be blurred by the participants' sometimes confusing oral prose and by written transcriptions that contain errors or omit details. For instance, the written transcripts may fail to indicate which Justices made which comments, and they omit aural and visual information. Despite these challenges, we are optimistic that helping students understand the underlying argument structure is pedagogically valuable.

It remains to be seen how best to help students to understand that structure. In particular, we are investigating: 1) whether relatively simple annotations of the argument texts in the form of self-explanation prompts can help reveal the structure; 2) whether we can develop a computational model of the underlying argument structure including the use of hypotheticals in formulating and testing legal hypotheses; and 3) how the annotations and computational model can be combined in an intelligent tutoring environment to guide law students in learning that process from the oral argument examples. We plan to follow the same methodological approach as in our past work on CATO (Aleven, 2003). There we used a tutoring application to drive the development of a cognitive model of a legal reasoning task. The model in turn facilitated the development of the ITS.

2. Concept Formation and Testing

In Supreme Court oral arguments, each advocate formulates a legal hypothesis, that is, a standard or test for how the problem should be decided with respect to a set of issues. The attorney defends her hypothesis as serving the (and sometimes reconciling the conflicting) purposes and principles underlying the relevant legal rules and as being consistent with past decisions. The advocate proposes the test more or less explicitly and identifies key points on which the issue should turn. In stating a test, the advocate adopts a conceptual framework with which, she argues, the Court should view the facts at hand from which, it would follow, her client's position would prevail. The conceptual framework admits certain facts, filters out others, and provides a way of characterizing facts relative to the hypothesis. In this way it serves as an interpretation relating the facts at hand to the preferred hypothesis, choosing how best to describe them so as to satisfy the proposed test (or not). In turn, the Justices test a proposed hypothesis using a number of argument moves including posing hypothetical scenarios. These scenarios are designed to challenge the hypotheses' consistency with past decisions and with the purposes and principles underlying the laws at hand.

The first column of Table 1 shows such a cycle excerpted from the case of *California v. Carney,* 105 S. Ct. 2066 (1985). As discussed in Rissland (1989), the *Carney* case involved the legality under the 4th Amendment of a warrantless search of a motor home located in a downtown San Diego parking lot. Police suspected defendant Carney of trading marijuana for sex acts. After they questioned a boy leaving Carney's motor home, drug agents knocked at Carney's door. Carney emerged; an agent entered the motor home without a warrant or Carney's consent and observed the marijuana. Carney was arrested and the motor home searched revealing more marijuana. The State's attorney, Mr. Hanoian, had proposed a bright line test of when the vehicle exception to the warrant requirement should apply: if the vehicle is capable of self-locomotion or is mobile. The defendant's attorney Mr. Homann responded with another test: if the place to be searched has the indicia of a home then a warrant is required.

In the course of the cycle, the Justices' questions and hypotheticals push Mr. Homan to modify his proposed test. In the third column, which represents a model interpretation of the oral argument, one sees three successive versions of the test:

1. If the place to be searched has the indicia of a home then a warrant is required.
2. If a vehicle has the reasonably objectively observable attributes of a home then it requires a warrant to search.
3. If a vehicle has the reasonably objectively observable attributes of a home then it requires a warrant to search unless it is imminently capable of motion.

Indeed, viewing examples like that in Table 1, it is clear that often, the Supreme Court oral arguments are dialogues about proposed tests, their relation to the current case, precedents, and hypothetical examples, and how to modify the proposed tests. The Justices employ a variety of argument moves in facilitating the movement from one version of a proposed test to the next. At 192, a Justice suggests mobility as a necessary concept that Mr. Homann's test omits with its focus on protecting 4th Amendment expectations of privacy in the home. At 231, a Justice poses a hypothetical to probe the meaning of "home". The hypotheticals at 236, 259, 262, and 273 all probe the outer limits of vehicles as "homes" and explore whether Mr. Homann's test provides police with sufficient guidance as to when a warrant is required. The hypothetical at 275 forces Mr. Homann to acknowledge an exception in order to address the exigent loss of evidence.

What "intellectual work" has been accomplished by such cyclic exercises? It appears to be a process by which the Justices and the advocates view the problem from alternative conceptual frameworks and co-construct the most defensible (from the advocate's viewpoint) hypotheses within (and sometimes across) the frameworks for how the case should be decided. It remains for the Justices to select among these competing hypotheses. In the *Carney* case, the Court decided the case in favor of the State of California. They found that the motor home fell within the automobile exception from the search requirement, not just because motor homes like automobiles are mobile and thus evidence may be lost, but because motor homes are subject to the same state motor vehicle regulatory regimes as automobiles. Since drivers are accustomed to the fact that motor vehicles are subject to inspection requirements and police stops for traffic regulations, the Court reasoned, the expectations of privacy in motor vehicles, including motor homes, is much more limited than that in ordinary homes.

Interestingly, there is barely a hint in the oral argument of this motor vehicle regulatory regime rationale. The Justices and advocates discussed the fact of motor vehicle regulation of both automobiles and motor homes, but the discussion did not mention

the consequences for reduced expectations of privacy. At 215 (not shown), one Justice noted that a particular precedent [the *Cady* case] implies "that there are some unusual circumstances where, even though not mobile, the automobile exception applied." Might that have been the seed of the Court's ultimate rationale?

Exchanges like the above occur under extreme time pressure. Using the cyclic process of hypothesis, justification, challenge and response, the Justices, working with accomplished advocates, often engage in an extensive analysis of a case in the short span of time (thirty minutes per side) allocated to oral arguments. Table 1 shows only a brief excerpt, but (Rissland, 1989) maps the considerably expansive analysis the participants traverse, and they do so using little more than repeated applications of this cyclic process.

Table 1: Excerpt of transcript of oral argument made before the US Supreme Court in *California v. Carney,* 105 S. Ct. 2066 (1985), with self-explanation prompts added

Argument Transcript	Self-Explanation Prompts	Model Explanation
182. MR. HOMANN: The motor home was parked; the drapes were closed. It contained upholstered furniture. It contained a table, kitchen features, a refrigerator. It contained all of the indicia of a home.	Is this Mr. Homann's proposed test?	Yes. (Vers. 1) If the place to be searched has the indicia of a home then a warrant is required.
192. QUESTION: Well, you had the possibility of movement here, didn't you? 193. MR. HOMANN: There was no possibility of movement after the driver, the only occupant of the motor home, left it. As a matter of fact --	Is this Mr. Homann's response to Mr. Hanoian's proposed test? What kind of a response is it?	Mr. Hanoian's test is, "if the vehicle is mobile then no search warrant is required." Mr. Homann distinguishes the Carney motor home as not being immediately moveable.
231. QUESTION: We're getting closer to your case. Suppose somebody drives a great big stretch Cadillac down and puts it in a parking lot, and pulls all the curtains around it, including the one over the windshield and around all the rest of them. Would that be a home?	How does this relate to Mr. Homann's proposed test?	It focuses on "vehicles" and poses a hypothetical to determine when a vehicle exhibits sufficient indicia of being a home.
236. MR. HOMANN: Does it have a bed? 237. QUESTION: Yes, yes. 238. MR. HOMANN: If it is reasonably objectively observable that it has the attributes of a home in it, then I think we have to give it those -- I think we have to give it the same protections that we ordinarily give dwelling compartments.	What test does Mr. Homann propose in order to decide whether a search warrant is needed?	(Vers. 2) If a vehicle has the "reasonably objectively observable attributes of a home" then it requires a warrant to search.
259. QUESTION: Would it be enough under your test if the defendant claiming the right testified that he simply has a sleeping bag, sleeps in the back of his van, but drives from place to place. But that's the only living place he has according to his testimony. 260. MR. HOMANN: All of the indicia of a home are not present when it's a sleeping bag in the back of a van. Among other things, I think that the compartments for storing personal items are somewhat key to a determination that it is being used residentially.	How does this relate to Mr. Homann's proposed test? Why does Mr. Homann insist on the compartments for storing personal items?	This goes to what a "home" is and what "reasonably objectively observable attributes of a home" means. It makes the vehicle less home-like to show that it is hard to tell if a vehicle has the attributes of a home. Note Mr. Homann's addition of language meant to satisfy his test provides a bright line guide to police. The reference to compartments for storing personal items is to strengthen the connection to the Chadwick case where searching a suitcase in an automobile trunk required a warrant.
262. QUESTION: What about the old covered wagons?	How does this relate to Mr. Homann's proposed test? How is an old covered wagon different from the San Diego motor home?	Does a covered wagon "have the reasonably objectively observable attributes of a home"?
271. QUESTION: Mr. Homann, what about a van? You see thousands of them on the road. 272. MR. HOMANN: I think that's true. A van ordinarily would not be subject to the motor home exception. 273. QUESTION: Well, I've seen some with the chairs, all upholstered chairs in them. 274. MR. HOMANN: And I think that once it becomes obvious to searching police officers that the item is being used as a home for its residential purposes, then I think the search has	How does this relate to Mr. Homann's proposed test?	It is a limiting case. A van does not require a search warrant, but a van police officers can tell is being used as a home does.

to be -- the search has to be limited. Ordinarily, the situation in which I would anticipate that would arise, the police officers --		
275. QUESTION: In order to help you out, the van is running down the road at 55 miles per hour. 276. MR. HOMANN: That helps me tremendously. That helps me tremendously, because the rule that I've proposed at least is not going to preclude the police from entering the van or the motor home, for that matter, when it is speeding down the highway in most circumstances.	How does this relate to Mr. Homann's proposed test?	It flips one over to Mr. Hanoian's test. Mr. Homann's concession suggests a modification of his test: (Vers. 3) If a vehicle has the "reasonably objectively observable attributes of a home" then it requires a warrant to search unless it is imminently capable of motion.

3. Self-Explanation Prompts

Examples of oral argument can give beginning law students an overview of a creative reasoning process which they may only dimly perceive, even as they engage in it in a Socratic law school class. Conveniently, the Supreme Court oral arguments are available electronically in written and (sometimes) audio form. Most beginning law students probably are unfamiliar with the cyclic reasoning process, or may have missed some aspects of it when forming their conceptual models. Even practicing litigators wonder how best to respond to the Justice's hypothetical challenges (Prettyman, 1984).

While the Supreme Court oral arguments provide concentrated examples of this creative reasoning process, it remains to be seen how useful they are in teaching the process. Although the outward manifestations of the cycle appear in the transcript, the process itself unfolds against a background of shared but implicit knowledge. The participants (advocates, justices and their clerks) have all read written briefs, lower court opinions, relevant statutes and precedents. Moreover, there exists a shared conceptual vocabulary for explaining the argument moves (e.g., in terms of issues, hypotheses and rule-like tests, legal conceptual predicates in those rules, and the purposes and policies underlying the rules) and a set of skills for performing the moves (e.g., distinguishing or explaining away distinctions) with which the students may not be sufficiently familiar. In addition, typically the oral arguments are somewhat sketchy and the hypothetical examples or references to precedents often extremely terse or sometimes highly convoluted. Students must induce their conceptual model from examples that, being real and not cleaned-up textbook versions, are far more complicated than students are accustomed.

The pedagogical utility of an example depends upon the students' ability to assimilate the cycle of hypothesis, justification, challenge and response that occurs within it. In order to make good use of it they must be able to do so well enough to replicate or even extend the cycles on their own.

In (Aleven, et al. 2005) we describe initial efforts using self-explanation prompts (Chi, et al. 1994) to help students reflect on the advocates' proposed tests, the relationship to those tests of examples in the Justices' hypotheticals and in past cases, the modifications to the tests required by the examples, and the relationships of the tests to the principles and policies underlying the particular legal issues.

While we will not reiterate that discussion of self-explanation prompts here, we have included in Table 1's second column examples of the kinds of prompts used. The prompts are designed to focus students on identifying legal hypotheses (i.e., proposed tests and standards) and on the use of examples to test and modify the hypotheses. The third column shows model self-explanations that the prompts ideally would elicit. One issue we aim to address in our pilot studies is how specific the prompts should be. The examples in Table 1 are fairly general; they do not provide much detail about the proposed tests or the relationships between examples and tests.

4. Feasibility of a Computational Model

Even if self-explanation prompts are pedagogically helpful, students may learn better if they can engage in a process of hypothesis formation and testing in an intelligent tutoring environment that provides some feedback (Aleven, 2003; Ashley, et al. 2002). Automatic feedback requires a computational model. We are only in the most preliminary stages of designing one; examples of hypothesis formation and testing like that in Table 1 will drive the design of our model.

Legal philosophers have developed theoretical models of a reasoning process of formulating hypotheses about how a problem should be decided and testing them in light of the decisions of past cases (Brewer, 1996; Sunstein, 1993). The field of AI & Law has developed computational models of some of the fundamental kinds of arguments used to determine whether a proposed rule and decision are consistent with past decisions (Ashley, 1987, 1990; Rissland & Skalak, 1991; Branting, 1991; 1999; Rissland, et al. 1996; Aleven, 1997, 2003). If AI & Law has not yet modeled the process by which Justices pose and use hypothetical examples to test proposed rules for deciding a case, researchers have studied certain aspects of it (McCarty & Sridharan, 1981; Rissland, 1983; 1989; Rissland & Ashley, 1986; Ashley, 1987, 1990). Some AI & Law models have begun to address legal inference as theory construction that takes into account the purported values or purposes the rules are intended to promote (Prakken & Sartor, 1997; Bench-Capon & Sartor, 2001).

Of course, there is little hope that a program can understand natural language exchanges like the one shown in Table 1. In addition, as the hypotheticals indicate, it requires a great deal of commonsense knowledge to pose or compare examples involving Cadillacs with curtains drawn, sleeping bags in vans, or even vans speeding at 55 mph. General commonsense knowledge to pose such hypotheticals across domains is impossible so far (but cf. Cyc).

Our aims are much more limited. Focusing on two or three domains, our goal is to represent a model of argument, a handful of precedents, and enough commonsense knowledge to automate posing hypotheticals, explaining how they relate to a proposed test, and modifying the hypothesis, so that a program can engage students in fairly simple dialogues about proposed tests. Inputs to the model include the facts of a dispute, not represented in text, a statement of a proposed test for deciding it, and the dialogue to date concerning the proposed test. The output is the next move in the dialogue about the proposed test, comprising one of the following types of moves: 1. posing a hypothetical or example drawn from a precedent that challenges the proposed test as not relevant, too broad, or too specific, and 2. responding to the hypothetical or example by explaining why it does not challenge the rule, changing the rule to accommodate the example while still deciding the problem, or distinguishing the example from the problem.

As noted, these dialogues about formulating, assessing, and modifying proposed tests for deciding a case require a fairly deep semantic knowledge representation of objects and legal concepts. This is consistent with the focus on creative legal reasoning. Creativity in law involves creatively formulating rules to achieve sometimes competing goals, and that requires a deeper representation of the meanings of terms and their application (Ashley, 2003). Specifically, it requires the following:

- Object ontology of ordinary objects and events in the domain, for example, homes, vehicles, automobiles, motor homes, vans, suitcases, etc. The ontology needs to include a variety of hierarchies: is_a hierarchies, but also hierarchies indicating objects' functions and components.
- Concept ontology representing legal concepts for use in fashioning proposed tests and standards (i.e., legal hypotheses). Some concepts like "vehicle" may appear in both the concept and object ontologies, but here they are used in a "technical" legal sense as open-textured predicates. Nevertheless, connections across the ontologies (e.g., that vehicle has a common sense meaning as well as a legal one) may motivate certain hypotheticals (e.g., posing a moveable tent or a covered wagon.)
- Legal Rulebase comprising relevant legal rules in the domain, such as the rule requiring a search warrant.
- Priniciples and Policies Rulebase comprising relevant ethical principles concerning protecting expectations of privacy in ones home or providing easily applicable rules to guide police.
- Case and example base containing relevant precedents and commonly discussed hypothetical examples.
- Argument moves for reasoning about proposed tests, their application to cases and examples, and their modification given problematic hypothetical examples, as well as rules for implementing the argument moves.

In pursuing this deeper representation of the meanings of legal concepts and objects, we will traverse territory explored by Thorne McCarty in the Taxman II project, which focused on representing prototypical legal concepts and also deformations or variations of them (McCarty & Sridharan, 1981). Our hope is that by developing more general structures for representing the above domain and legal knowledge, and a general procedure for integrating that knowledge, we will facilitate representing the knowledge and generating dialogues in a variety of legal domains.

Since the dialogues to be modeled are about constructing and assessing legal hypotheses (i.e., proposed tests or standards for deciding a case), the recent work of Trevor Bench-Capon and colleagues on legal reasoning as theory-construction will be very relevant (Bench-Capon & Sartor, 2003). There are, however, a number of differences. That work, like our previous work on CATO and HYPO, employs factors for representing stereotypical patterns of facts that strengthen or weaken a claim or legal issue in a fact situation. Creative legal problem solving of the type at issue here, using hypothetical examples to debug proposed tests, requires implementing a deeper representation of the meanings of the legal predicates and of the examples' objects and events than CATO's Factors or even HYPO's Dimensions allow. Factors and Dimensions are still very relevant to modeling reasoning with hypotheticals (Rissland, 1989 and Ashley, 1990) and some argument moves we observe in the Supreme Court oral arguments clearly have a Dimensional quality, but we doubt that they will be sufficient. In addition, the relationship between the proposed tests, the facts of examples and cases, and the overarching legal values embodied in normative principles and policies appears to us to be more nuanced in the oral argument examples than in the theory-construction work to date.

5. Integrating Model Into ITS

Our ultimate goal is to use the AI model of legal hypothesis testing and formation in an intelligent tutoring system that goes beyond supporting self-explanation and engages students in a simplified hypothesis-testing process. Ideally, the model will generate reasonable dialogues about proposed tests for deciding problem situations. It will embody a fairly rich set of connections between issues, general concerns, proposed tests, and strategies for posing and responding to hypotheticals. We foresee a system in which students can participate in or comment on such dialogues by responding to prompts implemented with menus. The menus can be populated with explanations (good and bad) collected in the planned experiment (Ashley, et al., 2002). Menus, combined with feedback, can be a surprisingly effective way of supporting learning by self-explanation (Aleven and Koedinger, 2002).

Evaluating the ITS and the model also presents challenges. We are attempting to devise a reproducible way to assess the students' understanding of the oral arguments. Unfortunately, no generally-accepted test of argumentation skills or oral argument comprehension is available. Thus, we plan to measure students' understanding by the quality of their answers to the self-explanation prompts and summary questions, as well as their performance on an argumentation task. With respect to grading, we will follow an approach we have tried before (Aleven, 1997), using both "Gestalt grades" and more detailed grading criteria. Once we have a range of student answers, we will ask graders to rank them and to explain their rankings. These rankings will then be used to develop our grading criteria. For evaluating the model, we plan to ask graders to rank program-generated and student-generated dialogues in a blind test.

6. Discussion

The experiments, if successful, will contribute to the AI & Law literature in several ways. The work will demonstrate a practical way in which US Supreme Court oral arguments can be leveraged for instructional purposes. As illustrated above, these arguments are concentrated examples of creative legal reasoning. Using them successfully in a pedagogical context poses certain challenges of helping students understand the dialogues and providing them with feedback on their attempts at performing the hypothesis-testing process illustrated in these arguments. We are experimenting with self-explanation prompts to facilitate understanding and developing a computational model to provide feedback. The model will generate simpler dialogues involving the formulation, testing, and modification of legal hypotheses (i.e., proposed tests and standards) for deciding cases. It will focus particularly on posing hypothetical examples for testing legal hypotheses.

Creative legal reasoning operates with a deep knowledge of the elastic meanings of legal concepts and of their use as a conceptual framework for filtering the nature and description of commonsense objects and events involved in the cases and examples. The Supreme Court oral arguments illustrate the creative process of formulating, testing, and modifying legal hypotheses with hypothetical examples. A proposed test or standard imposes a conceptual framework, filtering the facts in a case and examples, admitting some, suppressing others, and informing the characterization of all. In designing an AI model of the process, we are following a bottom-up approach, identifying examples and implementing a model to account for a small collection of them.

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