

Hypothesis Formation and Testing in Legal Argument¹²

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Abstract

Formulating hypotheses about natural phenomena and testing them against empirical data have long been cornerstones of the natural sciences. As a cognitive framework, hypothesis formation and testing also play important roles in mathematical discovery and in legal reasoning, especially as illustrated in oral arguments before the United States Supreme Court. A hypothesis is a tentative assumption made in order to draw out and test its normative, logical or empirical consequences. A hypothetical is an imagined situation that involves a hypothesis; it is a tool for drawing out those consequences. In Supreme Court oral arguments, the hypotheses are an advocate's proposed test or standard for deciding a case. The Justices pose hypotheticals to probe the advocates' tests, assessing their meaning, consistency with past decisions, and their legal and policy implications. In challenging a proposed test by posing hypotheticals, the Justices sometimes induce the advocate to modify or abandon the hypothesis. This paper presents a model of the role of hypotheticals in assessing legal hypotheses and illustrates it with examples drawn from actual Supreme Court oral arguments. A study of these examples and of jurisprudential models has led to a more complete schematization and model of the process of framing and testing legal hypotheses for purposes of designing an Intelligent Tutoring System. The paper will introduce a new approach to help law students understand the interpretive role of hypothetical reasoning in legal argument, a computerized collaborative instructional environment for graphically marking up and reflecting upon the relationships of proposed tests, hypothetical challenges, and responses like distinguishing the hypothetical or modifying the test.

Introduction

On May 31, 1979, agents from the California Drug Enforcement Agency patiently watched a Dodge Mini Motor Home parked in a downtown San Diego lot as a youth stepped out of the vehicle. The window shades of the motor home had all been drawn. Previously, the agents had received information that someone had been using the motor home in connection with trading marijuana for sex. After questioning the youth, the agents asked him to return to the motor home and knock on the door. One Charles Carney stepped out. The agents identified themselves; one of them entered the motor home without a warrant or consent, observed drugs and drug paraphernalia, arrested Carney, and impounded the motor home. At a preliminary hearing, Carney moved to suppress the drug evidence discovered in the motor home. Carney argued that since he lived in his motor home, the police should have obtained a warrant before they searched it under the Fourth Amendment of the U.S. Constitution. The Court rejected the claim, holding that there was probable cause to arrest Carney, and that the search of the motor home was authorized under the automobile exception to the Fourth Amendment's warrant requirement. On appeal, the California Supreme Court reversed the conviction, holding that the expectations of privacy in a motor home are more like those in a dwelling than in an automobile. The United States Supreme Court agreed to consider an appeal by the State of California.

More than five years later, the case came up for oral argument before the U.S. Supreme Court. The advocates for Mr. Carney and for the State of California would each have one half hour to convince the nine Justices that his side should win. For the State of California, an

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advocate argued that the motor home should be treated like an automobile. He proposed a test: If the place-to-be-searched has wheels and is self-propelling, then no warrant should be required. Such a rule, he argued, would serve the underlying principles at stake. It would prevent the loss of evidence in an emergency situation and it would be a “bright line” rule that the police could easily apply. Mr. Carney’s advocate, Mr. Homann, posed an alternative test: If the place-to-be-searched has the indicia of a home then a warrant is required. Only such a rule, he argued, would preserve the Fourth Amendment principle of autonomy and privacy in ones home.

In the face of the competing analogies between motor homes, automobiles and houses, and of the conflicting principles of exigent loss of evidence of a crime, privacy in ones home, and police efficiency, how would the Justices decide which proposed rule to adopt, if either? Or would they come up with a rule of their own? The judicial decision-making process is not transparent, of course, but one thing is clear. In the course of the oral arguments, the Justices posed more than a dozen hypotheticals to the advocates as a way of probing the proposed tests and assessing their consistency with past decisions and appropriateness for deciding future disputes. For example, Mr. Carney’s attorney, Mr. Homann, presented his test as follows:

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.

Later, a Justice posed a hypothetical that led Mr. Homann to modify his test:

231. QUESTION: 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?

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.

A subsequent hypothetical from a Justice led Mr. Homann to modify his test yet again:

275. QUESTION: Mr. Homann, what about a van? ...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, 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. *California v. Charles B. Carney*, 1984 U.S. TRANS LEXIS 209 No. 83-859 (U.S. Sup. Ct.)

This paper offers an account of the kind of legal reasoning with hypotheticals illustrated above. Based on recent jurisprudential theories, the account explains the cognitive and interpretive work that hypotheticals perform. It then addresses why the skills of hypothetical reasoning are important but difficult to teach in law schools. Finally, it offers a model of this kind of reasoning and outlines a technological approach to helping law students learn these skills.

Defining Hypotheses and Hypotheticals in Law

The concepts of “hypothesis” and “hypothetical” are closely and functionally related. In arguments generally, an advocate often states a *hypothesis*, a tentative assumption made in order to draw out and test its normative, logical or empirical consequences. A *hypothetical* is an imagined situation that involves a hypothesis. The arguer designs the hypothetical and employs it help draw out those consequences.

In legal argument, a hypothesis often takes the form of a proposed test or standard for deciding an issue in the case before a court. An advocate (or even a judge) may formulate the test or standard based on the relevant statutory or constitutional texts, if any, and the interpretations in past cases involving the issue. The advocate asserts that (1) the proposed test or standard is the right standard for the court to apply in deciding the issue, and (2) when applied to the facts of the case, the standard yields the outcome urged by the advocate.

Judges employ hypotheticals to assess the proposed tests or standards and their application to the case at hand. In oral arguments before the U.S. Supreme Court, as noted, the justices frequently pose hypotheticals to probe an advocate's recommended test or standard in order to draw out the legal consequences of adopting and applying it. The hypotheticals explore the meaning of the proposed test, its consistency with relevant legal principles, policies, and past case decisions, its application to the case's facts, and its sensitivity to changes in the facts.

As a seasoned Supreme Court advocate put it, posing hypotheticals "is a testing, a probing, an evolving process that hopefully will illuminate the whole."

[T]he Court is testing the outer reaches both of what the advocate is asking it to declare and of what the Court may, in fact, have to decide. 'If we take this tack,' the Justices are asking, 'how will it affect a different set of facts?' 'What happens if we add this or that variant?' 'What are the outer limits of what you are proposing?' 'What will the next case look like?' ... 'How narrowly must we construct our decision in order to avoid all kinds of problems?' 'Or how broadly must we fashion it in order to cover the essential points that may be troubling the lower courts?' ... [M]any hypotheticals are ... addressed to ... fellow Justices. A hypothetical from one wing of the Court to another may be a way of saying: 'Look, if you start down that road, this is where it will lead you.' Or: 'Do you really want to go as far as I think you are heading, even if you have the votes?' (Prettyman, 1984, p. 556)

The Role of Hypotheticals in Legal Reasoning

More generally, hypotheticals are conceptual tools for anyone—attorneys, judges, law professors or students, to employ in reasoning about statutory provisions, legal rules, underlying policies, and how they apply in specific situations. A systematic comparative study of legal argument (MacCormick & Summers, 1997, pp. 528-9) succinctly summarizes eight purposes for which academics and practitioners employ hypothetical cases in legal reasoning:

1. "construction of clear cases to which a code section, statute or doctrine must apply if it is to have any rational application;"
2. "the construction of *reductio ad absurdum* arguments demonstrating the unsoundness of proposed applications of code sections, statutes or doctrinal formulations;"
3. "the elaboration of coherent patterns of applications of authoritative language and demonstrations of how proposed or possible applications would not be coherent,"
4. "the formulation of paradigm cases so as to display a policy rationale in its clearest application;"
5. "the articulation of distinctions between paradigm cases and borderline cases;"
6. "the creation of conceptual bridges between cases along a continuum;"
7. "use [of] a well-designed hypothetical case to help justify extending a rule;"
8. use of a "hypothetical case ... to help justify rejecting the application of a rule in a precedent to the case ... about to be decided."

The authors maintain that, "use of hypothetical cases in [academic] work...is a major technique used in the United Kingdom and in the United States, and also in most civil law countries...."

Hypotheticals and Legal Rules

One may observe all of these uses in arguments before and opinions of U.S. appellate courts; each is associated with a pattern of reasoning that involves various argument moves and responses based on hypotheticals. Although all of the uses are related, the last two are most relevant for purposes of elaborating a model in which hypotheticals are used to assess proposed tests or standards. Both involve using hypotheticals to guide decisions about applying rules and both are drawn from Melvin Eisenberg's *The Nature of the Common Law*. Eisenberg identifies the particular pattern of reasoning associated with each use (1988, p. 99).

"A court is faced with a case that presents admitted difficulty in choosing between competing rules. [It] states a hypothetical that has, at least in the court's view, three critical characteristics. First, the hypothetical differs from the case.

Second, the hypothetical seems easier to decide than the case—in the hypothetical, one of the competing rules seems clearly preferable.

Third, although the hypothetical differs from the case, the case cannot be distinguished from the hypothetical under applicable social propositions. Accordingly, if one of the competing rules should govern the hypothetical, it should govern the case as well.”

In arguing that a rule should *not* be extended, the reasoning pattern is similar, except that the indistinguishable hypothetical is one in which the proposed rule “seems clearly improper” and leads to the conclusion “since the hypothetical future case should not be decided that way, neither should the real present case.” (Eisenberg, 1988, p. 101)

To be useful in these reasoning patterns, the hypotheticals must be different from the new case and somehow easier to decide from a normative viewpoint, but ultimately not rationally distinguishable from the new case. The manner of attempting to distinguish the hypothetical from the case at hand in the third step is particularly important. “Although the hypothetical differs from the case,” ultimately “the case cannot be distinguished from the hypothetical under *applicable social propositions*.” [emphasis added] As discussed more fully below, for Eisenberg, “applicable social propositions” include moral principles and policies.

An example of the reasoning pattern can be seen in the court’s opinion justifying a case decision, *Vincent v. Lake Erie Transportation Co.* 109 Minn. 456, 560 (1910), as interpreted by Eisenberg. (Eisenberg, 1988, p. 100) The defendant, Lake Erie Transportation, had moored a vessel to plaintiff Vincent’s dock to unload cargo when a fierce storm came up. The vessel finished unloading, but instead of leaving, the vessel rode out the storm in the relative safety of the dock. The defendant’s master reinforced the mooring to avoid damage to the vessel. The waves repeatedly forced the vessel against Vincent’s dock, however, causing extensive damage to the dock. Under the doctrine of necessity, the defendant had a right to keep the vessel moored at plaintiff’s dock, but was the defendant nevertheless liable to pay for the damage or not? In analyzing that issue, the court posed a hypothetical that differed from the case’s facts, but one that was easier for the court to decide:

Let us imagine in this case that for the better mooring of the vessel those in charge of her had appropriated a valuable cable lying upon the dock. No matter how justifiable such appropriation might have been, it would not be claimed that, because of the overwhelming necessity of the situation, the owner of the cable could not recover its value.

Since the court could not rationally distinguish the hypothetical from the case at hand, the court ultimately decided that the defendant was liable for the damage to plaintiff’s dock. The reasoning pattern led to that conclusion in the following way. First, the differences between the hypothetical and the case are noted. In the hypothetical, unlike the case, the defendant acquires something of value at the plaintiff’s expense by intentionally taking possession of the cable. Second, the hypothetical appears to be easier to decide than the case. “Surely one who appropriates another’s goods, even for the best of reasons, should make compensation.” Third, the applicable social propositions are found not to support treating the case differently from the hypothetical. There are differences: B’s acquiring value at A’s expense versus B’s preserving value at A’s expense, B’s taking A’s goods versus B’s using A’s goods in a way that foreseeably diminishes their value, and B’s intentionally appropriating value from A versus B’s acting in a way that likely but unintentionally causes A’s value to diminish. According to Eisenberg, if the shipping company would be liable in the hypothetical, these differences do not warrant treating it as not liable in the case. (Eisenberg, 1988, p. 100)

In elaborating the reasoning pattern, Eisenberg, of course, explicates inference steps that the court left implicit, but it does seem to be a plausible interpretation of the court’s reasoning.

In particular, the interpretation suggests the conceptual work that the hypothetical performs. Since the hypothetical is arguably indistinguishable from the problem scenario, it provides leverage or traction in reasoning about the problem because the hypothetical has been designed to present an easier problem to decide than the case under conditions that prove on deeper analysis to be normatively indistinguishable. As the legal philosopher S.L. Hurley describes it in her account of coherence in legal reasoning,

Hypothetical cases are not merely posed by lawyers and judges, but answers to questions about how they should be resolved are often taken for granted in a way which the argument of the case at issue depends on. The answers to hypothetical cases may be implicitly assumed rather than explicitly stated, but nevertheless they are often depended on in the reasoning of opinions.... This is to say that legal hypotheses are responsible to data about settled hypothetical cases as well as settled actual cases; both are among the cases with respect to which the requirement that like cases be treated alike must be understood. (Eisenberg, 1988, pp. 234-35)

According to Hurley, a settled hypothetical case is one “whose resolution would be clear to the relevant decision-maker or decision-makers were the case to be considered.” (Hurley, 1990, p. 221) This is related to the use of hypothetical paradigm cases in normative and legal reasoning, that is, clear cases of the application of a rule, principle, or policy or of the resolution among conflicting rules, principles or policies.

Hypotheticals and Legal Principles and Policies

The way that moral principles and policies influence legal decision-making with doctrinal rules is even clearer in Eisenberg’s account. As noted, applicable social propositions play a specific and important role in the reasoning patterns involving hypotheticals (as well as those with precedents and analogies). He defines applicable social propositions as “those moral norms, policies, and experiential propositions that it is proper for a court to employ,” including “usages (experiential propositions about how the world works in a relevant subgroup).” (Eisenberg, 1988, p. 43). As Schauer succinctly notes in a review of Eisenberg’s book,

[D]octrinal propositions are to be applied or extended ... only if they are congruent with the social propositions applicable to the same type of conduct...[A] doctrinal proposition may be reformulated when, without such reformulation, it would generate a result different from the one that would be generated by the applicable social proposition (pp. 66-68-Eisenberg). The determination of social congruence, ... also occurs when a doctrinal proposition is followed... [A] decision not to set aside a doctrinal proposition is a decision, sometimes explicit but usually implicit, that the doctrinal proposition is congruent with the applicable social propositions. (Schauer, 1989, p. 465)

From the viewpoint of jurisprudential theory, this role for applicable social propositions may account for the kind of dynamism characteristic of common law legal reasoning. Much turns on what courts are willing to regard as similar, as Levi observed. Since similarity depends at least in part on applicable social propositions, what counts as similar will change as those propositions change. In Levi’s terms,

“the rules change as the rules are applied.” (Levi, 1949, p. 3) “The finding of similarity or difference is the key step in the legal process.” (p. 2) Reasoning by example shows the decisive role which the common ideas of the society and the distinctions made by experts can have in shaping the law. ... The concept is suggested in arguing difference or similarity in a brief, but it wins no approval from the court. The idea achieves standing in the society. It is suggested again to a court. The court this time reinterprets the prior case and in doing so adopts the rejected idea. ... Ideas first rejected but which gradually have won acceptance now push what has become a legal category out of the system or convert it into something that may be its opposite.” (pp. 5-6)

In fact, this role may entail too much dynamism. Schauer offers an amendment of Eisenberg’s model to add additional constraints to this process of reformulating doctrinal propositions. According to Schauer’s “presumptive positivism”, “a doctrinal proposition presumptively controls even when it is inconsistent with some, or all, social propositions. Only when the weight of the inconsistency is overwhelming is the presumption overcome.” (Schauer, 1989, p. 470)

For present purposes, however, it is worth noting the role of hypotheticals in this reasoning pattern; they mediate a process of determining the congruity of a legal rule as applied to the facts of the case at hand with the applicable social propositions. “Reasoning by hypothetical depends on an interplay between applicable social propositions and conceivable doctrinal propositions and cases.” Hypothetical reasoning is not alone in playing this mediational role according to Eisenberg. Reasoning from precedents and analogical reasoning follow similar

patterns. Although “reasoning from hypotheticals is not directly supported by either the specific principle of *stare decisis* or the general standard of doctrinal stability” it is not, however, merely a “rhetorical rather than a decisionmaking device.” (Eisenberg, 1988, p. 102)

The Interpretive Work of Hypotheticals in Legal Reasoning

Eisenberg’s explication of the example in terms of a reasoning pattern for arguing with hypotheticals suggests the feasibility of identifying reasoning schemas associated with all of the various uses of hypotheticals in arguments. Although one could explicate similar reasoning patterns for the other six uses of hypotheticals listed above, space allows only summarizing what the roles of hypotheticals in those patterns entail. Posing hypotheticals allows decision-makers to explore novel cases that present new dilemmas, new issues of congruity with applicable social propositions, new reasons for interpreting rules, and new hypotheses, while at the same time affording flexibility in setting up comparisons.

Posing hypotheticals is a systematic methodology for creative, exploratory reasoning. It helps the decision-maker explore the space of situations that may and may not be distinguished on a normative and policy basis from the case at hand; these situations serve as fulcra for arguments that the rule should extend to the case at hand or not. Hypotheticals can take into account current societal circumstances that give rise to novel issues of congruity with applicable social propositions. One frequently sees hypotheticals that involve, for instance, the latest dilemmas to which technological innovations in communications or surveillance give rise. Exploring this space means not only considering novel scenarios but new moral norms and policies. “Reasoning from hypotheticals may... enable a judge to move from a social proposition with which he is naturally empathetic, because it involves everyday experience, to a social proposition that is more remote from his experience, but to which his awakened empathy can be transferred.” (Eisenberg, 1988, p. 103)

This creative reasoning includes exploring new formulations of hypotheses (i.e., tests or rules) for deciding the case, and how these new tests and standards relate to previous decisions.

[R]easoning from hypotheticals may serve as a sort of standard of doctrinal stability run in reverse from the future to the present. By means of such reasoning the court can spin out the alternative legal regimes that would follow, under the standard of doctrinal stability, from the adoption of competing legal rules, and then choose the rule that promises the best of these regimes.” (Eisenberg, 1988, p. 103)

Using hypotheticals to revise hypotheses or tests for deciding the problem at hand is important in Hurley’s 5-step legal reasoning process, as well; hypotheticals help to gather data for formulating and modifying hypotheses of the form: “... ‘Reason X tends to outweigh Reason Y when it is the case that p, while Reason Y tends to outweigh Reason X when it is the case that q; when it is the case that both p and q, but not r, Reason X has more weight, but when r is present as well, Reason Y has more weight’, and so on.” Having (1) specified a problem in terms of alternative resolutions and reasons and (2) considered the purposes that underlie the reasons, a reasoner (3) gathers data, that is, settled hypothetical and actual cases, to which the reasons apply. The reasoner then (4) tries “to formulate hypotheses about the relationships between the conflicting reasons under [the] various different circumstances ... which account for those resolutions. ... We thus go back and forth between stages three and four, looking for settled actual and hypothetical cases that help us to refine our hypotheses about the relationships between the conflicting reasons in various circumstances.” Finally, the reasoner (5) works “out the consequences of the best hypothesis ... arrived at for the original case at issue” in terms of an all-things-considered ranking. (Hurley, 1990, pp. 222-3)

Since hypotheticals are artifacts constructed by the reasoner, one can design them flexibly to facilitate comparisons for purposes of exploring alternatives. For instance, a reasoner may generate a scenario that differs from the problem in only one respect to enable a *ceteris paribus* comparison or a series of hypotheticals that incrementally and cumulatively differ from

the problem for a “slippery slope” into a *reductio ad absurdum*. Hypotheticals can make particular assumptions explicit, explore linkages among facts, theories, and evaluation criteria, explore the core as well as the fringe of a concept’s meaning, and incrementally make rules relevantly more and less general. For instance, the Justice’s example in the Introduction of the “stretch” Cadillac with curtains explores the linkages among the facts, proposed rule, and policies underlying the motor home dilemma.

Teaching Skills of Hypothetical Reasoning

Given the role of hypotheticals in facilitating reasoning about how factual circumstances, reasons, doctrinal rules, hypotheses, principles and policies in a particular legal domain interact and how those interactions bear on deciding a particular problem, hypotheticals play a prominent role in legal education. Not only is reasoning from hypotheticals “a common method of adjudicative reasoning” but “a central method of teaching law and legal reasoning to law students.” (Eisenberg, 1988, p. 99). “Today, an advocate must, more than ever before, prepare himself for a stream of hypothetical questions touching not only on his own case but on a variety of unrelated facts and situations.” (Prettyman, 1984, p. 555)

For various reasons, however, teaching skills of hypothetical reasoning in law school is somewhat hit-or-miss. It is probably rare for law school educators to focus students explicitly on reasoning with hypotheticals in the sense of explaining such patterns of reasoning. (But see Gewirtz, 1982) Instead, professors engage students in classroom discussions, in which they elicit students’ propositions of law and then pose hypotheticals to test the propositions in a manner similar to the way Supreme Court justices do. Thus, it is generally assumed that students will pick up this and other reasoning skills from the process of performing the skills in class. Of course, not all professors are very good at this Socratic style of teaching and not all students participate in the classroom discussions. Students may take notes about the discussions, but they probably do not take detailed notes of the give-and-take between professor and students at the level of recording the hypotheticals and responses.

As a result, in their normal law school education, students do not ordinarily encounter a ready supply of transcribed examples of legal reasoning with hypotheticals. This is where the Supreme Court oral arguments come in. They are transcriptions of actual working dialogues in which highly competent legal reasoners employ hypothetical reasoning, among other things, to explore facts, concepts, rules, policies and principles in making real-world decisions. As such, they are unique examples of a kind of reasoning and argumentation instructors would like students to be able to perform in a classroom setting. Furthermore, the oral arguments are increasingly available; for the more recent or more famous cases, there are on-line databases of written transcripts (Lexis® and Westlaw®) and even aural recordings (e.g., see the OYEZ website, <http://www.oyez.org/oyez/frontpage>).

On the other hand, as teaching examples, the oral arguments are fairly oblique. The argument participants, the justices and advocates, have all read the same materials: the proceedings below, the precedents, the statutes, the briefs. Law students do not share that background knowledge, although, of course, they can “read up” on the subject on their own or with the aid of summaries. Moreover, the arguments unfold in a somewhat haphazard way. Advocates keep talking until interrupted by a Justice, and then they need to follow wherever the Justices may lead. Thus, it may be difficult for students to see and explain interpretive relations in the argument texts: to identify and formulate the proposed tests, explain how a hypothetical relates to a test and why, explain how an advocate responds to a hypothetical, and evaluate the response to hypothetical vis á vis the test. Even if they read and understand the arguments, it may still be difficult for students to make such interpretive arguments on their own: hard to invent and tailor factual hypotheticals for purposes of testing a proposed test and hard to integrate the facts,

the normative reasons why a suitable test should reach a certain outcome, and the criteria for making and evaluating arguments and selecting appropriate responses.

Our research asks the question whether an explicit model of reasoning with hypotheticals can help teach law students to understand and appreciate examples drawn from the Supreme Court oral arguments by helping them to identify, relate, and explain the argument components in the transcripts. It explores a number of different ways to engage law students with the model, one of which will be illustrated below.

Model of Hypothetical Reasoning

Reasoning schemas involving hypotheticals such as Eisenberg's explication of the *Vincent* case example and Hurley's 5-step process suggest their utility in explaining to law students the uses of hypotheticals in legal argument and helping them to recognize and make such arguments. For instance, instructors might encourage students to identify reasoning schemas in realistic examples of legal argument and reflect upon them. It may even be possible to implement the schemas in computer models that could enable experimentation with the schemas or using them in computerized tutoring systems for law students.

Such a schema is captured in a heuristic 3-ply interpretive process of reasoning with hypothetical and other counterexamples. It is intended to guide a student, advocate or a judge in considering a new case, the current fact situation or cfs, by: (1) making a point in an argument by posing a test for deciding the cfs and justifying it with reasons, (2) constructing a response to the point by posing a past-case or hypothetical counterexample on behalf of a respondent, and (3) rebutting or otherwise replying to the response on behalf of the proponent in one of three ways: by disputing the counterexample's significance, modifying the proposed test, or abandoning the proposed test.

Point: For *proponent*, propose a test and argument for deciding the cfs.

Examine past cases and their decision rules and see if a past rule applied to the cfs arguably leads to a favorable decision. If so, use that rule as a proposed test for deciding the cfs and give reasons. If not, construct a proposed test that, when applied to the cfs, leads to a favorable decision and is consistent with the results of some important past cases, and give reasons.

Response: For *respondent*, pose past-case or hypothetical counterexample and argument.

Inspect *proponent's* test and argument in light of past cases/rules that arguably lead to the opposite conclusion. Find a past-case counterexample or construct a hypothetical counterexample to the proposed test, such that the counterexample is:

- [analogous to] [disanalogous from] the cfs (i.e., a suitable test when applied to the counterexample should yield [the same][a different] result) and yet the proposed test when applied to the counterexample leads to [a different][the same] result, and give reasons.

Recovery: For *proponent*, rebut or otherwise reply to *respondent's* counterexample:

- Save the proposed test by disputing that a suitable rule applied to the counterexample should yield [the same] [a different] result (i.e., show that the supposedly analogous counterexample is really [disanalogous] [analogous]). Or
- Modify the proposed test so that it behaves like a suitable rule or does not apply to the counterexample (i.e., [remove][add] a condition (or [expand][limit] a concept definition such that the modified rule applies to the counterexample and yields the same result, applies to the counterexample and yields a different result or no longer applies to the counterexample, as appropriate.) Or
- Abandon the proposed test.

The heuristic process is an attempt to adapt HYPO's 3-ply arguments to a more complex kind of legal argument, one that makes explicit a proposed test for deciding the cfs, a test that is phrased in terms of abstract legal concepts. It involves posing hypothetical counterexamples to the tests and making arguments that a proposed test should or should not apply to the

counterexamples. It also requires an ability to modify the proposed test as a way of recovering from the response. It accommodates at least some aspects of the schemas introduced by Eisenberg and Hurley³, and it also is adapted from Lakatos's mathematical reasoning method of proof and refutations in three heuristic rules.⁴ Note that this heuristic process could guide the interactions of an advocate and a judge in an oral argument, or guide the reflections of a reasoner like an advocate who is trying to prepare an argument by considering the possible responses of a judge.

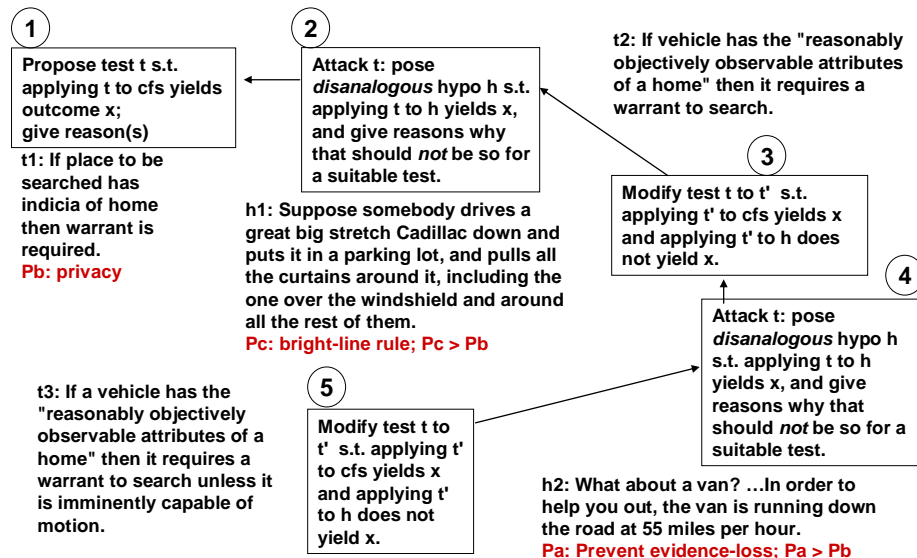


Figure 1: Applying 3-Ply Process Model to Carney Oral Argument Example

The 3-ply heuristic reasoning process can be used, as in Figure 1, to explicate the Introduction's example of an advocate's proposing a test and then modifying it in response to a series of hypotheticals posed by the Justices. At (1), Mr. Homann, the advocate for Mr. Carney, has proposed a test t1 that yields a favorable outcome and justifies it in terms of a reason, principle Pb: the Constitutional right of privacy in ones home. At (2), a Justice attacks test t1 with the curtained stretch Cadillac hypothetical. The Justice implies that the test applies to the hypothetical, but that it should not apply because of principle Pc, the police need a bright-line rule, which trumps Pb. At (3), the advocate recovers by modifying the test t1 into t2, adding the qualification "reasonably objectively observable attributes" to accommodate Pc's requirement of an easy-to-apply rule. At (4), the Justice attacks t2 with the speeding van hypothetical. Test t2 applies, but it should not given principle Pa, which protects against loss of evidence of a crime and which trumps Pb. This leads Mr. Homann to recover at (5) by modifying test t2 into t3, adding a condition that the vehicle not be "imminently capable of motion."

³ (Hurley, 1990, p. 227) illustrates an application of her 5-step method to the *Carney* case oral argument.

⁴ **Rule 1.** If you have a conjecture, set out to prove it and to refute it. Inspect the proof carefully to prepare a list of non-trivial lemmas (proof-analysis); find counterexamples both to the conjecture (global counterexamples) and to the suspect lemmas (local counterexamples). **Rule 2.** If you have a global counterexample discard your conjecture, add to your proof-analysis a suitable lemma that will be refuted by the counterexample, and replace the discarded conjecture by an improved one that incorporates that lemma as a condition. Do not allow a refutation to be dismissed as a monster. Try to make all 'hidden lemmas' explicit. **Rule 3.** If you have a local counterexample, check to see whether it is not also a global counterexample. If it is, you can easily apply Rule 2. (Lakatos, 1976, p.50)

Computational Approach to Teaching Model of Hypothetical Reasoning

Unquestionably, the above model of hypothetical reasoning is complex. It is remarkable that law school professors' use of a Socratic method of teaching presumes that students can learn a process of reasoning something like that described in the model without ever making the model explicit. Perhaps it is even more remarkable that the presumption is often correct! Nevertheless, it is tempting to think that a computational implementation could help more students learn this kind of complex behavior, and learn it more easily with greater appreciation of its underlying assumptions and the possibilities for creative responses and recoveries.

On the other hand, it appears that no AI and Law program has modeled all of this behavior computationally. (Indeed, I do not present such a computational model here, only a goal.) There have been a number of notable efforts. (McCarty & Sridharan, 1981) developed a program that modeled an argument in a Supreme Court tax case, including reasoning with rule concepts, past cases, and an accepted hypothetical. My goal is to generalize such a model to account for more aspects of the last section's 3-Ply interpretive process model and that can apply to a wider range of cases and arguments. As noted, the 3-Ply process model generalizes the 3-Ply arguments in HYPO (Ashley, 1988; 1990). HYPO posed hypothetical variations of problem situations to strengthen/weaken arguments; it represented cases in terms of factual dimensions and used five heuristics to pose hypos by modifying cases along dimensions. It modeled a number of argument moves relevant here such as analogizing, distinguishing, and posing counterexamples, but not in dialogical context in which hypothetical counterexamples are used to put pressure on proposed tests and their terms. (Ashley, 1988; 1990) interprets a number of Supreme Court oral arguments in terms of a dimensional model and the five heuristics; (Rissland, 1989) applied this approach to interpreting the oral argument in the *Carney* case. These interpretations did not focus on modeling a number of phenomena of interest here: proposing tests, using hypotheticals to challenge proposed tests, and responding to such challenges. Similarly, CATO (Alevan, 1997) and a variant (Ashley, et al., 2002) engaged students in making case-based legal arguments analogizing and distinguishing cases, but not posing hypotheticals to assess tests. (Bench-Capon & Sartor, 2003; Chorley & Bench-Capon, 2005) present a model and program that reasons with cases represented as factors whose significance is based on abstract values, models arguments about values principles, and rule-making that reflects preferences among conflicting values. While relevant to various aspects of the 3-Ply interpretive process model, it does not model the entire behavior. More generally in AI machine learning, (Hayes-Roth, R., 1983) and (Pease, Colton, et al., 2002) describe programs that perform Lakatos-style reasoning in card game play (i.e., Hearts) and with number theory concepts, respectively.

It may well be, however, that a different kind of computational approach may assist law students to learn skills of hypothetical reasoning, and to use the 3-ply interpretive process model in helping them interpret examples of this type of reasoning when they encounter it in, say, Supreme Court oral arguments. A collaborative mark-up program, developed by Niels Pinkwart under the direction of Vincent Alevan and me, helps law students to identify the components of the 3-ply process as they read transcripts of Supreme Court oral arguments. (Pinkwart, et al., 2006) For instance, Figure 2 shows a mark-up of a portion of the oral argument in the *Carney* case corresponding to the example in the Introduction. The program allows students to highlight portions of the text and associate them with icons corresponding to the facts of the cfs, proposed tests for deciding the cfs, and hypotheticals for challenging the proposed tests. Students fill in the details of the cfs facts, proposed tests, and hypotheticals and link these components together in order to indicate: (1) relevant analogies or distinctions between the cfs and a hypothetical—these are important in the response or recovery step—and (2) modifications to tests in recovery from a hypothetical challenge.

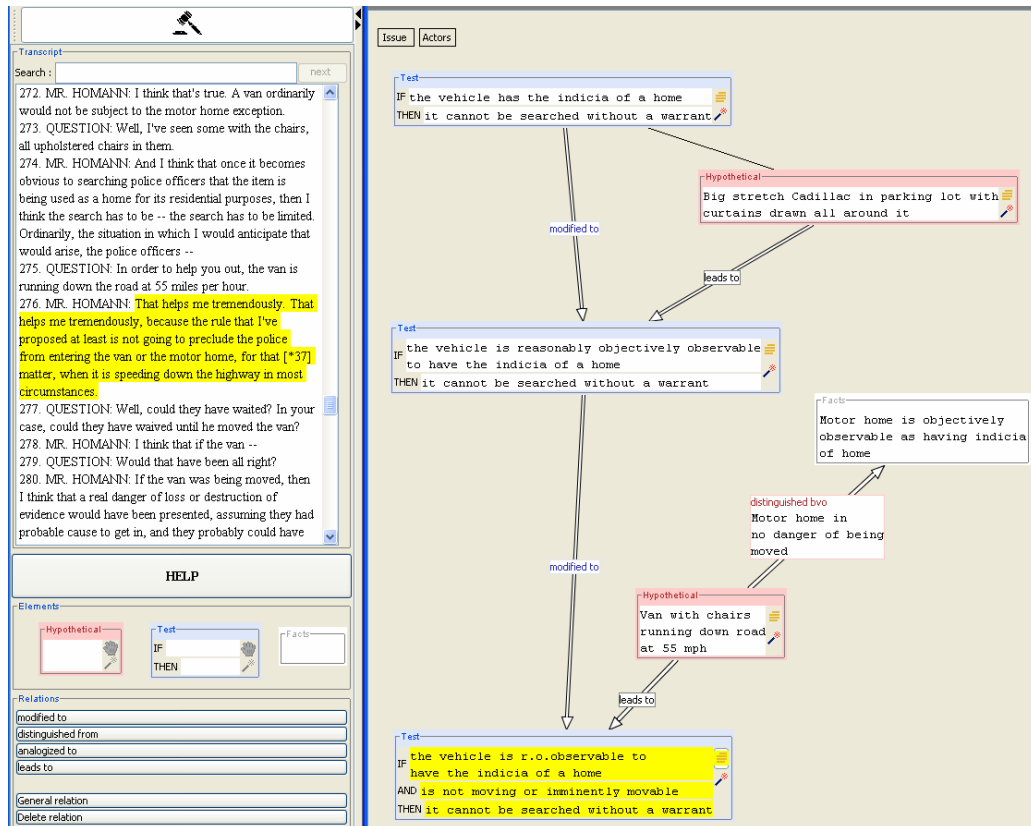


Figure 2: Marking Up Carney Oral Argument Text

In Figure 2, for instance, the series of modified tests of Figure 1 are represented with a link to the corresponding argument text as well as various relations, analogies, and distinctions among the hypotheticals and the cfs. The program has a grammar of rules to assist students in filling out the representation of the argument. Using the rules, once the program detects pedagogically significant collections of tests and hypotheticals, it encourages the student to reflect about the relationships among them. It would note that a student had not linked up the curtained stretch Cadillac hypothetical to the facts of the cfs, ask how these two compared, and suggest reflecting on the relationship of that comparison to Mr. Homann’s argument and the (upper) two versions of his proposed test.

In fall, 2006, we will conduct an experiment to see how well students using this approach learn skills of hypothetical reasoning and can transfer them to new arguments and contexts.

Conclusion

In the end, Mr. Homann’s responses to the Justice’s hypothetical challenges were to no avail. They ruled against Mr. Carney, holding his motor home to be covered by the automobile exception to the Fourth Amendment warrant requirement. In their opinion, written some time after the oral argument and after the Justices could confer about their decision, the Court seemed to regard the motor homes as vehicles by virtue of the fact that like automobiles, motor homes are subject to state license and registration requirements, thus diminishing expectations of privacy, a point mentioned in the oral arguments, if only briefly. *California v. Carney*, 471 U.S. 386 (1985). In fact, predicting case outcomes from the oral arguments is notoriously risky.

Instead, as a recent study observes, “oral arguments provide information to justices that allows them to act strategically.” The study reports empirical analyses of justices’ conference discussions and majority opinion syllabi to support the conclusion that the oral arguments matter in terms of the final decision; things referred to there were discussed at the oral arguments. The

posing of hypothetical questions during oral arguments is one of a number of ways in oral argument for “justices to determine the ramifications of choosing one decision over another.... These questions allow the justices to push counsel about how particular policy choices will hold up in slightly different circumstances and factual patterns.” (Johnson, 2004, pp. 49, 125, 127)

While learning skills of interpretive reasoning with hypotheticals is a key law school lesson, not just for budding Supreme Court advocates, but for everyone engaged in reasoning about facts, underlying principles, proposed tests and rules, such skills are not easy to teach. This paper has described a heuristic 3-ply interpretive process of reasoning with hypothetical and other counterexamples, illustrated its utility in explicating an example drawn from Supreme Court oral arguments, and sketched an approach for a computational tool to help law students identify and reflect upon the role of hypotheticals and how to respond to them.

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