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The Development of Legal Reasoning Skills in Law Students: An Empirical Study

Stefan H. Krieger

This article describes a study examining the development of legal reasoning skills in law students through their law school careers and reports some preliminary findings comparing the cognitive development of medical and law students.¹ During the past two decades, scholars have begun to study the process by which medical students progress from novices to expert practitioners and the effect of different curricula on this development.² Studying subjects at all levels of medical expertise—from first-year medical students to medical residents to experienced specialists in practice, these researchers have developed theories grounded in empirical findings about the reasoning process of expert

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1. The study was conducted in consultation with educational psychologist Vimla L. Patel and one of her associates, David Kaufman. It extended her studies on the development of skills of medical students. Vimla L. Patel et al., *Differences Between Medical Students and Doctors in Memory for Clinical Cases*, 20 *Med. Educ.* 3 (1986).
2. See, e.g., David R. Kaufman and Vimla L. Patel, *The Nature of Expertise in the Clinical Interview: Interactive Medical Problem Solving*, in *Proceedings of the Tenth Annual Conference of the Cognitive Science Society* 461 (Hillsdale, N.J., 1988); Vimla L. Patel, David R. Kaufman, and José F. Arocha, *Conceptual Change in the Biomedical and Health Sciences Domain*, in *Advances in Instructional Psychology* (Robert Glasser ed., Mahwah, N.J., 2000) [hereinafter Patel et al., *Conceptual Change*]; Vimla L. Patel, José F. Arocha, and David R. Kaufman, *Expertise and Tacit Knowledge in Medicine*, in *Tacit Knowledge in Professional Practice* 75 (Robert H. Sternberg and Joseph A. Horvath eds., Mahwah, N.J., 1999) [hereinafter Patel et al., *Expertise and Tacit Knowledge*]; Vimla L. Patel and David R. Kaufman, *Clinical Reasoning and Biomedical Knowledge: Implications for Teaching*, in *Clinical Reasoning in the Health Professions* 117 (Joy Higgs and Mark Jones eds., Oxford, 1995); Vimla L. Patel and Guy J. Groen, *The General and Specific Nature of Medical Expertise: A Critical Look*, in *Toward A General Theory of Expertise* 93 (K. Anders Ericsson and Jacqui Smith eds., Cambridge, 1991); José F. Arocha and Vimla L.

physicians and the most successful methods for training them.³ This study is an initial attempt to extend this research program to the field of law.

A disclaimer is necessary at the outset. Findings of an individual study are only preliminary, subject to confirmation by replication. The sample size was small; the subjects were from a single law school; and no attempt was made to control for the differences in background or academic achievement of the different subject groups. As limited as this study may be, however, it demonstrates that empirical methods can help assess law student learning. By using an anonymous sample of students and a somewhat controlled environment, this type of research can provide methodological controls which do not exist in studies based solely on anecdotal evidence or theoretical analysis.⁴ I hope that this study will be tested with further, fine-tuned research, and the data collected will be reassessed by third parties.

Background

Researchers examining numerous fields have described four levels of professional expertise: (1) *Novice*: someone at the early phases of acquiring expertise or basic competencies; (2) *Intermediate*: someone who is above the novice level but below a subexpert; (3) *Subexpert*: someone with a generic knowledge but inadequate specialized knowledge of the domain; (4) *Expert*: someone with a specialized knowledge of the domain.⁵ This research has shown that across domains, experts and novices tend to use different reasoning strategies. Novices tend to use backward-directed reasoning: they first generate hypotheses from the data they have gathered and then search for

Patel, Novice Diagnostic Reasoning in Medicine: Accounting for Evidence, 4 *J. Learning Sci.* 355 (1995); Henry P. A. Boshuizen and Henk G. Schmidt, On the Role of Biomedical Knowledge in Clinical Reasoning by Experts, Intermediates and Novices, 16 *Cognitive Sci.* 153 (1992); Vimla L. Patel, Guy J. Groen, and Geoffrey R. Norman, Reasoning and Instruction in Medical Curricula, 10 *Cognition & Instruction* 335 (1993); Vimla L. Patel and Guy J. Groen, Developmental Accounts of the Transition from Medical Student to Doctor: Some Problems and Suggestions, 25 *Med. Educ.* 527 (1991); Vimla L. Patel, Guy J. Groen, and Geoffrey R. Norman, Effects of Conventional and Problem-Based Medical Curricula on Problem Solving, 66 *Acad. Med.* 380 (1991) [hereinafter Patel et al., Effects of Conventional and Problem-Based Curricula]; Vimla L. Patel, Guy J. Groen, and José F. Arocha, Medical Expertise as a Function of Task Difficulty, 18 *Memory and Cognition* 394 (1990). See generally Stefan H. Krieger, Domain Knowledge and the Teaching of Creative Legal Problem Solving, 11 *Clinical L. Rev.* 149, 153-54, 178-85 (2004).

3. See generally Krieger, Domain Knowledge, *supra* note 2, at 153-54, 178-85.
4. The problem administered to the subjects in this study, the transcripts of the subjects' answers (the data collected), the protocols developed to measure the data, and the analysis conducted are posted on The Student Legal Reasoning Survey website, available at <<http://www.studentlegalreasoning.info>> (last visited Sept. 16, 2006).
5. Patel et al., Expertise and Tacit Knowledge in Medicine, *supra* note 2, at 80. "Domain knowledge" is the explicit knowledge of the concepts, principles, and structures of thinking about the particular domain in which a problem arises. *Id.* at 77-78. See generally Krieger, Domain Knowledge, *supra* note 2, at 149, 153.

information to confirm or refute them.⁶ This type of reasoning, also termed “hypothesis-driven reasoning,” is slow and cognitively demanding because the problem solver must engage in the lengthy process of testing multiple hypotheses. Experts, on the other hand, tend to use forward-directed or “data-driven reasoning.” The data observed by the problem solver triggers a line of thinking that leads to a solution in a semi-automatic or reflexive manner. This type of reasoning makes smaller demands on working memory than backward-directed reasoning.⁷

In medical practice, for example, “[f]orward reasoning is characterized by drawing inferences from available data (e.g., a patient’s symptoms) and sequentially moving toward the solution without having to explicitly test and evaluate hypotheses (e.g., medical diagnoses).”⁸ When examining patients, forward-reasoning physicians reason inductively, recognizing important cues in the symptoms that lead directly to diagnoses, ignoring irrelevant information and focusing on relevant cues. Backward-reasoning physicians think through the problem deductively. They examine their patients and then develop alternative hypotheses about the possible diagnoses and test out these theories with the information obtained from the patient. In this process, they tend to focus on more irrelevant facts than experts. Researchers have found that forward reasoning provides an efficient, natural way of approaching problems and is more typically associated with accurate problem-solving in medical diagnosis than backward reasoning.⁹

Cognitive scientists theorize that experts tend to use forward reasoning because they have highly developed schema systems. Schemas are “ordered patterns of mental representations that encapsulate all our knowledge regarding specific objects, concepts, or events.” Developed from repeated encounters with similar experiences, “[a] schema can be viewed as a coded expectation about any aspect of an individual’s life, which dictates which characteristics of a given event are attended to, which are stored for the future, and which are rejected as irrelevant.”¹⁰ In regard to the development

6. See Ed O’Donnell, *Use of Forward Versus Backward Reasoning During Audit Analytical Procedures: Evidence from a Computerized-Process-Tracing Field Study*, 44 *Acct. & Fin.* 75, 76 (2004).

7. Mark P. Higgins and Mary P. Tully, *Hospital Doctors and Their Schemas About Appropriate Prescribing*, 39 *Med. Educ.* 184, 186 (2005).

8. Patel et al., *Effects of Conventional and Problem-Based Medical Curricula*, *supra* note 2, at 382. For an illustration of the differences between forward and backward reasoning in the field of financial auditing, see O’Donnell, *Use of Forward Versus Backward Reasoning*, *supra* note 6, at 86.

9. Researchers have found, however, that experts need to resort to backward-directed reasoning when they face difficult and factually unfamiliar problems. Faced with such problems, forward reasoning is not helpful because the situation is unlike previous cases, and experts must engage in developing and testing different hypotheses. Patel et al., *Conceptual Change*, *supra* note 2, at 329, 387.

10. See Higgins and Tully, *Hospital Doctors*, *supra* note 7, at 185.

of expertise, researchers theorize that as a result of greater experience in a particular domain, experts use their well-developed schemas to filter out reflexively irrelevant data and focus on relevant information to come to a solution. Novices, who have not yet developed such schema systems, must rely on backward reasoning for their problem solving, testing multiple hypotheses before they can develop a solution."

Medical Studies

The current study attempts to extend research conducted on the development of medical expertise by educational psychologist Vimla Patel and her associates, first at McGill University's Centre for Medical Education and presently at Columbia University's Department of Biomedical Informatics.

In several of their studies, Patel and her colleagues explored the development of the reasoning process throughout medical school.¹² In these studies, subjects were divided into three groups of eight students: students in their first year of medical school; second-year medical students who had completed all their courses on basic medical science but had not yet begun clinical work; and final-year students three months before their graduation. The subjects were given particular medical problems and asked to recite the facts of the problem, their solution, and the explanation for their solution.

The findings from this research demonstrate that as novices progress to become experts, their patterns of reasoning change. Initially, novices rely on their lay experiences and commonsense explanations for solving medical problems. Even when provided with relevant medical texts, they are unable to use them effectively to determine an accurate diagnosis. Second-year medical students are able to identify specific rules that they have learned in their courses but have difficulty applying them in drawing inferences and developing a coherent explanation for the problem. They recall more facts in a case than experienced doctors, but many of those facts are irrelevant. And when they are provided textual material about the problem, their reasoning becomes even less coherent. Finally, final-year medical students reason more like expert doctors. They recall fewer facts of the case than second-year students but draw more consistent inferences and develop more coherent explanations for problems than those students. Even when presented with relevant textual material after their initial explanations, they do not change their diagnosis but merely elaborate on their findings.

From these and other studies of medical education and practice, Patel and her researchers have found that expert medical problem-solving is usually

11. *Id.*

12. Vimla L. Patel et al., *Biomedical Knowledge in Explanations of Clinical Problems by Medical Students*, 22 *Med. Educ.* 398 (1988); Vimla L. Patel et al., *Reasoning Strategies and Use of Biomedical Knowledge by Students*, 24 *Med. Educ.* 129 (1990).

associated with forward-directed reasoning.¹³ The data provided to expert physicians trigger different schemas and reflexively lead to particular diagnoses. Novice medical students, on the other hand, tend to use backward reasoning, thinking through the problem more explicitly, developing alternative hypotheses about the possible diagnoses, and testing out these theories with the information obtained from the patient. In the process, they will focus on more irrelevant facts and will likely use inconsistent and incoherent reasoning.

The Study

Similar to the medical studies, this study presented law students at several stages of their education with a problem. Their responses were transcribed, coded, and then analyzed to identify patterns of reasoning for students at each stage.¹⁴ Our goal was to analyze whether and how reasoning skills develop as law students progress through each year in law school. Do they initially rely on common sense and lay experience to solve legal problems? Do they then begin to apply legal rules in solving problems but in an inconsistent and incoherent manner relying on both relevant and irrelevant facts? Do they eventually start to filter out irrelevant facts and focus on facts relevant to an effective legal theory? When, if ever, do they use backward-directed reasoning?¹⁵ Do they ever start to use the forward-directed reasoning of an expert practitioner? Our hypothesis was that the development of reasoning skills in law students would be similar to that of medical students because of the similar cognitive processes involved in developing expertise. We were unsure, however, how the differences between the domains of medicine and the law or between pedagogy in medical and law schools would affect the outcomes. The conclusiveness of any tentative findings depends in large part on the data's robustness. As with much qualitative empirical work, however, future replication of this study is desirable.

Subjects

The study was conducted with Hofstra Law School students during the 2003-2004 academic year. The research focused on three groups: (1) incoming law students; (2) law students completing the first semester of their second year; and (3) law students nearing graduation. Each group contained ten volunteer subjects. We initially solicited volunteers with an open memo and e-mail to each group of students assuring them that their identities would

13. See *supra* notes 8-10 and accompanying text.

14. The study was modeled on Patel, Differences Between Medical Students and Doctors, *supra* note 1; Patel et al., Biomedical Knowledge in Explanations of Clinical Problems, *supra* note 12, at 398; Patel et al., Reasoning Strategies and Use of Biomedical Knowledge, *supra* note 12, at 129.

15. These questions were suggested by studies cited in notes 1, 2, 12.

be kept confidential.¹⁶ When the initial response was not overwhelming, we offered a \$15.00 payment to each participant and were able to fill the full complement of subjects.

This sample size may appear too small and the absence of any attempt to account for differences in demography, academic background, or course experience either between members of each group or between different groups, may seem flawed. This is a qualitative study however, attempting, like case studies or ethnographic field work, to analyze data so as to develop explanations about phenomena we cannot directly observe.¹⁷

Stimulus Material

The stimulus material used in this study was a consumer fraud problem concerning the sale of a used car. The fact pattern is based on the Illinois Appellate Court decision in *Miller v. Williams Chevrolet*.¹⁸ In that case the salesman told the customer that the car had been “executive driven” and was a “great used car.” The title of the car that was given to the buyer, however, stated that the former owner was a rental car company. The customer experienced no serious malfunctioning of the car. While the actual case raised issues of both common law fraudulent misrepresentation and alleged violation of a state consumer fraud statute, the problem provided that no statute pertained to the situation so that the inquiry would be limited to issues concerning a possible common law claim.

The problem raised four primary legal issues: (1) whether “executive driven” was a representation of a fact or mere puffing; (2) whether the representation was material; (3) whether the buyer reasonably relied on the misrepresentation; and (4) whether the customer incurred any damages.

The case was selected as a basis for the problem for several reasons. The factual issues were simple enough so that students entering law school would have some lay understanding—either through general reading or their own firsthand experiences—of fraud claims. Serious analysis of the legal issues in the case, however, required a basic knowledge of the elements of common law fraudulent misrepresentation. Since basic elements of common law fraud, including the issue of puffing, are covered in the first-year curriculum, second-year subjects should have had some exposure to rules relating to the problem and should have some ability to reason about them. The problem, therefore,

16. Copies of the solicitation memos are available at <<http://www.studentlegalreasoning.info/memos.html>> (last visited Sept. 16, 2006). Hofstra’s Institutional Review Board found that this study was exempt from its rules governing humans as research subjects because it concerned educational testing.

17. Richard K. Neumann, Jr. and Stefan H. Krieger, Empirical Inquiry Twenty Years after the Lawyering Process, 10 Clinical L. Rev. 349, 353 (2003).

18. 326 Ill. App. 3d 642, 762 N.E.2d 1 (2001). A copy of the problem is contained in Appendix “A.”

provided an opportunity to assess the effect of this doctrinal exposure in the first year.

Moreover, the subject of fraudulent misrepresentation arises throughout the law school curriculum, for example, in classes such as Business Organizations, Commercial Transactions, Debtor-Creditor, Real Estate Transactions, Securities Regulation, and Bankruptcy. Accordingly, it was probable that many if not all of the third-year subjects had obtained some further and repeated exposure to the rules of common law fraudulent misrepresentation after the first year. The problem therefore created the opportunity to measure the effect of this additional knowledge. Also, some aspects of the problem raise more advanced legal, factual, and policy issues for which a level of knowledge different from mastery of common law rules was helpful. A full consideration of the issue of damages, for example, required examination of diminished resale value rather than the more obvious deterioration in functioning. Finally, the gaps in the fact pattern, for example about the specifics of the buyer's discussion with the salesman, provided opportunities for identification of possible circumstantial evidence and areas for fact investigation.

In addition to the facts from the actual case, several red herrings were included in the fact pattern to add to its complexity: (1) the buyer was described as a thirty-seven year old electrician with an eighth grade education; (2) English was identified as his second language; (3) while the client's name is "Samos," the name on the title was written as "Stamos"; and (4) the sticker stated that the car was sold "as is." The first two facts were added to create some sympathy for the buyer but neither appears to have any legal relevance. The "client" in the problem was literate (he had an eighth-grade education, read the sticker at the dealership, and signed all the paperwork), and did not complain that he misunderstood anything that the salesman told him or the documents provided to him. Under these circumstances, the client's limited intellectual and language capacities probably were not relevant to a common law misrepresentation claim.¹⁹ Likewise, the misspelling of the name was irrelevant to any actionable common law claim. This fact was included, however, to assess whether any subjects, especially first-year students, might focus on purely formalistic claims. Finally, the reference to the "as is" representation on the sticker was included to examine whether the subjects had an understanding of the relationship between a tort claim for misrepresentation and waiver of contractual warranties.²⁰

19. In most circumstances, a reasonable person standard is used for determining the justifiable reliance element for a misrepresentation claim. See Restatement (Second) of Torts §538(2)(a).

20. A waiver of warranties usually does not provide a defense to a claim for fraudulent misrepresentation. See, e.g., *Gable v. Boles*, 718 So.2d 68, 72 (Ala. 1998); *Wagner v. Rao*, 180 Ariz. 486, 885 P.2d 174, 177 (Ariz. 1994); *Godwin Aircraft, Inc. v. Houston*, 851 S.W.2d 816, 822 (Tenn. 1993); *Reilly v. Mosley*, 301 S.E.2d 649, 651 (Ga. 1983).

Before the problem was administered to the different subject groups, it was test run on two experts to identify the existence of any major glitches.²¹ These experts, an experienced commercial law litigator and a seasoned trial court judge, readily identified fraudulent misrepresentation as the possible cause of action, identified most of the issues discussed in the actual case, and disregarded the irrelevant facts. One expert stated that as a practical matter, the case was not economically feasible unless a lawyer could get attorneys' fees. Since this issue requires knowledge of the mechanics of law practice management rather than substantive law, an attempt was made to remove it from consideration by including language in the problem that the state has a statute "that allows a court to award attorneys' fees to the prevailing party in any case concerning a consumer transaction."²²

Interview Methods

This study was conducted using "semi-structured" interviews of each of the subjects.²³ In each interview, the subjects were asked to verbalize their thoughts as they had them. The purpose of using this method was to replicate as closely as possible the actual cognitive process of the subjects. A major problem faced by cognitive psychologists in studying thinking is that "thinking cannot be observed by other people." One of the methods developed to address this difficulty is the "think-aloud protocol," in which subjects are asked during the interview to verbalize their thoughts spontaneously as they emerge in attention. Even though use of this method does not provide a perfect match between subjects' thoughts and reports, researchers have found consistently strong evidence that this method results in a strong correlation between the two.²⁴

In some situations, however, the think-aloud protocol is ineffective by itself for the collection of relevant data. For example, in routine cases, experts often provide very sparse answers, resulting in unsatisfactory information for assessing their reasoning process.²⁵ For this reason, Patel and her associates have refined the think-aloud protocol by using various kinds of probing tasks to elicit a more detailed verbalization of the reasoning process. These semi-structured

21. Given the small sample size of two, the purpose of the test run was only to determine if any major defects existed in the drafting of the problem, not to determine the "expert" answer.
22. A number of states have statutes with such attorneys' fees provisions. See, e.g., Mont. Code Ann. §30-14-133(3); Ohio Rev. Code Ann. §1345.09(f)(2); Idaho Code §48-608(4).
23. For a complete description of the theory underlying this methodology, see Vimla L. Patel et al., *Diagnostic Reasoning and Medical Expertise*, 31 *Psychol. Learning & Motivation* 187, 194-95 (1994).
24. Researchers have found that if subjects are asked to recall their reasoning process after a long delay, the completeness and accuracy of recall is impaired, and subjects are prone to infer their thoughts as opposed to correctly recall them from memory. K. Anders Ericsson, *Protocol Analysis*, in *A Companion to Cognitive Science* 425, 429, 430 (William Bechtel and George Graham eds., Malden, Mass., 1998).
25. Patel et al., *Diagnostic Reasoning and Medical Expertise*, *supra* note 23, at 194-95.

interviews require subjects to answer specific questions about their reasoning.²⁶ Subjects are still encouraged merely to verbalize their thoughts but are given particular prods during their interviews.

The semi-structured interviews in this study were all conducted and taped by second- and third-year law student research assistants. A script was drafted for the interviews and research assistants were trained in techniques for using the modified think-aloud protocol.²⁷ Pursuant to the script, the research assistants told the subjects that they were participating in a study on the development of legal reasoning by law students; that they were not being graded on their answers; and that although their responses were being taped, their identities would be kept confidential. The research assistants then described the process the subjects should use in answering the question at the end of the problem:

When answering the question please verbalize your thoughts as naturally as possible. Please do *not* explain or rationalize your thoughts but rather communicate them in a free flowing manner. The easiest way to do this is to go through your normal thought process but say everything aloud as if no one else were in the room.

At this point, the subjects were given a sample LSAT problem to give them a test run at the process. Throughout the answer to this problem, the researchers would discourage subjects from explaining their answers or reasoning and encourage them to verbalize their normal thought process. Then the research assistants gave the subjects the problem and told them:

Please read the problem (aloud or to yourself) and verbalize any thoughts you have *as you read*. This should mirror your normal thought process. It should be as natural as possible. Remember, just as in the previous exercise you only need to report what you are thinking without explaining why you think it. Following the presentation of the case you will read a question. The information on the page is all the information available regarding the problem.

After the subjects read the problem, the research assistant retrieved it and asked them to provide a summary of the facts of the case. After exhausting the subjects' memory of the facts, the research assistants returned the problem to the subjects and asked them for their thoughts on the question at the end of the problem. In order not to skew the data, the research assistants were trained to refrain from asking the subjects closed questions about their responses and only to encourage verbalization of their reasoning process. When subjects ended their answers, they were prodded to verbalize any other thoughts they had.

26. *Id.*

27. A copy of the protocol is included in the material for this study's website, available at <<http://www.studentlegalreasoning.info/script.html>> (last visited Sept. 16, 2006).

Coding the Data

The tapes were transcribed after the interviews and marked at fifteen second intervals so the time periods for a subject's reading the problem, reciting the facts, and starting the answer to the problem could be calculated.²⁸ The transcripts were then analyzed using the "propositional analysis" method employed by Patel and her associates.²⁹ This technique involved (1) segmenting each of the transcripts by clause (propositions); (2) identifying each of the facts set forth in the written problem; (3) identifying each of the rules discussed in the decision in *Miller v. Williams Chevrolet*; (4) coding each of the transcripts, noting all the facts and rules which corresponded with those in the problem and case and those that did not; (5) coding the transcripts for all inferences subjects drew from the facts; and (6) coding the transcripts for procedural rules or approaches identified by the subjects (e.g., need for legal research or fact investigation or consideration of evidentiary or burden allocation issues).³⁰

From their review of other studies of the reasoning process, Patel and her colleagues have concluded that the propositional analysis technique—examining discrete propositions in the subjects' responses—is superior to other methods for examining complex written or spoken discourse about the solving of a problem. Some researchers, for example, consider only the common sense surface structure of the problem solvers' answers by merely examining the literal words stated. Such an approach, Patel and her associates assert, fails to take into account research on the psychology of comprehension that indicates that stimuli are stored in memory in small chunks of meaning. These chunks can best be represented as propositions. Accordingly, the Patel researchers argue, the propositional analysis technique more adequately represents the actual process of memory and comprehension by focusing on the propositions contained in the transcripts, the discrete chunks of the subjects' responses.³¹

In the present study, the process of coding was initially conducted independently by my two research assistants and me. Protocols were developed for the different types of coding.³² After the individual codings were made, the three coders met and

28. Copies of the transcripts are available at <<http://www.studentlegalreasoning.info/group1.pdf>>, <<http://www.studentlegalreasoning.info/group2.pdf>>, and <<http://www.studentlegalreasoning.info/group3.pdf>> (last visited on Sept. 16, 2006).

29. Patel et al., Differences Between Medical Students and Doctors, *supra* note 1, at 5. For a full description of the theories underlying propositional analysis technique and the empirical research supporting it, see Walter Kintsch, *The Representation of Meaning in Memory* (Hillsdale, N.J., 1974); Carl H. Frederiksen, *Representing Logical and Semantic Structure of Knowledge Acquired from Discourse*, 7 *Cognitive Psychol.* 371 (1975).

30. Patel et al., Differences Between Medical Students and Doctors, *supra* note 1, at 3-4.

31. Patel et al., Biomedical Knowledge in Explanations of Clinical Problems, *supra* note 12, at 3-4.

32. Specific descriptions of these protocols will be provided in the following section.

reconciled any discrepancies. Comparisons were made between the codings for the different groups.

Analysis of Data

Level of Recall of Facts

The transcriptions were first coded for identification of facts during the second stage of the interview when subjects were asked to summarize the facts.³³ The purpose of this coding was to determine if, through the acquisition of a legal knowledge base throughout the years in law school, the subjects' treatment of relevant and irrelevant facts in a legal problem changed significantly. Examining each proposition stated by the subjects during their fact recitals, we independently coded the facts as "fully recalled" or "partially recalled," and reconciled them using a standard protocol.³⁴ We coded a subject's statement as fully recalled if it substantially restated the proposition in the problem; if the recital omitted or misstated a material element of the proposition, it was coded as partially recalled.

Additionally, each proposition set forth in the problem was scored for its relevancy: (1) most relevant to answering the question in the problem; (2) relevant to answering the question; (3) limited relevance to answering the question; and (4) little, if any, relevance to answering the question. To make this determination, I analyzed the text of the *Miller* decision and identified every fact the court used in its analysis of the common law fraudulent misrepresentation claim.³⁵ We scored the essential facts to the plaintiff's fraudulent misrepresentation cause of action as "1" and cumulative evidence in regard to the most relevant facts as "2." We scored every contextual fact for the relevant propositions (those facts that would have to be shown at trial to lay the foundation for the relevant facts) as "3." We also scored any statement that might be used as a defense to a fraud cause of action as "3." All other statements were scored as "4." Of the sixty-four factual propositions in the problem, five were scored as having most relevance;³⁶ eleven were scored as being relevant; thirty-two were

33. The protocol used for the fact recitation coding is posted on the study's website available at <<http://www.studentlegalreasoning.info/protocol.html>> (last visited Sept. 16, 2006). In one of the Group 1 (first-year student) interviews the protocol was not followed precisely. The research assistant failed to retrieve the problem after the subject (Subject 3) read it and allowed the subject to give a summary of the facts of the case with the problem in hand. To address that problem, we coded that subject's recital of facts focusing solely on his/her identification of facts in the answer to the problem.

34. A chart reflecting those codings is available at <<http://www.studentlegalreasoning.info/factid.html>> (last visited on Sept. 16, 2006).

35. This analysis is available at <<http://www.studentlegalreasoning.info/relevancy.html>> (last visited Sept. 16, 2006). We did not use the responses of the test run expert practitioners, *supra* note 21 and accompanying text, for this scoring because of the small sample size. A significant correlation existed, however, between the facts identified by those experts and those set forth in the *Miller* decision.

36. These facts were: (1) Warren told [plaintiff] that the car was "executive driven"; (2) [plaintiff]

scored as having less relevance; and sixteen were scored as having little or no relevance.³⁷

The summary of the data on the subjects' recital of facts is set forth in Tables 1 to 4. In regard to recall of all sixty-four of the factual propositions, Table 1 shows that second-year students (Group 2) recalled a higher mean percentage of all the factual propositions than first-year students (Group 1)—24.7 percent compared to 20.4 percent. Third-year students, however, recalled only 20.2 percent of all the propositions, slightly less than the second-year subjects and comparable to first-year subjects. There appears to be some difference between the mean percentage of the overall propositions—both relevant and irrelevant—recalled by the subjects in the different groups with only the second-year students recalling a higher percentage than subjects in the other groups.

Table 1: Mean Percentage of Propositions Recalled

	Group 1	Group 2	Group 3
Fully Recalled	14.1 (5.9)	19.2 (3.2)	15.6 (4.7)
Partially Recalled	6.3 (1.8)	5.5 (2)	4.5 (2)
Total	20.4 (5.9)	24.7 (4.3)	20.2 (5.8)

*SD in parentheses

As to the recall of *relevant* propositions, on the other hand, the differences are more substantial. As Tables 2 and 3 demonstrate, second-year students on average recalled 56 percent of the most relevant propositions and 23.6 percent of the relevant facts. First-year students, on average, recalled only 38 percent of the most relevant facts and 19.1 percent of the relevant facts. Third-year students, on average, showed no improvement over their second year counterparts and actually showed a decrease in recall, although not to the level of the first-year subjects. They recalled 42 percent of the most relevant facts and 20 percent of the relevant facts.

Table 2: Mean Percentage of Most Relevant Propositions Recalled

	Group 1	Group 2	Group 3
Fully Recalled	14 (.7)	36 (1.2)	28 (.8)
Partially Recalled	24 (.9)	20 (.7)	14 (.5)
Total	38 (1.1)	56 (1)	42 (.7)

*SD in parentheses

found out the previous owner was an automobile rental company; (3) [plaintiff] relied on the statement that the car was "executive driven"; (4) plaintiff wants any damages to which he is entitled; and (5) your state has no statute that applied to the situation.

37. In determining relevance, we did not consider possible affirmative defenses to the claim. The question in the problem asked whether the plaintiff had any viable legal claim for damages, not whether he would eventually prevail. Like the *Miller* court, we used a summary judgment standard and focused only on the facts necessary to establish a prima facie case of common law fraud.

Table 3: Mean Percentage of Relevant Propositions Recalled

	Group 1	Group 2	Group 3
Fully Recalled	13.6 (.8)	20.9 (1.2)	15.5 (1.2)
Partially Recalled	5.5 (.8)	2.7 (.5)	4.5 (1)
Total	19.1 (1.4)	23.6 (1.3)	20 (1.8)

*SD in parentheses

Table 4 reflects the mean percentage of relevant facts recalled in relation to the number of propositions actually recollected by the subjects. Of the propositions recalled, second-year students recalled a slightly higher mean percentage of relevant facts than first-year students—34.7 percent compared to 30.8 percent—and a slightly lower mean percentage of irrelevant facts—65.3 percent compared to 69.2 percent. But again, third-year students showed no improvement. Of the facts they recalled, only 33.6 percent were relevant.

Table 4: Of All Propositions Identified, Mean Percentage of Relevant Propositions Recalled

	Group 1	Group 2	Group 3
Most Relevant	14.6 (1.1)	18 (1)	16.4 (.7)
Relevant	16.2 (1.4)	16.7 (1.3)	17.2 (1.8)
Total	30.8 (2.1)	34.7 (1.8)	33.6 (2.2)

*SD in parentheses

In terms of the ability to fully and accurately recall propositions, third-year students had improved results in regard to the most relevant facts recalled. As Tables 2 and 3 demonstrate, of the most relevant propositions these subjects, on average, recalled, 66.7 percent were fully recited, compared to 36.8 percent for first-year students and 66.3 percent for second-year students. As to relevant propositions they recalled, on average, third-year students fully recalled 77.5 percent, compared to 88.6 percent for second-year students and 71.2 percent for first-year students. Apparently, third-year students recall a smaller mean percentage of overall propositions and relevant facts than do first or second-year students, but when they do recollect a particular proposition, they are more likely to recall it more fully and accurately than first-year students and are at least as likely to recall it as fully as second-year students.

As might be expected, in relation to the specific relevant propositions recalled, second- and third-year students usually performed much better than first-year students. In regard to the specific wording of the alleged misrepresentation, for example, only one first-year student fully and accurately recalled "Warren told [Samos] that the car was executive driven," while four second-year students and six third-year students fully and accurately recalled that proposition.³⁸ Only four first-year students accurately recalled

38. One first-year student recalled that Samos "eventually decided on buying a car which he

"Samos wants any damage to which he is entitled," while nine second-year students and seven third-year students fully recalled this proposition. In regard to certain propositions, however, few students recalled very relevant propositions. No first-year students, for instance, recalled—either fully or partially—the proposition, "[Samos] relied on the statement that the car was 'executive driven.'" Only one second-year student recollected that fact, and only two third-years recalled it.

In summary, second-year students on average recalled more overall propositions and more relevant propositions than first-year students did. They also recalled more accurately the textual material provided. The knowledge gained in the first year-and-a-half of law school appears to affect students' ability to identify and recall relevant propositions in a problem. The performance of the third-year students, though, is different from that of their medical student counterparts. In the Patel studies, the final-year medical students were able to focus on more relevant features of the clinical information provided than students in earlier years of medical school.³⁹ Third-year law students, however, identified a higher mean percentage of relevant propositions than first-year students, but a lesser mean percentage of relevant propositions than second-year students. And in terms of all propositions recalled, they identified a mean percentage of relevant facts comparable to that of their second-year counterparts. They out-performed second-year students only in regard to their recall of most relevant facts and that was by a very slight margin. These findings appear to raise some questions about the effectiveness of the final year-and-a-half of law school on students' ability to focus on the relevant facts in a legal problem.

Drawing of Inferences

In addition to reciting specific factual propositions in the problem, many of the subjects drew inferences from the facts in the problem either during the recital or answer stages of the interviews. An inference was defined as the drawing of a conclusion from known facts based on premises known or assumed to be true.⁴⁰ In some instances, legal rules were the underlying premises of some of the subjects' inferences. An analysis of the identification of legal rules will be given in the next part. In other cases, the premises were based on the subjects' lay experience. The purpose of this analysis is to examine the effect, if any, of law school on the tendency of students to rely on common knowledge in drawing inferences.

believed to be executive driven." Another first-year student recollected that the dealer told him that the car "was previously owned by, a, um, executive, some sort of executive ownership." A third recalled that "the paperwork said it was a used car and that it is...was executive driven."

39. Patel et al., *Biomedical Knowledge in Explanations of Clinical Problems*, *supra* note 12, at 405.
40. See David A. Binder and Paul Bergman, *Fact Investigation: From Hypothesis to Proof* 82 (St. Paul, Minn., 1984).

To collect data on inferences, my research assistants and I independently examined every proposition in the transcripts throughout the responses to the problem. We coded every instance in which a subject did not merely recite a fact in the problem but made an assumption about it or drew an inference from it. We then reconciled the codings.

On average, first- and second-year students identified approximately the same number of inferences from common experience (2.4 and 2.7 inferences respectively), but third-year students drew substantially fewer inferences (1.3). These findings suggest three possible hypotheses. First, as might be expected, in reasoning about legal problems, students entering law school rely heavily on inferences drawn from their own common experience. The transcripts for these subjects are replete with such inferences: "Mr. Stamos's second language is English...probably first language is most likely some Spanish"; "the first thing I think of when I think of an auto rental is they, they really mess these cars up"; "he would be somebody easily taken advantage of by smooth talking salesperson"; "you would think that in buying a new car you would ask a lot of questions." Interestingly, second-year students continued to draw such inferences: "signs a whole bunch of paperwork...uh, typical sort of transaction"; "I think the dealer should have been aware of the person's limited knowledge"; "[he later found out that it was used in a rental car agency] which I am guessing means that the car took a lot more abuse."

Second, the actual substance of the inferences from first- and second-year students indicates what law instructors might call sloppy reading of the problem. Sometimes the students explicitly stated that they were making assumptions about the facts. But, at other times, students relied on their common experience to read facts into the problem. Here are some examples from first year: "he definitely wants used car because he can't afford"; "[after the test drive Samos] liked the car"; "he was happy with the purchase." Second-year students fared no better: "they don't speak English well"; "he didn't really know what [executive driven] meant"; "[he was] not highly educated." At least from these transcripts, it seems as if the second-year students continue to have problems paying attention to detail in the problem.

Finally, the substantial decline in inference-drawing by third-year students suggests that by the third year, students may be better able to pay closer attention to detail than their first- and second-year counterparts. Indeed, in most instances, when the students drew inferences, they couched it in tentative language (e.g., "apparently the uh, the car doesn't have any malfunction"). It may also indicate, however, that these students feel inhibited from using their common experience in solving legal problems. Perhaps the questioning regimen in law school classes and experience with exams have ingrained in them the notion that they should just stick to the facts given in a problem rather than rely on their own experiences.

Identification of Rules

The transcripts were also coded for identification of rules. A rule was defined as any factor that the subject took into account in determining if Samos had a claim for damages. The purpose of this coding was to assess the effect of increased exposure to legal doctrine throughout law school on students' ability to identify rules applicable to a particular legal problem.

Reviewing each proposition recited by the subjects during any portion of their discussion of the case, my research assistants and I identified every rule considered by each of the subjects.⁴¹ After we reconciled these identifications, the rules were scored for their relevance. A rule was scored as relevant only if it concerned one of the elements of a claim for common law fraudulent misrepresentation: (1) false representation; (2) material fact; (3) dealer's knowledge of the falsehood; (4) intent to induce reliance; (5) reliance by the customer; and (6) damages.⁴² Since our assessment was focused on identification of relevant rules, we scored a proposition as relevant even if the subject's application of the rule was different from the court's in *Williams*.

Tables 5 and 6 summarize the data on identification of rules. The average number of total rules identified by subjects increased from group-to-group. On average, first-year students identified 2.7 rules, second years identified 3.1, and third years identified 4.5 rules. The average number of rules identified as relevant increased only slightly between the different groups—1.1 relevant rules for Group 1 subjects compared to 1.3 for Group 2 and 1.9 for Group 3. But in regard to rules that *are irrelevant* to a claim for fraudulent misrepresentation, the numbers increased substantially—1.6 irrelevant rules for Group 1 compared to 1.8 for Group 2 and 2.6 for Group 3. In fact, in respect to total rules identified, nearly 60 percent of the rules identified by all three groups were irrelevant to a claim of fraudulent misrepresentation.

41. A chart reflecting the rules identified by each subject is available at <<http://www.student-legalreasoning.info/ruleid.html>> (last visited Sept. 16, 2006). Since a number of subjects began to answer the question raised in the problem during their fact recital, we did not limit our analysis of rule identification to the "Answer" stage of the interview.

42. *Williams*, 326 Ill. App. 3d at 648, 762 N.E.2d at 7. While this definition is very narrow, and it can be argued that experienced lawyers might be able to identify other possible causes of action for Samos from the facts in the problem, the most relevant common law claim from these facts is one for fraudulent misrepresentation. Our goal here was to examine the subjects' ability to identify rules concerning the most relevant cause of action, not possible rules applicable to some less relevant hypothetical claim. Accordingly, by scoring a rule as irrelevant, we intended only to note that it was not applicable to a claim for fraudulent misrepresentation.

As with the relevancy scoring for the fact recital, in determining rule relevancy, we did not consider possible affirmative defenses to the claim since the question in the problem asked whether the plaintiff had any viable legal claim for damages, not whether he would eventually prevail.

Table 5: Average Number of Rules Identified

	Group 1	Group 2	Group 3
Average Number of Total Rules Identified	2.7 (.9)	3.1 (1.8)	4.5 (2.1)
Average Number of Relevant Rules Identified	1.1 (1.3)	1.3 (1.3)	1.9 (1.2)
Average Number of Irrelevant Rules Identified	1.6 (.8)	1.8 (1.5)	2.6 (2.8)

*SD in parentheses

Table 6: Mean Percentage of Relevant Rules Identified

	Group 1	Group 2	Group 3
Relevant Rules Identified	40.7 (.4)	41.9 (.3)	42.4 (.4)
Irrelevant Rules Identified	59.3 (.4)	58.1 (.3)	57.8 (.4)

*SD in parentheses

The Group 3 subjects, more than their counterparts in other groups, appeared prone to generate different possible theories. One subject, for example, stated:

I wonder if a mechanic looked at the car and said that there was anything wrong with it I am not really sure why who the previous owner is makes not much of a...of a difference unless the dealership did falsify the documents presented to this man um so far it doesn't seem like the fact that he has an 8th grade education or has English as a second language makes a difference here because it doesn't seem like he was really taken advantage of...and the sticker said that there was no warranty on the car so he was alerted to the fact that he was buying the car as is...mean I guess he didn't know that he was entitled to know who the owner is he could have done a vin number search to see if it had been in any accidents or um had been stolen or had some kind of bad past history.... I also don't know what the difference between executive driven as he interpreted it and the used car uh car dealership owning the car.

Another subject responded:

There is always a lemon law warranty of some sort and every state has that, uh New York State definitely has that. Um and which, depending upon the mileage of the car, um goes to 30 days, 60 days, 90 days depending on the different parts of the car. So that would be um fraud there by not issuing a warranty. Um...also non-disclosure of it being from an automobile rental agency is also goes against, I believe, regulation Z of New York State law, um in which they have to disclose if it was a rental car previously having to

disclose that on sales receipts, um and I believe there are usually check boxes on the retail installment contract, and such um.

These responses seem to be drawn from the subject's own experience (e.g., the need to have a mechanic inspect a used car), doctrine learned in law school classes (e.g., lemon law warranties and undue influence), or experience in clerkship positions (Regulation Z or VIN searches).

These findings suggest that as students progress in law school, they are able to identify more rules in relation to a legal problem. But, at least in regard to the problem presented to the subjects in this study, their ability to identify the most relevant rules increases only slightly. At the end of their third year they seem prone to generate indiscriminately a large number of rules, many of which are irrelevant. This finding seems to reflect what Patel and her associates term "the intermediate effect." They have found that intermediates on their expertise scale, when confronted with a problem in their specialty, often engage in a wide scope of information gathering without screening out irrelevant information. They simply process too much garbage.⁴³ Here, third-year students appear to be processing too much garbage. For example, even though the problem explicitly stated, "Your state has no statute that applies to this type of situation," some of the Group 3 subjects appeared unable to keep themselves from identifying possible statutory rules applicable to the problem.

Identification of Procedural Aspects of the Case

Our review of the transcripts indicated that besides identifying substantive legal rules, subjects also explicitly raised recurring issues relating to the procedural aspects of the case. These included the lack of certain factual information in the problem and the need for fact investigation; the need for additional legal research; the impact of the lack of a statute on the problem-solving process; and the evidentiary and burden allocation issues raised by the problem. We decided to examine whether law school appeared to have any effect on the subjects' tendency to identify issues in those categories.

As with our analysis of fact recital, inference drawing, and rule identification, my research assistants and I reviewed each proposition in all the transcripts and coded different procedural issues raised by the subjects. We then reconciled these codings. Table 7 summarizes the data collected on these issues.

43. Patel and Groen, *The General and Specific Nature of Medical Expertise*, *supra* note 2, at 532.

Table 7: Procedural Categories Identified

	Group 1	Group 2	Group 3
Total Number of Procedural Categories Identified	10 (1.3)	9 (1.1)	15 (2.1)
Total Number Identifying Need for Fact Investigation	1	3	3
Total Number Identifying General Need for Legal Research	4	0	1
Total Number Identifying Need for Statute	1	1	3
Total Number Identifying Need for Analogous Cases	1	1	1
Total Number Identifying Burden Allocation	1	0	1
Total Number Identifying Evidentiary Rules	0	1	0
Total Number Identifying Lack of Statute	2	3	6

*SD in parentheses

Given the fairly low occurrence of identification of a number of these issues, most of our findings on this aspect of the study are tentative at best. Nevertheless, the data raise a few interesting questions. First, the failure of most upper-level students—many of whom had completed Evidence—to consider evidentiary and burden allocation issues seems puzzling. Only one subject (a member of Group 2) raised an issue relating to evidentiary rules (parole evidence), and only two subjects (one each from Groups 1 and 3) considered questions concerning burdens of proof. While the students may have felt limited to consideration of purely substantive legal issues since the problem only asked whether the client had “any viable legal claim for damages,” I find it surprising that more students did not raise some evidentiary issues given that the problem referred to numerous documents and a significant conversation between the salesman and the client.

Second, while the identification of the need for additional fact investigation increases between Group 1 and 2, the reverse was the case for the need for legal research. As shown in Table 7, only one Group 1 subject raised the need for further

fact investigation, but three subjects from both Groups 2 and 3 identified this issue. In regard to the need for legal research, however, four Group 1 subjects identified this issue but no Group 2 subjects and only one Group 3 subject raised it. (One subject from each of the groups also identified the need to find analogous cases.) While this dropoff seems odd, it could have been caused by the instructions by the interviewers that “[t]he information on the page is all the information available regarding the problem.” Perhaps considering this problem similar to a law school exam, subjects felt reluctant to merely answer it with the response that they needed to conduct further legal research. They may also have felt, however, that the problem was so simple, that they already had the requisite knowledge to respond to the question.

A more significant issue raised by the data on procedural aspects of the case concerns the identification of the lack of a statute. While only two Group 1 and three Group 2 subjects identified this issue, more than half of the members of Group 3 (six subjects) raised it. Several, in fact, expressed frustration that no statute applied to the problem. One third-year student, for example, responded, “It is tough to answer when you say that the state has no statute that applies to this situation.” Another observed, “I also don’t know if he should even bring the case because the only statute that we have is that he gets attorney’s fees.” These data suggest that as students progress through law school, they are more aware of statutory causes of action and in fact would rather rely on such claims to solve legal problems than consider common law theories.

Preliminary Hypotheses on the Development of Expertise in Law Students

The Patel studies of medical students show that as these students progressed through medical school, their reasoning strategies for solving medical problems changed significantly. Entering medical students relied on lay experiences and common sense explanations for medical problems and even when provided medical knowledge could not apply it effectively. Second-year students recalled more facts in a case but many of them were irrelevant. Moreover, while they could identify more rules than first-year students, they had difficulty developing coherent solutions to problems. Final-year students recalled fewer facts in the case than second-year students and were able to identify better patterns of relationships in problems and to develop coherent explanations for problems. These students were beginning to display the forward-directed reasoning approach used by experts in solving routine problems and identifying important cues provided in the problem to develop a hypothesis. Novice medical students used backward-directed reasoning, developing alternative hypotheses and testing them with the information provided. In the process, they identified more facts and rules but were less likely than their final-year counterparts to develop coherent solutions.

The findings in the current study are generally similar to those of the Patel research. Yet in some significant respects, especially in regard to third-year law students, they appear to be quite different. As might be expected,

the reasoning strategy of entering law students seems to be similar to that of their medical student counterparts. They relied heavily on their common sense experience and recalled fewer total facts and substantially fewer relevant facts than second-year law students. Perhaps because of their lack of knowledge of legal doctrine, they were less able to fully and accurately recall the facts in the problem and did not pay close attention to the factual details, often making assumptions about the case without realizing it. Finally, they identified fewer rules, although several did identify the need for further legal research. Entering students seem to rely on their lay experience and to have difficulty handling the facts in a problem or identifying applicable rules. As in the medical school studies, the findings of this research show entering students rely on their lay experience and have difficulty handling the facts in a problem or identifying applicable rules.

Like their counterparts in medical school, second-year law students displayed some significant changes in their reasoning process. Apparently using their increased knowledge of legal doctrine, they recalled substantially more relevant facts than first-year students and were better able to fully and accurately recite them and to remember the precise language of key elements of the relevant claim. These subjects, on average, were more likely to identify legal rules than entering students. But second-year law students were unable to distinguish adequately between relevant and irrelevant rules. Moreover, the students in this group often continued to rely on their own experiences in reasoning about the problem and still had difficulty paying close attention to the details of the problem. In short, like second-year medical students, their reasoning did not reflect a coherent approach to the problem or an ability to filter out irrelevant facts and rules.

Unlike the final-year students in the medical school studies, in most respects, the third-year subjects in this study showed only a slight change in reasoning strategy compared to second-year students. Similar to their medical student counterparts, on average they recalled fewer total facts than second-year students. They also were more proficient in fully and accurately reciting the language of the relevant facts, and, unlike the first- and second-year subjects, relied less on their own common experience in reasoning about the problem.

But unlike medical students, there was little change between their recall of relevant facts and that of second-year students. In other words, in contrast to final-year medical students, third-year law students apparently had not yet refined the skill of distinguishing adequately between relevant and irrelevant facts. The rule identification findings support this conclusion. Fourth-year medical students focused on developing a coherent explanation for a problem. On the other hand, graduating law students, on average, identified substantially more rules than first- and second-year students, and a large number of those rules were irrelevant to the claim for common law fraudulent misrepresentation. Indeed, the theory generation exhibited by several of the third-year subjects is more similar to the backward-directed reasoning of the second-year medical students than the forward-directed reasoning of the

graduating medical students. They simply do not appear to have begun to develop the screening process used by experts.

A number of reasons can be hypothesized for these findings about the strategies of third-year law students. Perhaps the doctrine learned in the first two years of law courses has not been reinforced adequately in the third year so graduating students are uncertain about the applicability of particular rules to a problem. Moreover, the significant offerings of statutory courses in the final two years may leave students handicapped when facing a legal problem in which only common law rules are applicable. In fact, the large number of third-year subjects who identified the lack of a statute as a problem suggests that we may be teaching students to look for the quick fix of an applicable statute or regulation. Additionally, the proliferation of perspectives and policy courses in the law school curriculum may not help students develop coherent rule-based theories for solving legal problems.

Another possible explanation is that, unlike medical school, all law students have not had a chance during their academic program to be involved in clinical studies. In medical school clinics, third- and fourth-year students have the opportunity to apply medical knowledge learned in earlier years in the actual treatment of medical problems and to develop forward reasoning strategies in the process. While it is unclear how many third-year subjects in this study had been enrolled in a clinical course, that experience would not have been equivalent to the extensive one provided in medical school.

This discrepancy between the findings for final-year students in medical and law school could concern the different natures of medical and legal problem-solving.⁴⁴ Perhaps by its very nature, legal analysis requires more backward-directed reasoning than medical practice. The psychological literature on expertise, however, suggests that across specialties, forward-directed reasoning is an attribute of expert problem solving.⁴⁵

Conclusion

Unlike other disciplines, scholarship on legal education has tended to be based on the instructor's experiential recollections, philosophical theories, or psychological theories developed in other areas. The study described in this article provides an alternative method for assessing the effectiveness of our pedagogy. Empirical research has a number of benefits: the use of anonymous samples, the application of standard methodologies and measurements, and, most importantly, the close analysis of actual reasoning by law students. This study, however, does reflect the limitations of an empirical approach to legal education. It is impossible to draw any definitive conclusions from this single study, especially one with a very small sample from only one law school.

44. See generally Mark N. Aaronson and Stefan H. Krieger, Teaching Problem-Solving Lawyering: An Exchange of Ideas, 11 *Clinical L. Rev.* 485 (2005).

45. See *supra* notes 6-10 and accompanying text.

The findings here suggest that second-year law students have begun to rely on their knowledge base in solving legal problems but still have some of the same problems in paying attention to detail as entering students. They also indicate that students have learned to pay more attention to detail between the second and third years of law school, but they have not yet started to use forward-directed reasoning and are unable to distinguish adequately between relevant and irrelevant facts and rules. While robust, these findings are very preliminary. The data and findings for this study should be thoroughly assessed by other researchers; this study should be replicated at other schools and with more controlled samples; and perhaps other types of problems (e.g., using a statutory issue or providing the applicable legal authority) should be administered.

Patel and her associates have provided legal scholars with the tools for quite rigorous analysis of our teaching enterprise. The use of semi-structured interviewing techniques, propositional analysis, and coding protocols provides researchers with methods for assessing a number of issues in legal education and practice. Possible research projects include the effect of particular courses in the curriculum (e.g., clinical and skills classes) on the development of reasoning skills in students; the impact of those courses on practice two or three years after law school; the nature of problem-solving used by generalists and specialists in practice; and the comparison between law school curricula and those in other professions on the development of expert problem-solving. These and other studies can help us assess the effectiveness of our curricula and pedagogy and better understand the limits of what we can accomplish in the three years of law school.

APPENDIX –PROBLEM

Eight months ago, your client, Alexander Samos, a 37 year old electrician with an eighth-grade education, went to the Midtown Chevrolet dealership and told the salesman, Edward Warren, that he was looking for a used vehicle. Mr. Samos, whose second language is English, had not dealt with the dealership on any prior occasion and called his decision to look at its cars “spur of the moment.” After discussing available cars and financing with Warren, Mr. Samos took a Nissan Altima (different than the one he eventually purchased) home for the night as a test drive.

The following day, your client returned the car to the dealership and began discussions about the 2001 Nissan Altima that he ultimately purchased. Warren told him that the car was “executive driven” and that it was a “great used car.” The sticker stated, “**2001 NISSAN ALTIMA, 4 DOOR GLE \$14,500. AS IS-NO WARRANTY.**”

Upon his decision to purchase the Altima, Warren prepared a number of documents for your client to sign. These documents, which Mr. Samos shows you, include a retail installment contract with a purchase price of \$13,999; an odometer disclosure form showing 31,248 miles; a handwritten vehicle sales order; a typed vehicle sales order; and a certificate of title. The retail installment

contract contains the typed word “used” in a box designated “New or Used.” Both vehicle sales orders contain checks in the “Used” box of a section which also contains boxes titled “New” and “Demo.” None of these documents make reference to the car’s prior owner. The front of the certificate of title lists “ENTERPRISE AUTO RENTAL OF INDIANAPOLIS” as the original owner. The back of this title contains a section labeled “First Re-Assignment By Registered Dealer Only” under which Midtown Chevrolet is listed as dealer and Alexander Stamos is listed as purchaser. Your client admits signing all the papers. Although your client does not remember in detail each form he signed, he did recall that he was neither pressured nor rushed to complete the paperwork.

Mr. Samos admits having driven the Altima since its purchase without any serious malfunction. But recently, his friend looked closely at the certificate of title and found that the previous owner was an automobile rental company. Your client states that he interpreted Warren’s statement “executive driven” to mean that the car had previously been used by high ranking employees of either Nissan or Midtown Chevrolet and feels that he was deceived into purchasing the car because he relied on that statement. Your client admits he knew he was purchasing a used car, but did not know, nor did he inquire further, about the Altima’s history or previous owner.

Your client wants any damages to which he is entitled. Your state has no statute that applies to this type of situation. It does have a statute, however, that allows a court to award attorneys’ fees to the prevailing party in any case concerning a consumer transaction.

Based solely on these facts, does your client have any viable legal claim for damages? What is the basis for your answer?